

The Legislature of Rockland County



HARRIET D. CORNELL

Legislator – District 10

Chair – Environmental Committee
Chair – Special Committee on Transit

Economic Development Committee
Budget & Finance Committee

October 5, 2015

VIA ELECTRONIC FILING SYSTEM

Hon. Kathleen M. Burgess
Secretary to the Commission
New York State Public Service Commission
Agency Building 3
Albany, New York 12223-1350

Re: Reference Case 13-W-0303 - Proceeding on Motion of the Commission to Examine United Water New York Inc.'s Development of a Long-Term Water Supply Source
NOTICE SEEKING PUBLIC COMMENT ON ABANDONMENT OF THE HAVERSTRAW PROJECT PLAN ("NOTICE")

COMMENTS OF Harriet Cornell, Chairwoman, Rockland Task Force on Water Resources Management, in Cover Letter on behalf of the Task Force; Comments from Task Force Committees; and Technical Memorandum of Amy Vickers & Associates, Inc. which includes two attachments.

Dear Secretary Burgess:

Thank you for the opportunity to respond to the Public Service Commission with regard to the above referenced Notice Seeking Public Comment. On behalf of the dedicated women and men of the Rockland Task Force on Water Resources Management, I thank the Public Service Commission for giving Rockland County the necessary support and opportunity to create a safe, long-term water supply plan that incorporates sustainability, demand-side principles and conservation. We are doing this with a data-driven approach, with independence and transparency so all will have confidence in the outcome. Special thanks to Chairwoman Audrey Zibelman and to Chief Policy Advisor Peter McGowan for their assistance during this first year of the Task Force.

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On August 6, 2015, the Public Service Commission (Commission or PSC) released a *Notice Seeking Public Comment on Abandonment of the Haverstraw Project Plan* (Notice) in reference case 13-W-0303 (Needs Case) in which the Commission asked whether abandonment of the Haverstraw Desalination proposal is in public interest and requested comments on two relevant reports filed by United Water New York, Inc.¹ (UWNY) and the Rockland County Task Force on Water Resources Management² (Task Force). The reports were filed to comply with the Commission's Order issued on November 17, 2014 (November Order) that required, *inter alia*, that UWNY work with the Task Force to identify measures to reduce water demand by two million gallons per day (MGD), conduct a study of other potential water supply projects that could provide said amount of water supply and repair public image and trust of the community.

I am Harriet Cornell, Chairwoman of the Rockland County Task Force on Water Resources Management and Chairwoman of the Legislature's Environmental Committee. From January 1, 2005 through December 31, 2013 I served as Chairwoman of the Legislature and submitted formal comments on the topic of the Haverstraw Water Supply Project (desalination), to state agencies including the Public Service Commission, contending that a combination of actions to ensure a safe, long-term sustainable water supply would preclude the necessity of a single energy-intensive project which carries with it a number of undesirable and costly results. With the creation of the Rockland Task Force on Water Resources Management, its ongoing work, and the strength of the independent Report commissioned by the Task Force (Vickers Report), I am confident that this is the path to follow.

On behalf of the Task Force, I respectfully submit Comments in response to the Commission's Notice in this letter. The Task Force submission also includes Comments from Task Force Committees. These documents address the issue of abandonment of the desalination proposal, as well as United Water's June Report and the TF Vickers Report and related relevant documents. Notably, the Task Force submission also includes *Technical Memorandum*³ prepared for the Task Force by Amy Vickers & Associates, Inc., which addresses comments and questions, including those submitted by UW to the Commission on August 4, 2015, prepared by UW's consultant Ove Arup & Partners, P.C. ("Arup Company" and "*Arup Report*").

Special Thanks

For the most part, the members that comprise the Task Force and members of the public have had the past several years to understand and learn the details of the desalination project, its potential impacts and available alternatives to it. And, in fact, numerous members of the public, elected officials and concerned organizations have devoted countless volunteer hours to doing just that, resulting in the parties joining under the leadership of the Task Force. I extend my

¹ On June 30, 2015, UWNY submitted to the PSC its *Report on Feasibility of Incremental Water Supply Projects and Conservation Opportunities, Rockland County, New York* ("UW Report" or "UW June Report").

² On July 22, 2015, the TF filed the final report, *Water Losses And Customer Water Use In The United Water New York System* ("Vickers Report"), prepared by Amy Vickers & Associates, Inc. as a supplement to the TF Interim Report that was timely filed with the PSC on May 18, 2015.

³ Following UW's submission of the Arup Report and allegations of errors in the Vickers Report, the Task Force hired Ms. Vickers through the County, under a new contract, to provide additional consultation and address substantive comments and questions that require her level of specialized expertise and experience.

deepest appreciation to all these individuals and organizations. *I especially want to thank Patricie Drake, Esq, the Coordinator of the Task Force, for her most excellent work in helping to propel Task Force priorities, always with intelligence and good cheer, and for her work with me to develop this Task Force submission. My thanks go as well to her predecessor John L. Parker, Esq. who helped to focus the newly-created Task Force and provide immeasurable wisdom and advice.*

The public has been introduced to such concepts as rule curve negotiation, demand side solutions, drought management, price elasticity and surcharges, among others. The Task Force and residents of Rockland County are in a far better position now to participate in and contribute to the development of a comprehensive water plan under the leadership of the Task Force that now forms the nerve center of the concerted water efforts in the County. The public is now better educated and motivated and is eager to play a role in this process.

PSC Precedent in Rockland

It was pointed out recently by a volunteer and a water expert, that in the history of water conservation in Rockland County there is a precedent for the PSC to take an active role with respect to UWNY and the actions UWNY is required to take with respect to water conservation. In the 1980s and '90s the PSC played an active role with UWNY, requiring the analysis and implementation of conservation programs. This included the summer-winter rate structure implemented in 1980 and the conservation studies and programs implemented in the early '90s. This historical precedent for an active Public Service Commission role with respect to conservation is encouraging in the present circumstances where outdated measures are no longer the best that UWNY can do and the community has become greatly involved, sophisticated and collaborative in the effort. Not only did the technology change, the social, economic and political winds have shifted to create the perfect climate for concerted and aggressive conservation planning and implementation. Conservation must be part of the water story and it has to be done with the community.

How To Succeed In Conservation By Really Trying

For years before Amy Vickers did her analysis of the UWNY system and customer use and found that between 4.4 to 7.0 mgd of water could be saved by aggressive conservation and through leak reduction, other esteemed experts have been saying the same – there is much opportunity that is untapped.

For instance, Dr. Stuart D. Braman, adjunct associate research scientist at Lamont-Doherty Earth Observatory at Columbia University, has previously presented his views with regards to the conservation potential in Rockland County in his testimony to PSC in 2013⁴. Dr. Braman has been studying residential water use in the County since 2007 and he pointed to the two Columbia University Sustainable Development Workshops that the county worked on in 2012 to begin to address water conservation potential in Rockland County. The first workshop estimated water savings that could be achieved from increased water conservation using software and

⁴ These comments were in response to the United Water Supplemental Submission, *Response by United Water New York, Inc., to Issues Raised During the Public Statement Hearings*, November 8, 2013.

methodology from the Alliance for Water Efficiency on behalf of the Rockland County Department of Health (an active Task Force member.) And in the course of a project for the Environmental Committee of the Rockland County Legislature, the second workshop did due diligence and a sensitivity analysis to increase comfort with the results of the first workshop. The results have been presented publicly three times in Rockland County. At least two and probably all three of the presentations were attended by United Water employees.

These workshops assessed the impact of potential water conservation programs, both individually and in combination. The programs analyzed were:

- High efficiency toilet rebate programs,
- High efficiency washer rebate programs,
- Water efficient outdoor nozzle & water efficient pre-rinse spray nozzle giveaway programs
- Irrigation controller rebate programs and
- Outdoor water waste ordinances

As Dr. Braman notes, in addition to estimating water savings, the workshops analyzed cost effectiveness as well, under both pessimistic and optimistic assumptions. This was the kind of feasibility study that UWNY was asked to do by PSC in its 2014 November Order but did not deliver in its compliance June 2015 Report. UWNY was invited to contribute survey data to the analysis undertaken at Columbia in order to make sure that the best available information was used, but it declined; nor has UW ever commented on the results of this research, providing an analytic response that would suggest an alternate view.

Dr. Braman testified that the combined results of all the programs studied by the Columbia workshops were cost effective under both pessimistic and optimistic scenarios, and savings 9 years into the program ranged from 1.14mgd in the pessimistic scenario to 3.15mgd in the optimistic scenario. Looking at the mean result of 2.15mgd and adding in a proportional amount of non-residential conservation yields approximately 3mgd savings. These identified amounts of feasible conservation payoff are consistent with the amounts identified by others that had spoken on these issues and commented to the PSC previously, such as Amawalk Consulting, former Commissioner Al Appleton of New York City Department of Environmental Protection, and many others.

Now, Amy Vickers has drawn her findings from UWNY's actual data and its public filings, and her findings turn out to be in the same order of range as previously projected by others. This is very encouraging news for the Task Force and for the County of Rockland. It is my hope that these findings will further encourage active support of the Task Force by the PSC in pursuit of modern and innovative conservation planning with UWNY as a key partner.

As Dr. Braman enumerated in his testimony, there are numerous conservation actions UWNY is legally empowered to undertake with PSC approval. With the exception of an Audit Pilot Program to assess water fixtures in County government public buildings, the majority of other measures were not explored for feasibility and not planned for in collaboration with the Task Force in preparation of UWNY's June Report.

UWNY again touts its water conservation device distribution program that is modest in design and goals compared to the high efficiency toilet and washer rebate programs analyzed by the Columbia Sustainable Development Workshops and compared to the programs that could be assessed if UWNY completed the Conservation Feasibility Study in collaboration with the Task Force. The June Report rehashes the same uninteresting story on UWNY's commitment to conservation. UWNY failed to provide any analysis or concerted plan, and failed to address the potential gains from more ambitious kinds of programs. Instead, UWNY is continually giving the impression that it has invested its analytic resources solely to defend no further action on demand management rather than assessing what might actually be accomplished.

UWNY has made claims that the majority of UWNY's customers already use water-efficient plumbing fixtures. No source for these claims was revealed and in fact, during UWNY's time with the Task Force, UWNY finally began a pilot Audit program: the fate of its broader implementation is now uncertain as UWNY withdrew from participation on the Task Force. Rockland County has a relatively old housing stock with only 17% built after 1990, when the U.S. Energy Policy Act of 1992 went into effect mandating low-flow plumbing fixtures, etc. Probably many homeowners have updated kitchens and bathrooms in their older homes but without actual research to verify, UWNY's claim is specious. If new fixtures were installed in only 50,000 units or half of the housing stock in Rockland, it would amount to significant water savings. However, the details of conservation planning are not fleshed out in the June Report.

It is truly striking that the Task Force input and effort do not seem to feature in the UWNY report in any way, other than one or two general references to the existence of the Task Force. The conservation section notably does not show any integration with the Task Force, but merely rehashes former, and often admittedly ineffective, disjointed projects that satisfy minimum requirements. There is not much in the manner of analysis or goals to be reached, but there are again citations of "limitations" that are self-imposed if UWNY insists to remain absent from its commitments with the Task Force.

If UWNY is serious about achieving and not just nominally promoting conservation, it needs to reach out to the public, rather than wait for the public to find UWNY. The Massachusetts Water Resource Authority, which UWNY cites, is an inspiring example. Facing a major infrastructure project to increase water supply, they reduced per capita water consumption by one third after a sustained conservation effort. This was achieved by first addressing 'lost water' or leaks in the system, implementing code changes, and instituting an aggressive conservation program. They designed a pilot program to determine which strategies were most effective for households and discovered the most cost-effective method was **direct installation of low-flow fixtures in homes**. They do public education to teachers and students, outreach to the private sector and collaborate with other utilities. As its Director of Research explained in a phone call, "*The best time to do conservation is when you have people's attention.*" We have the public's attention and, thankfully, the attention of the PSC.

I included this information in my testimony to the PSC on October 1, 2013⁵ and my written comments of November 7, 2013 after my assistant had interviewed the Director of the MWRA.

⁵ See New York State Public Service Commission, Transcript Public Hearing (October 1, 2013), Case No. 13=W-0303, Leg. Harriet Cornell Reports at page 19.

It highlights the importance of effective strategies that are energetically, consistently and pro-actively promoted. When MWRA subsequently expanded the program, they added residential leak identification and education. The system leak detection program is on-going.

Another proven program, Operation WaterSense, has produced impressive results for years. This program was neither quick nor inexpensive but in comparison to UWNYS's proposal to build a desalination plant, it is both. The Task Force and the County of Rockland recently joined the EPA WaterSense program and many measures are already being processed through the Conservation Committee, as noted in the comment document attached.

United Water Report of June 2015

In response to United Water's June Report and its recent unilateral withdrawal from the Task Force, I would like to offer my characterization of the submission and recent events, as well as a few specific points that follow in this document.

I found the submission by United Water to be encouraging in some respects and very disappointing in others. The encouraging part is that UW has recognized that its past demand projections have failed to materialize, that supply and demand are likely to remain balanced for at least the next decade, and that there is time and opportunity to explore other sustainable long-term water supply alternatives.

The Task Force leadership and membership have worked respectfully with United Water, and have voiced and demonstrated appreciation for UW staff support and promises to assist the forward momentum of the Task Force. UW management remarked in its May 15 letter⁶ to the Commission on the close, collaborative work and the "*productive and respectful dialogue among stakeholders*" that the TF leadership fostered. At that time, UW expressed gratitude for the opportunity to be active participants and for having the initial phase of the Conservation Study underway. It is clear that the TF and UW can work well together.

On the other hand it was disappointing to see United Water submit a report by Ove Arup Company to the PSC, that was so deficient in factual data applicable to this case, that the title page had a disclaimer that "[i]t is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party."⁷ While that disclaimer may be standard language in certain transactions, it is embarrassing and disrespectful when a document is being submitted in a high-stakes public forum where the reliability of the information is essential for third party recipients-- in this case the members and staff of the New York State Public Service Commission.

<http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={490CF409-004F-400B-819B-71EE6158B504}>

⁶ On May 15, 2015, UWNYS filed with the PSC a letter in Ref. Case 13-W-0303, requesting that PSC extend the deadlines set under the November Order to study conservation opportunities ~~with~~ in collaboration with the Task Force and to file a report within six months of the order with feasibility studies.

⁷ Arup & Partners P.C., *United Water New York Inc. Independent Review of July 2015 Report Entitled "Water Losses and Customer Water Use in the United Water New York System," Prepared by Amy Vickers & Associates, Inc.*, (Arup Report), August 4, 2015, see Title Page. Filed by UWNYS in PSC Ref. Case 13-W-0303 on August 4, 2015.

The UWNY-Arup Report sought to discredit the Task Force Report as an “*aspirational advocacy document, and not as a serious engineering study,*”⁸ but the reality is that the in-depth analysis of United Water customer and system use by Vickers confirmed in detail what a number of other distinguished experts had delivered in oral and written testimony to the PSC in 2013 on the question of Need. For example, Charles McLane III, PhD, founding Principal of McLane Environmental, LLC, in Princeton, NJ, who for nearly 30 years has provided hydrologic and hydrogeologic investigations, including the management, planning, protection and restoration of water resources for corporate, municipal and governmental clients as well as site characterization, remediation and groundwater modeling activities at U.S. Department of Defense and Department of Energy sites, testified to the PSC on October 1, 2013 and filed a written report the following month⁹.

In it Dr. McLane said, “*the system capacity increase that UWNY contends is needed to meet future demand was developed, presented and applied in a misleading and improper manner. In order to support the claim that a new water supply project is required for Rockland County, UWNY has provided overly conservative demand figures and fabricated a requirement for a 7.5 mgd supply increase when in fact this number is an engineering estimate of the potential desal plant output and not an actual water demand projection. UWNY then improperly held other water supply alternatives up against this false and overblown 7.5 mgd standard (without consideration of reasonable combinations) and then failed each alternative when the alternative, standing alone, was unable to ‘compete’ with the desal plant output.*”

His conclusion was that realistic current and future estimates of water demand, coupled with an assessment of the County’s water resources based on current trends, technology and hydrologic information demonstrate that a new water supply project is not needed for a time period extending to at least 2025, and that there is adequate time to develop a plan that integrates proper water resource management in a way that is most advantageous to Rockland’s current and future residents as opposed to a plan based solely on increased production that will only exacerbate current water problems and costs.

It is even more disappointing that despite the findings in the Vickers Report and despite UW’s own conclusions that supply will be sufficient over the next 10 years, UW persists in considering the Haverstraw desalination proposal. Water demand has been flat since approximately 2000, a nation-wide trend that is likely to continue, experts say, despite growth in population. More people are using less water and the current system has 5.5 million gallons a day more than is in demand. It is clear at this juncture that the desalination proposal is not needed and its exorbitant cost to the rate-payers and the environment could not be justified. It would be imprudent, when system water loss recovery and robust conservation efforts could boost the available quantity of water supply by 4.4 to 7.0 millions of gallons per day (*see* Vickers Report). **The Haverstraw**

⁸ Chris Graziano (General Manager, UWNY), Cover Letter of Arup Report to Kathleen Burges (Secretary, PSC), filed in PSC Ref. Case 13-W-0303 on August 4, 2015.

⁹ Report of Dr. Charles McLane III., Ph.D., *Evaluation Of The Need For United Water New York, Inc.’S, Development Of A New Long-Term Water Supply Source Based On A Review Of Rockland County, New York Hydrologic Factors*, November 2013. Filed with Ref. Case 13-W-0303 on November 8, 2013.

Project will continue to be a source of conflict within Rockland County if this project is left in abeyance, hanging as a sword of Damocles. It should be terminated.

Glass Half-Empty?

Unfortunately, the classic “glass half-empty” approach creeps in again, as UW continues to downplay the potential impact of conservation and continues to cite "private company" limitations to its conservation efforts and its involvement with the Task Force as an excuse for lack of commitment to continued collaboration on the required Conservation Study. United Water's June Report markedly lacks any meaningful integration of the Task Force in the very brief recitation of its own limited conservation projects, which were not prepared in collaboration with the Task Force, and which are more geared to meet minimum required response than to foster actual concerted pursuit of aggressive, innovative conservation measures specifically tailored to Rockland County.

The Commission's November Order linked the company as a partner and stakeholder with a government-community Task Force because it wisely recognized that, *inter alia*, United Water had a credibility problem; and a successful implementation of a robust conservation effort requires involvement with community stakeholders and cannot be achieved in a self-imposed vacuum.

Rockland County government named UWNYS as a Task Force member under law, and UW accepted and made commitments. The County of Rockland and the Public Service Commission both decided that United Water will be a part of the solution for the water needs of Rockland County. United Water is a business and clearly needs to make business decisions. But it has another role: that of participant on a legally-constituted Water Task Force with directives from the PSC. It is therefore important that United Water be required to fulfill its role and legal obligations on the Water Task Force and furthermore to contribute technical expertise, information and data in a timely manner, and financial resources in order for the Task Force to accomplish its public mission.

The parties that are working together on the water issues are diverse and, importantly, that requires sometimes contradictory world views to come together to reach consensus. At this point, we ask that the PSC make clear, as will the Task Force, that United Water is expected to meet its obligations through active participation. Again, United Water may not lament the limitations it has as a private entity in implementing a successful conservation plan, and with the next breath unceremoniously opt out of a partnership forged by the County government and the Public Service Commission that was intended to help overcome these cited limitations. Such a course of action is irresponsible when the large bulk of our work still lies ahead of us. The Task Force is ready to welcome UW back to the table, despite any differences or conflicting incentives, and I have already extended that invitation in person to the General Manager of United Water.

Rockland's Glass is Full

I propose to the Commission that what we have is a great opportunity to turn a corner: Rockland's "glass" is full, and there are a number of ways to ensure that it stays full for generations to come. There is a task at hand and we are ready to do it. We are *determined* to succeed. This work however requires commitment of resources as well as good will to carry on collaboratively, our government-community Task Force and United Water in a unique public-private partnership. The Conservation Study that the Commission requested remains unfinished.

Very truly yours,

A handwritten signature in cursive script that reads "Harriet Cornell". The signature is written in black ink and is positioned below the closing "Very truly yours,".

Harriet Cornell
Chairwoman, Rockland Task Force on Water Resources Management

**ROCKLAND COUNTY TASK FORCE ON WATER RESOURCES
MANAGEMENT**



COUNTY OF ROCKLAND

**NOTICE SEEKING PUBLIC COMMENT ON ABANDONMENT OF
THE HAVERSTRAW PROJECT PLAN ("NOTICE")**

Reference Case 13-W-0303

Proceeding on Motion of the Commission to Examine United Water New
York Inc.'s Development of a Long-Term Water Supply Source

**Comments from Rockland Task Force on Water Resources
Management**

October 5, 2015

Leg. Harriet Cornell
Chairwoman

Patricie Drake
Task Force Coordinator

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I. EXECUTIVE SUMMARY

A. Desalination Against Public Interest - Task Force Continues Work to Identify Ways To Conserve Supply and Reduce Demand, Awaiting UW's Collaboration

Following years of public concern about United Water's proposed Desalination Plant, where residents and elected officials asked who would pay for the new energy-intensive facility, whether it was needed, whether it was sustainable and whether residents would have confidence drinking water pumped from the river near Indian Point, the New York State PSC decided to hold public hearings in Rockland on the question of "Need."

Two hearings were held in October 2013, one in the Town of Clarkstown and one in the Town of Haverstraw. Over 1700 residents attended the hearings. On November 17, 2014 the Public Service Commission put the desalination plant on hold and further ordered United Water to produce solutions to the water needs of the future and to do so with the already-established Rockland Task Force on Water Resources Management¹. The PSC has been extraordinarily supportive; the PSC's interest, as clearly stated by Chairwoman Zibelman, is to have a successful model which can be replicated for future water conservation efforts throughout New York State.

Since June of 2015 three separate reports have been issued regarding the potential for water demand reduction in the Rockland County United Water New York service area.

- The United Water New York (UWNY) Report of 6/30/15
- The Vickers & Associates Report (Vickers) of 7/21/15
- The Arup Report of 8/4/15

Although the reports differ on a range of details, each clearly identifies one important finding for Rockland County, that water supply and demand are balanced for at least the next ten-year period, and possibly longer. Multiple factors contribute to this finding, but one important piece is the decline in customer water use in Rockland. This decline in use is in line with national trends over the last several decades and can be attributed in part to improved efficiency in fixtures and appliances. While conservation measures may have contributed to this reduction in use, the reports also agree that additional conservation opportunities exist, and in fact each identifies some general options. The fact that all three reports arrive at one bottom line highlights the opportunity for Rockland County to develop a comprehensive water management and conservation plan in order to more specifically identify and implement additional water saving measures. Additionally, it clearly illuminates the finding that there is no need for a desalination plant in Rockland County. This project should be formally abandoned.

The road ahead for Rockland County has some rocky patches. In addition to the major issue of funding, the stated intention to circumvent the work of the task force is a major problem, an impediment to progress. A holistic approach is needed, including public education, coordinated messages and coordinated policy initiatives. A fragmented approach will result in confusion and further conflict. In other words, we need an approach that gets at water use from multiple angles and

¹ The Task Force was created in June 2014. See Rockland County Resolution No. 296 of 2014 Repealing Resolution No. 599 of 1999, Disbanding the Rockland County Water Board and Creating a Task Force on Water Resources Management, June 19, 2014. The Task Force is comprised of 19 members who are representatives of the County Executive, the County Legislature and representatives of local government, academia, business, advocates and United Water.

is well coordinated to leverage the resources of the company and equally important, the political will that can be mobilized only through the task force. The conservation rate, water audits, technical assistance, and incentives, all need to be joined with a vigorous and sophisticated public education program with shared messages coming from the task force. However it is important to remember that we have identified that the County has sufficient water for at least the next decade. Three reports have been completed, and while they disagree on a wide range of details, on this point they are crystal clear. The desalination plant should be formally abandoned at this time. Until this action is taken by the PSC there will never be full commitment or focus by UWNY on working with the Task Force to protect our water resources.

We know we have the time to develop the plan—there is no crisis. We want the opportunity. It is PSC’s support that the Task Force and Rocklanders need.

B. Key Vickers Findings Show No Need For Desalination:

- Water demand has been flat since 2000, despite growth in population – more people are using less water and the current system has 5.5 million gallons a day more than is under demand. United Water itself predicts that its supply will be sufficient to meet demands over the next 10 years.
- Customer-oriented conservation measures—reasonable limitations on summertime irrigation, water efficient fixtures, conservation rebates, and rainwater harvesting, among others—could reduce demand by up to 3.6 million gallons per day.
- Nearly 3.3 million gallons per day of water is being lost to leaks in UWNY’s current system! UWNY is more than a decade behind the state-recommended timetable for surveying system leaks and in 2014 was on a staggering 704-year schedule to replace all their mains if this pace continues.
- In the years 2012 and 2013, UWNY main replacement schedule was 248 and 389 years respectively, yet, UWNY characterized this backslide in 2014 as “*UWNY has made significant progress*”
- Neglect in the timely repair of leaks results in much higher costs to the ratepayers and other impacted parties at a later date (for example damage to homes and businesses and other infrastructure).
- The estimated average 63 gal/connection/day lost to leakage in 2014 is equivalent to an additional water-using occupant at every service connection in the UWNY system (Vickers Report, pages 2-13 to 2-14). With nearly 75,000 single family homes in the service area, this is equivalent to adding 75,000 people to the population in the service area!
- 4.4 – 7.0 million gallons of water can be saved daily by conservation and leakage reduction combined – almost as much as UWNY’s desalination project would have provided. No long-term water supply project is needed and the desalination project must be abandoned!
- Capital costs to develop additional freshwater supplies usually range from about \$2 million to \$9 million per mgd of capacity. In comparison, desalination plants run this cost up to tens of millions; the estimated cost to build the Haverstraw desalination plant’s initial phase with 2.5 mgd capacity would bring the cost to \$60 million per mgd. The proposal is oversized for Rockland’s needs, too expensive for ratepayers and has other negative impacts.
- UWNY’s decades long record of high system water losses and minimal conservation efforts have put the public, ratepayers and the environment at risk. Now, UWNY must comply with an earlier PSC order and fully cooperate with the Rockland Water Task Force as it examines water conservation as an important component of long-term planning.

- The PSC should assist the Task Force in devising funding and technical resources in collaboration with UWNY to develop a comprehensive conservation plan in Rockland County.

C. UWNY June Report Drops Task Force Input on Water Supply Alternatives, and Lacks Conservation Feasibility

- The UWNY June Report purports to be submitted in response to the directive of the PSC's November 2014 Order to identify feasible conservation measures to reliably reduce water demand and small-scale incremental water supply projects that may be implemented for United Water's operations in Rockland County, but many options were ignored and no feasibility or substantiated consideration was provided.
- Water usage trends have changed significantly enough in recent years to indicate that there may be enough time to pursue demand reduction strategies before new supply projects are needed.
- Decentralized, small or mid size series of water supply projects together with water save from leakage (real water loss) and from conservation can meet the needs of UWNY's customers long into the future.
- Both the Vickers' Report and UWNY's Incremental Report either say, or infer, that the long-term water supply source plan does not need to be pursued at this time
- Some of the initiatives mentioned in the UWNY report appear positive, but there is not enough detail provided to understand what is really being proposed.
- UW's June Report does not contain the required Conservation Feasibility produced in Collaboration with the Task Force as Ordered by PSC. The Task Force and UWNY yet need to identify and evaluate specific conservation opportunities that are best applicable in Rockland County, analyze the costs and benefits of such measures and estimated demand reductions associated with each conservation measure.
- United Water, despite its resources and the tens of millions of dollars spent so far, failed to properly analyze the alternatives to its proposed desalination plant in the proceeding to date and while working with the Task Force ignored questions and input.
- Both the Task Force and UWNY will be most effective when they work together. Choosing to operate outside the Task Force reduces UWNY's community reach and will in all probability result in ongoing confusion and conflict with the Task Force, thus impeding progress.
- The Conservation Committee of the Task Force has discussed a rebate program and has asked repeatedly for an update from UWNY in order to co-promote this project. We have asked for an open dialog on this item but have not received any feedback.
- Water audits & technical assistance could play a significant role, especially if this was a requirement for largest commercial and residential users.
- Both UWNY and ARUP list the UWNY conservation programs that are already in place, the very same public education program for which the company has consistently forecast a 0.1% demand reduction goal, half of the natural replacement rate for fixtures.
- ARUP mentions the 5,000 conservation kits given out in 1990s! 25 years later these kits should not be considered part of their conservation program, we are forced to wonder what the impact would be on 77,000 households, most of them with multiple fixtures. In fact, those of us that installed energy efficient appliances 25 years ago would note that 1) more efficient appliances are available today, and 2) few of those appliances are still in use today.
- UWNY often mentions that they already have conservation rates. Their existing water rates are very far from a true conservation rate.

- UWNJ needs to catch up with modern technology on infrastructure maintenance, and look at using C-900 PVC pipe for water main construction and replacement. It is cheaper, lightweight and easier to install versus ductile iron pipe.
- It is time to give a very thorough review of the requirements and standards in UWNJ's Underground Infrastructure Replacement Program (UIRP). The PSC should have the UIRP assessed for performance and updated as needed to propose a new schedule of main replacement and speed up the system wide replacement from its current inadequate pace.
- UWNJ's The Arup Report of 8/4/15 was contracted by UWNJ as a review of, and response to, the Vickers report. The Arup is not a report on water use developed from a review of the primary usage data; rather it is a report on a report, completed in short 2 weeks. The report is unsupported with any actual data or robustly demonstrated analysis. In no way does it address any of the questions raised by the Vickers report in a substantive manner.
- UWNJ has not addressed or resolved apparent data discrepancies pointed out by an independent consultant upon several months of review
- United Water's June Report fails to properly explore the renegotiation of an equitable apportionment of the safe yield from the Hackensack River, which holds the potential to increase Rockland County's water supply by 11.42 Million Gallons Per Day. UWNJ may have a conflict of interest due to its status as a whole owned subsidiary of UWNJ that would be possibly adversely affected by this renegotiation.
- Based on the information available, a Committee Member estimated that Rockland could draw as much as 7 MGD from the New York side of Lake Tappan; depending on the safe yield of Lake Tappan and the passing flow rate per square mile in MGD.
- UW June Report fails to properly evaluate and provide basis for rejecting the option of Dredging Lake DeForest to increase its capacity.
- The cut off for production of new wells should not be 100 gpm since UW already has wells that produce at that lower level. By raising minimum production, several hundreds of thousands of gpm may be artificially excluded from analysis and development.
- UW's statement about how is arrived at the subject 10 potential well sites seems conclusory. UW should provide a sworn financial statement specifying all costs incurred regarding tests down at all above mentioned sites: costs of pumps tests, land, taxes, environmental tests, permitting, etc.
- UW failed to provide information on the capacity of all the wells on the Pfizer site and Nanuet School District (FKA St. Agatha's property).
- Overall, as to all site considered (not just 10 preliminary sites) UW should provide any and all permits (even those that may have expired) for each such well, from whatever agency or governmental authority that it possesses.
- Task Force agrees that development of a modeling tool to further evaluate the interaction between the Ramapo River and the RVWF is a task worth taking on, but the watershed assessment must be extended beyond political boundaries and must include Mahwah River Watershed.
- Reusing wastewater is an essential strategy for wastewater treatment plants in those areas where water is a scarce commodity, and UV disinfection is a key element in the treatment scheme.
- If a suitable area, sufficiently away from residential and public areas (such as parks) can be found in close proximity to any of the wastewater treatment plants in Rockland County, portions of their effluent can be discharged into seepage areas that could have significant impacts on the underlying aquifers.
- Cleaned plant effluent can also be use to supply people with irrigation water, fire hydrants, and process water for cooling units, etc.

- An ancillary benefit to reusing plant effluent is that eventually you will significantly reduce pollution in the Hudson River, a benefit that could not be claimed by the desalination plant that which would have untold adverse environmental impacts.
- UWNY proposed its Desalination Plant to be constructed in close proximity to the JSRB plant, so that it would received the waste load from plant. Instead, a simple conversion of the treatment train to handle recycled water from the JRSB plant would yield a potential supply of 8.0 MGD of recycled water for the residents of North Rockland (Towns of Haverstraw and Stony Point) at a far lower cost.

II. INTRODUCTION & BACKGROUND

Rockland County's water supplier is the private company United Water providing over 90% of its water. The public service commission regulates United Water and the rates it charges its customers. The Commission required United Water to determine how it would supply water through the year 2035. The company's proposal, a plant that would desalinate Hudson River water, and the process for its approval awakened the community. Many hard questions were asked, prompting the Commission to order United Water and the Task Force on Water Resources Management to work together to determine a water conservation strategy.

The United Water New York Haverstraw Water Supply Project was the subject of lively debate since it was proposed in 2007. The company, which supplies water to over 90 % of the water customers in Rockland County, was required by the Public Service Commission to evaluate and to propose new sources of water supply that would produce an additional 7.1 million gallons of water per day by the end of 2015.² The proposal was reviewed by a number of New York State agencies, including the Department of Health, the Department of Environmental Conservation, and the Public Service Commission. The environmental review, required by the State Environmental Quality Review Act, would focus regulatory agencies on the project details and the permits that would be required by state law.³

The company's selected project provides up to 7.5 million gallons a day by building a desalination plant that would be built into Haverstraw Bay. The plant would filter Hudson River water to drinking water standards and then pump the water to customers. The proposed facility was located on the western banks of the Hudson River, across from the Indian Point Nuclear Generating Facility that is located in Westchester County. During the review process, focused and significant public concern about the details of the project, including its methods, safety, cost, and specifically, the question of whether such a project was necessary, would eventually impact the Public Service Commission's view of the project. By November 2014, the Commission would change course on its review of the Haverstraw Water Supply proposal.

² See Order Approving Merger and Adopting Three-Year Rate Plan in Cases No. 06-W-0131 – Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulation of United Water New York Incorporated for Water Service and No. 06-W-0244 – Joint Petition of Untied Water New York Incorporated and United Water South County for Approval of a Certificate of Merger with United Water New York Inc. being the Surviving Corporation 2-28-06, New York State Public Service Commission, December 14, 2006.

³ Environmental Conservation Law Article 8; 6 NYCRR Part 617.

A. November 2014 Order

On November 17, 2014, the Public Service Commission issued its, “*Order Addressing Status of Need and Directing Further Study*.”⁴ The Commission's Order discussed and reviewed the many questions raised by the public regarding the Haverstraw Water Supply Project. The Order directly addressed a fundamental question - the need for the proposed project - and required further analysis before final conclusions regarding Water Supply Project would be reached. Notably, the Commission Order recognized the Task Force, empowered it, and required it to become an active participant in the review of the proposed project. The Order required United Water and the Task Force, separately, to provide to the Commission reports about water supply and about water supply. Specifically, the Order requires:

- UWNY shall study what conservation opportunities exist, in collaboration with the Task Force, with the goal of identifying measures that may reduce demand by 2 million gallons (mgd) and shall file a report with the Secretary within six months of the issuance of this order identifying the feasibility, cost and estimated demand reductions associated with each identified measure.
- UWNY shall conduct a study and file a report with the Secretary within six months of the issuance of this order describing the feasibility, anticipated cost of development and description of the associated permitting process and processing time for a project or series of projects that could yield an additional 2-3 mgd of water supply.⁵

B. Task Force Created by Rockland County Resolution No. 296 of 2014

In June 2014, months before the Commission issued its November 2014 Order, Rockland County created the Task Force on Water Resources Management, in its effort to bring together a diverse representative group from the community to volunteer and work together to develop a long-term strategy for the County Water supply. The Task Force became law by the efforts of Rockland County Executive Edwin Day and the Rockland County Legislature under the leadership of Chairman Alden Wolfe. Harriet Cornell, the former County Legislature Chairwoman and County Legislator, who had called for Task Force creation, presides it as its Chairwoman.⁶ The Task Force is made up of 19 members who are representatives of the County Executive, the County Legislature and representatives of local government, academia, business, advocates and United Water.

The *Mission Statement* for the Task Force is to:

Develop a County Water Plan that ensures a safe, long-term water supply for Rockland County that incorporates sustainability, demand-side principles and conservation. It shall assemble, examine, and investigate relevant data, further County goals regarding protection of floodplains, woodlands, and wetlands, increasing groundwater supply, reducing storm water runoff, and preventing flood damages to residents and businesses. The Task Force shall also develop education and outreach programs, seek funding opportunities, and report its findings, conclusions, and recommendations to the Legislative and Executive branches of County government.

⁴ See *Order Addressing Status of Need and Directing Further Study* in Case No. 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, Public Service Commission, November 17, 2014.

⁵ Id at pages 66-67.

⁶ See Rockland County Resolution No. 296 of 2014 Repealing Resolution No. 599 of 1999, Disbanding the Rockland County Water Board and Creating a Task Force on Water Resources Management, June 19, 2014.

The Task Force is organized into five committees that look at different aspects of the County water supply picture. These committees include conservation, groundwater and stormwater, drought and flood management, systems management, and community communication. The dedicated groups conduct many meetings and also meet together as a Task Force once per month in a public meeting announced on the Task Force web site⁷, through email and social media. During that process, the Task Force not only focused its efforts on key issues, but it continues to develop a number of specific projects to look at and to analyze as possible water conservation and water supply solutions.

The Task Force Interim Report, timely submitted to the PSC on May 18, 2015 in compliance with the PSC Order to report within 6 months.

In December 2014, a number of decisions were made regarding the operations of the Task Force that have guided the Task Force process.

- The three operational principles of the Task Force are transparency, independence, and a data driven approach.
- The contracting and the funding of Task Force projects are done through the Rockland County government. The laws and rules that govern financing, transactions, and contracting follow the standard practices of the County rules. The use of the county as the fiscal agent meets the guiding principles of transparency and independence for the Task Force. Importantly, it demonstrates to the community that the process to procure analysis is truly independent and free from influence from United Water or any other entity.

The County administered approach to Task Force projects (and the rules governing financing thresholds for sole source contracts versus an open bidding process for larger contracts) dictated that the first major undertaking of the Task Force - the United Water customer water use data and conservation strategies analysis - be handled in a two Phase approach. The contractor for Phase 1, Amy Vickers and Associates, Inc., was unanimously chosen by the Task Force to examine customer and systems water use. Phase 2 of this project, the water conservation feasibility study, will involve more extensive analysis, effort, and cost, and will be procured through Rockland County with a Request for Proposals to be issued as soon as dedicated funding is provided.

The Task Force funding comes from a variety of sources. The County, as fiscal agent for the Task Force, receives, holds, and pays monies for all projects. Rockland County contributes to the Task Force by funding the Task Force Coordinator position in its Department of Planning. Contributions have been made to the County and will be used for specified projects, like the Phase 1 data use and analysis of Amy Vickers. The contributors thus far have been the Rockland Water Coalition, United Water, and the Sierra Club. The work to turn Committee deliverable items into proposals for funding continues. The Task Force will then seek funding from appropriate sources including government grants and not-for-profit funding. The largest deliverable item in the short term will be for the Phase 2 water conservation feasibility study.

At the conception of the Task Force, it was agreed that the members would seek consensus on methodology and goals for the necessary data-driven studies and the use of independent parties to conduct the analyses:

- To investigate case studies of communities that have fully embraced conservation in their water planning and identify means and methods that are applicable to Rockland. The NYS

⁷ Rockland County Task Force on Water Resources Management official website:
<http://rocklandgov.com/departments/planning/task-force-on-water-resources-management/>
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DEC published a Water Conservation Manual in 1998 that is comprehensive and can serve as a template.

- To identify green infrastructure projects involving water that are being built all over the country and investigate the most promising ideas in order to determine their applicability to Rockland. (Not long ago, a group from IBM Intelligent Water program made a presentation to the Rockland County Legislature about a new software platform that helps water managers better monitor their systems and assets, quickly allowing them to identify and correct leakages, saving “lost water.” Furthermore, EPA recently developed a new water planning calculator as a tool for water planning that is used in assessing effectiveness of Green Infrastructure).

The Task Force efforts to meet the Commission's Order, as well as its broader mission stated in its creating law, have been ongoing, and the results of these efforts have been significant. For more information about the ongoing efforts, progress and plans going forward, please see Section II of this document.

In February 2015, the monthly Task Force meeting included Public Service Commission Chairwoman Audrey Zibelman and senior executive staff of the Commission as honored guests and participants. The well-attended public meeting was a significant success. The Task Force Committees each presented to the Chairwoman and to the public their mission statements and their priority issues. Among the issues addressed in that meeting was the Commission's commitment to the groundbreaking effort of a Task Force of community volunteers to have a meaningful role in the water resources planning for their future and to provide a model for other communities in New York to use in similar efforts. The Public Service Commission required United Water and the Task Force to work together to identify water conservation opportunities, and the presentations and discussion with Chairwoman Zibelman that evening demonstrated the commitment of the Task Force to meet those obligations.

In March 2015, on recommendation from the Conservation Committee with UWNy in representation, and with unanimous approval, the Task Force hired renowned expert Amy Vickers to produce a comprehensive water use data analysis that will become the basis for the water conservation plan for the county.

Ms. Vickers is a nationally recognized water conservation and efficiency expert, engineer, and author of the award-winning *Handbook of Water Use and Conservation: Homes, Landscapes, Businesses, Industries, and Farms*. In addition to writing the national water efficiency standards for plumbing fixtures adopted under the U.S. Energy Policy Act of 1992, she has also authored or co-authored several state and municipal laws to reduce water waste. Ms. Vickers brings to the project her state of the art water data analysis methodologies that she developed for the American Water Works Association and that she used in other studies including the City of Dallas, Texas.

The “Vickers Report” was finalized and submitted to PSC on July 22, 2015. The Amy Vickers’ analysis and report assessed United Water customer and system water use data. The detailed analysis looks at current and historical United Water production and customer use data, the company's reports and filings with the Public Service Commission, and conducted an in-depth analysis of the past three years data including customer meter and billing data. The report identified and discussed high indoor or outdoor data use, compared data to benchmarks for water efficiency, and provided an analysis of residential, non-residential (commercial, industrial, public / institutional), and system/ utility use including infrastructure leakage and water losses. The purpose of the water use data analysis was to

produce analytical findings to influence a future water conservation program strategy that will be developed in Phase II Conservation Feasibility Study.

Many of the Task Force members are volunteers and it was a show of great commitment and dedication to our goals that the Task Force submitted the Interim Report in compliance with the Commission's instruction. As noted in the Interim Report and its supplement, the Vickers Report, the Task Force and UWNY have yet the most critical part of compliance ahead in anticipation of going forward on Phase II of the Conservation Feasibility tailored to Rockland County. As per the Commission's November Order, the Task Force and UWNY yet need to identify and evaluate specific conservation opportunities, which are best applicable in Rockland County, analyze the costs and benefits of such measures and estimated demand reductions associated with each conservation measure. This technical analysis and feasibility study should be informed by the initial data analysis to inform a Conservation Plan and recommendations for implementation, and to provide basis for an effective public outreach strategy.

III. SUPPLY AND DEMAND ALTERNATIVES EXIST FOR SUSTAINABLE WATER FUTURE – TASK FORCE CONTINUES ITS WORK

A. Interim Report Outlines Roadmap and the Task Force Work Continues

The Task Force Interim Report, timely submitted to the PSC on May 18, 2015 in compliance with the PSC Order to report within 6 months, discussed and presented the results of the considerable efforts of the Task Force, and it began to outline a roadmap for future progress in each of the specified Committees. The roadmap requires that each deliverable idea be formulated as a specific proposed project and that appropriate funding, budgeting, and program management be undertaken to advance them to conclusion. Through the efforts of the Task Force, there is a strategy to develop the Task Force recommendations for law and policies to the County Executive, the County Legislature, and the Public Service Commission for the short-term and long-term water supply needs of the residents of the County of Rockland.

1. Overview of Conservation Committee Work and Goals Going Forward:

The Conservation Committee (CC) counts the following accomplishments in their first year of operation.

Conservation Study: In order to fulfill their mandate to develop and promote water conservation efficiency goals by user classification the committee proposed a two-phase conservation study. They sought an expert to complete the first piece of the study, the 'Initial Demand Forecast' and worked with the wider Task Force to gain approval for this. Vickers was hired for this job and the work has been completed. The second piece of the plan involves developing a tailored program that will build on the specific findings of Phase 1. The Request for Proposal is currently being drafted.

Sub-committees were established and completed the following: The committee had a range of expertise and interest so several different sub-committees were established to focus on policy recommendations, water audits, and landscaping issues.

Policy: The Policy Committee has examined a range of legislative policy initiatives including new building codes, irrigation, incentives and rebates for the Environmental Protection Agency WaterSense type fixtures and appliances. As a first step the CC recommended the Task Force and Rockland County become WaterSense partners. Both voted to move forward

on this recommendation and now have access to water saving tips and information through webinars, printed materials and partner advice and suggestions.

Water Audits: United Water's employed and trained two engineering student interns over the summer to initiate a water audit of the County buildings. Working under the oversight of UWNY engineers the students were trained and developed a plan. 1000 fixtures were audited in the County Buildings and a database was developed to catalog each fixture, its age, operating level, if in need of repair what would be the potential cost of repair, the potential cost of replacement with a WaterSense recommended fixture, and finally the potential savings over time for the two choices. The audit is close to completion with only SUNY Rockland Community College left to audit, and will then be provided to the County for review and consideration of action.

Landscaping – A range of recommendations and suggestions have been discussion and a healthy archive of material accrued on this topic, but it was determined that the Phase 2 Conservation Study is needed before any actual recommendations can be moved forward.

Xeroscape Garden Pilot Planned & Approved

UW has proposed, and the County Legislature and approved, a Xeroscape garden demonstration project as a pilot of further ongoing effort. The specific site for the Garden was selected and approved by Rockland County Facilities Manager. Two potential contractors have been narrowed down and it is the hope the Task Force that UWNY will continue with this work in collaboration with the Task Force. The committee aims to prioritize green demand reduction measures with the biggest possible impact and UW is a key partner in that conversation.

- **Highlight:** Garden should begin to be installed in the Spring 2016

WaterSense Member: The Conservation Committee proposed in July becoming a member and taking advantage of resources available through **WaterSense program** of which UW is already a member. This is a great starting point for discussion of specific conservation measures, policies and outreach or education strategies suitable for our **local** concerns. Both the TF and the County on Task Force recommendation have become members.

In the coming year the CC is looking forward to the following:

- **Phase 2** of the Conservation study being completed so that it can inform the CC an enable data driven decisions.
- **Water audit** of County buildings leading to a replacement plan that will use Water Sense certified fixtures.
- **Database** developed through the audit project will become part of the fabric of operations for the County, being updated and maintained on a regular basis and leading to a planned replacement that is informed by savings.
- **Audit program extend to the schools**, beginning with BOCES. UWNY has been in discussion with BOCES to provide training to their students in order move this project into the school. It is hoped that this will become a 'turnkey' project that is replicated in other schools and large facilities throughout the County.
- **Audit program extended to businesses** and residences with UWNY working with NYSERDA or others to provide energy audits. The CC recommends that the Water Task Force be a co sponsor on such a program.
- **Outreach to municipalities** the CC wants to work with the Task Force town and village representative to share the work of the CC and the wider Task Force starting with promoting

WaterSense partnership. Engaging the towns and villages is critical in building Countywide acceptance of policies and plumbing standards to help keep our water usage in check.

- **Develop an outdoor water use policy** designed specifically for Rockland County and her residents. Working with our Conservation Plan once it is completed we will review policies in other communities and look for comparable communities and also trend setting communities to understand both their polices and the implementation.
- **Develop plumbing standards** based on WaterSense standards and working with the plumbing groups to design something that will be effective in Rockland. We will work with Cornell Cooperative, BOCES and SUNY RCC to develop training on the policy and fixtures. We will work with the local hardware stores to ensure access to the fixtures and promotion within the stores.
- **Develop a Continuing Education Program for Green Infrastructure and BMP certification with Rockland Community College (RCC).** The Westchester Community College has a similar program and the committee members have reached out to both colleges to begin preparing the proposal. RCC was very receptive to the idea but the implementation will rely on the Committee members' work, which next requires collaboration with WCC to pull together the proposal for the Director of CE department of RCC.

2. Drought & Flood Committee Work

Drought Model Completed.

- **Highlight:** A drought model has been completed, but awaits delivery of findings and presentation.

This highly data-driven deliverable conducted collaboratively with UWNY, the Rockland County Department of Health and a subcontractor. The only thing remaining is to have its results presented to the Committee and the Task Force, enabling discussion and recommendations from the Task Force. Recently, following UWNY's withdrawal from the Task Force, UWNY's team put off a scheduled delivery and has become unavailable for definitive re-scheduling of the Drought Model presentation to the Task Force. The Task Force, through the great efforts of its representative in the RCDOH has worked to ensure that this takes place at the earliest possible time so we have a fully-completed deliverable.

Equitable Apportionment and Water Permits

The Task Force, in collaboration with community partners, will commence endeavors to petition the New York State Department of Environmental Conservation to reopen the Lake DeForest Water Supply Permit to make appropriate adjustments to the permitted flow of water to New Jersey so that it is operated "solely for the benefit of the citizens of Rockland County" as originally intended. The Committee will use the analysis prepared by the Committee to inform the request made to reopen the permit analysis in following months.

3. Groundwater & Stormwater Committee Work

Task Force GIS Application Developed – Live!

- **Highlight:** This application with many water related GIS data layers is available on the Task Force Website under Resources section.

The Rockland County Department of Planning created an Interactive Mapping application specifically for the Task Force and unveiled it at the TF Public Meeting on July 13, 2015. The

Committee members that developed the “app” also presented a Tutorial of its use for the public at the same meeting.

The system underwent extensive internal review and testing before it could be used as a public resource. It includes the most current data pertaining to both surface and groundwater and allows users to visualize data, in three dimensions, to foster informed data-driven discussions and decisions. This deliverable was completed through volunteer-government collaboration by donated time from a dedicated Groundwater/Stormwater Task Force Member and the County Planning Department.

Pilot Green Infrastructure (GI) Project Underway to Enhance Recharge

The currently proposed **Stevens Institute of Technology Green Infrastructure pilot** project is a great start that would benefit from UW’s input, but a wider implementation should be anchored in the results of the Watershed Assessment. Students in the Engineering Department of Stevens Institute will conduct the Stevens’ study.

Under their supervision, a group of senior Civil Engineering students will work with the Task Force (TF) to develop a feasibility study of potential implementation of Green Infrastructure throughout Rockland County to increase surface water storage and augment groundwater recharge. The students would complete this feasibility study as their Capstone Design Project during the 2015-16 academic years over the course of 2 semesters.

- **Highlight:** Team of 4 students, 3 CE and 1 Environmental engineer already selected. The student team leader reached out to the Task Force and began organizing a Kick-Off meeting with the selected TF Workgroup designated for this project. It is our hope to meet the week of October 5, 2015 (this week). The students already began collecting necessary GIS data from Planning Department (this department is represented on the Task Force and has readily provided information and support).

The focus of the project would be to design and assess Green Infrastructure to increase both surface water storage and groundwater recharge. The team will begin by using the US EPA National Stormwater Calculator (NSC) to assess the potential infiltration capacities of various technologies. This model determines the fraction of annual rainfall that is infiltrated, evaporated, or becomes runoff using GI-specific calculation routines and publicly available climate data in long-term continuous simulations. This would allow the team to make recommendations as to which GI technologies would provide the greatest benefit. With this information gathered and analyzed in the first semester, the design team would focus its efforts on site-specific conceptual designs for 1 or 2 representative sites in Rockland County during the second semester.

The intended scale includes sites such as shopping malls, commuter park-n-rides, train stations, or schools, as opposed to neighborhoods, sewersheds, or cities. To the extent feasible, publicly owned sites will be prioritized for conceptual design analysis that will take place in the second semester. The Senior Design team will develop further site selection criteria. Final site selection will be determined in consultation with the TF and will be informed by the planning and feasibility work performed during the first semester.

UW’s contribution to that effort would be very beneficial, to help prioritize areas of greatest impact and tailor our implementation efforts to everyone’s greatest advantage.

As infiltration/groundwater augmentation is one of the key goals for this project, the GI technologies to be considered will be limited to permeable pavement, bioretention (rain gardens), infiltration basins, and subsurface detention. To provide potential for expansion of conceptual designs elsewhere in Rockland County, important technology-specific feasibility considerations, opportunities, and limitations will be documented.

Rockland County Sewer District No. 1 Water Reuse Study.

The Task Force and the District identified this option to have a major potential source of water for Rockland County. Sewer District No. 1 is represented on the Task Force by its director. As noted by

UW up to 7.5 mgd of water could be produced through wastewater reuse. UW were to work with the TF and the Sewer District on further determining the scope of the necessary study but after having stepped away from active participation, the Task Force and SD have to explore the scoping of the feasibility study without UW's involvement.

- **Update:** The District has funded through its capital budget the scoping of a potential feasibility study to be prepared by Stearns & Wheeler who will update an older study that was also prepared by S & W in 2002. The configuration of the older feasibility and possibly the technology need to be updated and there is a good chance that the new scenario would be much more economically feasible than the scenarios previously explored and rejected by United Water. **We hope to have some results of the initial scoping for the feasibility incoming within next couple of months.**

Ramapo and Mahwah Watershed Assessment and an Enhanced Recharge Study

A comprehensive integrated water resource management plan and watershed assessment has not been completed for the entire Ramapo River and Mahwah River watersheds. The initiative requires review of these rivers to their headwaters to determine whether they can be sustainably used for potable supply, riparian rights, and maintenance of ecological resources. Previous New Jersey Geological Survey and United States Geological Survey studies of the Ramapo River and Mahwah River in New Jersey have determined that the valley aquifers are overdeveloped and not sustainably used. Excess withdrawals of water from the Ramapo River create a condition where the composition of river water is more "treated wastewater" than "freshwater," and this situation is particularly acute during summertime low flow conditions. The United Water Ramapo Valley well field, which supplies 30% of Rockland County drinking water, is directly impacted during these summer conditions. Because of these reductions in flow in the Ramapo River due to withdrawals, the Ramapo Valley well field may need to cease operations more frequently in the future when its passing flow is not maintained.

The Committee is pursuing the comprehensive assessment and modeling initiative. Modeling of the Ramapo River and Mahwah River watersheds needs to assess remaining additional water supply in the watershed. It will also determine a safe yield of the Indian Kill Reservoir in order to assess the limits of the watershed at its headwaters near Kiryas Joel in Orange County.

The modeling should also determine the ecological constraints of the watershed and what uses are sustainable, and what uses are not sustainable. The modeling effort should establish the level of use that can be sustained and still meet surface water quality standards both in New York and in the receiving state New Jersey, potable water standards, and passing flow requirements into New Jersey.

- **Update:** the Rockland County Drainage Agency, represented on the Task Force by its director, requested and received approval from the County to budget for these studies. We hope that the funds are available soon; in the mean time the Agency and Task Force shall work on the scope and parameters of the proposal.
 - **This work, being very technical, would benefit greatly from input and information as well as financial "match" from UWNY,** given the fact that UWNY would largely be the beneficiary of such endeavors to bring more accuracy and take the "guess work out" from their capacity projections.

UWNY in its June Report seems to agree that a watershed assessment of Ramapo River would be useful. It is our hope that UWNY returns to the work with the Task Force so that these efforts are no duplicated.

Comprehensive Groundwater Study and Modeling: Independent review of the capacity of the Ramapo and Mahwah aquifers

A dedicated Committee member and Co-Chair is currently formulating a scope of work for a comprehensive groundwater study to characterize and 3D model the key aquifers in Rockland County
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and through the transparent data driven process, take some of the guess work out of future supply capacity projections. The RCDOH representative on the Task Force has indicated that a consultant that collaborates with the Health Department and worked on the “Drought Model” is able to meet and discuss with this committee the necessary technical parameters of the coping work. The concerted effort on this proposal began in early August.

Moving past the deadlines of the current administrative process, the Task Force intends to focus concerted effort on turning out a fundable proposal and seeking technical assistance from UWNYS as well as grants. The preliminary scope ascertains that field-testing and monitoring would likely be required at some stage of the project. Some of the information and data should already be available from DOH and UWNYS. The Committee will try to work closely with both, so as to build on what exists and avoid duplication of effort.

4. Communications Committee Work Overview

Flyer: The Communications Committee developed the “**WaterWise**” flyer with tips and recommendations for water conservation and information

Task Force Website – the TF now has an official website that maintains schedule of public meetings and announcements and a Facebook account is planned to help with outreach and community education.

Compiled List of Potential Partners and Stakeholders to be used in outreach and education efforts and to support the efforts of Conservation Committee as they develop projects

Work on Consistent Messaging

Committee pointed out, some work needs to be done in bringing a consistent message to the customers, tried to coordinate with UWNYS. We hope that UW having stopped its active involvement with the TF will not work at cross-purposes with the TF.

Example: Recently the County Executive announced that Rockland may be soon entering a drought and urged voluntary conservation until situation improved – same day, UW’s website was urging their customers in Rockland to water their lawns for at least 15 minutes. Such a message may be in contradiction to recommendations for residents to use less water-intensive landscaping practices and to conserve water in peak season. Certainly, there is room for improvement in conservation outreach and education strategies that **would be well served by UWNYS collaboration and discussion with the Task Force.**

5. Systems Management Committee

The Systems Management Committee, among other things, was tasked with reviewing possible alternative additional water supplies and reviewing UWNYS’s non-revenue water. The Committee met several times to review these possibilities (leaving additional supply from additional wells and conservation to other committees). At least one representative from UWNYS attended each of the meetings. The committee is chaired by Bruce Levine, Esq., an appointed designee on the Task Force of the Rockland County Executive.

As the time to submit a preliminary feasibility report⁸ to the PSC approached in May 2015, the Committee Chairman prepared a draft document for the UWNYS's consideration and inclusion in the

⁸ UWNYS's *Report on the Feasibility of Incremental Water Supply Projects and Conservation Opportunities in Rockland County, New York* (UWNYS's June Report), filed with the PSC on June 30, 2015 after UWNYS requested and received an extension of time to file the report pursuant to the PSC November Order that required collaboration with the Task Force.

submission. On May 19, 2015, this TF input was sent by the Committee Chairman to a representative of UWNY to help inform UWNY's feasibility report submission to the PSC. The TF Interim Report was submitted to the PSC on May 18, 2015.

Upon UWNY's submission to the PSC of their feasibility report on June 30, the Committee planned to hold a meeting at which UWNY's representatives could discuss the options UWNY did submit and to discuss why UWNY failed to include or address the options raised by the Committee as contained in the draft comments by the Committee for consideration and possible submission to the PSC. Prior to UWNY's abrupt withdrawal from the Task Force, UWNY committed to a follow-up meeting with the Task Force to discuss the report in detail. The Committee Chair requested a detailed discussion of the water-supply alternatives that were being considered as well as those that were being disregarded, and on what basis those decisions were being made by UWNY.

However, UWNY never followed through on the promised detailed review and group discussion and did not consider and in any way address the input of the Task Force and the Systems Management Committee. The UWNY June Report purports to be submitted in response to the directive of the PSC's November 2014 Order to identify feasible conservation measures to reliably reduce water demand and small-scale incremental water supply projects that may be implemented for United Water's operations in Rockland County, but many options were ignored and no feasibility or substantiated consideration was provided.

Detailed description of options and recommendations to the UWNY and PSC are provided in Section IV.D. of this document.

B. Conservation Feasibility Study: Phase I Shows Promising Conservation & NRW Reduction Opportunities

1. Background

The Task Force was created to provide advice and recommendations in a transparent manner to the County Legislature and to the County Executive. United Water and the Task Force share the responsibility to identify potential water supplies and to exchange information regarding how the decisions were made. Any effort and product produced by United Water or the Task Force will be enhanced by collaborative efforts that ultimately lend credibility to conclusions reached by the Task Force or United Water. In working together, we seek to increase public confidence in the data, technical decisions, analyses, and cost estimates that form the underpinning of decisions to pursue or to discontinue pursuit of certain sources of future water supply.

Early in 2015, the Task Force unanimously selected Amy Vickers, a nationally-renowned water conservation and efficiency expert, engineer, and author, to conduct Phase 1 of an independent study, Water Data Analysis, that would inform Phase 2, Conservation Feasibility Study necessary for the TF to fulfill its obligations under the Order. Finalizing a contract with Ms. Vickers took over two months to satisfy UWNY's concerns about maintaining customer confidentiality and concerns expressed by Ms. Vickers. Negotiations were aided by the participation of Deputy County Attorney Tom Simeti, Task Force Coordinator John Parker and Peter McGowan, Senior Advisor, Public Service Commission. The Task Force hired Amy Vickers through the County of Rockland on March 24, 2015.

On March 28 at Rockland Community College, the TF held the "kick-off" of ***Phase 1: Water Data Analysis to Support a Water Conservation Study*** at Rockland Community College, so that the Task

Force and the public would fully understand the process of analysis that Amy Vickers would use to determine water use in Rockland—the necessary basis for a second phase of study which would focus on specifics about how to capture the millions of gallons of water per day to meet goals set by the PSC as well as conservation strategies and policies. In Phase I Vickers contracted to study and analyze data to be received from United Water and from public documents to determine production and leakage, specifically on how much water is going out and may be unaccounted for, as well as customer usage.

2. Roadblocks

During the collaborative process between UWN Y and Amy Vickers, the consultant encountered serious issues with UWN Y's data. Ms. Vickers attempted to resolve these issues through iterative process of back-and-forth requests for information; she also brought these issues to the attention of the PSC and the Task Force. The Task Force Chairwoman, Harriet Cornell wrote a letter to David Stanton, CEO of UWN Y, on May 19, 2015, requesting that UWN Y staff address these issues in a timely manner before even the draft report is produced. Following is a quote from the letter:

“For the most part, United Water has been providing water usage data to Ms. Vickers incrementally, requiring repeated requests by her for outstanding necessary information. Additionally, Ms. Vickers has identified and submitted requests to United Water staff to **clarify apparent data discrepancies in an effort to give United Water an opportunity to address them prior to completion of the final report. The goal is to prevent unnecessary misunderstandings or duplication of effort at a later stage when these issues would resurface and require further scrutiny.**” [Emphasis added].

Nevertheless, UWN Y failed to take the opportunity to collaboratively resolve these issues, and at the end of June, Ms. Vickers substantially completed her data research and draft report. Pursuant to Section 22 of Ms. Vickers' contract agreement of March 24, "Confidential Information Provided by United Water New York, Inc.," UWN Y and PSC representatives reviewed the draft report for confidentiality of customer data and were satisfied that the draft report contained no confidential customer information. UWN Y indicated in an email on June 25, 2015 from John Dillon, company Senior Corporate Attorney, that the report was free to be shared with the County of Rockland. On Saturday, June 27, 2015 Ms. Vickers presented her findings to the Task Force and the public at Rockland Community College.

3. Major Milestone Completed

The presentation was a major milestone for the Task Force in accomplishing the mandates of the 2014 Commission Order. The draft report was extraordinary for many reasons. It's hard to imagine a technical presentation being so gripping, but the extensive painstaking analysis done and Amy Vickers' expertise were self evident. It was more than that though - Ms. Vickers' knowledge of best practices and current industry standards, and the professionalism of her presentation impressed the scientists, engineers and mere mortals like me who were in attendance.

The Vickers Presentation slides that contained her substantial findings were available to the public following the presentation and were posted on the County website. The Draft Report had been available to the PSC and UWN Y since the confidentiality review; and all members of the Task Force, including UWN Y were advised that comments and questions could be sent to Ms. Vickers following her presentation and she will take them under advisement. Amy Vickers' data-driven Water Use Analysis is an important supplement to the Water Task Force report to PSC and the Task Force wanted to ensure that the report was a reflection of true collaboration.

Ms. Vickers received some comments from David Stanton, UWNYS President, shortly after the draft report had undergone the confidentiality review and been released. She took them under advisement when completing the Final Report. A videotape of the entire June 27th presentation was made by Rockland Community College staff, and sent to PSC Chairwoman Audrey Zibelman for use by PSC staff. In my transmittal message I stated that viewing the video would provide an insightful window on the reasoned, thoughtful, and careful work done and conclusions reached by Ms. Vickers.

The Final Vickers Report was completed on July 21, 2015, after allowing nearly a month for any remaining comments and feedback, and was submitted to PSC the next day, to supplement the Task Force *Interim Report* filed with PSC on May 18, 2015.

4. Key Findings.

- 1) Water demand in United Water New York's service area has been largely flat since 2000 despite a growing service area population, a trend that may continue for the foreseeable future.
- 2) Data inconsistencies, errors, and missing data in UWNYS records and reports make it difficult if not impossible to know the true volumes of water supplied, imported, exported, consumed by retail customers, and "lost" to non-revenue/unaccounted-for water (e.g., leakage, meter and other accounting errors) for the years 2012, 2013, and 2014 that were the focus of analysis for this study.
- 3) The sluggish pace of UWNYS main replacement put it on a multi-century 704-year schedule in 2014, on top of being more than a decade behind the state's recommended timetable for surveying leaks in system mains. In addition, despite the New York Department of Environmental Conservation's recommended maximum 3-year schedule for water system leak surveys, in 2014 UWNYS sounded only 7% of its mains for leaks, putting it on a 14-year schedule that likely contributed further to the utility's backlog of needed leak repairs.
- 4) An estimated 2.5 MGD to 3.3 MGD of potentially recoverable leakage exists within the UWNYS system based on revised AWWA Water Audit reports using corrected data, UWNYS Annual Report figures reported to the PSC, and AWWA defaults for 2012-2014—a sharp contrast to previous UWNYS estimates using flawed data and assumptions.¹ A series of data errors, missing and inconsistent data, and flawed assumptions about system water losses appear to have resulted in several major errors in UWNYS AWWA Water Audit reports to the PSC for at least 2012-2014.
- 5) A preliminary estimate of 1.9 MGD to 3.6 MGD of potential water demand reductions from customer-oriented conservation measures exists within the UWNYS system.
- 6) A preliminary estimated combined total of 4.4 MGD to 7.0 MGD of potentially recoverable system leakage and customer water savings from conservation is currently available within the UWNYS system. There are precedents for system-wide savings from conservation that exceed 25%, as evidenced by programs sponsored by New York City (NY), the Massachusetts Water Resources Authority (metropolitan Boston, MA), and Seattle (WA), among other U.S. water systems. These savings estimates are preliminary only and will likely be refined as part of a more detailed analysis in the conservation planning project that will follow this study.
- 7) In addition to conservation, water reuse technologies, rainwater harvesting, and green infrastructure options offer Rockland County significant new opportunities to drive down UWNYS water demands even further while also achieving increased water supply independence.
- 8) The need for additional water supply capacity seems doubtful at this time given UWNYS potential water savings from aggressive system leak repairs and main rehabilitation, implementation of a comprehensive customer-oriented conservation program, and opportunities for Rockland County to develop alternative reuse and rainwater harvesting water supplies in the future. An optimistic picture of new water supply capacity emerges in the form

of water waste that can be recaptured through system rehabilitation and conservation. Those untapped opportunities to drive down water demands, in addition to alternative water supply options such as reuse and rainwater harvesting options available to the County, offer a range of future water supply and demand scenarios that are sharp contrast to those considered in the recent past.

- 9) Updated and more aggressive system water loss reduction and customer water conservation standards and requirements are needed in New York to minimize avoidable system leakage and customer water waste. Failure to establish a higher standard for water conservation and efficiency will continue to put the public, ratepayers, and the environment at risk from costly new water supply projects that may not be needed. Both the PSC and DEC appear to be relying on outdated water conservation standards, guidance documents, and approaches that fail to guide water utilities toward the many more efficient and green water development and management practices that are available today. Examples include the DEC water conservation manual published in 1989 (26 years old) and the PSC's outdated definition and standard for system water losses. States such as Massachusetts, Texas, and Georgia are just a few examples of those with more updated and rigorous conservation and water loss requirements and resources than those available currently in New York.

5. Vickers Technical Memorandum – see Addendum A

A follow-up **Technical Memorandum** prepared for the Task Force by Amy Vickers is attached as **Addendum A** to this document, and will be filed on October 5. The Vickers Memo addresses comments received in connection to the Vickers Report and elaborates on process and methodology.

For the full final Vickers Report, visit the PSC website Ref. Case 13-W-0303 and see the Report submitted in 3 parts on July 22, 2015.

Or, visit the Resources page of the Task Force at:

<http://rocklandgov.com/departments/planning/task-force-on-water-resources-management/resources/>

C. Phase II of Conservation Feasibility - Needs Commitment from UWNY

Funding For Second Stage of Conservation Report

UWNY was mandated by the PSC to work on a collaborative conservation report with the Task Force. We have completed just the preliminary part of this through identifying the initial demand through the Vickers Report, now we need to complete the actual Conservation Study. We will need professional assistance in order to tackle the most important water targets the most effectively.

It is essential that we have funding in order to do this, and entirely appropriate that UWNY provide funding for this as the agency that is overseeing this precious resource for the County. In fact UWNY should fund not only the conservation report, but also other projects that are critical to conservation and demand reduction, including outreach and education. Company revenue is from the ratepayers and should be used to support the work of the Task Force, on behalf of the ratepayers.

Recommendation by the System's Management Committee that PSC Order UWNY to Fund Study:

As the TF will need to hire experts to undertake studies that should have been taken by United Water years ago to evaluate all of the alternatives described above, the PSC should require that United Water fund these independent studies with a return of \$1,000,000 from the amount requested but not approved for its costs for the desalination permitting project. Any funds from these costs and other costs approved by the PSC should be recoverable through the rate base but with no reasonable return

on expenditure (profit) to the company. At this time, we suggest that no more than \$3,000,000 be approved for recovery with the rest held in abeyance. We further request that the PSC permit the TF to request that further funding of TF studies be ordered upon good cause shown with notice and an opportunity to be heard granted to United Water.

IV. PSC NOTICE: COMMITTEE COMMENTS ON REPORTS AND WATER SUPPLY ALTERNATIVES – NO NEED FOR DESALINATION

A. Conservation Committee Comments

The Three Reports:

Each of the three reports has been discussed widely so it bears a quick overview to highlight their unique characteristics, and more importantly, their differences.

1. UWNY Report of June 30, 2015

The UWNY Report of 6/30/15 was prepared for the company by CDM Smith in Association with AKRF to fulfill reporting requirements of the November 17, 2014 direction of the PSC. The order directed UWNY to work with the Rockland County Task Force on Water Resources Management (Task Force) report on conservation and supply opportunities in UW Rockland County's water supply system. The 93-page report was released shortly after UWNY's review of the preliminary Vickers Report. The projected water savings through conservation was a slim 3% savings, or 1mgd total over 10 years, and the non-revenue water (NRW) reduction was an additional 1mgd total over 10 years. This provided the 2mgd noted by the PSC but is significantly less than what Vickers suggests is possible. In addition the savings is not grounded in any supporting data analysis, rather it is merely stated in the expansive report. In addition their approach to communicating their programs and initiatives as stated is almost a mirror of their existing practices, with no real sign of innovation or adjustment to a program that is currently underperforming.

Perhaps the most startling thing about the report is that there is absolutely no mention of the Task Force except in the opening paragraph as a direct quote from the PSC order of November 17, 2014 requiring working with the Task Force to identify demand reductions of 2 mgd. This lack of mention of the Task Force throughout the report is startling given that for months UWNY had been working side by side with members of the Task Force looking at a range of options for conservation. While several of the initiatives that UWNY included in the conservation section of the report are items that have been discussed at Task Force meetings with UWNY representatives, there is no mention of these discussions, or of leveraging their work with the Task Force to either improve their reach or to engage the community more actively in conservation. It has been mentioned repeatedly in meetings that working together we can connect more effectively with the community and build a stronger following. The Task Force has very different networks than the company does, expanding the base of communication, but perhaps more importantly we are voting members of the local community. A neighbor mentioning both water saving and money saving tips is perhaps a more trusted messenger than the water company; a voter appealing to their local board or legislature brings the weight of the ballot box.

2. The Task Force Vickers Report of July 2015

The Vickers Report of 7/21/15 was completed under contract with the Task Force in order to provide a customer and system water use data analysis as a first step towards a more extensive Conservation Study. Vickers, a nationally recognized conservation and efficiency expert presented at the initial Task Force meeting, and David Stanton President, Regulated Segment of UWNY, identified Vickers

as the preferred firm to complete the review. The Task Force concurred. The 103 page analysis identified trends in past use through a review of data provided by the company, such as billing information and mandated reports submitted to oversight agencies (PSC, DEC, American Water Works Association). Considerable back and forth occurred during the data review as questions on lack of consistency of data inside the documents provided made it challenging to complete the report with full confidence of the 'facts'. The final Vickers report noted inconsistency in the data within specific reports as well as between the reports, and the resulting difficulty in identifying volumes of water imported, exported, consumed by retail customers and unaccounted for water also called NRW.

A major difference in this report over UWNY's was the finding that there was an estimated 1.9 to 3.6 mgd potential in reductions from customer conservation measures, or projected water savings of 10%. Unlike the UWNY report this report identified possible reduction areas of focus, including working with the top 50% of the users to conserve. The lower 50% were already identified as conserving according to Vickers' comparison with the national average. The report noted that simple measures like accelerating installation of high efficiency plumbing fixtures and appliances, focusing on managing outdoor irrigation, hi-e commercial equipment and processes, water audits, rebates and a more effective conservation-oriented rate structure could yield the noted savings. These are not extreme measures that would be unpalatable to the community, contrary to the words UWNY issued in a press release in response to receiving the Vickers report.

It should be noted that two years ago Dr. Stuart Braman, Lamont-Doherty Earth Observatory of Columbia University, independent of Vickers estimated a 10% reduction. Braman arrived at this in his estimate of the seven most cost effective programs for conservation. (See attached PSC testimony from Stuart Braman.) Additionally the New York City program for demand reduction in Westchester County and the city is at 5%; again almost double the 3% of UWNY.

The Vickers report noted an additional 2.5 mgd to 3.3 mgd was projected as available from recoverable leakage. The findings in this report were the opposite of the findings in the UWNY report, in that Vickers found high volumes of NRW resulted from leakage, with only moderate levels related to apparent loss. With the higher amount being identified as leakage, it would be potentially recoverable, thus explaining the difference between the UNWY and the Vickers' numbers for potential savings.

3. UWNY's Arup Comments to Vickers Report of August 4, 2015

The Arup Report of 8/4/15 was contracted by UWNY as a review of, and response to, the Vickers report. The Arup report is not a comparable report to either the UWNY or the Vickers report; it is not a report on water use developed from a review of the primary usage data; rather it is a report on a report, i.e. the Vickers report. Completed in a short 2 weeks and 16 pages in length, its focus area was reviewing the scope of work for the Vickers report, the materials provided to her and the final Vickers report to determine its 'worthiness'.

The report is **unsupported with any actual data or robustly demonstrated analysis**. In no way does it address any of the questions raised by the Vickers report in a substantive manner. What it does offer a series of critiques. For example Arup critiqued Vickers for using National averages as a means of comparison, noting that the UWNY and United Water Westchester (UWWC) 'data' is more reliable. The UWNY 'data' provided Vickers was not clear or consistent. It stands to reason that if a firm was hired to complete a review of another company's data, and found themselves concerned about the lack of internal consistency in the numbers, it would chose to compare the numbers to National standards and averages rather than a sister company run by the same parent organization. Further, even if the numbers were consistent, a prudent reviewer would compare the UW/Suez

company practices to other practices around the country, and measure savings against the national average. This allows for including innovation and best practices. The goal of the Vickers report was not to simply affirm what UWN Y was doing by looking at another branch of their company, but rather to look at their operations with a different set of well train eyes in order to provide realistic and reasonable numbers for potential savings.

The Arup report goes to great extent to point out that although Vickers had noted inconsistent UWN Y data that in the end UNWY and Vickers came very close in their number for water use. However as noted above, the differences, were in how the numbers were allocated i.e. from leakage or apparent loss. **UWN Y leaned more heavily on apparent loss**, thereby reducing their focus and commitment for repairs to leaky infrastructure. Vickers used her knowledge of the industry to determine that their repair schedule was well in excess of what would be acceptable. Arup in their report discussed UWN Y proposing an increased investment in underground infrastructure to 0.7 % annually by 2020; this is less than 1%, minimal at best given their already lethargic repair rate.

Misstatements appear throughout the report, such as “In the New York City (NYC) system, higher rates of conservation are realized only during declared drought conditions, and unfortunately these levels are not typically sustainable.” In fact, NYC is currently engaged in a program to reduce customer demand by 5%, this is 2% higher than the rate of conservation proposed by UWN Y, and this is after NYC has previously made significant customer water reductions.

Arup also seriously **misrepresent** Vickers Report on demand reduction in single family (SF) homes in: “We also suggest that the Vickers Report represented values of an average 28.2% reduction in demand for single family homes and a 10.7% percent overall reduction, are high, and not sustainable⁹.” In fact, what the Vickers Report says on potential conservation is: “**Preliminary estimate of potential water conservation savings by Single-family customers:** Approximately 1.0 to 2.1 MGD based on 2012-2014 average day demands, assuming a **10% to 20% savings among the top 50% of water-using customers**¹⁰. The chart that includes the 28.2% figure for SF users in the Vickers Report refers NOT to the percentage cut in SF usage, but rather, as the chart states, to the percentage of the total amount of demand reduction¹¹. Making a statement like this reflects a serious misunderstanding, and in all probability a very cursory review of the report. This calls into question the remainder of the Arup Report.

4. A Review Of Specific Initiatives Proposed By The UWN Y June 30 Report:

Overview:

Some of the initiatives mentioned in the UWN Y report appear positive, but there is not enough detail provided to understand what is really being proposed. However, the main problem is that the proposals are situated entirely outside of the Conservation Plan mandated by the PSC Order of 11/17/14, thereby setting the stage for work *based on collaborative Conservation Plan*. The County and the PSC have designed an opportunity for UWN Y that would allow them to be leaders in the water industry. Their Task Force work, structured with County, Municipal, and Community partners, is a novel opportunity that they have chosen to walk away from.

UWN Y states that they will work with local municipalities to implement regulations. This is a stated goal of the Task Force, with both a Village Mayor and a Town Supervisor position slated in the 19 members Task Force to provide a voice and a conduit to that group. Working through the mechanism

⁹ Arup Report, p 15

¹⁰ Vickers, 3-8

¹¹ p. 8 & 52 of Vickers Report

of the Task Force will ensure there is a consistent and vetted message, however UWNY has chosen to work outside the Task Force. This sets up a confusing situation, for example the statement of ‘alternate day lawn watering ordinance and (the) requirement for in ground sprinklers specific policies’ suggested in the 6/30 report. Both of these have been problematic in some communities, with both the specific suggested lawn watering policy and in ground sprinkler systems found to drive up lawn watering. In fact, in past documents the company has specifically cited automatic in ground systems as one of the drivers of increased lawn watering¹². Concern over this item has been discussed at length in the Conservation Committee with David Stanton. To move forward unilaterally on this project seems to be in direct conflict with the Task Force. Messages and proposals that are in conflict between UWNY and the Task Force will set up the County to fail in the establishment of a water management plan.

In addition, any **change in policy will need public support**. This can only come through the Task Force and its members and associated community groups on Task Force and committees, such as mayors, Rockland Business Association, Rockland Water Coalition, American Association of Retired People, the schools etc. Of course an additional risk is that by operating alone they will further exacerbate their longstanding negative relationship w/ community.

Both the **Task Force and UWNY will be most effective when they work together**. Choosing to operate outside the Task Force reduces UWNY’s community reach and will in all probability result in ongoing confusion and conflict with the Task Force, thus impeding progress. UWNY releasing a public statement that the Vickers Report was advocating “drastic resident behavioral changes¹³” undermines the work of the Task Force. In fact, Vickers specifically emphasizes efficient fixtures and *not* behavioral changes. This statement is not only disingenuous but appears to be designed to deflect any focus on their very paltry water conservation and repair plan.

Conservation rates:

UWNY often mentions that they already have conservation rates. Their existing water rates are **very far** from a true conservation rate. The current rate increases for all users in the summer, with only a slight increase for the larger users, and there is a lack of coherent labeling to explain to the user that this is designed to encourage seasonal conservation. At the very least the bills should be clearly labeled and coupled with effective and seasonally coordinated billing messages along with a much more sophisticated public education campaign. A more equitable system would be a change in summer rates to provide basic essential water use at a lower rate and several clearly labeled increases for seasonal use, as strong disincentives. Given that the top 25% of residential users are responsible for 51% of demand from all accounts. Therefore, the first non-essential level should be significantly increased; the second one steeply increased in order to discourage the largest users from failing to conserve.

Rebate program:

A rebate program is an essential part of an indoor water conservation program, but it should be co-branded and promoted together with task force for maximum effectiveness. The Conservation Committee of the Task Force has discussed a rebate program and has asked repeatedly for an update from UWNY in order to co-promote this project. We have asked for an open dialog on this item but

¹² Draft Environmental Impact Statement, Appendix 1.6, p. 22

¹³ To ensure that the water savings from conservation are permanent, emphasis needs to be less on consumer behavior and more on the installation of high-efficiency “hardware” measures such as water-efficient fixtures, appliances, and commercial and industrial processes and equipment.

have not received any feedback. This type of program is one that the Task Force could be very beneficial in promoting.

Water Audits:

Water audits & technical assistance could play a significant role, especially if this was a requirement for largest commercial and residential users.

UWNY has developed a program of audits of county buildings by college engineering interns. The program sounds like a nice complement to the WaterSense program as the County, currently WaterSense partner, can use the audit report to plan for replacement of aging and underperforming fixtures in a coherent and cost effective manner. We have not been provided any of the outputs of the program, but from the descriptions by the UWNY representatives at our meetings it seems like a program that could provide water saving and money saving benefits. Recent statement at the Conservation Committee seemed to imply that this program is winding down so it is unclear if this is a commitment to continue the program to schools, industry and other large water users in the County as we have recommended.

Public Education

The company's public education is entirely unchanged from the past, and is more about repairing the company image than about repairing leaks or conservation. They are focusing their efforts on: the local radio station, which their own representative notes has a very limited audience; reaching out to school children, which is useful but certainly should not be their full outreach program; stuffing inserts into bills, which is a passive outreach that has a limited readership, and is completely absent for the online paying customer. Both UWNY and ARUP list the UWNY conservation programs that are already in place, the very same public education program for which the company has consistently forecast a **0.1% demand reduction goal**, half of the natural replacement rate for fixtures.

ARUP mentions the 5,000 conservation kits given out in 1990s! 25 years later these kits should not be considered part of their conservation program, we are forced to wonder what the impact would be on 77,000 households, most of them with multiple fixtures. In fact, those of us that installed energy efficient appliances 25 years ago would note that **1) more efficient appliances are available today, and 2) few of those appliances are still in use today**. Following on from this the 2009 survey on fixtures in Rockland County that is cited on page 14 of the Arup Report, has often been referred to in previous UWNY documents, but has never been seen. Who conducted that survey, how many households were surveyed? What was the nature of the questions? This would all be useful information that could help in planning a more effective program, since clearly there is room for improved conservation in Rockland.

In summary, it is essential that the public education program be closely coordinated with the Conservation Committee of the Task Force. We need a sophisticated, interactive, and well-coordinated program of messages, not just a repeat serving of the program we have had in the past.

Funding For Second Stage of Conservation Report

UWNY was mandated by the PSC to work on a collaborative conservation report with the Task Force. We have completed just the preliminary part of this through identifying the initial demand through the Vickers Report, now we need to complete the actual Conservation Study. We will need professional assistance in order to tackle the most important water targets the most effectively. It is essential that we have funding in order to do this, and entirely appropriate that UWNY provide funding for this as the agency that is overseeing this precious resource for the County. In fact UWNY should fund not only the conservation report, but also other projects that are critical to conservation

and demand reduction, including outreach and education. Company revenue is from the ratepayers and should be used to support the work of task force, on behalf of the ratepayers.

Conclusions

The road ahead for Rockland County has some rocky patches. In addition to the major issue of funding, the stated intention to circumvent the work of the task force is a major problem, an impediment to progress. A holistic approach is needed, including public education, coordinated messages and coordinated policy initiatives. A fragmented approach will result in confusion and further conflict. In other words, we need an **approach that gets at water use from multiple angles and is well coordinated to leverage the resources of the company and equally important, the political will that can be mobilized only through the task force.** The conservation rate, water audits, technical assistance, and incentives, all need to be joined with a **vigorous and sophisticated public education** program with **shared messages coming from the task force.** However it is important to remember that we have identified that the County has sufficient water for at least the next decade. Three reports have been completed, and while they disagree on a wide range of details, on this point they are crystal clear. The desalination plant should be formally abandoned at this time. Until this action is taken by the PSC there will never be full commitment or focus by UWNY on working with the Task Force to protect our water resources.

B. Drought & Flood Committee Comments

1. Comment by RC DOH Represented on the Task Force

In response to the Public Service Commission's request for comment in CASE 13-W-0303 I have reviewed the recent submission by United Water New York (UWNY) and the Rockland County Task Force on Water Resource Management (Task Force). The scope of my review of UWNY's Report on the Feasibility of Incremental Water Supply Projects and Conservation Opportunities in Rockland County (UWNY's Incremental Report) and Amy Vickers' report on Water Losses and Customer Water Use in the United Water New York System (the Vickers Report) was limited to that relevant to form an opinion and provide comment on PSC's invitation to "comment on whether United Water New York Inc/ should be authorized to abandon its proposed long-term water supply source plan." The broader conclusions of both reports, along with current demand data, were used to focus comments on this important decision point.

Both the Vickers' Report and UWNY's Incremental Report either say, or infer, that the long-term water supply source plan does not need to be pursued at this time. The reports also prioritize demand side strategies as actions to be taken in the short term to balance the water supply and demand needs in the UWNY system. Although the reports disagree as to the potential amount of demand reduction that could be realized from real water loss and conservation, the differing views of what is available may not be particularly significant with respect to the decision point the PSC is at right now. Specifically, whether UWNY should be authorized to abandon the proposed long-term water supply project.

There is a fair amount of uncertainty in projecting future water demands, as have been seen in practice since 2006, but water usage trends have changed significantly enough in recent years to indicate that **there may be enough time to pursue demand reduction strategies before new supply projects are needed.** These recent trends coupled with what seems to be a growing consensus that demand side strategies should be the first priority, form the basis of my support that UWNY be authorized to abandon the long-term water supply project. The amount of time that is available is debatable and the data will need to be watched closely moving forward as it could change with usage patterns and economic recovery in the coming years.

Although this Commenter supports the abandonment of the long-term project at this time, it is important to recognize the risks of underestimating Rockland's future water demands.

One of the primary water supply related responsibilities of the Rockland County Department of Health (RCDOH) is to ensure there is an adequate quantity of water available from our public water systems. The RCDOH routinely evaluates the adequacy of water sources, under the requirements of Subpart 5-1 of the New York State Sanitary Code; each time an approval is issued to expand UWNY's water system to support new residential or commercial growth. In addition, Article V of the Rockland County Sanitary Code empowers the Commissioner of Health to declare mandatory water use restrictions should there be a water supply emergency in Rockland.

Inadequate supply would result in our inability to approve any expansions to serve new development, whether residential or commercial. Stalling or delaying growth could have significant impacts to economic recovery that should be considered. Further, some growth that occurs within the County is not subject to the approval mechanism in the State Sanitary Code. Should there be quick increases in demand from a resurgence of commercial water usage within the existing infrastructure that could cause a supply demand shortage and potential emergencies during dryer, hotter years that the demand trends and data cannot predict.

Additionally, recent modeling that employs the SUTRA model developed by the United States Geological Survey (Scientific Investigations Report 2010-5250) suggests that current safe yield estimates for some of UWNY's wells may be overestimated, (although these findings have not been finalized and presented to the Task Force as of yet). These data and risks must be considered by all of the stakeholders when making these important planning decisions and an ongoing analysis is necessary to determine if a change in direction is needed in the coming years (at the same time, this data may be a source of opportunity for explore enhanced recharge measures in areas that are lacking – these questions will be explored with the Task Force).

UWNY's report also proposes a variety of alternative smaller water supply projects that could be pursued to meet future demands. The Vickers' report suggests that demand will stay flat for the foreseeable future and that no additional supply should be pursued at this time. Although the Commenter agrees there may not be an immediate need to begin a water supply project, it would be prudent to have a funding mechanism for new supply built into a future rate proposal that is targeting demand reduction first. Should UWNY be ordered by PSC to discontinue the long-term project, perhaps a new rate proposal could be structured such that demands are watched and expenditures toward new supply are only started when and if the data and timing support moving forward. Possibly using some type of a demand trigger similar to what was proposed by DPS staff previously in the current needs case. Since at least in theory some of the smaller supply projects could be designed, approved and built more quickly, there may be a way for PSC to structure such a funding mechanism that is only triggered when there is more certainty that it is needed, while still enough time to get something built and online before a situation became critical. This may be risky going into Plan A "demand reduction," where there is more uncertainty in what can be feasibly realized, without having a Plan B for increasing supply if demand reduction does not adequately meet the need for growth. Having a trigger-based mechanism in place for Plan B would take the PSC approval of the funding mechanism out of the timeline and help UWNY more quickly respond to the increased in water demands should they occur.

It should be noted that these comments are not based on any financial analyses of the long-term project versus the demand side strategies and potential incremental supply options. The Commenter

is not qualified to perform a financial comparison to see which course of action would be the most beneficial to ratepayer of UWNY and would leave that to the respected professionals of the DPS staff. UWNY should provide financial feasibility to illuminate this aspect. My limited knowledge of the remaining costs of the long-term project and the estimates provided in UWNY's Incremental Report would lead me to conclude that pursuing the course toward demand reduction and smaller supply projects may be more prudent. I would assume there could be potential long-term disadvantages to that course if a long-term project was still needed eventually. However, the current demand trends and potential for demand reduction would suggest that the need may be too far in the future to provide sufficient certainty to justify moving forward with a long-term project at this time. Should a fiscal analyses of the options also support this course of action there would appear to be a clear path forward for UWNY and their ratepayers.

2. Other Comments

a. Reliance on information supplied by United Water New York

It is apparent from the past record¹⁴ and the recent findings of the Vickers Report that there have been substantiated concerns with reliability of UWNY's record keeping and reporting. Public confidence is essential – UWNY may be a private company, but it is a regulated and reporting one, because it provides public service of essential value. As such, UWNY has not only the responsibility, but also the affirmative duty to do its due diligence and to provide accurate and timely information and avoid omissions that have, in the past, resulted in regulatory enforcement actions¹⁵ or scrutiny by the Rockland interested community and regulators. UWNY has an opportunity to repair their image by working in good faith with the Task Force and resolving any data issues satisfactorily.

Regulators as well as the public rely on UWNY's information and on the data and soundness of assumptions used in making decisions of profound impact on Rockland County. The PSC relied on this data and the narrative that UWNY presented, that the desalination proposal was the best solution for Rockland's long-term water needs. The projection of "need" and the data that it was based on are now proven to have failed.

UWNY has not addressed the data inconsistencies uncovered by the Vickers Report as of this date. The Arup Report did not resolve any of the data issues, but simply attacked Ms. Vickers and attempted to dismiss her findings without providing any supporting analysis to resolve the questions she unearthed through her months of work. Perhaps, the data problems may be the result of a misunderstanding and could be clarified easily; however, the Task Force and the ratepayers are left wondering in absence of UWNY's clarification or detailed explanation.

Ms. Vickers is a reputable and experienced water data analyst – there is no easy way to simply dismiss her points without proper consideration by calling her an "aspirational advocate." It is insulting that UWNY would ask the PSC to simply disregard the community's input prepared by a highly skilled expert. This would indicate that only UWNY controls and owns the story that becomes

¹⁴ UWNY failed to notify the County of Rockland Department of Health, the NYS DEC, the NYS PSC and the parties to the Joint Proposal that an alleged malfunctioning valve was causing excess releases of over 5 Million Gallons Per Day from Lake DeForest to New Jersey, at the same time that the parties to the Joint Proposal were evaluating Rockland County's water needs.

¹⁵ In 2008, UWNY was fined by the NYS DEC for excess releases of water from the Lake DeForest Reservoir that occurred between June 1, 2007, and Sept. 22, 2007. DEC determined that UWNY exceeded its permit limits by some 231 million gallons. DEC's determination was based on a review of the releases by a consultant hired by UWNY.

the truth on record. It is recommended that UWNYS avoid attacks on the consultant of the Task Force and rather show good faith to work out these issues in a transparent and verifiable manner, if in fact UWNYS intends to improve public's confidence. This would assure a final resolution and allow the Task Force and UWNYS to move forward toward more constructive work.

b. Equitable Apportionment, Passing Flow, Safe Yields of the Hackensack River

The State of New York is required to allow a certain flow rate of waters in the Hackensack River Basin to flow downstream to New Jersey. The rate of flow, and the number of millions of gallons a day that flow to New Jersey largely come through United Water's Lake DeForest system. The amount of flow is regulated by a NYS Department of Environmental Conservation permit and fluctuates based upon water conditions in New Jersey - particularly in times of water shortage and drought. As planned in the Interim Report, the Committee examined the permit and the watershed to determine if the correct amount of water is being transported. There are a number of fundamental questions to address. How much additional safe yield could be drawn from the Hackensack River with a change in the minimum Passing Flow? Should Rockland County be entitled to an additional 11 million gallons a day from the Hackensack River?

The former County Executive, Scott Vanderhoef and the Rockland County Legislature have consistently petitioned the State of New York Department of Public Service and the State of New York Department Environmental Conservation to re-examine Equitable Apportionment agreements with New Jersey. Unfortunately, these requests have up till now gone unheeded.

United Water's June Report fails to properly explore the renegotiation of an equitable apportionment of the safe yield from the Hackensack River, which holds the potential to increase Rockland County's water supply by 11.42 Million Gallons Per Day. UWNYS may not be in the best position to negotiate for a more equitable apportionment of the Hackensack River that would favor Rockland County, because it is a wholly owned subsidiary of United Water New Jersey. Due to this United Water conflict of interest, it may be advisable that PSC assist the Task Force in pursuit of this initiative.

c. Lake DeForest Water Permit:

In its November 8, 2013 *Response to Issues Raised During the Public Statement Hearings* in Case 13-W-0303, UWNYS devotes pages 26 through 30 (5 pages) to the issue of Equitable Apportionment. However, there is no mention about Rockland County's riparian rights accruing from the increase in safe yield from the Hackensack River resulting from the construction of Lake Tappan. Rockland would be entitled to 3.35 Million Gallons Per Day (MGD) from Lake Tappan if the current Lake DeForest passing flow rate of 0.291 Million Gallons Per Day Per Square Mile (MGD/SQMI) was applied to allocating Rockland's equitable share of Lake Tappan. At a passing flow rate of 0.125 MGD/SQMI Rockland's equitable share of Lake Tappan's safe yield would be 7 MGD.

Changing the Lake DeForest passing flow rates and Rockland taking water from Lake Tappan would achieve a more complete utilization of Rockland's existing water resources and riparian rights resulting in an increase in Rockland County's safe yield from the Hackensack River by 11.42 Million Gallons Per Day (MGD) (calculation spreadsheet can be provided upon request).

Highlight: The Task Force, in collaboration with community partners, will commence endeavors to petition the New York State Department of Environmental Conservation to reopen the Lake DeForest Water Supply Permit. **UWNYS June Report** again cites many permit limitations, but does not actually

analyze the issue or plan to work with the Task Force on pursuing petitions that would be required to overcome these limitations and would open new opportunities.

d. New York State Department of Health Permit

The Lake DeForest water treatment plant capability is 20 million gallons a day but the New York State Department of Health's permit limited production to 10 million gallons a day. In 2103, the permit was modified removing the 10 million gallons a day limitation. The stated purpose of the permit modification was "to eliminate the unintended consequence of limiting the raw water taking from the reservoir during periods when takings would not affect the storage of the reservoir and thus its safe yield." The permit change allows the treatment of more water, which will increase the yield from the reservoir during normal to wet conditions, but this will not increase the safe yield of the reservoir.¹⁶ Nonetheless, the additional yield reduces demand on Rockland's ground water resources allowing aquifers and well fields to more fully charge than otherwise, consequently augmenting the county's overall supply during high use periods.

e. Lake Tappan

The Committee set out to work on determining the proper safe yields from Lake Tappan and how the daily yield available from Lake Tappan would impact the allocation of water to Rockland County residents. Based on the information available, a Committee Member estimated that Rockland could draw as much as 7 MGD from the New York side of Lake Tappan; depending on the safe yield of Lake Tappan and the passing flow rate per square mile in MGD.

The preliminary assessments are as follows:

The possibility of allocating a share of the safe yield of Lake Tappan for Rockland County was discussed a length in testimony given during the May 19, 1965 Lake Tappan Hearing. (*See: Lake Tappan Hearing of 5-19-1965* at page 33 and pages 38 through 45). In its July 22, 1965 decision the State of New York Conservation Department reserved to itself the right to consider future applications for the taking of water by communities in New York State from the Hackensack River for public water supply purposes.

From the State of New York Conservation Department Lake Tappan Decision of 7-22-1965:

"Paragraph 16: Hackensack Water Company reportedly has future plans for the installation of pumps and transmission facilities which could be utilized to pump water from River Vale Reservoir (Lake Tappan) to DeForest Lake in years such as the present one when DeForest Lake does not fill from snowmelt and spring runoff. The installation of such equipment is not a part of the instant proposal. Paragraph 17: In view of the above facts, the Commission will not reserve to New York State any portion of the yield of the Hackensack River attributable to the River Vale Reservoir. The Commission will however reserve to itself the right to consider future applications for the taking of water by communities in New York State from the Hackensack River for public water supply purposes."

On May 19, 1965, George H. Buck, P.E., President, Hackensack Water Company, Inc. (now United Water New Jersey) testified to the NYS Department of Conservation that the proposed Lake Tappan would not add any additional water for use in New Jersey, but would merely compensate for the 10 MGD being diverted to Rockland County (Lake Tappan Hearing of 5-19-1965 pages 29 and 30). At that time, the Hackensack River at West Nyack, NY, was calculated to have a safe yield of 7.75

¹⁶ See United Water New York, Inc.'s Report on the Most Recent Information Relating to Projected Demand and Need for a New Long-Term Water Supply Source in Rockland County, August 19, 2013 at 34.
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MGD after a 10 MGD diversion to Rockland County at Lake DeForest and a 2 MGD diversion to the Nyack Water Company just upriver from the USGS monitoring station at West Nyack, NY.

Given that Lake Tappan was intended to compensate for the 10 MGD being diverted to Rockland County, the safe yield of the Hackensack River at the Lake Tappan Dam, at a minimum, would have likely been calculated to be 17.75 MGD (10 MGD plus 7.75 MGD). (See: Increase in yield of Hackensack River)

At 100% of capacity the normal pool elevation of Lake Tappan is 55 feet above sea level. The datum of the USGS 01376800 Hackensack River at West Nyack NY gage adjacent to the Village of Nyack Water Treatment Plant is 1.5 feet lower at 53.50 feet above sea level. The head of the Lake Tappan reservoir is at the Village of Nyack Water Treatment Plant only 1 mile downriver from Lake DeForest. Actually the normal pool elevation of the USGS monitoring station pool is about 56 feet above sea level. The additional 1-foot in elevation, above the Lake Tappan normal pool elevation, is created by a 1-foot high weir which creates the USGS gaging station pool.

Recommendation: Do not pump water up to Lake DeForest from Lake Tappan as George H. Buck, P.E., President, Hackensack Water Company, Inc. suggested in 1965 when simple adjustment of the passing flows from DeForest could achieve the same result at a lower cost. Even better, use the Village of Nyack Water Treatment Plant to augment United Water's system through the already existing interconnection between the two systems.

The Village of Nyack Water Treatment Plant has surplus treatment capacity. The plant produces about 2 MGD operating only approximately 16 hours per day during electric rate off peak hours. During this time treated water is pumped to storage facilities for later distribution to customers.

In Summary:

Alternatives to the desalination plant have existed for many years but remain largely unaddressed and unexplored in earnest by UWNJ, even in its latest June Report.

There appears to be an inherent conflict of interest in the non-arms length relationship between United Water New York and United Water New Jersey. It has been demonstrated that United Water has previously violated water allocation permits and has had well documented and unresolved data problems and transparency issues.

With **United Water New Jersey** having complete control over 90 percent of Rockland County's water supply, it is recommended that the regulators of UWNJ including the State of New York Public Service Commission and all levels of government provide aggressive oversight and ensure proper controls and equitable renegotiations to protect the interests of the citizens and ratepayers of Rockland County.

C. Groundwater Stormwater Committee Comments

1. Comments Regarding Section 2, Additional Groundwater Supply from Wells

2.2.1.1 The cut off for production of new wells should not be 100 gpm since UW already has wells that produce at that lower level. By raising minimum production, several hundreds of thousands of gpm may be artificially excluded from analysis and development. Thus, UW should demonstrate profitability of existing wells, individually, and then give a specific break down of costs and benefits for each potential well site as low as 100 gpm.

2.2.1.2 UW should produce all pump test results done not only for this exercise, but any historic data on pump rates it has for any of its potential wells sites that it or its predecessor has examined that it still possesses, included data regarding the adverse impact (or not) regarding neighboring wells or streams.

2.2.1.5 UW should provide all documents it possesses regarding contamination of the above wells.

2.2.2.1 UW's statement about how is arrived at the subject 10 potential well sites seems conclusory. UW should provide a sworn financial statement specifying all costs incurred regarding tests down at all above mentioned sites: costs of pumps tests, land, taxes, environmental tests, permitting, etc. Costs related to existing wells in use should also be provided so a comparison can be made for economic feasibility claims. Revenue derived from wells in use should also be provided in furtherance of analyzing UW's economic feasibility claims.

2.2.2.2 UW failed to provide information on the capacity of all the wells on the Pfizer site and Nanuet School District (FKA St. Agatha's property). Specifically identify contaminants and quantities that have been identified at Pfizer site and all other sites. Reported maximum volumes of water allegedly used at times at Pfizer site sounds speculative. Provide a calculation of what a similar HVAC system would require or obtain real data from current owner. Document conversations with current owner for transparency and share this information with the Task Force.

2.2.2.3 UW's statement in this section and info in Table 2-2 is conclusory. UW should provide all data regarding capacity, interference, contamination, permitting, expenses regarding each site.

2.3.3 The conclusion as to probable cost has no basis and as such is an opinion. UW must provide specifics as to each in line with above.

Overall, as to all site considered (not just 10 preliminary sites) UW should provide any and all permits (even those that may have expired) for each such well, from whatever agency or governmental authority that it possesses.

2. Comments Regarding Section 4.0-Optimizing Supply from Ramapo Aquifer and Ramapo River Watershed

At the end of Section 4.2 the report states that during dry periods or when water released from Potake Pond is not sufficient, UWNYP pumps water from the Ramapo Valley Well Field (RVWF) to the Ramapo River to maintain the require flows in the river. It seems that this approach just draws water from the river to the aquifer (via the pumping well), only to return the water back to the River. An explanation would be appropriate to show how this helps maintain passing flow into NJ.

Section 4.3: Commenter agrees that development of a modeling tool to further evaluate the interaction between the Ramapo River and the RVWF is a task worth taking on. At the bottom of page 4-3, United Water states they are developing a thorough study of the hydrological and hydrogeological capabilities of the Ramapo Aquifer and the Ramapo Watershed. A 2-Phase scope of work is being developed; the first phase to consist of data collection and full definition of the scope; and the second phase involving development and application of the modeling tool. Estimated timeframe of 2-3 years, minimum. The commenter agrees with this proposed task, but would ask that the watershed study be modified to integrate evaluation of the watershed using

Integrated Water Resource Planning Concepts such as those outlined by Palmer and Lundberg. Additionally the use of modeling software such as RiverWare (www.riverware.org) could be used to assess the specific challenges in the Ramapo Watershed, which primarily exhibit water quality and quantity issues. There are other options/software programs such as MikeSHE, developed by the Danish Hydrological Institute (DHI), which could be used to further assess the Ramapo Watershed.

Sections 4.3 and 4.4 discuss several options for augmentation of Ramapo River flow. The concept is useful and should be evaluated. Some discussion focused on expected additional flow in the Ramapo from upstream development and subsequent increased treated wastewater discharges to the river as further development progresses in Orange County. The commenter is cautious of reliance on this augmentation for a number of reasons including:

- a. Increased development means more loss of recharge area due to an increase in impermeable surfaces
- b. Increased development means the makeup of the Ramapo River will shift from freshwater to treated wastewater as development increases and wastewater discharges increase.
- c. There is also the added concern that UWNY RVWF wells may not be equipped with their existing treatment schemes to adequately handle the increased “treated wastewater” being pumped by their wells.

3. Surface Water Sources and Water Reuse:

Treatment plants could be the source of water. Since there has always been a general dislike of the idea of “from toilet to tap”, it would be a hard sell, despite being easily attainable with current technology, to create drinking water from wastewater. However, it is achievable.

For example, the Commenter, was involved in converting an existing package wastewater treatment plant for the Wassaic DDSO on Welfare Road in Brewster, NY to provide drinking water quality effluent as their discharge went into a stream that fed the NYC Reservoir in Valhalla, NY (Kensico Reservoir). By attaching a rapid sand filter and an ultraviolet disinfection unit to the original discharge pipe, the upgraded plant was able to pump out drinking quality water. The Commenter then obtained the local Health Department approval and drank a sample of the water himself. It is possible and more sustainable to do this.

The Sloatsburg Wastewater Treatment Plant is currently configured as a tertiary plant and is discharging its effluent directly into the Ramapo River. This flow augments the natural base-flow in the river and helps to keep the river flowing. While the normal path of discharge is through a gravity outfall, there is an alternate system that pumps the treated effluent upstream of the plant to a point near the I-87/I-287/Route 17 interchange, which is done during periods of low-flow in the Ramapo River.

In another example: In Portland, Oregon, a brewery is proposing to use reclaimed wastewater to make beer. The Oregon Department of Environmental Quality has issued an approval for the brewery to start using the wastewater flow from a nearby treatment plant, so long as the treated water meets or exceeds the standards established by their State Standards (see Appendix B for further information). Therefore, the technology does exist to at least generate water that is clean enough to be discharged to a local watercourse that is tributary to a drinking water reservoir.

Municipal wastewater usually requires disinfection to meet targeted bacterial limits before being released to surface waters. The main objective of disinfection is to cut down on the number of

waterborne pathogens to safe levels, and thereby lowering the risk of exposing the public to infectious diseases. However, some pathogens remain in receiving waters and soils, which indicates that disinfection of wastewater effluents provide the first line of defense for drinking water from surface water or groundwater.

Typical disinfection standards for secondary and tertiary wastewater, such as 200 Fecal Coliforms per 100 mL on a 30 day geometric mean, can be achieved with a reasonably sized UV system. Most conventional wastewater treatment plants for the most part discharge effluent to water bodies such as lakes, rivers and streams. Adding filtration upstream of UV in a tertiary treatment process, while not necessary in most cases, will improve water quality by getting rid of more particulate matter and lets the wastewater treatment plants meet even more stringent permit requirements – in some cases for water reclamation.

UV is an ideal disinfectant for wastewater since it does not alter the water quality – except for inactivating microorganisms. It is a chemical-free process that can completely replace an existing chlorination system and also inactivate chlorine-resistant microorganisms like *Cryptosporidium* and *Giardia Lamblia Cysts*. Unlike other chemical disinfectants, ultraviolet disinfection does not produce any carcinogenic by-products that could adversely affect the water quality. There is also an added benefit of reducing the carbon footprint of the disinfection system when a plant switches to UV since the green- house gases from truck tailpipes are eliminated since there are no trucks delivering chlorine disinfection products to the plants in question.

Reusing wastewater is an essential strategy for wastewater treatment plants in those areas where water is a scarce commodity, and UV disinfection is a key element in the treatment scheme. UV offers the benefits of not producing by-products and replaces a complicated three step chemical disinfection process with a single physical UV process. When a chemical disinfection process is used, the reuse water must be chlorinated, dechlorinated and then aerated if required. For reuse water, high chlorine doses may be required which increases the likelihood of disinfection by-product formation (chloramines) which form when the treated water is exposed to sunlight.

Most regions require UV systems to meet high dose requirements (for example, in California it is known as Title 22) based on Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse published by the National Water Research Institute (NWRI) / American Water Works Association Research Foundation (AWWARF).

The high water quality produced by upstream media or membrane filtration provides excellent pre-treatment to increase the UV system's effectiveness. Units from different manufacturers have been installed in reuse applications around the world. The waters that have been so treated are being reused for recreational and agricultural irrigation, aquifer recharge and to reduce discharge to already-stressed waterways.

If a suitable area, sufficiently away from residential and public areas (such as parks) can be found in close proximity to any of the wastewater treatment plants in Rockland County, portions of their effluent can be discharged into seepage areas that could have significant impacts on the underlying aquifers. Disinfection of the effluent would be necessary, but ultrafiltration would only be required if there was a possibility for the recharge area to overflow to a watercourse that could be significantly impacted by the suspended solids from the plant flow. If a surface impoundment cannot be constructed, then either drywells or pipe galleys can be installed that will allow the discharged treated effluent to be safely discharged into the ground. In essence, they would become large-scale quasi-septic disposal fields, sans the danger associated with seepage.

But you can also use the “cleaned” plant effluent to supply people with irrigation water, fire hydrants, and process water for cooling units, etc., which would dramatically reduce the demand for water on a daily basis. For example, instead of building the proposed Desalination Plant (which, by the way, would have been built right near the Joint Regional Sewer Board treatment plant in the Town of Haverstraw), you could redesign it to take effluent from the JRSB plant and distribute it in a new water main system for commercial and irrigation use only. Connect the existing fire hydrants and any sprinkler systems to it, and watch the demand drop. This would be a similar effect as to that experienced by the MTMUA as mentioned previously. The same approach could be taken at any of the other wastewater treatment plants in Rockland County.

An ancillary benefit to reusing plant effluent is that eventually you will significantly reduce pollution in the Hudson River, thereby opening it up to further recreational activities. Also, if desalination becomes the only viable manner in the future to address possible water shortages for New York City, at least a cleaner Hudson River would provide those residents with a possible solution to their dilemma, especially considering their close proximity to the Atlantic Ocean and an obvious lack of groundwater supplies.

In regard to the hot button topics “Climate Change” and “Sea Level Rise”, one might easily argue that by reusing the plant effluents instead of discharging them directly to the Hudson River (as many currently do), there would be, even slightly, a decrease in water level which could impact the surface water elevation of the impacted waterbodies.

4. Opportunities for System Efficiency Improvement

The best alternatives in my opinion are actually a “joint venture” of sorts. It would entail a combination of increasing the storage capacity of DeForest Lake by removing excessive sedimentation coupled with an upgrade to the Rockland County Sewage Treatment Plant for District #1 or the Orangeburg Town’s Wastewater Treatment Plant, both located off of Route 303 in Orangeburg.

With an available volume of wastewater at roughly 20 MGD (per 2002 report previously referenced), these plants do have the ability to allow for additional withdrawals from DeForest Lake by shifting portions of either of their discharges to the upper portion of Lake Tappan near West Orangeburg Road. A microfiltration system composed of at least a rapid sand filter (possibly an activated carbon filter as well depending on chemicals in the effluent) and UV unit (for disinfection) will allow highly treated effluent to flow into Lake Tappan and eventually into Northern New Jersey (Bergen County) where it could be “harvested” by United Water New Jersey for their clients. The discharge out of DeForest Lake would be reduced to meet the same amount.

In essence, either plant would be converted to operate like the Sloatsburg Plant, with a portion of the flow going to Lake Tappan while the rest continues to flow out to the Hudson River per their respective SPDES Permits issued by NYSDEC. Theoretically, this flow diversion could allow for additional flows to reach either of these plants so long as the hydraulic loadings to the plant do not cause the plants’ effluents to exceed their permitted values.

At the present time, I would recommend that a 4 MGD modular system be installed which would have a pump station and force main to get the water from the plant to the lake. The design could also be for the entire flow being diverted in the future, so the pumping equipment would need to be equipped with “soft starters” (to avoid energy spikes) and variable speed drives/motors to cover a wide range of pumping scenarios. Most pump models also have several different impeller sizes to meet different pumping rates and conditions as well. With a vertical lift of about 150’ and a 3-4 mile long pipeline at 6.00 cfs (approximately 2.50 ft/sec) would yield a pipe size of 12” diameter. Using a

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C-900 or better pipe would bring the construction costs down significantly and would allow for future increases in flow without replacing the pipe. If the future called for the entire volume of the plant to be recycled, the pipe would still be safe as the flow velocity would only reach about 13 ft/sec, which is an acceptable flow velocity in high pressure PVC mains.

Based on a preliminary layout, with the new filtration units located at the rear of the RCSD #1 plant, the force main to Lake Tappan would be approximately 2.75 miles (14,400 linear feet), with an additional 200-300 linear feet of gravity main (to allow for pressure relief). The gravity main would more than likely be a 30" HDPE pipe at 0.05% slope, giving an ultimate capacity of 8.0 MGD (at full-flow). A rather sizeable rip-rap apron would need to be installed, even though the exit velocity from the outfall pipe would be in the vicinity of 2.50 ft/sec. **Keeping the ultimate flow below 8.0 MGD would help mitigate any flooding of the properties downstream of Lake Tappan as this flow would equal the additional withdrawal from DeForest Lake for Rockland County consumers.** The flow from the treatment plant could be higher than the additional amount withdrawn from DeForest Lake if the downstream channels from Lake Tappan are studied for hydraulic capacity to ensure that no overtopping/flooding will occur. Theoretically, the flows from either or both wastewater treatment plants in Orangeburg could easily provide the current level of flow from DeForest Lake to Lake Tappan that is mandated by the current operating permit (6.7 MGD).

William J. Stein, P.E., in a March 12, 2012 letter (see Appendix C) regarding the proposal by United Water /New York to construct the desalination project in Haverstraw clearly noted the ability of the Rockland County Sewer District #1 plant to be able to supply a significant amount of tertiary treated wastewater to Lake Tappan. While his proposal calls for up to 10 MGD of treated water to be set to Lake Tappan to be offset by similar reductions in water discharge from DeForest Lake reservoir, it nonetheless shows that the idea is feasible.

About the only serious stumbling block to this alternative would be the Palisades Interstate Parkway Commission, who owns part of the land through which the force main would have to pass (Palisades Interstate Parkway). At this location, the pipeline would need to be "jacked" (forced through the ground via a larger pipe known as a "casing" pipe) under the PIP's Right-of-Way to avoid open excavations that would probably cause the roadway to be closed for some time. Care would also need to be exercised when operating this re-directed flow, as the downstream channels from Lake Tappan may not be able to handle the full flow from either, or even both of the plants, especially during rainfall events. Perhaps during those scenarios, the plants would resume complete discharge to the Hudson River as per their previous designs.

The JRSB Treatment Plant in the Town of Haverstraw also has the ability to be upgraded with the same equipment. In particular, United Water New York had proposed its Desalination Plant to be constructed in close proximity to the JSRB plant, so that it would have received all of the waste load from the desalination plant. A simple conversion of the treatment train to handle recycled water from the JRSB plant would yield a potential supply of 8.0 MGD of recycled water for the residents of North Rockland (Towns of Haverstraw and Stony Point).

As mentioned previously, the filtration system for either the Rockland County SD#1 Plant or the Orangeburg Town Plant would more than likely need an activated carbon filtration media added to the system. An appropriate structure would have (as seen from the top) a layer of activated carbon (charcoal/anthracite) followed by a later of fine sand. The thickness of each layer and the overall particle sizes will need to be fine-tuned to the waste flow strength, especially if there are any chemical compounds left over from the existing treatment trains at the plants. The individual SPDES permit for the plants will identify the test parameters (and, therefore, the level of treatment necessary) to bring the water to a point where it could be safely discharged into the streams.

Based on an ultimate modular design of 4.0 MGD (which amounts to a flow of about 2,800 gpm), and an application rate of 5 gpm/ft², the total estimated surface area of the filter would have to be 560 ft². The Commenter would estimate that this filter would have three cells, each 10' wide by 20' long. Using 12" thick walls, you would have a structure that is 34' wide by 22' long. It would also need to be equipped with backwash gear and piping, which should discharge the remains back to the head of the plant or possibly to one of the sludge digestors at the plant. This system would also need a pump station to lift the effluent from the existing outfall line up to the surface of the filter media, as well as an ultraviolet disinfection unit to neutralize any biological pathogens that have passed through the filter. Depending on review by NYSDEC, a reaerator may also be needed as well.

Estimated Financial Costs

Richard Feminella, in a letter addressed to the Public Service Commission (see Appendix D), estimated the costs to construct a system to pass about 5 MGD of treated wastewater from the RCSD #1 plant to Lake Tappan at approximately \$97 million dollars in 2012. Adjusting for inflation (say 2.00% per annum), plus a reduction in the size of the equipment (4.0 MGD vs 5.0 MGD) would yield a current estimate, based on his letter, of \$80.7 million.

5. Underground Infrastructure Replacement Program (UIRP) - Needs a Hard Look and an Update

UWNY has been seriously behind the curve on infrastructure maintenance and upgrades to more durable and less likely to leak and break piping that should be the new standard requirement for north-east regions where we have always had cold winters.

UWNY at their presentation to the Task Force noted that there are many breaks and leaks due to the freezing conditions in the winter. Given the cost of unearthing the infrastructure to replace it, UWNY needs to look at using C-900 PVC pipe for watermain construction and replacement. It is cheaper, light-weight and easier to install versus "good 'ole ductile iron pipe". It's lighter weight and has a better flow capacity (PVC vs. Cement-lined DIP). There is no apparent reason for them not to keep up with the modern technology and no reason why this should not be a required industry standard enforced by the PSC.

It is time to give a very thorough review of the requirements and standards in UWNY's Underground Infrastructure Replacement Program (UIRP). Under PSC Order in 2006, UW was compelled to develop this Program and PSC approved monetary allocation to implement the Program. UWNY should disclose how that money was spent and why, given the dismal replacement and repair schedules cited for the past 3 years by the Vickers Report, this money seems to have not been put to its use; or, alternatively, if the money was used and ran out in proper use toward repairs and replacement (doubtful, again, by looking at the dismal statistics revealed in Vickers Report), why then did UW not notify the PSC that their Program is not capitalized and the proper maintenance and replacement are not being done.

The duty of the utility is to assure that all the necessary measures are in place to maintain the infrastructure and assure safe, reliable and sustainable flow of water supply. If the required Program ordered by PSC was no longer being implemented due to lack of money, then UW should have brought it to the PSC's attention. Unless, of course, the money went to the desalination plant, instead of incremental system updates as intended.

In any case, the UIRP needs to be assessed for performance and updated as needed - and clearly it is needed.

D. Systems Management Committee Comments

The following represents the Committee's comments on UWNY's June Report to the PSC.

1. Introduction - Improved Resiliency Through Decentralized Approach

The Committee believes that a decentralized, small or mid size series of water supply projects together with water save from leakage (real water loss) and from conservation can meet the needs of UWNY's customers long into the future. Since there is some issue of how much additional water supply will be needed (the Committee assumed that remedying leakage could produce 0.4 MGD over a five to ten year period and Conservation would save 2.0 MGD over time, probably over two decades for full effect), the Committee viewed various options based on the idea that some could be accomplished quickly (using unused municipal water from Suffern and Nyack), some over several years (the Suffern Quarry, new wells), and some over five to ten years (Ambrey Pond – Cedar Pond Brook Option and Wastewater Reuse), that as the new water supplies were put in place the actual future demand can be reassessed. The decentralized approach could mean that certain new water producing facilities might never be needed and that even if they all were needed, the decentralized approach would provide resiliency in times of drought or following the occurrence of natural or man made disaster or due to the effects of climate change.

The Systems Management Committee has never expressed categorical opposition to desalination technology if the need were to arise. It did assert that, first, the demand for an additional 7.5 MGD of potable water might never be reached and second, that the desalination plant, if needed despite incremental decentralized system of new water supply combined with aggressive conservation effort, should be at the least much smaller, in the unlikely event that it should be needed at all.

The remainder of this section provides comments on various water supply alternatives.

2. Water Supply Alternatives

a. Suffern Quarry Option - Utility Fails to Properly Analyze The Option

UWNY completely ignored this option. UWNY failed to consider and provide analysis of the exact nature of the need for a joint permit from the US Army Corps of Engineers and the PSC and or the DEC for the creation of a reservoir that would be operated under a management plan that would meet the use of this reservoir for additional water supply while providing flood mitigation downstream when a major storm is threatened. This Committee knows of no independent effort by UWNY to obtain and review the engineering plans, drawn up for the Town of Ramapo for the quarry's use as a retention area, to see if it could be a basis for a joint use reservoir. In its DEIS for the Haverstraw River Water Supply Project, UWNY never analyzed the engineering or costs of such a joint plan (as expressly stated by UWNY representatives to the Committee) for such a joint use or even for a sole use as a water supply. UWNY unilaterally rejected the option without sound basis and reasoning, simply because this option in itself could not provide the full 7.5 MGD of new supply that UWNY had erroneously projected to be necessary to meet the needs of Rockland County.

b. Wastewater Treatment Option - Inadequate Review in old DEIS Rehashed in June Report

UWNY's discussion and analysis of this option (Section 5 of June Report) is merely a rehash of the flawed review in the DEIS. It ignored the Committee's recommendation that wastewater reuse from Rockland County Sewer District No. 1's Orangetown Plant could be used at various levels to produce on site 2.0 MGD, 4.0 MGD and 6.0 MGD of potable water with the realistic expectation that it can flow directly into the Hackensack River south and downstream into Lake Tappan without significant and costly pumping (as proposed by UWNY for the Lake DeForest wastewater plan). Water can then be pumped into the UWNY system directly from the treatment plant in New Jersey at Lake Tappan or

the preferred option of using an offset generated at Lake DeForest by using the treated wastewater to maintain the required passing flow into New Jersey. The primary issue would then be to determine the impact on the Hackensack River from the point of a diversion of flow from Lake DeForest to the point where the supplemental flow would enter the Hackensack from the Orangetown plant. The Committee expects a much smaller cost to this option than any other wastewater reuse option (especially if it was limited to 2 MGD). The PSC should note that UWNY is using the same methodology to limit real analysis of this and other alternatives that it used in its entirely inadequate DEIS that led to the initial rejection of the Haverstraw River Water Project. While it is possible there are flaws to this option, UWNY fails to identify or address any flaws, if they exist, in any way. Because UWNY's analysis is so lacking, and the reuse option appears as potentially a very good one, the Rockland County Sewer District No. 1, represented on the Task Force by a named member, is conducting its own due diligence and, at its own cost, is sponsoring an updated feasibility study¹⁷ through an outside contractor.

c. Ambrey Pond/Cedar Pond Brook Option

UWNY entirely ignored this option. The insufficient old DEIS agrees that the potential supply from the watershed in this area would produce 7.5 MGD of potable water. However, if treated, the only access to this water would require that a dam be constructed, which would either yield 5.5 MGD or, with supplements from Lake Tiorati, could produce 7.5 MGD of potable water. This watershed used to supply 0.5 MGD of water supply to UWNY system, which was gradually lost from the system when the water works were overcome with silt as a result of neglect in maintenance by UWNY, approximately 20 years ago. Since the water supply is still there and since UWNY still owns considerable land on the site (though the Committee fears that UWNY has sold some of its land over the last three decades), the minimum that should be produced at this time is 0.5 MGD. This is water supply lost to the Rockland County through poor management by UWNY. The Committee's recommendation is that UWNY install a new water works at a site further upstream or in close proximity to Ambrey Pond itself without any dredging and damming. Alternatively, a small dam could produce a reservoir producing 2.0 MGD on the Ambrey Pond site. UWNY failed to have a water surveyor review this watershed to determine where and at what cost the site can be utilized at these lower amount of potable water and how long would it take to bring this additional supply on line. At this level of utilization, there would need to be new updated environmental reviews but this option would certainly cause less problems than the previously permitted big dam option. The Committee recommends that PSC order an adequate feasibility review and survey of this option, its cost and its yield.

d. Municipal Water Supply from Suffern, Nyack and New Jersey

The options of obtaining up to 1 MGD of potable water from the Village of Suffern municipal water supply is certainly feasible in terms of connection and cost, as United Water's submission makes clear. However, United Water did not conduct a well test or even state that it sought permission to conduct such a test, despite the willingness of Village officials to sell 1 MGD of potable water to UWNY. The Systems Management Committee has been stating for over 6 months that a well test is needed to determine the effects on downstream supply to New Jersey and on existing wells (public and private) in the area and on the Ramapo River. UWNY identified issues regarding salt in the water, which would also be resolved or quantified by a well test. The PSC should order UWNY to speedily obtain permission to conduct such a test or require UWNY to fund such a test to be conducted by the WTF. This water (or some amount less than 1MGD, depending on the results of the well test) could be added very quickly to UWNY's water supply. Elected officials and others on the

¹⁷ An update of Water Reuse Study prepared for Rockland County by Stearns & Wheeler, LLC and Lawler, Mutsky & Skelly Engineering, LLP in December 2002. The updated study would explore a more feasible modern configuration.

WTF can help mediate any negotiations leading to a long-term agreement between United Water and the Village of Suffern (20 or 30 years).

The Village of Nyack also seems to have some excess water supply that would be available for sale to UWNJ. The Systems Management Committee does not believe that Nyack as 1 MGD of available supply to sell to UWNJ due to the need to maintain passing flows towards Lake Tappan. However, some available supply is certainly available. Since the source of this water is Lake DeForest and since UWNJ has sufficient treatment capacity at its Lake DeForest waterworks, the Systems Management Committee is happy that UWNJ did consider the possibility of obtaining some additional water directly from Nyack's rights to Lake DeForest water at a very low cost to ratepayers. The 0.3 MGD identified by United Water merely requires regulatory approval. There is no reason that such a change in the permits could not be made immediately by consent of all parties including United Water New Jersey (which is unaffected by such a change). This should be done as soon as a simple 30-year agreement with Nyack is complete (a matter of months at best). The permit should include an option for Nyack to recover its supply in thirty years if there were a need or to renew it at a payment rate to be negotiated in the future. United Water should continue to pursue the other long-term options but it should be noted that these should be evaluated along with all of the alternative water supply options considered by the Systems Management Committee. The Systems Management Committee also recommends that free technology sharing to reduce real water losses in the Nyack municipal water supply should be included in any agreement for even the 0.3 MGD option.

As to the use of New Jersey water from NJDWSC via the Blaisdell Interconnection, the Systems Management Committee notes that no reason is given by UWNJ for not running the model that would give the true rule curve referred to in UWNJ's narrative and thus establish the true total water that could be used by UWNJ's customers as additional supply. For the present purpose, the Systems Management Committee believes that only 2 MGD would be necessary given all the other water supply options and the desirability of a decentralized approach to water supply for Rockland County. This should lower costs. Of course, a larger amount of water might be available (3-5MGD) requiring bigger pipes and greater pumping capacity but this would only be necessary if this water supply was also to be used to provide resiliency for New Jersey water customers. For example, if Lake Tappan were low but the supply from the west was still available; this supply could help New Jersey customers. In this scenario, New Jersey and New York customers should share the cost of the necessary infrastructure for this interconnection. This does seem to be something of benefit to both states and therefore the Systems Management Committee believes that both United Water companies pursue this option and cost out the necessary engineering and infrastructure and determine how the costs should be shared. As this benefits both states, and as customers in both states would share the costs, this should help with getting the necessary New Jersey and Federal permits.

Of greater interest for UWNJ, is the implication of this option on the equitable distribution of the water supply from Lake DeForest. If this extra supply were available to a wide swath of northern New Jersey now served by Lake Tappan, this would mean that New York's and Rockland County's need for more water should be met directly from Lake DeForest (perhaps with a cost sharing by the customers of both systems for the needed infrastructure). This would require a change in the permits but, based on the feasibility of this option, there is no reason UWNJ could not get the necessary interstate approvals without a costly litigation. Of course, United Water would have to manage the conflict of interests between its two subsidiaries but if both companies present a joint plan for approval by the regulatory authorities of both states and if the WTF supported the change, there is no reason this could not be achieved. Details of use of both water supplies in severe regional droughts would have to be worked out as part of the new permit.

There should be no change to the use by Montvale of Rockland's water supply. We are good neighbors.

e. Optimizing Supply from the Ramapo Aquifer and Ramapo River Watershed

The Systems Management Committee believes that all of the proposals made by United Water for this optimization are valuable except the idea of using more wastewater from an expansion of the Rockland County Sewer District No. 1's Hillburn Wastewater Treatment Plant. Currently all wastewater is required to maintain the required flow in the Ramapo River and is already being returned to the River. Pumping more wastewater that currently flows to the Orangetown site would be needlessly costly. The wastewater option the Committee prefers is the option of using wastewater directly from the RCSD #1 Orangetown wastewater treatment plant as described above. This is obviously more efficient.

The other options are valuable and deserve further study and fit into the Systems Management Committee's preference for a decentralized system of new water supplies for UWNY's customers. This is especially true since no well test of the Village of Suffern Municipal Water System has been conducted to date. The augmentation and optimization proposals may be needed to maximize the true amount of Suffern water that would be available to UWNY's customers.

f. Water Saved From Leakage – Real Water Losses

The Systems Management Committee notes that the report of Amy Vickers finds that the amount of real water losses from leakage is considerably greater than that stated by United Water to the committee and the Committee stands behind her expert evaluation. However it should be noted that United Water in its submission to the PSC has estimated the reasonable potential saving of 0.5 to 1 MGD can be saved by implementing its combined Advanced Metering Infrastructure, the creation of smaller District Metered Areas and the speeding up of its main replacement program. This is an amount significantly in excess of the estimate of potential savings from leakage provided to the Systems Management Committee by United Water personnel during committee meetings to discuss this issue. The Committee supports all of these initiatives and is happy the timeframe to implement the entire system would be within three to five years. The PSC should insure that these systems are implemented within this time frame and evaluate whether the number of smaller District Metering Areas should be increased. If the PSC adopts the recommendation of Amy Vickers that an independent monitor be required to make sure that UWNY's gauges and other system meters are properly read and recorded, then additional savings are possible. For planning purposes, the Systems Management Committee asserts that savings in the amount of 1 MGD should be expected by the PSC.

3. In Closing

The Systems Management Committee believes that United Water, despite its resources and the tens of millions of dollars spent so far, failed to properly analyze the alternatives to its proposed desalination plant in the proceeding to date and while working with the TF. If nothing changes, the PSC should deny the original application.

At this point, the Systems Management Committee believes that the TF should be permitted to conduct its own independent evaluation of the alternatives it is proposing to the degree to which the potential additional water supply from various decentralized projects can be refined in terms of potential MGD, projects planned out with estimated costs and timetables, and the regulatory constraints be reviewed with an eye toward their elimination. Environmental constraints of these alternatives should be identified to the extent that any new proposed projects could have most, if not all, environmental issues identified for a potential scoping session pursuant to SEQRA.

As the TF will need to hire experts to undertake studies that should have been taken by United Water years ago to evaluate all of the alternatives described above, the PSC should require that United Water fund these independent studies with a return of \$1,000,000 from the amount requested but not approved for its costs for the desalination permitting project. Any funds from these costs and other costs approved by the PSC should be recoverable through the rate base but with no reasonable return on expenditure (profit) to the company. We further request that the PSC permit the TF to request that further funding of TF studies be ordered upon good cause shown with notice and an opportunity to be heard granted to United Water.

In terms of systems to reduce real water losses from leaks, the PSC should order United Water to proceed with its planned systems improvements with regular quarterly reports on progress sent to the PSC and to the TF to insure that the present proposed three year schedule of implementation be met. We further request that the PSC order United Water to propose a new schedule of main replacement to speed up the system wide replacement from its current inadequate pace.

V. AFTERWORD

This Comment Report of the Water Resources Task Force to the Public Service Commission would not be complete without acknowledging the dedicated volunteer members of the Task Force. Many thanks to Chairwoman Audrey Zibelman and Public Service Commissioners for giving Rockland County the opportunity to develop long-term, sustainable water plan for Rockland.

We are proceeding.

*Harriet Cornell,
Chairwoman*

VI. ADDENDUM A - TECHNICAL MEMORANDUM BY AMY VICKERS & ASSOCIATES, INC.

Please see the attached Addendum A that was prepared for the Task Force by Amy Vickers & Associates to provide additional consultation and respond to commentary prepared by Arup & Partners P.C. on behest of UWNYS. Addendum A will be filed with this Task Force Comment Report on October 5, 2015 in response to the above referenced PSC Notice of August 6, 2015.

Addendum A

TECHNICAL MEMORANDUM

October 5, 2015

TO: Rockland County Task Force on Water Resources Management

FROM: Amy Vickers, Amy Vickers & Associates, Inc.

Subject: Comments on responses and follow-up issues to the "Vickers Report" to the Task Force (July 2015)

This Technical Memorandum was prepared at the request of the Rockland County Task Force on Water Resources Management ("Task Force") to address comments and issues raised since the release of the "Water Losses and Customer Water Use in the United Water New York System" ("Vickers Report") prepared by Amy Vickers & Associates, Inc. ("AVA") in July 2015. The report was prepared for the Task Force under order of the New York State Public Service Commission ("PSC") and funded by the Task Force through the County.

Four topic areas are addressed in this Memorandum:

1. Background and findings of the Vickers Report, including the analytical methodologies, standards and tools used in the study;
2. Report preparation and review process;
3. Response to comments on the Vickers Report, in particular those raised by UWNYS and its consultant, Ove Arup & Partners, P.C. ("Arup"); and
4. New issues and questions for UWNYS, the PSC, and the New York State Department of Environmental Conservation (DEC) that have been raised as a result of the Vickers Report.

1.0 BACKGROUND AND FINDINGS OF THE VICKERS REPORT

The study that resulted in the Vickers Report to the Task Force was conducted at the request of the New York State Public Service Commission's (PSC) directive of November 17, 2014, "Order Addressing Status of Need and Direct Further Study," Ref. Case 13-W-0303. The Order directed UWNYS and the Task Force to study in collaboration what conservation opportunities exist with the goal of identifying measures that may reduce demand by at least 2 million gallons a day (MGD) and to file a plan that would identify the feasibility, cost and estimated demand reductions associated with each identified measure. To that end, the Task Force, including UWNYS, proposed a two-phase project approach for a Conservation Feasibility Study to result in a comprehensive conservation plan for the County. The PSC endorsed the two-phase project approach. Phase 1, the Vickers Report, was the recommended "baseline" customer and system water use analysis and preliminary estimate of potential water savings to support the proposed Phase 2 (plan) of the Feasibility Study.

The focus of the Phase 1 study was the extent to which system water losses (e.g., leakage, accounting errors, and theft) and customer (residential and nonresidential) water use in the UWNYS service area are at, above, or below water industry standards, benchmarks, and performance indicators for water use efficiency. Preliminary estimates of the potential long-term water savings

from improvements to UWNY's water loss control and customer conservation programs were made and provided in the report, which are summarized below. In addition, the report presented findings on various sets of unexplained inconsistent data reported by UWNY that impacted the study as well as recommendations on several other project-related topics.

1.1 Study Approach and Report Preparation Process

A number of commonly referenced professional system water loss and water conservation manuals and guidance documents, standards, methodologies and software, including those established by the American Water Works Association (AWWA), were used in the analysis that guided the study findings in the Vickers Report. A list of those references is provided in Attachment A.

1.2 Key findings in the Vickers Report

The key findings in the Vickers Report satisfy the PSC's Phase 1 project goals for a water use analysis and preliminary estimates of potential savings in the UWNY system, and they also include related findings on UWNY's shortcomings with respect to system infrastructure maintenance as well as inconsistencies in their reported figures for water supply, consumption, imports, exports, system water losses and non-revenue water (NRW):

- **Water demand in United Water New York's service area was largely flat from 2000 to 2014, averaging about 29 million gallons per day (MGD) in both 2000 and 2014, despite an 11% population increase over those years.** This trend may continue for the foreseeable future due to the continuing impacts of national and state water efficiency standards for plumbing fixtures and appliances as well as changing economic conditions.
- **Data inconsistencies, errors, and missing data in UWNY's records and reports make it difficult if not impossible to know the true volumes of water supplied, imported, exported, consumed by retail customers, and "lost" to non-revenue/unaccounted-for water (e.g., leakage, meter and other accounting errors) for the years 2012, 2013, and 2014 that were the focus of analysis for the Phase 1 study.** Despite requests to UWNY to explain these troubling data inconsistencies, UWNY has yet to report to the public what is the one set of accurate figures for those years.
- **The sluggish pace of UWNY's main replacement put it on a multi-century 704-year schedule in 2014, on top of being more than a decade behind the state's recommended timetable for surveying leaks in system mains, facts that may explain why UWNY has for years failed repeatedly to comply with the PSC's maximum 18% system water loss standard.** Main replacement in the UWNY system in 2012 and 2013 were on 248-year and 389-year schedules, respectively, also hundreds of years behind replacing system mains and pipes that for many systems have a maximum average service life of about 100 years, at best.
- **An estimated 2.5 MGD to 3.3 MGD of potentially recoverable leakage exists within the UWNY system based on revised American Water Works Association (AWWA) Water Audit reports for 2012-2014 using AWWA defaults and corrected data, such as a consistent average length for customer service lines, and UWNY's Annual Report water data reported to the PSC. That potentially recoverable portion of UWNY's huge volume of system leakage represents about 10% of UWNY's average annual 29 MGD demand in 2014.** These findings are a sharp contrast to previous UWNY estimates using flawed data and assumptions that produced low estimates of recoverable leakage and high estimates of apparent losses (non-physical losses, e.g. meter under-registration and theft).

- **A preliminary estimate of 1.9 MGD to 3.6 MGD of potential water demand reductions from customer-oriented conservation measures exists within the UWNY system, which represents 7% to 12% of UWNY's average annual 29 MGD demand in 2014.**
- **A preliminary estimated combined total of 4.4 MGD to 7.0 MGD of potentially recoverable system leakage and customer water savings from conservation is currently available within the UWNY system.** If UWNY had previously invested sufficiently in aggressive conservation and leakage reduction programs to achieve those levels of potential water savings, UWNY's average 29 MGD demand in 2014 might have been reduced by as much as 15% to 25%, lowering average day demand to about 22 MGD to 24 MGD for that year.
- **The need for additional water supply capacity in the UWNY service area seems doubtful at this time given UWNY's potential water savings from aggressive system leak repairs and main rehabilitation, implementation of a comprehensive customer-oriented conservation program, and opportunities for Rockland County to develop alternative reuse and rainwater harvesting water supplies in the future.**
- **In addition to conservation, water reuse technologies, rainwater harvesting, and green infrastructure options offer Rockland County significant new opportunities to drive down UWNY's water demands even further while also achieving increased water supply independence.**
- **Updated and more aggressive system water loss reduction and customer water conservation standards and requirements need to be established—and enforced—by the New York PSC and DEC to minimize avoidable system leakage and customer water waste. Failure to establish a higher standard for water conservation and efficiency will continue to put the public, ratepayers, and the environment at risk from costly new water supply projects that may not be needed.** Currently both the PSC and DEC rely on outdated water conservation standards, guidance documents, and approaches that fail to guide water utilities like UWNY toward the many more efficient and green water development and management practices that are available today.

2.0 REPORT PREPARATION AND REVIEW PROCESS

2.1 Agreement on Scope and Process

Extensive initial negotiations with UWNY resulted in a contract agreement between AVA and the County, whereby UWNY would have the right to first review the final draft of the report for customer confidentiality prior to sharing it with the County. UW did not require content review or "peer review" prior to publishing of the report.

The report preparation process for the Vickers Report, like most studies, included preparation of a draft report, opportunity for feedback and comments, and a final report that incorporated comments received on the draft report.

2.2 Data Collection and Analysis

Starting with the project kick-off in late March 2015 during which AVA held numerous meetings with UWNY, the Task Force, and County staff, AVA's initial project work included data collection from UWNY. AVA worked with UWNY from March to June to obtain required data and information. However, many responses from UWNY were delayed, data was missing, data contained

clear errors and some data contained apparent discrepancies and inconsistencies. During April through June 2015, these issues were brought to the attention of UWNYS management, the Task Force management, as well as the Public Service Commission, in hopes of addressing and resolving them prior to completion of the draft and the final reports. The disconcerting data issues were not resolved by UWNYS prior to completion of the draft report, despite repeated requests made by AVA and the Task Force.

2.3 Draft Report and Period for Comments

On June 24, 2015, AVA sent a confidential copy of the Draft Vickers Report to UWNYS and the PSC for customer confidentiality review, as agreed in the contract. On June 25, 2015, John T. Dillon, Senior Corporate Attorney–Regulated Operations at UWNYS emailed AVA that the draft report was found to contain no confidential information and that it could be shared with the County of Rockland. The Draft Report was then emailed the same day to the Chairwoman of the Task Force, Leg. Harriet D. Cornell, and the Task Force Coordinator, Patricie Drake, Esq.

Amy Vickers, President of AVA, made a presentation of the draft report to the Task Force on Saturday, June 27, 2015 at Rockland Community College. UWNYS General Manager Christopher J. Graziano and Deb Rizzi (UW) were in attendance, but did not comment, ask questions, seek clarification or raise objections.

At the June 27th presentation and subsequently at a public meeting, The Task Force announced and allowed a sufficient amount of time to receive substantive technical comments and feedback to AVA prior to finalizing the report. United Water New York had four (4) weeks to review and provide comments and suggestions before the Vickers Report was finalized on July 22, 2015. Other than one short angry telephone call from David Stanton, president of UWNYS, to Amy Vickers, president of AVA, on June 25, 2015 about the tone of the Draft Report, UWNYS failed to provide written or constructive verbal comments or suggestions to AVA or the Task Force prior to release of the Final Report on July 22.

2.4 Finalized Report

After four weeks and several public prompts for comments, the Task Force and the PSC sought to have AVA finalize the report. On July 22, 2015, the Vickers Report was finalized and filed by the Task Force with the PSC in Ref. Case 13-W-0303. Over the course of four weeks, UWNYS failed to timely provide any substantive feedback or technical comments to enhance the accuracy of UWNYSs data as featured in the report.

In sum, UWNYS failed to take advantage of every opportunity in the months preceding and following the draft report to provide comments, clarifications, suggestions, corrections, and answer the many questions raised in the report. The outstanding data errors and discrepancies were not addressed in Arup’s review of the Vickers Report and remain unresolved.

2.5 UWNYS Response

UWNYS waited until *after* the Final Vickers Report was released to publish commentary on the Report as prepared by the consultant Ove Arup & Partners, P.C. Thus far, other than hiring a consultant, Arup, to respond for UWNYS–without UWNYS having to dialogue and answer directly–to the Vickers Report, UWNYS has yet to issue a comprehensive and direct response to the entirety of the report’s substantial findings, including serious questions about the accuracy of UWNYSs reports to the PSC and DEC for the volumes of water supplied, imported, consumed, exported, and lost to system losses and non-revenue water (NRW). UWNYS has also yet to explain if and when it will start

making investments to take advantage of the significant water demand reduction potential within its system, as identified in the Vickers Report, that may offer cost-effective alternatives to meeting Rockland County's future water supply needs. Instead, UWNYS has chosen the course of aggressive criticism of the Task Force and AVA, including ad hominem and damaging public statements about the report's author.

3.0 RESPONSE TO COMMENTS ON THE VICKERS REPORT

This section summarizes responses to a number of comments on the Vickers Report, in particular those raised by UWNYS's consultant, Arup, and some similar comments by UWNYS in their August 4, 2015 letter from UWNYS General Manager Christopher J. Graziano to Hon. Kathleen M. Burgess, Secretary to the New York State Public Service Commission.

3.1 Comments from Arup and UWNYS

The consulting firm Ove Arup & Partners P.C. ("Arup") was hired by UWNYS to review the Vickers Report, with Arup issuing a self-described "Independent Review" report on Aug. 4, 2015.

The Arup review contains a number of errors, distortions, and misinterpretations of the findings and tables and charts in the Vickers Report, which are based largely on data reported by UWNYS—albeit inconsistently for a number of years. In several instances it is clear that whoever wrote the Arup review—Arup omits their name(s)—they neglected to carefully read and fully comprehend the Vickers Report. Those shortcomings by the Arup reviewer(s) appear to be based on their lack of familiarity and professional experience with the water industry standards, analytical tools, and literature that underpin the analysis and findings in the Vickers Report on system water loss, customer water use, and potential savings from conservation. See Attachment A to this Memorandum for references to industry standards and standard methods used in the Vickers Report, such as the AWWA Water Audit software, AWWA Manuals of Water Supply Practice, and other guidance materials.

The following comments address Arup's review report by page number and topic.

3.1.1 On the cover page of its "Independent Review" of the Vickers Report, Arup notes its "instructions and requirements" from UWNYS and states that "it should not be relied upon," and disclaims responsibility for its review:

"This report takes into account the particular instructions and requirements of our client [United Water New York]. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party."

Arup's statement and disclaimer on the cover page of its report bear several observations and questions:

- What were the "instructions and requirements" of its client, United Water New York, to Arup in Arup's preparation of their review of the Vickers Report?
- How "Independent" is Arup's review in light of UWNYS's "instructions and requirements"?
- Why does Arup state publicly that its review of the Vickers Report "should not be relied upon"? Why is Arup of the opinion that their report is not reliable? Further, since Arup is

claiming that they assume “no responsibility” for their report, are they implying that their report is irresponsible?

- Why does Arup state that “no responsibility is undertaken to any third party” for its report, particularly when it contains several statements that besmirch the reputation of AVA and Amy Vickers? Examples of disparaging statements include: “there continues to be a general misinterpretation of complex UWNY data by Ms. Vickers, which has led to multiple inaccuracies in the report” and “Ms. Vickers perceived data inconsistencies in the information provided by UWNY.”
- What is the purpose of UWNY releasing the Arup report when Arup itself admits that its report “is not intended for and should be relied upon by any third party”?
- Can the PSC and others accept the Arup report as a credible and legitimate document, and should comments on it be accepted and published, when Arup is claiming that their report is “not intended for and should not be relied upon by any third party”?

3.1.2 What are the names and qualifications of Arup’s “peer” reviewer(s) of the Vickers Report, and why are they are not identified anywhere in the Arup report?

Strangely, neither the name(s) nor qualifications of the person(s) who prepared the Arup “peer” review of the Vickers Report are identified in the Arup report. That is standard information in a professional report, yet Arup omits it. Why Arup failed to include that information and UWNY did not require it are unanswered questions. Who conducted the Arup review and prepared the report, what are their qualifications to act as a “peer” reviewer of the Vickers Report, and why are their names not identified anywhere in the Arup report?

Facts: Arup’s failure to state its qualifications to perform a review of the Vickers Report, in addition to Arup’s cover page disclaimer that their review of the Vickers Report “should not be relied upon by any third party and no responsibility is undertaken to any third party,” cast fundamental doubts about the credibility, independence, and accuracy of every single page of Arup’s review.

3.1.3 Is Arup capable of an “Independent Review” of a report on a water conservation study given Arup’s growing international business activities that include the promotion, design, construction, and operation of desalination plants, and which in some cases may be rejected for less costly leakage recovery, water conservation, reuse, and rainwater harvesting project alternatives?

Facts: In addition to Arup’s cover page disclaimer that its review “should not be relied upon by any third party,” Arup also fails to claim responsibility for its potential pro-desalination business bias against typically less costly water efficiency and system loss reduction strategies that call into question Arup’s objectivity as an independent reviewer of the Vickers Report. A quick search online quickly reveals a number of very large and profitable desalination projects throughout the world with which Arup has been and is currently engaged.

3.1.4 Arup errors on Scope of Services and Work Performed

Page 2 of the Arup report asserts incorrectly the following:

“Amy Vickers & Associates’ March 12 scope of services for the Phase 1: Water Data Analysis to Support a Water Conservation Feasibility Study was intended to address the needs of the

NYSPSC “Order Addressing Status of Need and Directing Further Study” (Order), November 17, 2014, Ref. Case 13-W-0303, which specifically requires the following:

1. UWNY shall study what conservation opportunities exist, in collaboration with the Task Force [the Rockland County Task Force on Water Resources Management], with the goal of identifying measures that may reduce demand by 2 million gallons per day (MGD) and shall file a report with the Secretary within six months of the issuance of this order identifying the feasibility, cost and estimated demand reductions associated with each identified measure.

2. UWNY shall conduct a study and file a report with the Secretary within six months of the issuance of this order describing the feasibility, anticipated cost of development and description of the associated permitting process and processing time for a project or series.”

On page 3 Arup correctly notes that “[i]n general, the scope of the work described above was completed as represented in the Vickers Report.” It also states correctly that this scope “does not address the entirety of item 1 of the NYSPSC Order.”

3.1.5 Pages 2 and 3 of the Arup Report assert incorrectly:

that the Vickers Report was “*intended*” to have included a feasibility study of conservation opportunities and related potential water savings and costs for each measure, similar to the planning approach described in Amy Vickers’s *Handbook of Water Use and Conservation* (WaterPlow Press).

Facts: Arup misapprehends the Scope of Services as it relates to the overall Scope of Work *intended* and required to address the PSC Order.

Facts: The Phase 1 scope was **not** “*intended*” to “*address the entirety of item 1...*” As stated on p. 2 in the “Scope of Work for the Rockland County Task Force on Water Resources Management, Phase 1: Water Data Analysis To Support a Water Conservation Feasibility Study” as prepared by Amy Vickers & Associates, Inc. on March 12, 2015 (see Attachment B), and as attached to the project contract, “This scope of work, budget, and schedule is for the Phase 1 project only.”

Facts: the Task Force, including UWNY, unanimously agreed upon the Phase 1 Scope of Services. Budgetary constraints necessitated that the work be completed in two phases. The findings from the Phase 1 are meant to provide the necessary initial “baseline” system data analysis to inform the Phase 2 study, which would include the feasibility study ordered by the PSC and referenced above by Arup. The Task Force and UWNY agreed that the first phase, with a narrower scope, be completed by AVA (as provided in the Vickers Report).

Facts: Phase 1 was the initial step; Phase 2 is **intended** to bring the required work to completion. It is strongly recommended that the completion of the Conservation Feasibility Study involve active and constructive participation by the utility – it was, after all, under PSC order to complete this work in collaboration with the Task Force, as Arup notes. Once the work resumes, the information provided by UWNY can be fully utilized, provided that the data problems are adequately addressed and resolved.

3.1.6 Arup errors: Page 3 of the Arup report states:

“it appears that the information provided by UWNY was not fully utilized, particularly the three full years of historic data on the UWNY system (i.e. repair and replacement program) and the data provided from the UWNR system Non-Revenue Water (NRW) study.”

Facts: The Vickers Report DOES utilize UWNY data and information and also addresses the UWNR 2012 “Halcrow” report on the United Water New Rochelle (UWNR) system.

Facts: Arup seems to not understand that the Vickers Report relies almost entirely on historic UWNY system data reported by UWNY. Section 2, “System Water Use and Water Losses,” of the Vickers Report presents a 21-page comprehensive analysis containing numerous tables and charts, and discusses and references numerous sets of UWNY data—much of it conflicting—and UWNY reports on systems losses, non-revenue water, and system rehabilitation. Specifically, Tables 2-3, 2-4, 2-5, and 2-6 all address UWNY’s NRW and infrastructure problems in detail. In addition, Appendices A, B, C, D, E, and F of the Vickers Report are supporting attachments to Section 2.

Facts: Page 2-13 of the Vickers Report addresses the UWNR “Halcrow” study and found their 2012 Non-revenue Water study (based on 2010 and earlier data) of United’s *New Rochelle* system to be outdated and irrelevant to the water loss and infrastructure problems occurring presently in the United Water *New York* system, as explained in the Vickers Report (p. 2-13):

“UWNY’s estimated economic level of leakage (ELL)—the financial benefits and costs of its leak recovery—were requested of UWNY during this study. However, United Water does not appear to have a detailed financial analysis of leakage in the UWNY system. Instead, they base their assumptions for the cost-effectiveness of leakage recovery in the Rockland County service area according to a 2012 study by Halcrow consultants (based largely on system data for year 2010 and earlier) of United Water’s *New Rochelle* and *Westchester* service areas. However, it is difficult to understand how the condition of another water supply system could be directly comparable to that in Rockland County given the many factors which make water infrastructure systems unique (i.e., design, age, condition, service area, maintenance practices, operating costs, etc.).”

Facts: Arup admits that there has not been an individual detailed analysis of the UWNY system to date and in the absence of such information it advocates UWNY’s unsubstantiated use of data from the Halcrow report for another system, Westchester County, to Rockland County. The comparison is ludicrous and is similar to suggesting that because two adult males both work for water utilities in nearby counties, the health status of one of the individuals is relevant in describing the condition of the other. The fact that United Water Westchester is UWNY’s sister company and nearby, just as the New York City and United Water New Jersey water systems are nearby, is irrelevant as a basis for claims of sufficient similarities, especially given the aforementioned “*complexities*” of the UWNY system. They are two entirely different systems that also exist in different counties and are not geographically contiguous. The fact that UWNY has easy access to a study that was conducted across the Hudson River does not mean that the data should be used as a reliable source of representative scenarios.

Facts: Arup provides no basis for the relevancy of Halcrow’s outdated study of non-revenue water in one water system (New Rochelle, subsequently combined with Westchester and now referred to as ‘UWWC’), nor does Arup provide any basis for how that 4-5 year old study has “intrinsic value” and can be “representative” of another system, Rockland County. The Halcrow report did not study UWNY’s system and makes no appraisal of it. Arup cited no studies of NRW that it completed for a

water system that they recommend should be “fully utilized” and “representative” for another system. Arup makes a general statement about best engineering practices but does not indicate which set of United’s “real data” in Table 2-1 of the Vickers Report should have been used.

Further on page 4 Arup states:

“The Vickers Report also relied heavily upon use of national average data incorporated as default values in the American Water Works Association (AWWA) Free Water Audit Software. While the data on NRW and apparent and real losses is specific to the UWNR system, there is intrinsic value in comparing the demographics, data, and characteristics of water usage and the water distribution system to UWNR.”

“Several important concepts and goals are presented in the Vickers Report. However, the results are biased toward the use of national average default values, as opposed to a more balanced approach that includes both national average AWWA default values, as well as analogous UWNY and UWWC data. Best engineering practice considers real data first, then representative data such as the UWWC data, and finally average data (e.g., national data) or default values provided by AWWA. Default values are typically applied in the absence of site-specific or representative data.”

Facts: Indeed, the Vickers Report utilized AWWA and other standard water industry data and metrics, as recommended for water professionals by AWWA in their guidance materials for the AWWA Water Audit software and other programs. Further, the Vickers Report includes examples of UWNY’s AWWA water audits that failed to accurately report data required by the AWWA model in at least several recent years, which is partly why the Vickers Report prepared a second set of revised AWWA audit reports for UWNY so that UWNY’s water losses could be compared to industry standards.

3.1.7 Arup distortions: Pages 5-6 of the Arup report states:

“As per the Vickers report, ‘Water demand in United Water New York’s service area has been largely flat since 2000 despite a growing service area population, a trend that may continue for the foreseeable future.’ As shown in Figure 1-1 of the Vickers report, annual average day production in 2000 and in 2014 were virtually equal; however, during the 2002 through 2007 period, there was an increase in both average annual day production and maximum day demand.... Notwithstanding this recession-induced commercial and industrial decline, Rockland County was New York’s fastest growing county in 2014 based on percentage growth. UWNY must be prepared to meet current system demands, as well as to allow for future population growth and economic development.”

Facts: Arup distorts the facts of UWNY historical water demands by extracting one relatively minor 5-year period of slightly increased demand within UWNY’s most recent largely flat 15-year water demand history (and with an increasing population, Figure 1-1, p. 1-1 in Vickers Report), which is below the system’s safe yield, to imply that in 2015 UWNY is not prepared to meet its current and future system demands.

Facts: Arup fails to explain how those five years of minor demand increases, going all the way back to 2002-2007 and which were below the system’s average day safe yield, are relevant to Rockland County’s current 2015 and projected water needs. Further, given that UWNY’s 2014 and recent years’ demands are still below the system’s safe yield, and both the Vickers Report and other

studies have made preliminary estimates that UWNY possesses significant potential future demand reductions from conservation and leakage recovery, as well as additional demand reductions from reuse and rainwater harvesting, UWNY could be very prepared to meet future demands and growth in Rockland County through cost-effective investments in water efficiency.

Facts: Arup ignores the fact that not only was Rockland County the fastest growing county in New York in 2014, Rockland's average day water demands in 2014 were slightly less than those in 2000, underscoring one of the key points in the Vickers Report that both residential and nonresidential water use are declining in many U.S. regions, even as population increases and economic growth are occurring, thanks to advances in water efficiency standards and practices.

3.1.8 Arup errors: Page 6 of the Arup report states:

"The UWNY system is complex, and reporting to the various regulatory agencies has evolved over the years as UWNY has expanded its assets and operations. This extensive range of data would require a significant amount of analytics to draw reasonable and representative conclusions. Confidence in data to perform analysis of consumption, water use, and real and apparent losses is certainly crucial. It appears that Amy Vickers & Associates does not recognize these system complexities, which has therefore resulted in multiple inaccuracies in the Vickers Report's stated conclusions."

"Ms. Vickers perceived data inconsistencies in the information provided by UWNY. However, through a series of communications and development of a refined version of the data (v7), which relied on only NYSPSC data, UWNY again attempted to clarify the perceived inconsistencies. Based on the records reviewed and discussions with UWNY, several attempts were made to meet and explain the data to Ms. Vickers, to no avail. An insufficient understanding of complex data seems to have led to many of the flawed conclusions in the report."

Facts: Arup mischaracterizes the Vickers Report's findings of serious data and reporting problems as "*perceived*," and fails to address or resolve the multiple conflicting data sets, clear errors and inconsistencies within UWNY's reported historical data. Arup uses the word "*perceived*" on numerous occasions to characterize UWNY's many data inconsistencies and errors, as they were documented in the Vickers Report. However, Arup fails to provide an explanation in the 16 pages of its commentary for the reason that so many of UNWY's reports of water supplied, consumed, exported, imported, and lost do not match up (or add up internally), including those reported to the PSC, the New York Department of Environmental Conservation (DEC), and the multiple shifting data sets sent to AVA.

Facts: Repeatedly, AVA requested the same information from UWNY, but consistently received different answers. This is a historical record of water data between 2012 and 2014, yet, the numbers returned by UWNY shifted several times between April and May 2015. **The disparate and apparently fluid changes in records as provided by UWNY to AVA are a matter of fact, not "perception."** A problem was not "*perceived*" in the course of AVA's analysis, it was uncovered.

Facts: Arup, like UWNY, also fails to show how UWNY's data set v7 is consistent with data reported to the PSC and DEC, as documented in Table 2-1, Appendix A, and Appendix B in the Vickers Report.

Facts: Arup fails to note that after multiple inquiries by AVA to UWNY about their problem data, UWNY acknowledged its inability to explain its data inconsistencies, as discussed in several emails between UWNY staff member Donald Distante and AVA in May 2015.

Facts: Despite UWNY's own acknowledgement of their problem data and their inability to explain it, Arup fails to explain and detail what "complexities" exactly AVA does "not recognize" and only "perceive" about UWNY's problem data.

Facts: Neither Arup nor UWNY have explained by what justification historical records of water supply, demand, and system losses can be 'refined.' Further, Arup, like UWNY, is silent about UWNY's intentions to correct prior reports to the PSC, DEC, and other documents using its "refined" v7 version of its historical volumes of water supplied, consumed, and lost to system leaks and other losses.

Facts: Arup's comments on p. 6 get to the heart of the problem with UWNY's multiple and conflicting data sets while at the same time they ignore the fact that UWNY's troubled data sets make any projection of future demand or savings from conservation to be inaccurate to some extent. Arup ignores the fact that the Vickers Report makes clear note of that problem, stating on p. 2-5 that "UWNY's data inconsistencies will inevitably ripple through this report to some extent."

3.1.9 Arup errors: Pages 6-7 of the Arup report states:

"several attempts were made to meet and explain the data to Ms. Vickers, to no avail"

Facts: Arup provides no evidence to support the statement, nor does Arup clarify when and by whom these "*several attempts*" were made. The reverse is true. Repeated and documented email requests were made by AVA to UWNY in April and May 2015. Replies by UWNY staff acknowledged their data problems but do not resolve them – instead, a new set of different data for the same time periods was provided by UWNY. On May 19, 2015, Leg. Cornell sent a letter to David Stanton, President of UWNY, requesting full and complete answers to outstanding questions and data requests. In that letter, the Chairwoman of the Task Force pleaded with UWNY to provide timely clarifications and resolve data issues before they necessarily became part of the findings:

*"For the most part, United Water has been providing water usage data to Ms. Vickers incrementally, requiring repeated requests by her for outstanding necessary information. Additionally, Ms. Vickers has identified and submitted requests to United Water staff to clarify apparent data discrepancies **in an effort to give United Water an opportunity to address them prior to completion of the final report. The goal is to prevent unnecessary misunderstandings or duplication of effort at a later stage when these issues would resurface and require further scrutiny.**" [Emphasis added].*

UWNY's primary complaint seems to be that these inconsistencies and errors were not resolved/revised/corrected behind closed doors, but rather became a matter of public record. Nevertheless, AVA recommends that UWNY addresses these data issues and implements better controls and reporting practices.

3.1.10 Arup errors: Page 7 of the Arup report states:

"We question the value of providing these NYSDEC data in Table 2-1. The analysis presented in Table 2-1 states a maximum differential of between 98.34 million and 204.75 million gallons

per year, which is a misrepresentation and overstatement based on data that are not comparable.”

“Furthermore, it appears that Ms. Vickers did not make corrections to data to account for South County water, which is not part of UWNY’s system in Rockland County.”

Facts: Arup fails to explain by what definition(s) the data in Table 2-1 are not comparable, nor do they state what is UWNY’s correct data for each category shown in Table 2-1.

Facts: Arup fails to explain why UWNY provided data to AVA (and previously also to the PSC) that needs “corrections.”

Facts: Arup improperly places responsibility on AVA for correcting UWNY’s inconsistently accounted data that UWNY presented in its official reports to the PSC and DEC. It is the utility that has the affirmative duty to report accurately and make necessary corrections.

UWNY provided several changing sets of data to AVA during the Phase 1 study. In AVA’s process of searching for a data set that is “official” and reliable, AVA repeatedly asked for accurate information and clarifications, but instead received new sets with new questions. This process could have continued on, because UWNY did not seem able to reproduce the same report twice, despite being asked for the same historical information.

Several weeks after the original Vickers Report deadline, UWNY provided yet a new inconsistent set of data to AVA (v7). At that stage, no new round of corrections and adjustments by UWNY to their data would instill confidence in the reliability of those data. Thus, AVA resolved to utilize data that UWNY had reported to the PSC, given that the PSC and the public must rely on this information – not on shifting data sets that require multiple corrections that are not reflected or explained in the official record.

3.2.11 Arup errors: Page 7 of the Arup report states:

“Ms. Vickers incorrectly shows the take-or-pay amount for Letchworth as water imported. The value used, 182.5 MG, is from NYSPSC annual reports and is provided strictly for financial reasons and does not represent the actual amount of water used.”

Facts: Arup does not counter this fact, but rather states that UWNY does not really mean it and it is up to AVA to correct for it. UWNY states on p. 305 in its Annual Reports to the PSC that the volumes of water sold and purchased, which in other documents UWNY claims are merely financial transactions, are recorded by UWNY by volumes of “Gallons Supplied” and not just cost totals. UWNY also failed to record in its 2012-2014 AWWA Water Audits the volumes of water it purchased and imported. As stated in the Vickers Report (p. 2-5), when UWNY staff was asked about this discrepancy and why volumes of water were reported to be associated with those transactions, which implies that water was moved, no answer was provided. The question of this accounting remains outstanding.

Facts: This is not a system “complexity” issue or a misunderstanding – it is an issue with keeping accurate, reliable and verifiable records. The Arup Report repeatedly misplaces UWNY’s affirmative duty to properly record and report water system data. AVA recommends that if, in fact, there are no volumes of water transmitted, UWNY should stop reporting otherwise and thus avoid the need for such sidebar qualifications that the reported volumes are not really

representative of real water transactions. AVA was not retained to make corrections to UWNY's water use data in order to reflect poorly accounted transactions.

3.1.12 Arup errors: Page 8 of the Arup report states:

Page 8 of the Arup report states:

"The Vickers report uses the term "corrected" on multiple occasions throughout the report, which is an inaccurate portrayal of the data provided. Amy Vickers & Associates may have decided to use different assumptions than UWNY did to reach conclusions, but to refer to these assumptions as "corrected" in any way is misleading."

"implying that the water audit reports provided by UWNY are erroneous is not an appropriate characterization of the provided data."

Facts: Arup mistakes the revelation of inaccurate data for "inaccurate portrayal of the data provided." Arup denies data errors in UWNY's AWWA Water Audits that UWNY has already conceded. UNWNY staff acknowledged that errors exist in some of UNWNY's reports of water loss as well as supply and consumption data in several emails, including those from Donald Distanto to AVA, which is why UWNY reworked their audit reports after they were alerted to errors by AVA.

Facts: Arup confuses the draft and final versions of the Vickers Report, which the latter in most cases refers to revised and not "corrected" audits. Nevertheless, needed "corrections" to UWNY audit reports were discussed between UWNY and AVA on at least one occasion, as shown in the emails between UWNY and AVA discussed earlier.

Facts: UNWNY staff acknowledged that errors existed in their 2012-2014 water audit reports, which is why they revised them after being alerted to that fact by AVA. UWNY subsequently prepared revised audit "scenarios" using new data for those years. Thus, UWNY did "correct" their reports despite Arup's claim to the contrary. For example, the Vickers Report documents how UWNY used an average 75-foot distance for customer service lines in their 2012 and 2013 AWWA Audit Reports, which is incorrect as documented in other UWNY reports. UWNY's use of a 75-foot distance for those years contributed to more favorable reports on non-revenue water, yet Arup describes UWNY's 2013 NRW practices as "utilizing the best practices and strategy developed from that analysis." Further, Arup fails to understand that the revised AWWA Water Audit reports for 2012-2014 in the Vickers Report are not the same revised "scenarios" sent by UWNY to AVA.

3.1.13 Arup errors: Page 8 of the Arup report states:

"A more reasonable estimate of potential leakage reduction of 0.5 to 1.0 MGD, is reflected in the June 2015 Report on the Feasibility of Incremental Water Supply Projects and Conservation Opportunities in Rockland County, New York."

Facts: The Vickers Report's higher 2.5 MGD to 3.3 MGD preliminary estimate of UWNY's recoverable leakage is based directly on UWNY's own data and results from the revised AWWA Water Audits using the water industry's standard water loss analytical software.

Facts: Arup fails to explain the basis, methodology and standards used to determine the lower 0.5 MGD to 1.0 MGD estimate in the June 2015 report. UWNY's much lower estimate of potential

leakage reduction appears to be geared more toward meeting the minimum water savings goals set by the PSC than recovering its huge volume of chronic, unrepaired leakage.

3.1.14 Arup Errors: Page 12 of the Arup Report inexplicably characterizes as “*misleading*” the Vickers Report’s questions about UWNY’s zero/no volume estimates for its approximately 170 billed unmetered customers that are not included in UWNY’s water audits.

Facts: Arup offers no explanation for these unusual if not preferential service procedures for selected customers.

3.1.15 Arup errors: Pages 9 and 15 of the Arup report state:

“Table 4-1 also assumes an average 28.2% reduction in demand for single family homes and a 10.7% percent overall reduction. These levels seem high to sustain on a long term basis.”

“We also suggest that the Vickers Report represented values of an average 28.2% reduction in demand for single family homes and a 10.7% percent overall reduction, are high, and not sustainable.”

Facts: In both instances, Arup has clearly misread and mischaracterized what is presented in Table 4-1 of the Vickers Report. Table 4-1 presents a preliminary estimated average Single-family savings potential of 1.6 MGD as 28.2% of the total preliminary estimated savings for UWNY, which is 5.7 MGD. Based on a 28.5 MGD annual average day for the UWNY system, the 1.6 MGD savings estimate for Single-family customers represents a 5.6% reduction in total demand—hardly the 28% that Arup claims incorrectly.

3.1.16 Arup errors: Pages 9 and 10 of the Arup report fail to see the gravity of UWNY’s backlogged system repair program, implying that 2012 and 2013 were a meaningful improvement over UWNY’s 704-year main replacement schedule in 2014:

“The 2012 and 2013 repair and replacement work...in fact reflects a 248 and 389 year replacement cycle.”

“UWNY has made significant progress in leveraging technology to better manage its water resources.”

Facts: This is a sad admission that UNWY is centuries behind in its failure to maintain its system to industry standards. These statistics unequivocally bolster the Vickers Report’s findings that UWNY continues to have such persistent and high system leakage and other losses that may be more recoverable than UWNY represents. These facts make less likely Arup’s statements that the higher recoverable leakage numbers are due to “*perceived data inconsistencies*” (Arup, p. 8) or incorrect “*scenarios*,” as discussed previously.

Facts: Main and pipe replacement for many if not most U.S. water systems are on a maximum 100-year schedule in order to meet required standards and minimize system leakage. Incredulously, Arup implies that the 248- and 389-year main replacement schedules in 2012 and 2013 are examples of how “*UWNY has made significant progress*” in better managing its resources, despite UWNY’s 2014 main replacement program being even further behind, on a 704-year schedule, as documented in the Vickers Report. These numbers speak volumes about the condition of Rockland infrastructure under UWNY’s management.

3.1.17 Arup distortions: Page 14 of the Arup report:

"References to these communities is unclear."

Facts: Arup promotes desalination projects in Australia and other countries, yet the Vickers Report's references to communities with successful conservation programs and savings, including Melbourne, Australia, to Arup for some reason are "unclear."

Facts: Arup appears to have a double standard when it comes to meeting future water supply needs. The head of Arup Australia's water unit, Daniel Lambert, was quoted last year in *The Sydney Morning Herald* (Aug. 31, 2014) as saying "more openness to privatization" is needed because it allows "greater participation of additional service providers" to create "hybrid" business models to invest in new supply options like desalination.

3.1.18 Arup distortions: Pages 14-15 of the Arup report:

"Several good concepts and goals are presented, and applied, as indicated in the Vickers Report. Unfortunately, the analysis is biased toward the use of national average or default values."

Facts: Arup criticizes the Vickers Report for using and referencing AWWA standards and default values, which are the standard methods used and recommended by many if not most water professionals, yet Arup provides no explanation for the methods and standards used by UWNY to determine their inexplicably high estimates of unmetered water which they claim is not leakage.

4.0 NEW ISSUES AND QUESTIONS

Below are follow-up issues and questions for UWNY, the PSC and DEC that have been raised subsequent to the Vickers Report:

1. **What is UWNY's final and correct set of annual and monthly volume figures for water supply, water imports and exports, retail customer consumption, and water losses for the years found to be contradictory in the Vickers Report as summarized in Table 2-1 on p. 2-4?**
2. **For how many years has UWNY been reporting inconsistent and conflicting data, and in how many reports? How many errors have occurred, and what is their significance for Rockland County?** To answer that question, a collection and review of all of UWNY's Annual Reports to the PSC, annual Water Withdrawal Permit Reports to DEC, and all water supply and quality reports to the Rockland County Department of Health (and Department of Planning, if applicable), for at least the years 2000 through 2015, would be required at a minimum. The figures in those reports would also need to be cross-checked with water planning and water rate documents prepared by UWNY, including those for the Haverstraw project and customer rate studies.
3. **Are UWNY's multi-year water data inconsistencies in its reported volumes of water supply and customer consumption in violation of Federal, State and County laws and regulations?** Has UWNY violated DEC, PSC, and other state and federal regulations and laws in issuing different and conflicting numbers for the volumes of water supplied, consumed by customers, and lost to nonrevenue water in state and federally mandated

reports? Have the conditions of UWNY's state water withdrawal permits been violated as a result of water data reporting inaccuracies? What are the fines and penalties for misstatement of facts by water utilities in Annual Reports to the PSC and annual Withdrawal Permit Reports to DEC? Have UWNY's data inconsistencies and conflicting data also been included in their reports to federal agencies, i.e., EPA water quality reports, and those to the Rockland County Department of Health? Do those federal and county agencies have rules and penalties with respect to reported faulty data?

4. **When will UWNY issue corrected Annual Reports to the PSC and corrected Annual Water Withdrawal Reports to DEC for the years in which they have reported conflicting water supply, demand and water loss data?** There can only be one accurate set of figures for the volumes of water supplied, consumed by customers, and lost to nonrevenue water. What are those numbers? How can UWNY accurately assess historical and future water supply needs if it lacks an accurate and reliable set of water data? The UWNY reports for which there are conflicting data exist at least for the years 2012-2014 that are cited in the Vickers Report.
5. **Will the Rockland County Department of Health conduct a formal review of the water supply records received from UWNY, in particular those associated with UWNY's water quality reports, to determine the accuracy of UWNY reported water volume data, at least for the years in which UWNY has issued conflicting water supply and demand figures?** Has UWNY's pattern of inconsistent and conflicting water volume data also occurred in its water quality reports? If so, has UWNY violated federal, state, and Rockland County regulations and laws with respect to its water quality reports, e.g., accuracy of reported data?
6. **Do UWNY's water supply and consumption data inconsistencies also occur in its water planning documents and its EIS for the proposed Haverstraw desalination project?** How and when will Rockland County and/or the Task Force, PSC and DEC conduct a formal review of the accuracy of UWNY's historical water supply and demand data, particularly with respect to the proposed Haverstraw project, for at least the years on which UWNY has based its assumptions on Rockland County's future water supply needs?
7. **When will the PSC require UWNY to issue revised planning documents and recommendations with respect to the Haverstraw project in light of UWNY's water data inconsistencies shown in the Vickers report?** Depending on whether UWNY will or can issue a revised and final set of water supply and demand figures for prior years in which the Vickers report found inconsistently reported data, does that change the forecasted future water supply needs of Rockland County?
8. **How may UWNY's inconsistent water supply and customer consumption figures affect current and past rate studies, specifically how much customers were or should have been charged in light of UWNY's multiple sets of historical customer consumption data?** Based on those findings, is it prudent for Rockland County and the PSC to require UWNY to issue revised past and current rate studies and customer rate schedules?
9. **Are refunds owed Rockland County water customers of UWNY who may have been overbilled in light of UWNY's revised historical customer water volume consumption figures?** How can Rockland County ratepayers be sure that their water bills have accurately reflected their true volume of water consumption if UWNY in 2015 revised the total volume of customer consumption for several prior years? How do those total revised consumption figures affect previously reported and billed consumption paid by Rockland customers? Have some Rockland customers been overcharged, and if so, what refund is due to them? Do those customers include businesses and government agencies, some of which have high volumes of water use, and thus they may be owed refunds on their water bills?

10. **Given the data inconsistencies found in the volumes of water reported by UWNY in 2012-2014 as listed in Table 2-1 of the Vickers Report, should the accuracy of UWNY's drinking water quality and safety records also be reviewed?** Do UWNY's problematic water supply recordkeeping practices also occur in their drinking water quality and safety records? Has the Rockland County Department of Health reviewed UWNY water quality reports, including reported volumes of treated water consumed in Rockland County.

Attachments

- A. References in the Vickers Report. (Includes commonly referenced water conservation and system water loss guidance documents, standards, methodologies and software.)
- B. Scope of Work for the Rockland County Task Force on Water Resources Management, Phase 1: Water Data Analysis To Support a Water Conservation Feasibility Study," prepared by Amy Vickers & Associates, Inc. on March 12, 2015.

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- “Water Loss Control: Apparent and Real Losses” (2012)
- Manual M6–Water Meters: Selection, Installation, Testing, and Maintenance (5th ed.)
- Manual M36–Water Audits and Loss Control Programs (3rd ed.)
- Manual M52–Water Conservation Programs–A Planning Manual (1st ed.)
- Partnership for Safe Water Distribution System Optimization Program, June 2014.

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United Water New York, Inc.

- Historical system production, water loss, and customer meter data and related background information and reports.
- Supplemental Submission to the New York Public Service Commission, Case 13-W-0303, November 8, 2013
- *Update Report* (to The Rockland County Task Force), May 11, 2015.

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Vickers, Amy. “Water Efficiency and Drought Management Practices: Comparison of National Perspectives and Local Experiences,” Annual Water Conference–Agricultural & Urban Water Use: Drought Management Practices, Water Efficiency, and Energy, sponsored by Southern California Edison, Tulare, CA, November 5, 2014.

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Scope of Work for the Rockland County Task Force on Water Resources Management

Phase 1: Water Data Analysis To Support a Water Conservation Feasibility Study

Submitted by:

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March 12, 2015

Background

This project will provide analytical support and guidance to the Rockland County (NY) Task Force on Water Resources Management (“Task Force”), whose members include, among others, representatives from Rockland County (“County”) and United Water New York, Inc. (“UWNY”), with several tasks that the Task Force seeks to complete as part of its response to the State of New York Public Service Commission (“PSC”) directive of November 17, 2014, “Order Addressing Status of Need and Directing Further Study,” Ref. Case 13-W-0303 (“Order”), at pages 66-67 that specifically require:

- UWNY shall study what conservation opportunities exist, in collaboration with the Task Force, with the goal of identifying measures that may reduce demand by 2 million gallons (mgd) and shall file a report with the Secretary within six months of the issuance of this order identifying the feasibility, cost and estimated demand reductions associated with each identified measure.
- UWNY shall conduct a study and file a report with the Secretary within six months of the issuance of this order describing the feasibility, anticipated cost of development and description of the associated permitting process and processing time for a project or series of projects that could yield an additional 2-3 mgd of water supply.

Approach

The key mission of the Task Force, to help reduce future water demands in Rockland County, includes a comprehensive water conservation planning approach that is similar to that described in Chapter 1 (“Planning a Successful Water Conservation Program”) of the widely referenced planning book *Handbook of Water Use and Conservation* by Amy Vickers (WaterPlow Press, 2001; Fourth printing, 2012.) The following two project phases and related tasks are recommended to support the completion of a Water Conservation Feasibility Study that at a minimum meets (if not exceeds) the goals and requirements of the PSC’s Order of November 17, 2014:

Phase 1: Water Data Analysis

Task 1 Project Kick-off

Task 2 Data Collection

Task 3 Profiles of Customer and System Water Use

Phase 2: Water Conservation Feasibility Study

Task 4 Identify Conservation Opportunities (based on Phase 1 project findings)

Task 5 Feasibility Analysis (potential water savings, program costs and benefits)

Task 6 Forecast Future Water Demand Scenarios

Task 7 Program Implementation Strategy

Task 8 Draft and Final Reports (Water Conservation Feasibility Study)

Task 9 Additional Services (As Needed), for example:

- Research and drafting of water conservation policies, standards, and legislation, e.g.,
 - Outdoor watering schedule
 - County and/or State water efficiency standards and regulations for water-efficient fixtures, appliances, and equipment
 - Water-wise landscaping
 - Requirements for the installation of water-efficient fixtures, appliances, and equipment at the point of property transfer or lease
- Expert witness testimony
- Water conservation program management and oversight
 - Detailed strategy development, e.g., public information campaigns, community support building and participation, equipment and vendor selection
 - Monitoring, evaluation, and reporting on program progress

This scope of work, budget, and schedule is for the Phase 1 project only.

Scope of Work: Phase 1

Task 1 Project Kick-off

Task 1 deliverables: 1) Bring together the Task Force members for a project kick-off meeting, 2) Conduct meetings with the Task Force and United Water New York staff to collect and discuss project background information and data needs, and 3) Participate in a “windshield tour” of the UWNY service area. (Total one 1-day project trip for Task 1)

- **Project Kick-off meeting with the Task Force.** Review of project goals, deliverables, schedule, project management, and related Task Force issues (including where this project overlaps with the activities of the Task Force—and other additional issues, i.e., drought and flood management, groundwater and stormwater resources). Consultant will prepare for this meeting in consultation with the Task Force Chair, Legislator Harriet Cornell and Task Force Coordinator and Project Manager, Mr. John Parker, respectively. Planned kick-off meeting date: Saturday, March 28, 2015.
- **Meetings with United Water New York and (Rockland County 1 day):**
 - Review consultant information and data needs list (see Task 2).
 - Review current and past conservation activities implemented by UWNY and Rockland County, including measured water savings (if available), and other factors that may influence the water data analysis (Task 3).
 - Preliminary discussion of ideas for new and revised water-saving programs and initiatives (to be discussed in more detail and evaluated during a future Phase 2 project), including incentives and measures such as public education, rebate programs, water conservation and green policies that would promote more efficient water use in the future.
- **“Windshield tour” of UWNY service area, Rockland County (as time permits).** A drive through of representative residential and nonresidential customer neighborhoods and districts in Rockland County will be taken with UWNY and/or County staff to gain a visual appreciation for the type and scale of current water-using activities—e.g., local lawn and landscape aesthetic, types of commercial, industrial, and public/institutional users—as well as potential new water-using activities that are planned, proposed or pending.

Task 2 Data Collection

Task 2 deliverables: 1) Preparation and submittal of data and information needs list, 2) Data checking of UWNY data sets in advance of data analysis, and 3) Background information review.

- **Data and background information needs list.** Preparation and submittal of data and information needs list, including but not limited to: current and historical UWNY production and customer meter and consumption data in an Excel file(s) for the past 36 months; all UWNY reports and data on current and historical water use and conservation programs; County and New York State water conservation requirements and standards; and UWNY and County census, demographic, planning, and forecasting data and reports.

- **Data checking of complete UWNY system production and customer meter and billing data sets, in an Excel file format, in preparation for a water use analysis to support a water conservation feasibility study.** Tasks include checking the data files for completeness and identification of potential errors or data anomalies that can occur with large data sets.
- **Background information review.** Project-relevant census, housing, water, and planning reports, studies, and data will be reviewed in preparation for the customer and system water use analysis (Task 3). For example, household size, type, and size of nonresidential and public facilities (e.g., estimation of nonresidential area and golf courses that have lawn and landscape irrigation), and related information will be collected. Previous UWNY water planning documents will also be reviewed.
- **Note:** If data and information provided to the Consultant is later found to contain errors or omissions (e.g., meter reading errors, missing or incorrectly identified data) that require the Consultant to revise her findings and deliverables, such work tasks are outside the scope of this project and budget. In such an event, Consultant cannot be responsible for work or reports based on faulty or incomplete data and information and thus additional compensation and time would be required to redo and resubmit deliverables.

Task 3 Profiles of Customer and System Water Use

Task 3 deliverables: 1) Water data analysis, 2) Report submittal, and 3) Presentation of findings to the Task Force. (Total one 1-day project trip for Task 3)

- **Sorting And Analysis Of Customer and Utility Water And Related Project Data.** Information and data received (e.g., UWNY individual and aggregate customer account meter data and system water use data, and census data) will be analyzed using applicable water use indicators—e.g., per capita, rank, percentile, indoor/outdoor, and nonrevenue water.

For this task, water data analytical methods will be used to produce detailed findings similar to the water utility project examples (i.e., **City of Dallas, Texas** and **Waukesha, Wisconsin**) presented by Ms. Vickers (“Conservation and Efficiency: Creating New Water Supplies for The Future” presentation) at the Rockland County Task Force’s “Getting up to Speed” Water Symposium on Oct. 25, 2014. These methodologies provide new and more detailed information about customer and system water use compared to conventional approaches (i.e., using only a gallons per capita per day metric to evaluate current and future water demand trends) that have been found to be very useful to water conservation program planning projects. Ms. Vickers is a leader in the development of these state-of-the-art water data analysis methodologies in both her work for water utility clients as well as in peer reviewed guidance documents and presentations developed for the American Water Works Association (among others):

- Vickers, Amy, et al (2013). *A Guide to Customer Water-Use Indicators for Conservation and Financial Planning* (American Water Works Association, Denver, CO, October, 2013).
- Vickers, Amy L., et al (2013). “Mining Customer Data to Better Inform Utility Decision-Making.” *Proceedings of the Annual Conference of the American Water Works Association*, Denver, CO, June 13, 2013.

- Vickers, Amy L. (2012). "Slice 'N Dice: Analytical Techniques For Customer Water Use Data To Evaluate Efficiencies And Identify Water Savings Potential." *Proceedings of the Annual Conference of the American Water Works Association*, Dallas, TX, June 10, 2012.
- **Analysis of Customer and System Water Use.** Identification and discussion of customers with significant or high indoor and outdoor water use using applicable water use indicators and benchmarks for water efficiency, including how these analytical findings can influence a future water conservation program strategy for the following categories of water use:
 - Residential
 - Nonresidential including (commercial, industrial, public/institutional)
 - System/utility including (infrastructure leakage and water losses)
- **Preparation of a report**, to be delivered electronically, summarizing the findings of the customer and system water use analysis as they relate to the needs of the Water Conservation Feasibility Study (Phase 2 project).
- **Preparation and presentation of findings to the Task Force (one trip).**

Project Budget: Phase 1

The project budget is provided in Table 1.

Table 1. Budget–Phase 1: Water Data Analysis To Support a Water Conservation Feasibility

PROFESSIONAL SERVICES		
Task	Description	Hours/Cost
1	Project Kick-off	8
2	Data Collection	37
3	Profiles of Customer and System Water Use	88
Total project hours:		133
Hourly rate:		\$ 225.00
Total Labor:		\$ 29,925.00
EXPENSES		
Misc. office and project-related expenses		\$ 70.00
Total Expenses:		\$ 70.00
TOTAL PROJECT COST:		\$ 29,995.00

Project Schedule: Phase 1

The project schedule is provided in Table 2.

Table 2. Schedule–Phase 1: Water Data Analysis To Support a Water Conservation Feasibility Study

Task	Description	2015										
		March			April				May			
		16	23	30	6	13	20	27	4	11	18	
1	Project Kick-off	• 3/28										
2	Data Collection	•										
3	Profiles of Customer and System Water Use				√ •							
	Draft report to United Water New York (allowed 14 days for review)				4/16							
	Draft report to Task Force (one week review)						4/30					
	Task Force comments on draft report due to AVA								5/7			
	Final report submitted to Task Force								5/14			

- **Project meeting**
- √ **Project deliverable**

Amy Vickers & Associates, Inc., Amherst, MA

March 12, 2015

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Purington, David and Amy Vickers. "Deerfield Academy's Million Gallon Water Conservation Challenge." *Proceedings of the Annual Conference of the American Water Works Association*, Boston, MA June 11, 2014.

Vickers, Amy. 2001. *Handbook of Water Use and Conservation: Homes, Landscapes, Businesses, Industries, Farms* (WaterPlow Press, Amherst, MA). Fourth printing: 2012.

Project-related documents, papers, and presentations by Amy Vickers:

American Water Works Association

- Vickers, Amy, et al. "A Guide to Customer Water-Use Indicators for Conservation and Financial Planning" (American Water Works Association, Denver, CO, October, 2013).
<http://www.awwa.org/Portals/0/files/resources/resource%20dev%20groups/tech%20and%20educ%20program/documents/Water%20Use%20Indicators%20for%20Conservation%20and%20Financial%20Planning.pdf>
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Dallas, Texas

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- “City of Dallas Water Conservation Five-Year Strategic Plan” (June 2010):
<https://savedallaswater.com/pdf/conservationstrategicplan.pdf>

Waukesha, Wisconsin

- Vickers, Amy L. (2012). “Slice ‘N Dice: Analytical Techniques For Customer Water Use Data To Evaluate Efficiencies And Identify Water Savings Potential.” *Proceedings of the Annual Conference of the American Water Works Association*, Dallas, June 10, 2012.
- Waukesha Water Utility’s “Water Conservation Plan” (May 2012):
http://www.ci.waukesha.wi.us/c/document_library/get_file?uuid=4312880e-46ef-4402-9cf5-43277d0dfdf0&groupId=10113