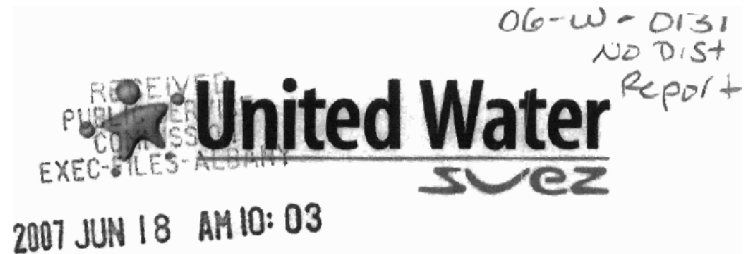


June 15, 2007



Honorable Jaclyn A. Brilling  
Secretary to the Commission  
New York State  
Department of Public Service  
Three Empire State Plaza  
Albany, New York 12223-0948

Re: United Water New York  
Case 06-W-0131

Dear Secretary Brilling:

Enclosed please find the Company's report detailing the actions taken and success achieved in meeting its targeted milestone that was outlined in Exhibit 11 of the Joint Proposal in the above referenced Case. The completion of the projects detailed in the report meet the first milestone and as a result United Water New York's (UWNY) has increased peaking capacity by 1.83 million gallons per day (mgd), exceeding the June 15, 2007 committed milestone of 1.5 mgd.

With the completion of further testing this month at the Letchworth Water Treatment Plant, UWNY will increase the flow there by an additional 1.5 million gallons per day of water. That would bring the total for Letchworth to 3 million gallons per day and the overall additional peaking capacity to 3.33 million gallons per day.

As part of UWNY's commitment to meeting the remaining milestones, the company is also actively engaged in several projects that are scheduled for completion by either December 2007 or December 2008. These projects are detailed in the attached report.

Please contact me at 845-620-3312 if additional information or clarification is required.

Very truly yours,

Michael J. Pointing  
Vice President and General Manager

cc:

Bruce Alch  
Thomas Bierds  
Ken Caffrey  
Hon. Harriet Cornell  
Susan M. Doherty, Esq.  
Dick Draper  
Jack Dunn  
Hon. Alex Gromack

Joshua Heintz, Esq.  
Hon. Ellen Jaffee  
Hon. Thom Kleiner  
John F. Klucsik, Esq.  
Kevin Manz  
Hon. Philip A. Marino  
Dan Miller, Ph.D.  
Francis W. Peverly

Hon. Howard T. Phillips  
Saul Rigberg, Esq.  
Hon. Christopher St. Lawrence  
Tom Walsh, Esq.  
Hon. C. Scott Vanderhoef  
Gordon Wren



**UNITED WATER NEW YORK**

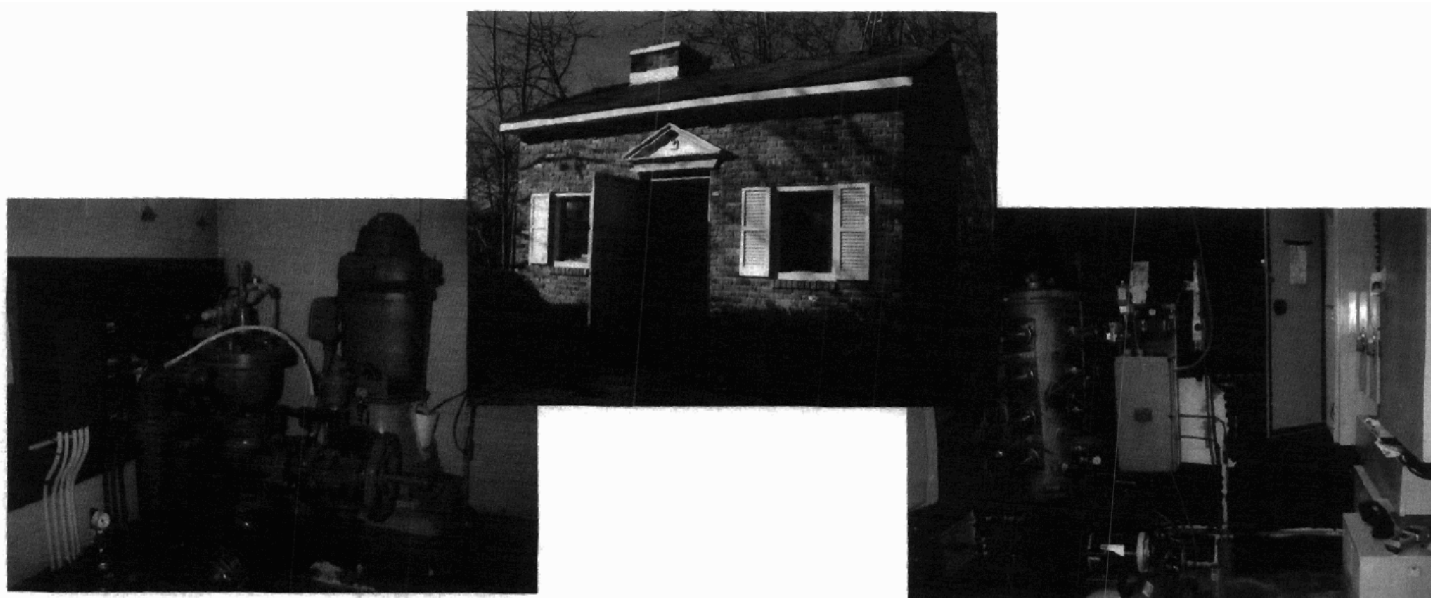
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**SHORT TERM WATER SUPPLY**

**SUBMITTAL SUMMARY**

**June 15, 2007**

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## **UNITED WATER NEW YORK**

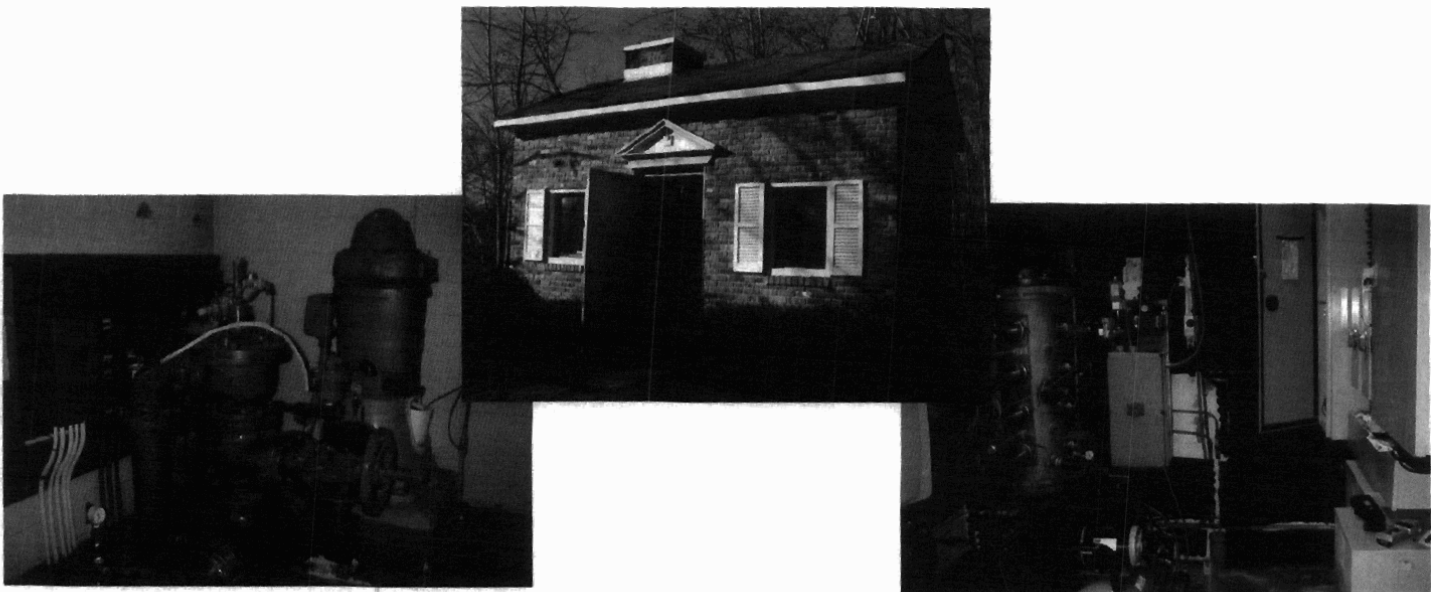
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# **SHORT TERM WATER SUPPLY**

## **SUBMITTAL SUMMARY**

**June 15, 2007**

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**UNITED WATER NEW YORK**

**SHORT TERM WATER SUPPLY  
SUBMITTAL SUMMARY**

**June 15, 2007**

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### **► Acknowledgements**



## **EXECUTIVE SUMMARY**

As part of United Water New York's (UWNY) commitment to meeting the requirements of the December 2006 Joint Proposal, UWNY has made infrastructure improvements that have increased the capacity of its overall supply. Through a series of projects, the peaking capacity of 45.5 mgd<sup>1</sup> has been increased by 1.83 mgd, for a total of 47.33 mgd capacity for June 15, 2007. The baseline peak capacity prior to the STWS program was the sum of Lake DeForest (20.0 mgd), the bedrock wells (20.5 mgd), Ramapo Valley Wellfield (4.0 mgd) and Letchworth Water Treatment Plant (WTP) (1.0 mgd). The projects and their capacity are:

- Letchworth Water Treatment Plant Upgrade – 0.5 mgd
- Bedrock Well Infrastructure Improvements – 0.85 mgd
- Catamount Wells Improvements – 0.20 mgd
- Well Capacity Increase (prior submittal) – 0.28 mgd minimum (up to 1.0 mgd)

Start-up activities at Letchworth documented successful operation of the plant at 1.5 mgd, producing filtered water in compliance with drinking water quality (turbidity) regulations (documentation included herein). Upon completion of demonstration tests, as required by the New York State Department of Health (NYSDOH), the Letchworth WTP will be fully tested and permitted at 3.0 mgd capacity, for a total net increase of 2.0 mgd. This will result in a total net water supply increase of 3.33 mgd.

UWNY is also actively engaged in several projects that are scheduled for completion by either December 2007 or December 2008. The projects and estimated capacity for each project include:

- Production Well Test Conversions - +/- 0.86 mgd
- Sparkill Wells No. 8 and 11 – 0.60 mgd
- Bedrock Well De-Aeration - +/- 1.0 mgd
- Viola and Elmwood Wells – 0.74 mgd
- Blaisdell Pumping Station – 0.25 mgd (Removal of Montvale customers from UWNY system).

Additionally, UWNY has started preliminary work on several projects that have the potential to be delivered in 2008, but are subject to multiple issues that are yet to be resolved. The projects and estimated capacity for each project include:

- Suffern Interconnection – +/- 1.0 mgd
- Ramapo River Augmentation – +/- 1.5 mgd
- New Wells – +/- 1.0 mgd
- Conjunctive Use Strategy/Modify Lake DeForest Withdrawal – Direct and Indirect Benefit to System Capacity

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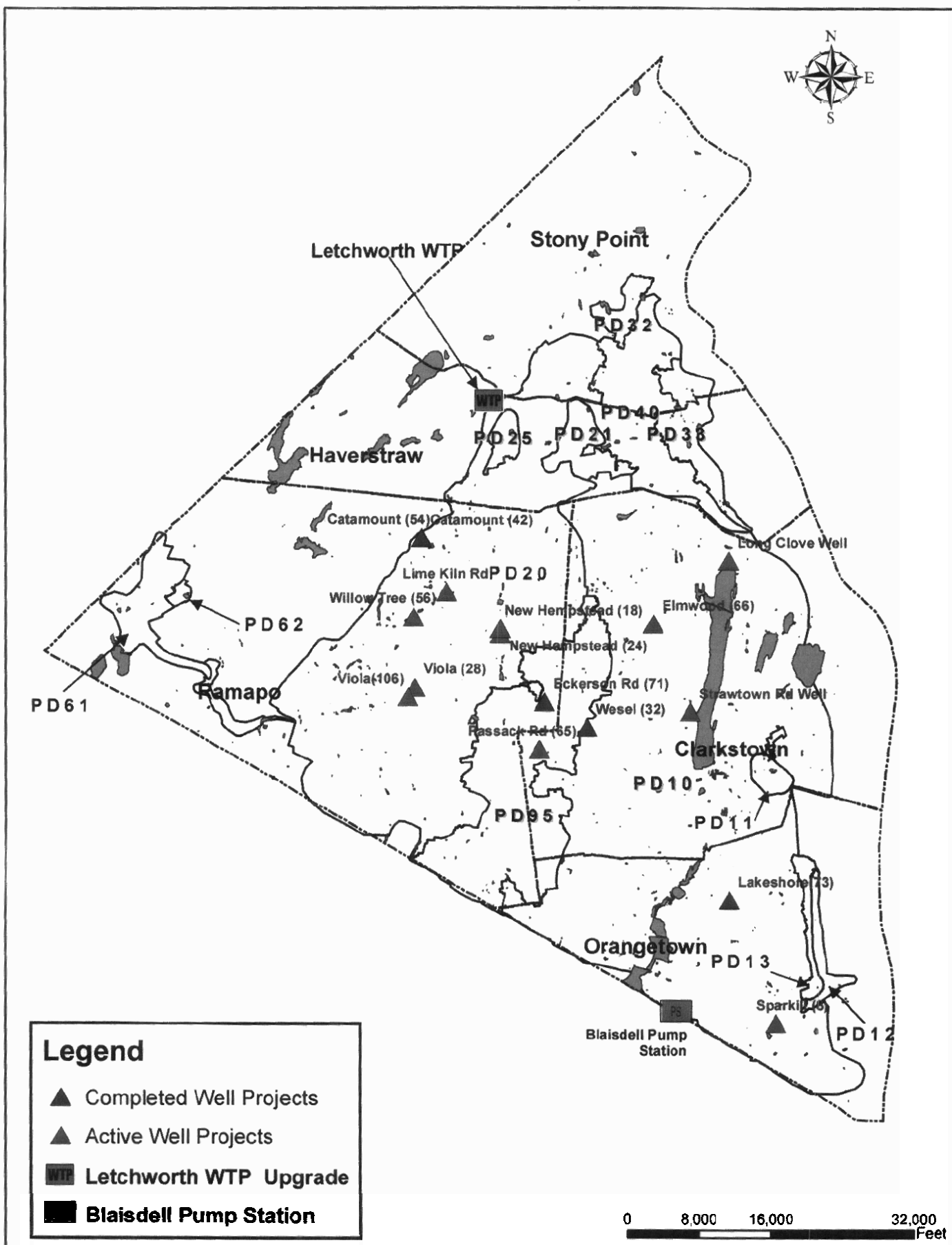
<sup>1</sup> Peaking capacity is quantified based on the long term planning scenario of 4.0 mgd from the Ramapo Valley Wellfield (RVWF). Short Term Peaking Capacity at the RVWF is 7.0 mgd.

- Distribution System Improvements – Indirect Benefit to System Capacity
- ASR project – Indirect Benefit to System Capacity

This document presents each project in detail, relative to each project's level of completion. Projects that have been completed for June 15 are included in the first major section of the document – "June 15, 2007 COMPLETED PROJECTS" – with additional detail provided in Appendices A, B, C and D. Projects that are scheduled for completion later in 2007 or in 2008 (as well as those that have the potential to be completed in 2008) are included in the second major section of the document – "December 2007 and 2008 ACTIVE PROJECTS" – with additional detail provided in Appendices E, F, G and H.

Figure 1 shows the location of each of the projects.

Figure 1  
June 2007 Completed Projects and  
December 2007/2008 Active Projects









<b>Letchworth Water Treatment Plant Upgrade</b>
<b>2.0 mgd Increased Capacity</b>

## **INTRODUCTION**

The Letchworth Water Treatment Plant (WTP) in Theills, NY is a conventional Water Treatment Plant (coagulation, sedimentation, filtration and disinfection) that United Water New York leases from the Palisades Interstate Park Commission (PIPC). The plant is currently rated at one million gallons per day (1 mgd) and was placed into operation in August, 2006.

The plant upgrade will utilize tube settlers to increase the overall capacity to 3.0-mgd. During construction, the hydraulics of the intake structure and piping were evaluated. Testing indicated high friction losses in the piping, resulting in decreased capacity. UWNY has installed bypass pumping to deliver a minimum of 3.0-mgd, while cleaning and lining the current intake piping.

## **APPROACH**

The New York State Department of Health (NYSDOH) approved plans to increase the rated capacity of the plant from one (1) mgd to three (3) mgd by making the following improvements:

- Provide a static mixer for more efficient coagulant mixing;
- Retrofit the existing sedimentation basins to provide new flocculation basins with mechanical mixers and provide tube settlers in the remainder of the basins; these hydraulic improvements will increase the capacity of the flocculation/sedimentation process;
- Replace the existing filter influent piping and valves with larger diameter piping and valves to increase capacity;
- Provide a three (3) mgd finished water pump station to replace the diesel pump currently in use;
- Provide a new underground electrical feed to replace the overhead transmission wires; and
- Provide two (2) emergency generators and switchgear; one for the plant and one for the new finished water pump station.

Phase 1 of the project includes installation of the static mixer, hydraulic improvements to the sedimentation basin and filter influent piping. This Phase was completed on June 15, 2007, enabling the plant to treat up to 3 mgd. The electrical feed and generator for the plant will be installed in the fall of 2007.

The new generator and finished water pump station will be installed in the Spring of 2008 as Part of Phase 2 (and the final phase) of the project.

### **Design, Permitting and Construction Timeline –**

- Design started in late 2005, completed January 2007.
- Permitting Required – New York State Department of Health (NYSDOH) and Rockland County Department of Health (RCDOH);
- Permitting Status – Received comments from NYSDOH and received response on June 12, 2007, including a test plan designed to demonstrate plant performance at flowrates of 1.5, 2.2 and 3.0 mgd;
- Construction – Phase I - commenced February 2007; substantial completion (i.e., ready to deliver water in to the system) by June 15<sup>th</sup>, 2007 (electrical work to be done in Fall 2007),
- Construction - Phase 2 - Pump station and generator to be installed in Spring 2008.

### **Confirmation Testing**

In addition to new construction, UWNY took precautionary measures to confirm that 3 mgd could be delivered through the plant. UWNY evaluated the hydraulic and mechanical components leading up to the plant. The results indicated that the intake piping is currently capable of delivering approximately 2.7-mgd due to excessive flow restrictions. In order to increase and maintain sufficient capacity, and create redundancy, a bypass line and pumping was installed from the reservoir to the plant to ensure 3.0-mgd. This will also allow for isolation and cleaning and lining for the intake piping.

On Friday June 15th, hydraulic testing was performed with these provisions. This testing was successful, obtaining over 3 mgd flow into the plant (3.4-mgd).

Additionally, as part of start-up activities, the plant successfully produced filtered water in compliance with drinking water quality (turbidity) regulations at a flow rate of 1.5 mgd. The plant operated for over 8-hours with filtered water turbidity below 0.1 ntu (documentation attached). Upon completion of demonstration tests, as required by the New York State Department of Health (NYSDOH), the Letchworth WTP will be fully tested and permitted at 3.0 mgd capacity, for a total net increase of 2.0 mgd. This will result in a total net water supply increase of 2.0 mgd for Letchworth.

### **SUMMARY**

The Letchworth Water Treatment Plant was previously rated at 1 mgd and was placed into operation in August, 2006. The plant was upgraded to increase the overall capacity to 3.0-mgd using tube settlers. UWNY has demonstrated filtered water in compliance with drinking water quality (turbidity) regulations at a flow rate of 1.5 mgd, and has demonstrated a flow rate of over 3.0 mgd will be achieved.

As a result of the completion of this infrastructure improvement, UWNY has increased production capacity by 0.50 mgd by June 15. During the remainder of June, the

**Letchworth WTP will be fully tested and permitted at 3.0 mgd capacity, for a total net increase of 2.0 mgd.**

Bob Raczko, P.E.  
Operations Engineer, NYS Licensed Plant Operator (1A)

United Water New York  
360 West Nyack Road, West Nyack, NY 10994  
Tel: 845-623-1500 x2267 • Fax: 845-620-3318  
bob.raczko@unitedwater.com



## MEMO

FROM: Bob Raczko

TO: Mike Pointing

DATE: 6/15/07

COPIES: Ken Caffrey/NYSDOH, Dan Miller/RCDOH

SUBJECT: Letchworth Plant Start-up

The construction of the improvements to the Letchworth Plant has been substantially complete and commissioning began the week of June 11<sup>th</sup>. On the morning of June 14<sup>th</sup> the plant was ready for start-up.

This memorandum documents the start-up activities and the successful operation of the plant at 1.5 mgd, producing filtered water in compliance with drinking water quality (turbidity) regulations. The plant operated for over 8-hours with filtered water turbidity below 0.1 ntu. The following outline is the chronology of events of the June 14<sup>th</sup> start-up activities;

- 11:00am - started running water through the plant using the existing raw water line at about 1050 gpm (1.5 mgd). PACl pump was set at 70/70 (speed/stroke) on the 1.3 gph LMI pump; this was based on a target dosage of 15 mg/L PACl.
- 11:30am - opened raw water valve all the way and got flow of about 1900 gpm (2.7 mgd); adjust PACl to 90/80 setting to maintain dosage. This was done to fill the sedimentation basins more quickly and also to test the hydraulics of the raw water line.
- 12:30pm - reduced flow back to 1050 gpm as sedimentation basins were almost filled and water was starting to enter the filters.
- 1:00pm - shut plant down to fix some leaks around the filter influent pipe penetrations into the walls. At this point we had treated approximately 182,000 gallons based on the influent meter totalizer.
- 2:15 pm - restarted plant at 1050 gpm, 70/70 PACl setting; filled filters and began running in filter to waste mode until filters below 0.1 ntu.
- 2:45pm - Filters 1,3,4 turbidities all below 0.1 ntu; Filter 2 had a burned out turbidimeter bulb, so was not used for the remainder of the day (all filter turbidimeter bulbs will be replaced on Monday as part of regular servicing). Filter effluent valves opened and hypochlorite feed pump started, initial setting at 100/90 to provide high residual into clearwell and backwash tank. Backwash pump started to fill backwash tank.
- 11:00pm - Shut plant down

Water Quality Data

Time	CFE Chlorine (mg/L)	CFE Turbidity (ntu)	Filter 1 Turbidity (ntu)	Filter 2 Turbidity (ntu)	Filter 3 Turbidity (ntu)	Notes
5:45 pm	>2.2	0.22	0.08	0.02	0.05	
6:45 pm	>2.2	0.12	0.08	0.02	0.05	Lowered hypo to 90/80
7:25 pm	2.07	0.11	0.08	0.016	0.046	
8:20 pm	1.63	0.10	0.080	0.016	0.039	Incr hypo to 100/100
9:30 pm	>2.2	0.09	0.070	0.016	0.040	
11:00 pm	2.1	0.09	0.057	0.012	0.037	Shut down

Related to ultimate hydraulic capacity, during testing it was discovered that the existing raw water supply piping has excessive hydraulic restrictions limiting flow below the 3 mgd design rate. As a result, the piping system will be inspected and cleaned and lined to improve hydraulic capacity. In the meantime, to fully test the upgrade plant at 3 mgd, temporary pumping and piping has been installed.

On Friday June 15th, hydraulic testing was performed with temporary pumping to allow provisions for 3 mgd supply. This testing was successful, obtaining 2350 gpm or approximately 3.4 mgd flow into the plant, such that over the next 2-weeks as the plant is demonstrated in accordance with Department of Health special requirements the plant will operate over the required ranges up to 3 mgd.

B. Raczko

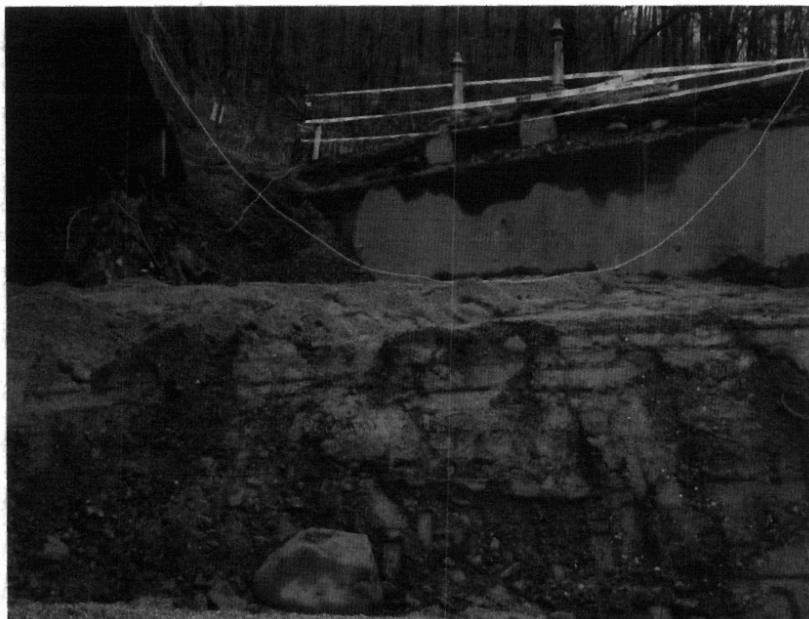
## **PHOTOS**



Construction at Coagulation and Sedimentation Basin



Equipment Storage Area (Filter Influent Piping)

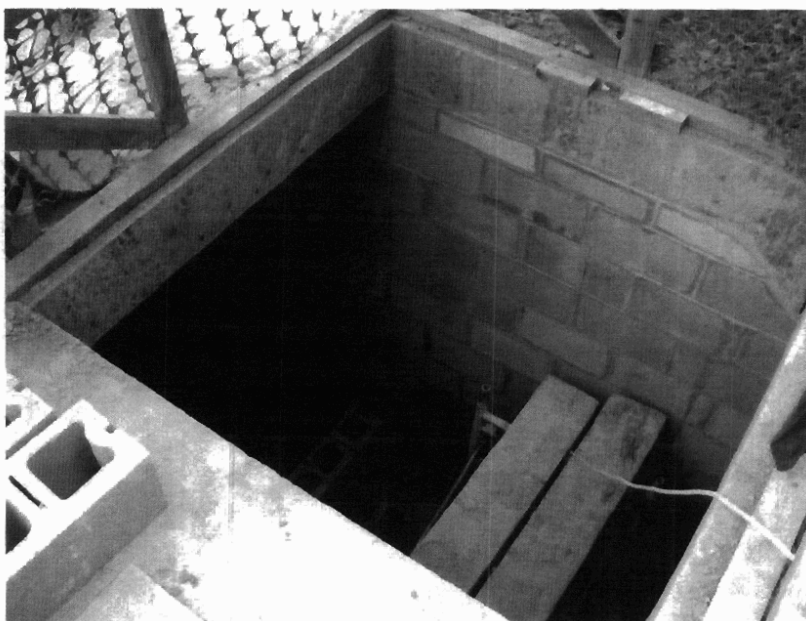


Excavated area for new 20" pipe from sedimentation basins to filter building

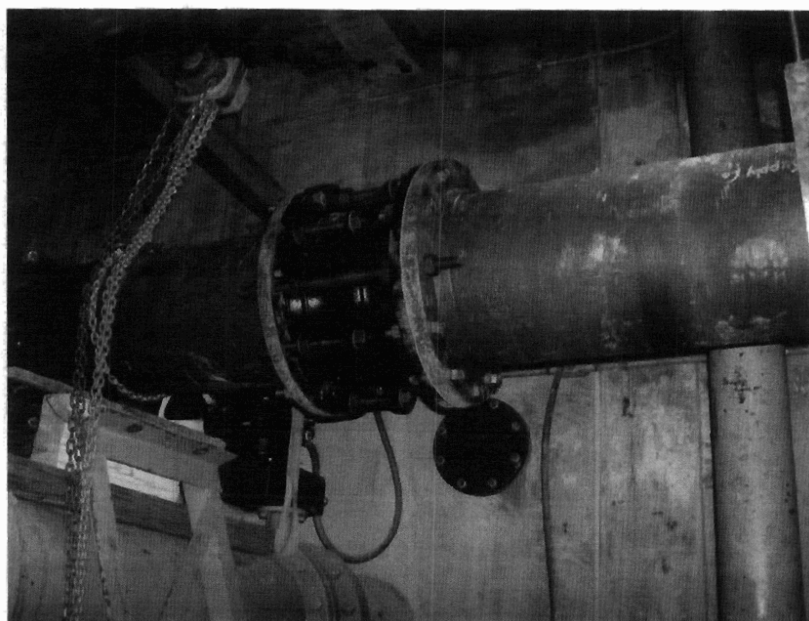


Coagulation Basin influent Pipe Modifications

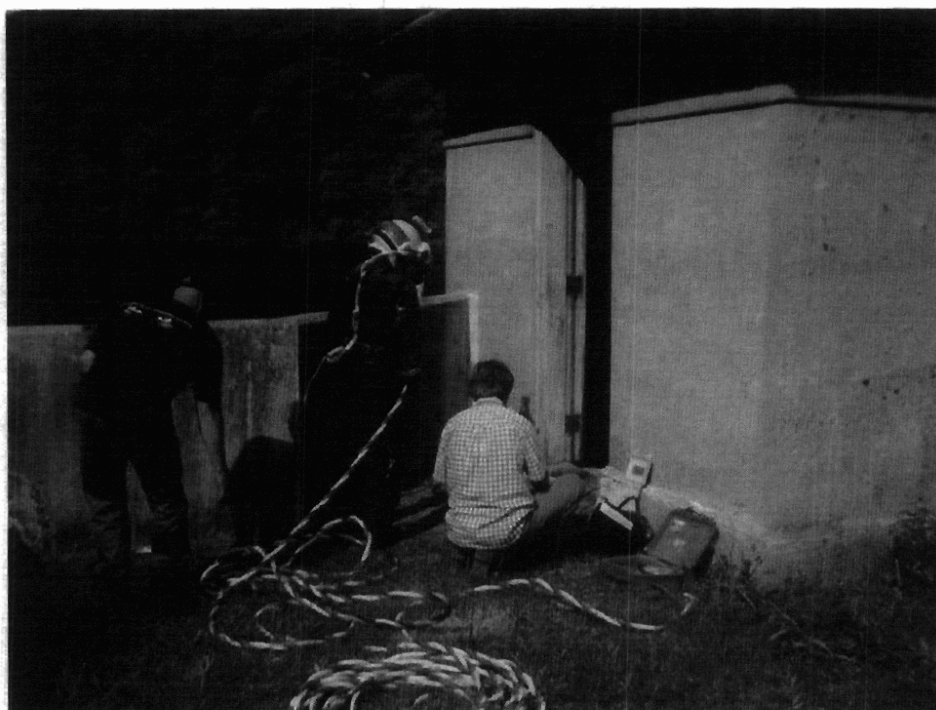




New 5' Square Access Hatch on coagulation basin



New Flange dismantling joint and new 20" filter influent pipe inside pipe gallery at filter building



Underwater Evaluation of Intake Structure

**Bedrock Wells**

<b>Bedrock Wells Infrastructure Improvements</b>
<b>0.85 mgd</b>

## INTRODUCTION

Six (6) existing bedrock production wells were identified as having the potential for additional capacity during the base drought period of August 8, 9 and 10, 2001 due to lacking infrastructure. The measure for performance improvements was a combination of the following:

1. Well pumps that were not pumping at their permitted capacity while fully open to the distribution system; and
2. Wells having sufficient available water-level drawdown available to allow pumping at their permitted capacity relative to 3-day peaking capacity.

Three of the wells and pumps have been addressed for this submittal and are currently on-line at increased capacity – these wells include:

- Wesel Road (Wesel) 32 (0.18 mgd increased capacity)
- Eckerson 71 (0.19 mgd increased capacity)
- Lakeshore 73 (0.48 mgd increased capacity)

The other three wells and pumps are currently being upgraded for capacity increase, however each well pumps to a clearwell, thus there is additional effort involved in upgrading the capacity. We expect these wells to be on line, at increased capacity, by the end of 2007 (if conditions warrant, UWNY may attempt to bring this additional capacity on line sooner, however weather conditions and demand will dictate the feasibility of doing this). These wells are shown below, and are included in the “2007/2008” section of this document:

- Viola 28 and 106 (0.58 mgd additional capacity)
- Elmwood 66 (0.16 mgd additional capacity)

## APPROACH

The hydrogeologic capacity for each location was calculated based upon review of historic Supervisory Control and Data Acquisition (SCADA) flow and submergence (water level) data during all seasonal and demand conditions, and current capacity testing results. The permitted capacity of each well was confirmed by reviewing the original NYSDEC WSA permits. The existing pump design point was compared to that which would be required to increase capacity during the worst case, peak demand conditions. If the current pump curve was underperforming, the pump well was selected as a candidate for replacement. Existing pump performance was measured in the field by conducting step-rate pump tests.

Testing indicated that some of the pumps were not meeting their current total dynamic head (TDH) requirements necessary to achieve permitted capacity. The new flow condition for each well location was then modeled under August 2001 drought demand conditions, with the overlay of increased capacity from each well, to determine the required pump operating point.

Additional information is included in Appendix B, including old and new pumping curves, testing and validation data. A more detailed description of the hydrogeologic approach is also included in Appendix B.

## PUMP REPLACEMENT

The new pumps were installed, along with new Variable Frequency Drives (VFDs) and motors, as shown on Table 1 below. The VFDs will provide additional efficiency in to the system by allowing for maximum production within the permitted rate while maintaining sufficient submergence relative to system pressure.

**Table 1 – Well Pump Improvement Summary**

Well No.	Capacity Increase	New Pump Design Point		Current Pump Design Point		August 2001 Peak Operating Point		Other Pump Improvements	
I.D.	mgd	gpm	TDH	gpm	TDH	gpm	TDH	New Motor	New VFD
Wesel 32	0.18	300	375	225	350	175	274	40 hp	Yes
Eckerson 71	0.19	300	400	300	368	170	350	40 hp	Yes
Lakeshore 73	0.48	700	415	500	310	370	260	100 hp	Yes

## SUMMARY

Several wells were identified as having the potential to achieve more capacity within their NYSDEC WSA permitted rates. Six of these wells were candidates for pump improvements resulting in increased capacity. Three of the wells are currently on line with additional capacity for June 15 (Wesel 32, Eckerson 71 and Lakeshore 73), and three of the wells are scheduled to be on line with additional capacity by December 31, 2007, if not sooner (Elmwood 66, Viola 28 and Viola 106).

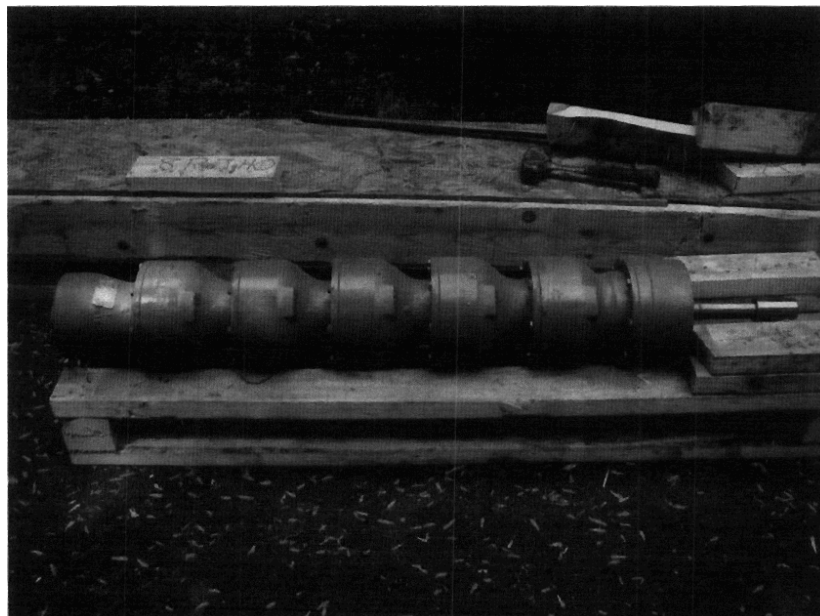
The wells were identified as candidates due to their unique combination of having pumps that were not meeting pressure head requirements, and the fact that there was additional hydrogeologic capacity that could be recovered within the existing NYSDEC WSA permitted rates. In summary, the additional capacity from the three wells for June 15, 2007 is a total of 0.85 mgd. Supporting and backup data is included in Appendix B.

As a result of the completion of these infrastructure improvements, UWNY has increased production capacity by 0.85 mgd.

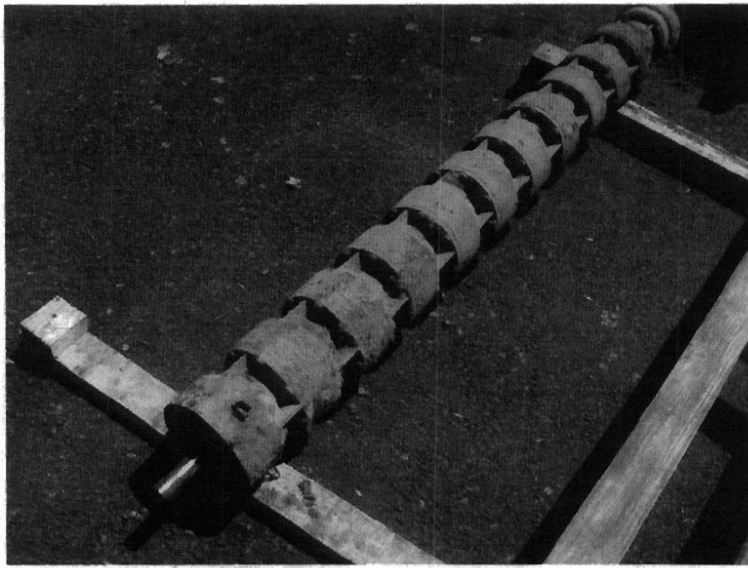
## **PHOTOS**



**Lakeshore 73 – Old Pump & Pump Column**



**Lakeshore 73 – New Pump**

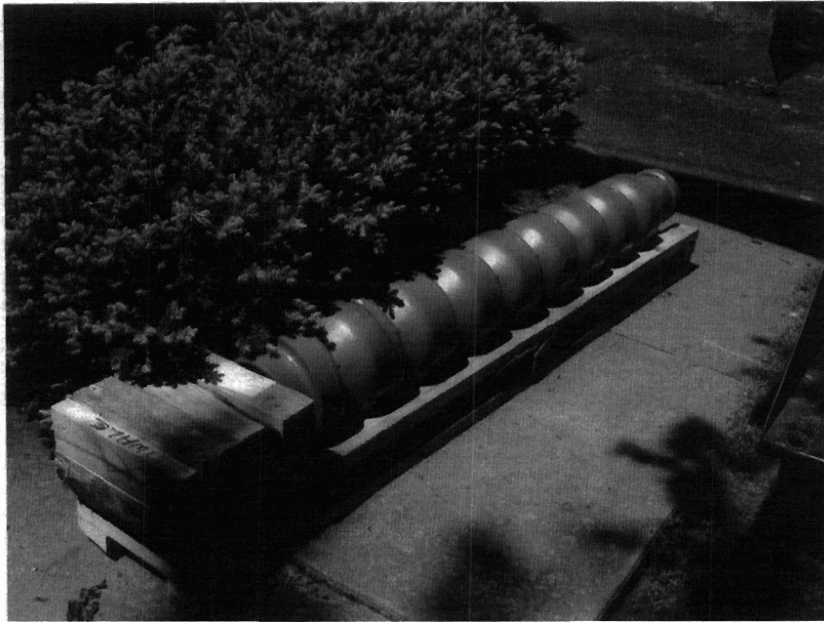


**Wesel 32 – Old Pump**

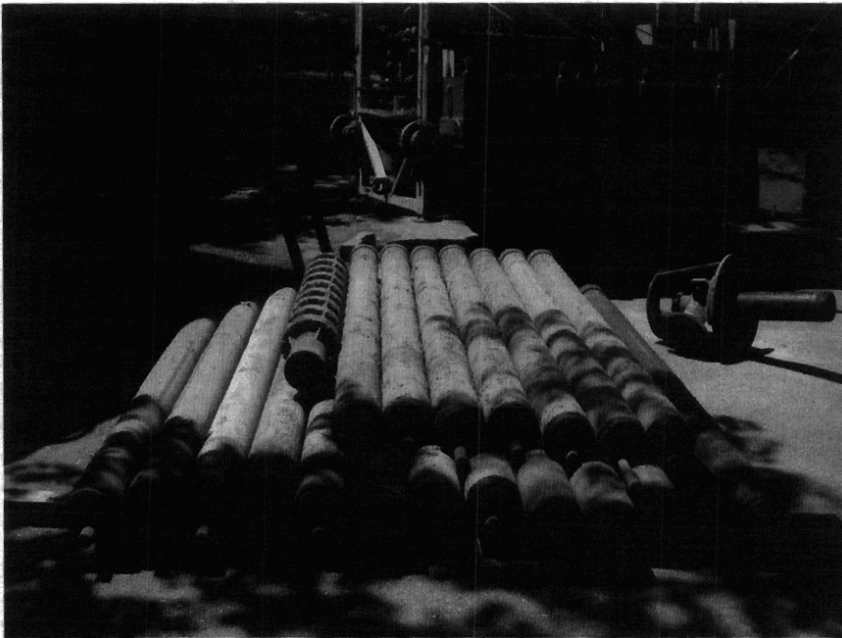


**Wesel 32 – Hole in Bowls**





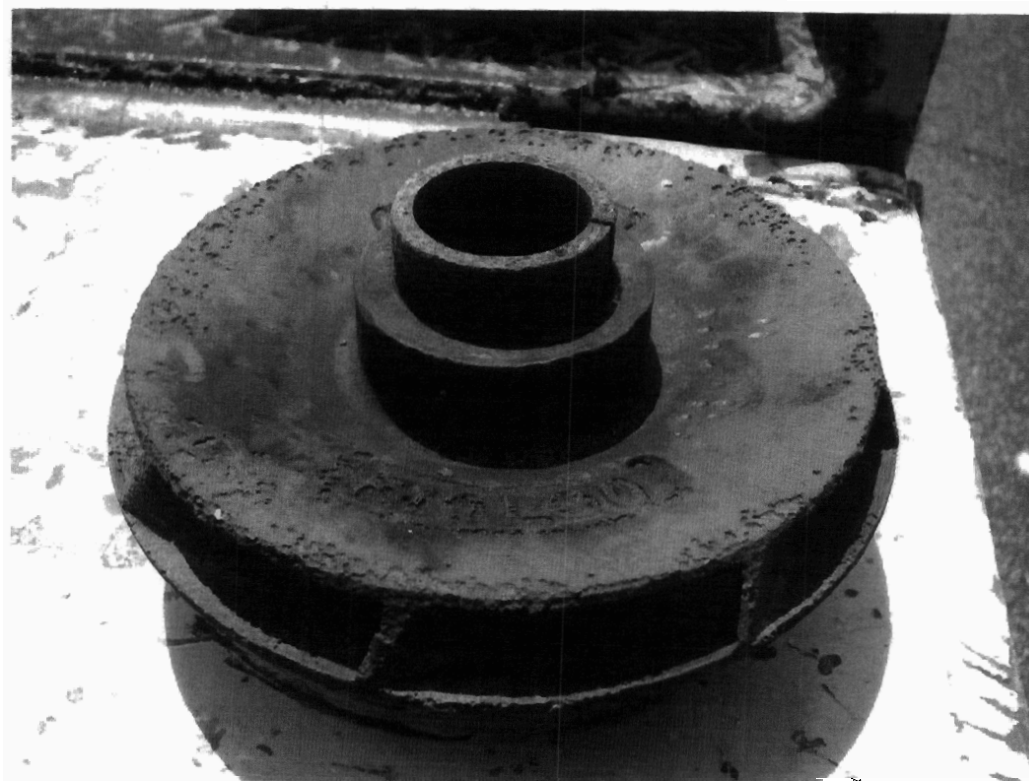
**Wesel 32 – New Pump**



**Eckerson 71 – Old Pump and Column**



**Eckerson 71 – New Pump and Column**



**Eckerson 71 Worn Impeller**



<b>Catamount Wells - 42/54 Modifications</b>
<b>0.20 mgd</b>

## INTRODUCTION

Catamount Wells 42 and 54 tap the local sand and gravel aquifer and have been capacity-limited due to biofouling. With any well, rehabilitation brings a well back very close to where it was prior the rehabilitation. Nevertheless, the major rehabilitation frequency at the Catamount wells is significant enough to impede optimal pumping capacity.

UWNY has installed a technology that will allow a more frequent and less manpower intensive means for maintaining optimal pumping capacity. The safe and proven technology injects carbon dioxide in to the aquifer (a common gas utilized for typical well rehabilitation) via a steel tube installed in the well at a frequency designed to maintain optimal pumping capacity. The frequency will likely be on the order of two to three months – this will be fine tuned in the first year.

## APPROACH

The technology being implemented includes rehabilitation of the Catamount wells utilizing carbon dioxide injection (Aqua Freed®) with surge block and simultaneous discharge, followed by the installation of carbon dioxide injection pipes into each well. The injection pipes are part of the Aqua Gard™ system to periodically rehabilitate the well with carbon dioxide injection. The pumps remain in the well during the carbon dioxide injection and are utilized to purge the well after injection.

Similar to the bedrock wells pump rehabilitations, the pumps in the Catamount wells were either too fouled to re-install and/or not currently meeting the required pressure head conditions to pump at maximum capacity (which is slightly below permitted capacity due specific capacity loss over time). A summary of past operating capacity and new capacity is shown in Table 1 below.

**Table 1 – Well Pump Improvement Summary**

Well No.	Capacity Increase	New Pump Design Point		Current Pump Design Point		August 2001 Peak Operating Point		Other Pump Improvements	
		gpm	TDH	gpm	TDH	gpm	TDH	New Motor	New VFD
42	0.03	200	520	300	428	175	450	50 hp	No
54	0.18	350	520	400	430	215	470	60 hp	No

## **SUMMARY**

Various rehabilitation techniques (major and minor) have been utilized at the Catamount Well Field in the past, including surge block / airlifting and also carbon dioxide injection. Although many of the major rehabilitations have been successful, the necessary frequency of rehabilitations to maintain productivity is significant, however rapid loss of specific capacity between the rehabilitations is still occurring. Major rehabilitations of the wells typically require a week or more of lost production to successfully complete the program. The technology introduced here will maintain an optimal capacity throughout the year and will minimize significant losses in capacity while also minimizing the time required to bring the well back on line.

As a result of the completion of these infrastructure improvements, UWNY has increased production capacity by 0.20 mgd.

**PHOTOS AND DOWNHOLE VIDEO LOG**



**Catamount – 54A – Biofouled Pump**



**Catamount 54A – Wire Brushing Pump**

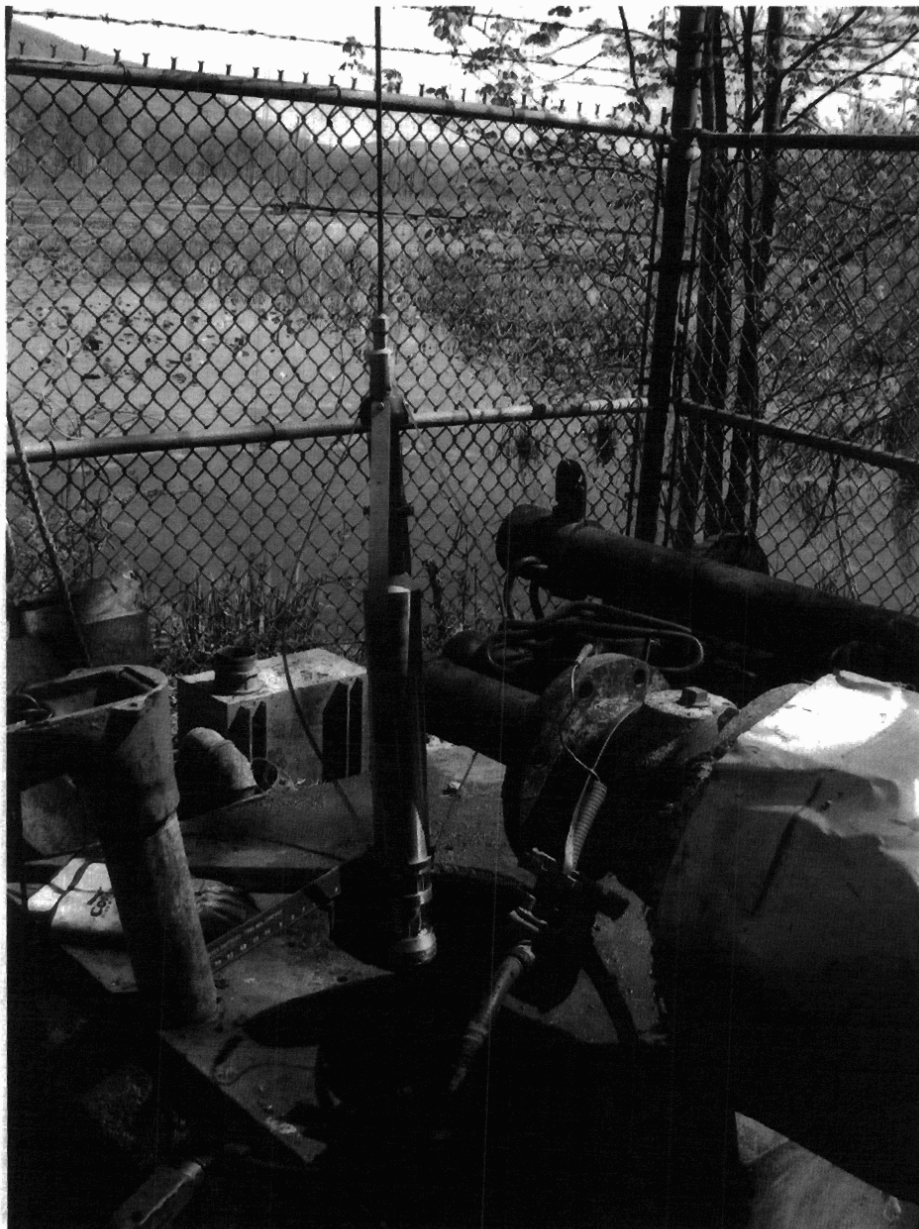




**Catamount – Pump Testing – Orifice Setup (Typical for All Well Testing)**


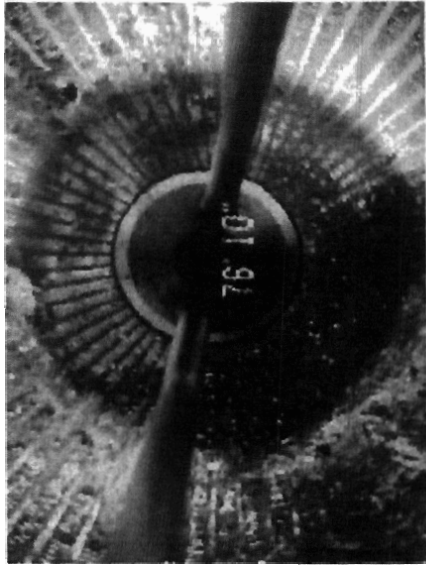
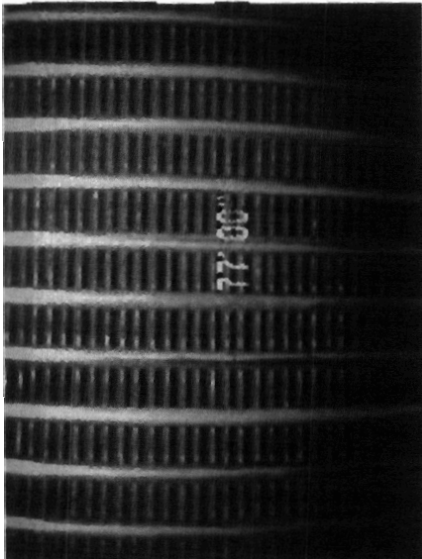
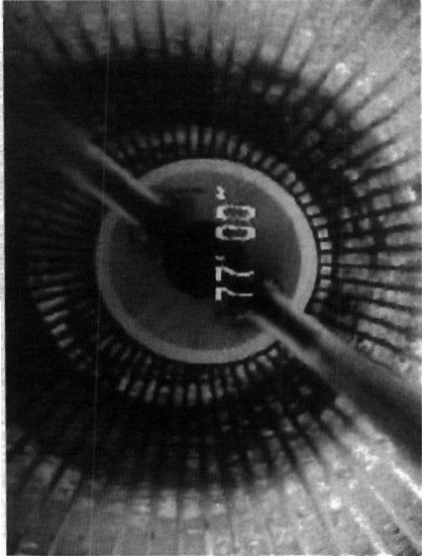



**Aqua Freed® Technology**



**Catamount 54A – Pre-rehabilitation Video Log**

**Video Log of Aqua Freed® Technology - Before and After Comparison**

 <p>Pre-redevelopment Side View</p>	 <p>Pre-redevelopment Downhole View</p>
 <p>Post-redevelopment Side View</p>	 <p>Post-redevelopment Downhole View</p>
<p><b>CATAMOUNT 54A</b> <b>VIDEO INSPECTION - 2007</b></p> <p> <b>United Water</b> Suez United Water New York</p>	



<b>Well Capacity Modifications</b>
<b>0.28 mgd Increased Capacity</b>

## **INTRODUCTION**

During the baseline time period of August 8, 9 and 10, 2001, there were several wells that were off line, or not used to full capacity for all, or a portion, of the three day period. The wells were off line for either operational or repair reasons, and were brought back on line shortly after August 2001 but before commencement of Short Term Water Supply (STWS) activities. The additional capacity of the new production of these wells was approximately 1.0-mgd. A letter submitted to the Rockland County Department of Health (RCDOH) from UWNYP on January 19, 2007 requested credit for the 1.0 mgd toward the STWS. A portion of the 1.0 mgd (0.28-mgd) was applied to the STWS as additional capacity. The January 19 letter is included as Appendix D of this document.

## **APPROACH**

The existing reported capacity of the system wells is 20.5 mgd, which was based on the actual production amounts attained during the 3-day historical peak demand days in 2001. For several reasons – briefly discussed below – UWNYP requested that the peak capacity be modified from 20.5 mgd to 21.5 mgd (an increase of 1.0 mgd, sustainable for two 3-day periods). The primary reasons for these modifications are as follows:

- The achieved capacity in 2001 was without the improvements made at Nanuet 13/14. Air strippers were installed at the site in 2002 for the removal of VOCs from groundwater;
- One well (Germonds 21) was not in-service in 2001 and has since been placed into service;
- Some wells were shutoff for periods of time during the August 2001 peak event (Spring Valley 3, Tappan 20 and New Hempstead 24). In reviewing the data it was determined that these wells had ample submergence to allow them to operate. In speaking to the operators about this, the issue of excessive pressure has been raised as one potential reason for shutting them down. To address this, UWNYP applied a hydraulic model with an overall system demand of 47.9 mgd (i.e., the 2007 projection). The results indicate that 21.5 mgd can be produced.

The actual submittal is included in Appendix D for your reference.

## **SUMMARY**

The current reported capacity of the system wells is 20.5 mgd, based on August 2001 capacity. Since then, and before commencement of the STWS program, an additional 1.0-mgd of well capacity has been added due to operations and/or well improvements. Thus, the system capacity prior to STWS activities was 21.5 mgd, not 20.5 mgd. Of this

1.0-mgd difference, 0.28 mgd is being applied to STWS goals, based on approval from the RCDOH. The increase has been applied to the following well locations:

- Tappan 20 (The well was not operated continuously in 2001; getting water out of PD10 was difficult in 2001 but this was resolved by construction of East West transmission): 0.04 mgd
- SV3 (similar to Tappan 20 – the well was not operated in 2001 but the submergence data shows that it could have operated. The construction of the Eckerson Booster station improved ability to move water out of district 95 to PD20: 0.11 mgd
- Germonds (not in-service in 2001): 0.13 mgd (The chemicals were not in-place to operate this well in 2001. Disinfectant and corrosion inhibitor have been placed onsite and the well tested to its indicated capacity)





<b>Other Improvements</b>
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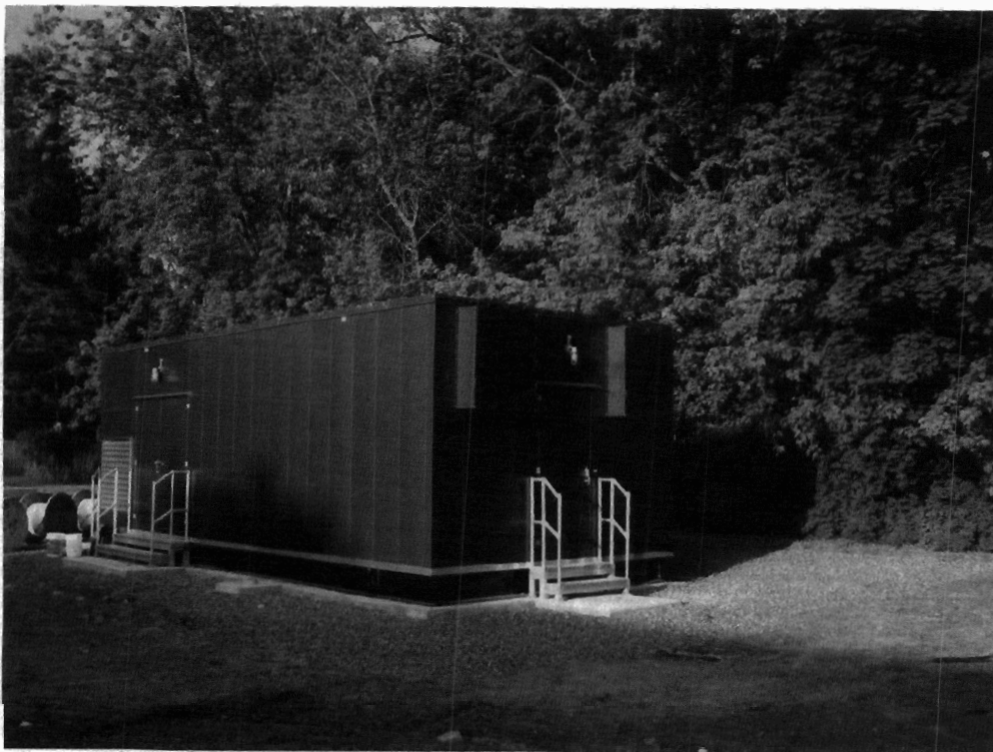
<b>Not Directly Applicable to STWS Capacity Increase</b>
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Related to the STWS, UWNY has made several significant infrastructure improvements. Though these improvements do not translate in to a direct increase in capacity, they make the system significantly more robust. Some of the major improvements that have been made recently or are currently under design or construction include:

- **Backup Power** - Generators were installed at the Lake DeForest WTP in May 2007. These units provide sufficient auxiliary power to run the plant at a maximum capacity of 20 mgd during a power outage. The generator for the Ramapo Valley Wellfield (RVWF) is currently under final design. Construction is scheduled for this October.
- **East-West Transmission Line** – Approximately 2,900 feet of 20-inch piping was installed from the Lake DeForest Water Treatment Plant to the Spring Valley Reservoirs in July and August 2006. The installation of this transmission main greatly improves the distribution of water between two pressure districts. The plant was additionally retrofitted with electric flow control actuators that detect supply/demand needs and modulate the flow accordingly between the two pressure districts.
- **Underground Infrastructure Renewal Program (UIRP)** - There are several projects underway as part of the Underground Infrastructure Renewal Program. Some of these projects are strictly to improve fire flow. Other projects are to improve transmission, which will ultimately provide the network capacity to support additional supply. One such project is the Spring Valley Booster Station. The necessary piping to support this booster will be installed later in 2007 and then the booster will be installed in 2008. This project will increase the capacity to transfer water from the pressure district that contains Lake DeForest to the highest major pressure district, located mostly in Ramapo. In addition to this major transmission improvement project, there will be others that will removal key hydraulic bottlenecks in the system, which will further improve capacity to deliver water into the network.
- **Arsenic Removal** - UWNY has also been sensitive to the elevated arsenic issue involving Grandview 67 and 78. Three ISOLUX™ skids were delivered to the sites on June 13 for the removal of arsenic from groundwater. In anticipation of the arrival of the units, UWNY had the site pre-surveyed and prepped, and was ready for rapid installation. The units were successfully installed and ready for delivery of treated water in to the system on June 15.

These improvements do not necessarily translate to a direct increase in capacity, however they do reflect a commitment to bringing quality, efficiency, redundancy and added robust capabilities to UWNY's system.

**PHOTOS**



**Lake DeForest Generators**





Test Wells

<b>Production Test Well Conversions</b>
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<b>± 0.86 MGD</b>
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## **INTRODUCTION**

UWNY is currently conducting field activities for the construction of new production wells at three (3) sites it owns and maintains. The sites were evaluated in the 1970's and test wells were constructed to determine potential production capacity. However, the test wells were not developed into production wells at that time as the additional capacity was not required. As demand has increased in Rockland County, so has the relative value of the increased capacity at these sites. Thus, UWNY is actively pursuing these sites for additional production capacity.

Eight (8) sites were initially evaluated for the development of production wells - some of the sites have existing test wells while others have dormant production wells or no test or production wells at all. The three (3) well sites that were selected for development were the most attractive because UWNY has the requisite easements. The three (3) properties currently under investigation are Strawtown Road, Long Clove Road, and Lime Kiln Road. The following is a summary for the three (3) properties:

### **Strawtown Road (Q = 325 gallons per minute, gpm), Hamlet of West Nyack**

- Strawtown Well includes one (1) test well that was previously constructed and is located on property along Strawtown Road (County Route 23).
- Current location of test well does not meet buffer zone requirements, a new test well needs to be constructed. The existing property is capable of locating a new test well to meet the buffer zone requirements.
- Status: Site survey conducted, wetlands delineation identified, test well drilled; currently contacting residents for capacity testing and monitoring. In May, Strawtown Well was air tested and the estimated capacity is between 300 to 400 gpm.

### **Long Clove Road (Q = 150 gpm), Hamlet of Congers**

- The Long Clove Well site includes two (2) test wells that were previously constructed and are located on private property along New York State Route 304.
- Current location of test well does not meet buffer zone requirements, a new test well needs to be constructed. The existing property is capable of locating a new test well to meet the buffer zone requirements.
- Existing test well on-site was approved by the New York State Department of Environmental Conservation (NYSDEC) Water Supply Application (WSA). The new production well will need to be drilled in a new location and require a new NYSDEC permit.
- Status: Site survey conducted, wetlands delineation identified, test well drilled; currently contacting residents for capacity testing and monitoring. In May, Long Clove Well was air tested and the estimated capacity was a disappointing 60 gpm and substantially less than the 150 gpm produced by the test well completed in

1969. It's been proposed to move the new test well closer to the location of the 1969 test well. It is thought there may be a fracture which if the test well is east of may result in better production. The new location would require easements on NYS Route 304 (including pavement) to the southeast and Lake DeForest Developers LLC to the north for the 200 foot radius requirement.

**Lime Kiln Road (Q = 125 gpm), Village of Wesley Hills**

- Lime Kiln Well includes one (1) test well that was previously constructed and is located on private property along Lime Kiln Road.
- Current location of test well is located within the one-hundred (100) year flood plain, a new test well needs to be constructed.
- Status: Site survey conducted, wetlands delineation identified federally regulated wetlands (U.S. Army Corps). Test well is not currently being pursued.

**APPROACH**

Because of the presence of wetlands and the 100-year flood plain at Lime Kiln Road and the potential to permit and develop two (2) wells that are located in the Town of Clarkstown at the same time, it was decided to drill and test the Strawtown Road and Long Clove Road sites. To meet the required buffer requirements, a new test well was drilled at each site. Pump capacity and a step test shall be performed to determine the capacity of each site. In addition, a full water quality analysis (NYSDOH Part 5) shall be performed to determine the need for additional treatment of the water beyond chlorination and corrosion protection.

After successful testing, each location shall include the construction and installation of a new above ground well house. The well house shall include a submersible pump, electrical cabinets, chemical storage facilities (for chlorination and corrosion control), piping and other miscellaneous equipment. The construction of a new above grade well house on the properties shall require approval from the Planning and Construction Departments of the Town of Clarkstown. After the test well is constructed, additional permits required for the construction of the well will be completed and filed.

UWNY will test for water quantity and water quality, as required by the NYSDEC and NYSDOH and RCDOH. The water quality analyses that will be completed encompass all regulated contaminants of concern for a public community supply well, including such contaminants as volatile organic compounds, pesticides, herbicides, metals and turbidity (clarity). A work plan will be submitted to the appropriate regulatory agencies for approval prior to any of the testing.

UWNY will be taking a conservative approach to the pump testing, monitoring neighbor's wells closely, if they choose to be monitored. Testing will cease if abutter's wells are significantly impacted. UWNY will be ultimately responsible for maintaining an abutter's current supply by either lowering their pump or drilling a new well, if they are impacted. If an abutter's current well supply can not be salvaged, UWNY will be responsible for providing water, including connecting to UWNY's system.

## **SUMMARY**

Eight test well locations were initially evaluated for full production consideration. From the initial 8 locations, 3 locations were selected for development. The list remains at 3 locations, however one of the test wells will be re-evaluated in light of wetlands that exist on the site.

Test wells have been drilled at two wells (Strawtown Road and Long Clove Road) to meet summer peak demands for an estimated combined capacity of approximately 0.68 million gallons per day (mgd). Both wells are scheduled to be constructed and on line by December 15, 2007, but the completion date for the projects is largely dependent on the environmental impact review, permitting process (submittal, review and approval schedules) and public comment on the projects. Lime Kiln Road site is not being developed at this time, but is being considered for construction, in balance with other STWS projects, for the year 2008.

The process for bringing a new well on line is time consuming and requires input from various agencies. A timeline of events and milestones is included in Appendix E.

As a result of the completion of these infrastructure improvements, UWNY has the potential to increase production capacity by 0.86 mgd.



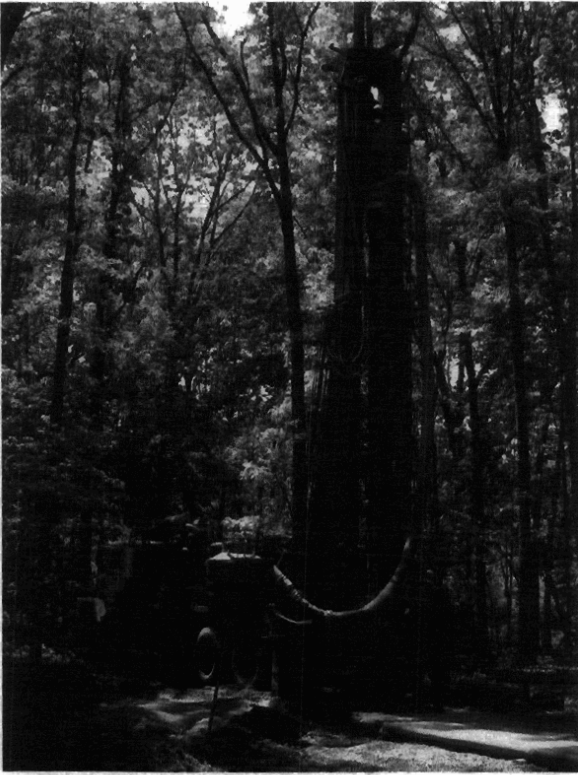
## **PHOTOS**



Strawtown Road Geotechnical Investigation Work



Strawtown Road Geotechnical Investigation Work



Long Clove Road Test Well Construction



Long Clove Road Access Road



<b>Sparkill Well Nos. 8 and 11 Water Treatment Facility</b>
<b>0.58 MGD</b>

## **INTRODUCTION**

The Sparkill well field property is a 7.25-acre parcel, located in an R-15 zoning district in the Town of Orangetown, NY. The site currently contains two production Wells No. 8 and 11, for a combined permitted capacity of 0.60 gpm. The well site was contaminated with gasoline constituents from a nearby gas station and shut down in 1989 as a result. UWNY has completed a full design for accessory treatment to the well field which is currently under regulatory determination. The proposed treatment is packed tower aeration designed to strip the volatile gasoline constituents.

A site plan of the proposed facility is included in Appendix F along with an architectural rendering of the proposed facility. As currently approved, the Sparkill water treatment facility will consist of two 24-foot-tall air stripping towers, contained within a 1,008 square-foot building designed to blend architecturally with the surrounding community.

## **APPROACH**

The Sparkill project was one of the most attractive projects for successful implementation and subsequent increase in average and peaking capacity. As such, the project commenced in early 2006 and recently completed the regulatory approval process. The project has undergone intense scrutiny by the RCDOH and was subject to appeal by one of the residents. Due to the intensive scrutiny the project has received, and the resultant meetings, technical support and legal support required to address all issues in a fair and comprehensive manner, UWNY has invested heavily in the project to-date.

UWNY has received project approval from the Town of Orangetown Architecture and Community Appearance Board of Review (ACABOR) and the Zoning Board of Appeals (ZBA) for Performance Standards. The Town issued a building permit for the project on March 9, 2007.

Additionally, UWNY received final approval for the project on June 6, 2007 when the Zoning Board of Appeals (ZBA) for the Town of Orangetown denied an appeal of the Town Zoning Director's prior determination that the project does not require a use variance.

Given the recent final project approval by the Orangetown ZBA, UWNY plans to start construction at the site immediately. Construction is expected to take approximately 5 to 6 months.

## **SUMMARY**

The project consists of the construction of a new air stripping facility for existing Well Nos. 8 and 11 located in Orangetown, NY. The wells have not operated since 1989 due to contamination of the groundwater by gasoline-affiliated volatile organic compounds (VOCs), including MTBE and benzene. The objective of this project is to provide treatment and reactivate the wells for a new water supply of 300 gpm (sustained) and 400 gpm (peak). The Sparkill project was included in rate case testimony as providing a yearly average capacity of 0.43 mgd and a peak capacity of 0.58 mgd to meet the 6/15/2007 Short Term Water Supply volume commitment.

UWNY has received all requisite approvals to commence construction, including a recent (June 6, 2007) decision by the Orangetown ZBA denying an appeal of the project. UWNY plans to start construction at the site immediately. Construction is expected to take approximately 5 to 6 months.

As a result of the completion of this infrastructure improvement, UWNY expects to increase peaking production capacity by 0.6 mgd.

## **PHOTOS**



**Well House For Well No. 8**



De-Aeration

1

<b>Bedrock Well De-Aeration</b>
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<b>+/- 1.0 mgd Increased Capacity</b>
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## **INTRODUCTION**

Several well fields were identified as underperforming relative to available submergence and NYSDEC permitted pumping rates during, and subsequent to, August 2001. The wells that are included in this section are unique due to their tendency to entrain air at higher pumping capacities, thereby limiting production. To address this, UWNYP has identified three well field locations as candidates for treatment. Willow Tree 56, New Hempstead 18 and 24 and Pascack 65 are all currently under design for the installation of de-aeration clearwells and new pumps (and motors and VFD's) to meet the higher capacity. Willow Tree 56 is furthest along in the treatment process due to a potential larger increase in capacity than the other two. Note that these de-aeration treatment designs will be similar to the current setup for Viola 28 and 106, which has proven successful in removing entrained air.

## **APPROACH**

Similar to the bedrock well infrastructure improvement program, the hydrogeologic capacity for each location was evaluated based upon review of historic Supervisory Control and Data Acquisition (SCADA) flow and submergence (water level) data during all seasonal and demand conditions, and current capacity testing results. The permitted capacity of each well was confirmed by reviewing the original NYSDEC WSA permits. In addition to evaluating current and potential pump design points, the historical data suggested that pumping typically ceased (or reduced) at certain points where air entrainment was noted in the discharge.

Along with the bedrock well improvements and test well conversions, the new flow conditions for each well location were modeled under August 2001 drought demand conditions to determine the required pumping operating point. New pumps are currently being designed around worst case pumping conditions at high flow rates during peaking conditions.

After successful testing, a new above ground structure will be constructed and installed at each location. The well house will include the new clearwell (below ground), the new clearwell pump(s), electrical cabinets, piping and other miscellaneous equipment. In addition, the existing well pump will be replaced. All pumps will be provided with VFDs. A geotechnical investigation (one or two borings at each location) will be conducted to obtain soil data for geotechnical recommendations for the new clear well and structure.

The construction of a new above grade well house on the properties will follow all State and local permitting regulations. The Village of Wesley Hills has reviewed preliminary

documents and plans for Willow Tree 56 and confirmed that the project will require planning board review and approval.

Well and pump capacity testing were conducted in the field at the three well locations. The field data for the three wells, and preliminary design for Willow Tree 56 are included in Appendix G.

Additional information is included in Appendix G, including old and new pumping curves, testing and validation data. A more detailed description of the hydrogeologic approach is also included in Appendix G.

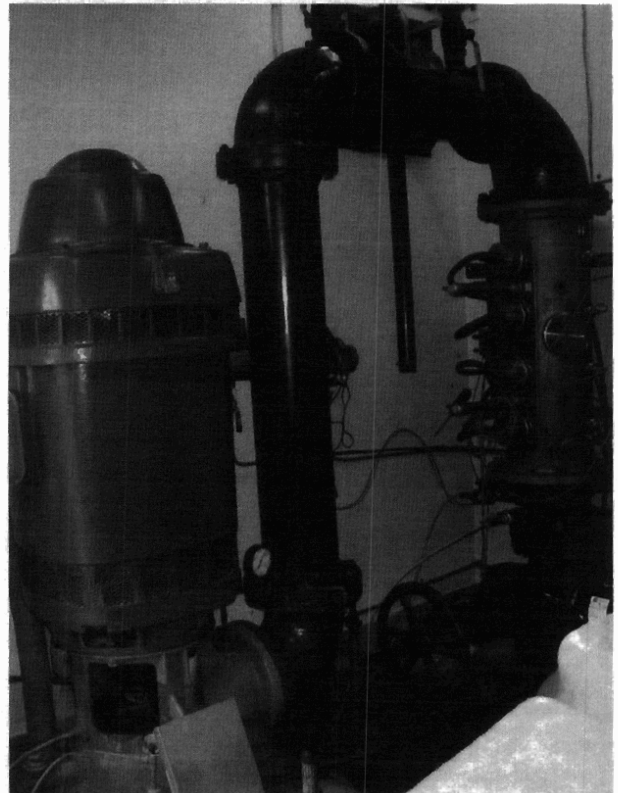
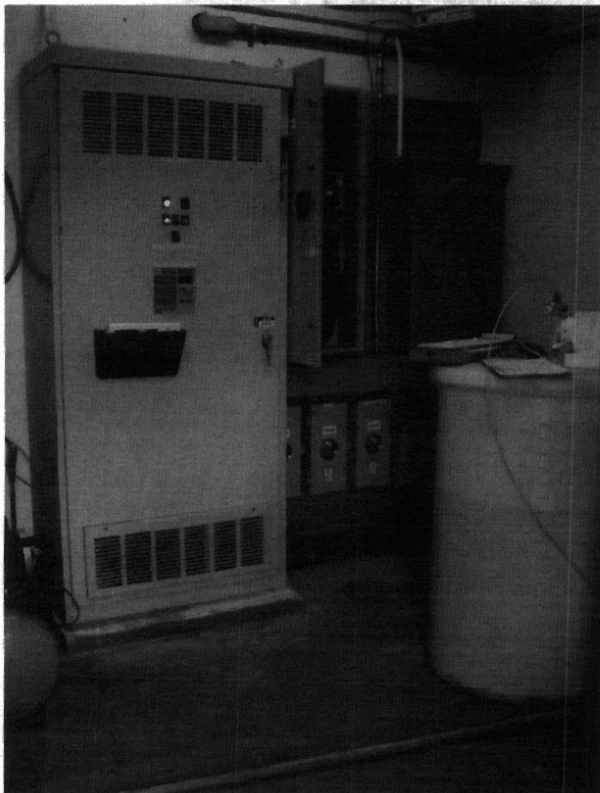
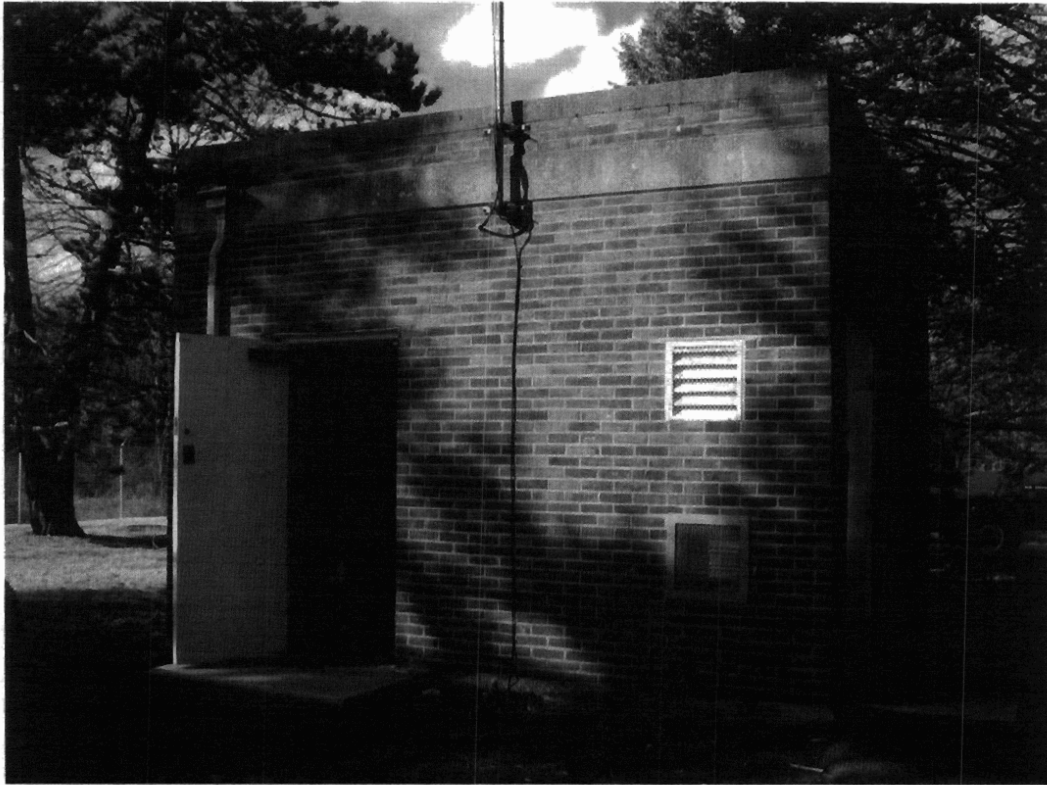
## **SUMMARY**

Three groundwater well de-aeration locations have been identified for treatment consideration. From the three locations, one location (Willow Tree 56) is currently in the process of design and permitting. UWNYP hopes to have Willow Tree 56 on-line by December, 2007, pending timely regulatory approval. The remaining two locations are in conceptual design and will be considered for construction for the year 2008.

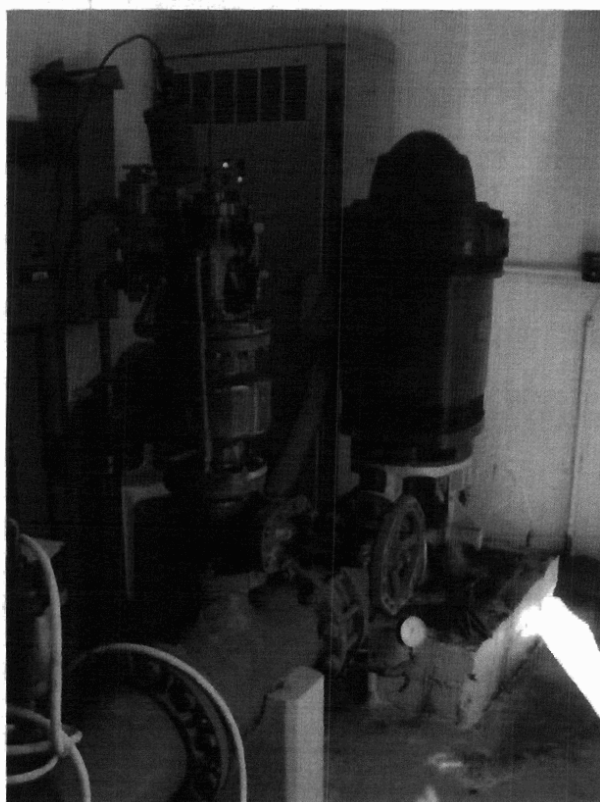
As a result of the completion of these infrastructure improvements, UWNYP has the potential to increase production capacity by approximately 1 mgd.

## **PHOTOS**

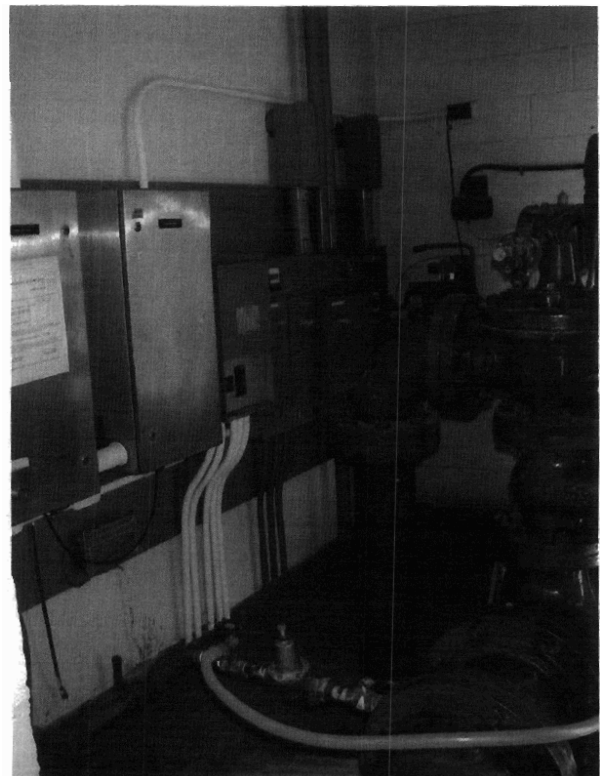
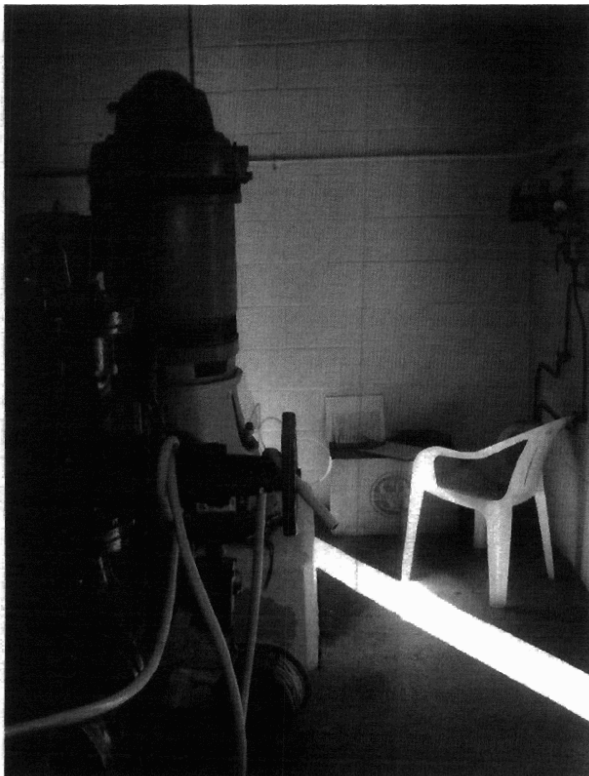
**New Hempstead 18**



**Willow Tree 56**



**Pascack 65**







<b>Viola 28/106 and Elmwood 66</b>
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<b>0.74 mgd Increased Capacity</b>
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## **INTRODUCTION**

As mentioned in the earlier “Bedrock Wells Infrastructure Improvements” section, six existing bedrock production wells were identified as underperforming during the base drought period of August 8, 9 and 10, 2001 due to lacking infrastructure. Three of the wells and pumps have been addressed and are currently on line.

The other three wells were differentiated because there is the extra step involved of pumping from the clearwell to the system after the groundwater is pumped to the clearwell. The other three locations discussed in this section are shown below:

- Viola 28 and 106 (0.58 mgd additional capacity)
- Elmwood 66 (0.16 mgd additional capacity)

## **APPROACH**

Similar to the “Bedrock Wells Infrastructure Improvements” hydrogeologic capacity for each location was estimated based upon review of historic Supervisory Control and Data Acquisition (SCADA) flow and submergence (water level) data during all seasonal and demand conditions, historic rated capacity and current capacity testing results. The permitted capacity of each well was confirmed by reviewing the original NYSDEC WSA permits. The existing pump design point for the well pump and clearwell pump was compared to that which would be required to increase capacity during the worst case, peak demand conditions. Existing pump performance was measured in the field by conducting step-rate pumping tests.

Pump testing and inspection conducted on the clearwell pumps at the Viola well site indicated that the impellers had been severely worn. Further evaluation indicated that the water chemistry at Viola created an aggressively corrosive environment for typical bronze impellers. The combination of aerated water, residual chlorine and (not necessarily in the case of Viola) high alkalinity is highly corrosive to bronze. In addition to the impeller findings, SCADA data indicates that the Viola boosters never actually achieved a pumping capacity up to the well field rated yield of 1400 gpm into the system. A similar inspection will be conducted on the Elmwood booster, though new ductile impellers have been installed and pump testing indicates the clearwell pump is on curve.

Pump testing on the well pumps at the Elmwood and Viola sites indicate that these wells are performing off curve. Additional capacity is available at each of these locations and the well pumps are currently under evaluation as part of the STWS program.

## **PUMP REPLACEMENT**

Larger pumps, motors and VFDs have been ordered and are scheduled for installation at the Viola clearwell. Bronze impellers will be replaced with ductile iron impellers. The overall capacity to the system will be dependent, however, on the optimal and simultaneous operation of both the well pumps and distribution pumps. Thus, if required, new pumps and/or impellers will also be installed in Viola 28 and 106.

Similarly, new ductile iron impellers were installed in the Elmwood 66 clearwell pumps and they appear to be operating on curve. The well pump is off curve and is currently under evaluation. If required, new pumps and/or impellers will also be installed for the Elmwood 66 well pump.

Additional information is included in Appendix H, including old and new pumping curves, testing and validation data. Updated, cleaner data will be presented for the December 31, 2007 submittal. A more detailed description of the hydrogeologic approach is also included in Appendix H.

## **SUMMARY**

Elmwood 66, Viola 28 and Viola 106 were identified as having the potential to achieve more capacity within their NYSDEC WSA permitted rates and are scheduled to be on line with additional capacity by December 31, 2007, if not sooner.

The wells were identified as candidates due to their unique combination of having pumps that were not meeting pressure head requirements, and the fact that there was additional hydrogeologic capacity that could be recovered within the existing NYSDEC WSA permitted rates. Full capacity will only be realized with both the well pumps and clearwell pumps operating at their design point. The clearwell pump at Elmwood is currently operating on curve and new, larger pumps have been ordered for installation at Viola. The well pumps are currently under evaluation.

In summary, the additional capacity from the three wells for December 31, 2007 is a total of 0.74 mgd. Supporting and backup data is included in Appendix H.

## **PHOTOS**



**Viola 28/106 Distribution Pump**



**Elmwood 66 Distribution Pump - Comparison of old bronze impellers  
and new ductile iron impeller**



<b>Blaisdell Road Interconnection</b>
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<b>0.25 mgd Increased Capacity</b>
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## **INTRODUCTION**

UWNY built a new pump station on Blaisdell Road in Orangeburg, NY in 2006. The primary purpose of this station and associated piping/valves was as an emergency interconnection between UWNY and UWNJ. Because United Water New Jersey (UWNJ's) hydraulic gradient in this area is lower than UWNY's, pumping is required to move water from UWNJ to UWNY. The pump station capacity is 3.0 mgd.

A secondary purpose of this station was to provide a means to transfer an amount of water from UWNJ to UWNY equal to the amount of water currently supplied by UWNY to UWNJ's Montvale system. However, is considering serving its customers in Montvale by constructing a booster system from its own system. If this were to happen, this will make the transfer of water from UWNJ to UWNY to offset usage by Montvale unnecessary, resulting in additional capacity of about 0.25 mgd for the customers of UWNY.

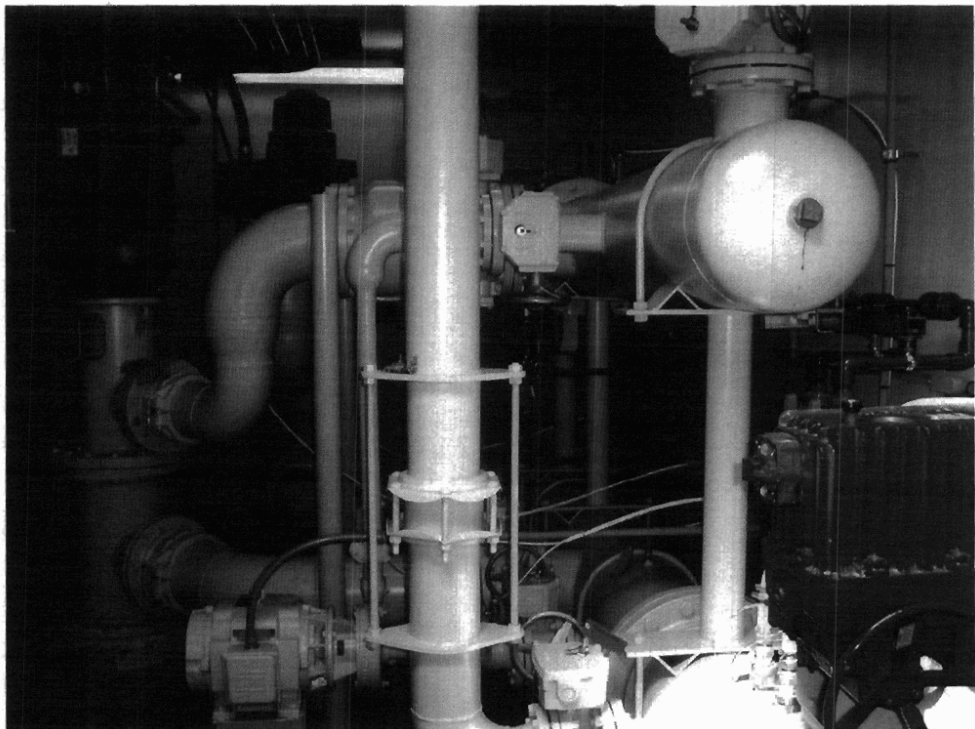
## **APPROACH**

UWNJ is currently considering serving customers in Montvale by constructing a new pump station. One scenario may be that UWNJ supplies all of Montvale and the interconnection remains open only for emergencies. Under this condition, the amount of water that UWNY was supplying to Montvale would now be recovered and available to UWNY as additional capacity.

Please note that this option is only under consideration at the time of this writing.

**PHOTOS**





Other

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<b>Other Projects Considered for 2008</b>
<b>Up to 3.5+ mgd Increased Capacity</b>

## **INTRODUCTION**

In addition to the projects that have been put on line in 2007, and those that are currently active and scheduled for later 2007 and 2008, there are several other STWS projects that have been initiated and are in the early stages of discussion and/or completion. These are projects that have good potential for increasing the capacity of UWNYS system, but typically require more outreach and are more dependent on input from multiple parties. While these projects are on-going, UWNYS efforts and resources have been more focused on projects that will yield immediate results for June 15, 2007 (i.e.; the 2007 projects in this document).

Technically, the projects identified in this section do have the potential of being on line by the end of 2008, but the feasibility of that depends on the input of regulatory agencies and other interested stakeholders. The projects are discussed briefly below.

### **Suffern Interconnection – +/- 1.0 mgd Additional Peak Capacity**

Several interconnections currently exist between the town of Suffern, NY and UWNYS distribution system. An analysis conducted in June 2006 indicated at least 1-mgd could be available for distribution from Suffern to UWNYS. Since the study, UWNYS has reached out to Suffern Town officials. Suffern officials were amenable to the proposal of a 1.0-mgd transfer. UWNYS remains enthusiastic in pursuing this option and has made several attempts to reach out to Suffern to discuss the alternative in more detail. Thus far, Suffern has not shown great interest in moving this along.

UWNYS will continue to reach out to Suffern Town officials with the hope of pursuing this as a viable alternative.

### **Ramapo River Augmentation – +/- 1.5 mgd Additional Peak Capacity**

UWNYS owns Potake Pond and conveys water via a pipeline to Nakoma Brook, a tributary to the Ramapo River, for the purpose of augmenting flow in the Ramapo River to support operation of RVWF. Potake Pond contains 700 mg. The current permit allows usage of the upper 7.0 feet of Potake Pond, which contains 190 mg. This project involves obtaining an additional 110 mg for a total of 300 mg (upper 11-feet). This project would also help prevent restrictions on RVWF pumping which are placed when the flow in the river drops below 8 mgd. The project has been strongly opposed by NJDEP and the Company continues to try to find a solution that will be acceptable to both States.

## **New Wells – +/- 1.0 mgd Additional Peak Capacity**

Several properties with existing wells that are either in use or abandoned, have been identified for developing additional supply. These include the St. Agatha's property in Clarkstown, Rockland Psychiatric Hospital in Orangetown and the Helen Hayes property in West Haverstraw.

## **Conjunctive Use Strategy and Lake DeForest Withdrawal**

UWNY has evaluated the characteristics of the various supplies and permitting constraints. Based on these parameters, there are optimal operating strategies that would, as an example, conserve water in those areas that are constrained by either permitting and/or hydrogeology, while optimizing and utilizing those supplies that allow more flexibility with operation.

As one step toward this program, UWNY has identified wells that have a range of recharge rates. The wells have been placed in to categories of Type 1 (high recharge rate), Type 2 (medium recharge rate) and Type 3 (low recharge rate). By utilizing Type 1 wells first (demand location dependent), Type 2 and 3 wells will be saved for higher demand periods. Layered on top of that is the most optimal use of surface water supplies in conjunction with the groundwater wells. Based on recent step testing and analyses, and the recent well improvements, UWNY currently has enough available information to bring this program in to full operation.

UWNY is required to limit withdrawal from Lake DeForest to 10-mgd on an annual average basis, and intends to pursue a modification to the permit that allows taking of water being spilled over the dam. Spillage occurs quite frequently and goes unused. Utilizing this water will protect other bedrock well sources for recharge and optimal use during the drier months and possibly allow RVWF to be operated in a manner that provides greater sustainability of this resource.

## **Distribution System Improvements**

UWNY has identified improvements to their distribution system. There are several areas in the system that experience high headloss, particularly during peak demand. Though the Letchworth improvements will mitigate much of this, distribution system improvements will effectively result in increased capacity by allowing more water in to the system with the reduced headlosses. In effect, this optimizes the capacity of the current sources of supply.

UWNY has conducted modeling on their entire system using the WaterGems® hydraulic model. The model has identified areas of excessive headloss and has provided the basis for improvement recommendations. As part of the Well Improvements for the STWS, the model was upgraded to include this additional capacity and it's impact on the overall system. Distribution system modifications will be prioritized based on this modeling and

the improvements that provide most benefit in the system will be implemented to optimize supply.

### **Aquifer Storage and Recovery (ASR)**

UWNY is currently evaluating the feasibility of ASR as a means for artificially recharging the aquifer for additional groundwater storage. This is a means of conjunctive use that would allow the storage of water in the aquifer for high demand periods. In May 2005, UWNY submitted a protocol for ASR to the NYSDEC and NYSDOH. Comments were received in September 2006. The next step is to collect system distribution samples in the vicinity of Viola well field during RVWF high pumping. These samples will represent the quality of the injection water, and we will assist in evaluating potential impacts. These will be incorporated into responses back to the NYSDEC and NYSDOH.



