# Long Term Water Supply Project

## United Water New York

### January 2007

Prepared in compliance with Commission Order in Case No. 06-W-0131 Issued and Effective December 14, 2006 by the New York State Department of Public Service

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# Section 1 EXECUTIVE SUMMARY

United Water New York's ("UWNY" or "Company") available supply has worked hard to keep pace with demands even with the use of water conservation programs. Moreover, it is estimated that water demand will increase over the next 20 years. As part of its 2006 rate filing, UWNY identified both short term and long term average day and peak day supply targets that would have to be addressed through an aggressive capital program. The intervening parties to the rate case (Department of Public Service Staff, Rockland County, Town of Ramapo, Rockland County Legislator Jaffee, Rockland County Fire Chiefs Association and The Woodlands at Tuxedo HOA) shared UWNY's concern and in the Joint Proposal approved by the New York State Public Service Commission ("Commission" or "PSC") have agreed that new sources of water supply are needed and outlined the increased volume required to bridge the gap of the current peak day supply of 45.5 mgd and the 2015 estimated peak day demand of 52.6 mgd.

UWNY has implemented a two-tiered approach to meet the supply commitments and projected water demand in the Joint Proposal. The first tier, a near term strategy, will be implemented to develop new supplies and improve and maximize the use of existing sources. The second tier of the strategy, the focus of this document, is the development of a long term water supply project that can be implemented in stages to meet the projected demands for the next 20 years. The project is anticipated to have an ultimate capacity of 7.5 mgd; however it would be implemented incrementally to keep pace with water demands.

There are a number of potential long term sources of supply available to UWNY, including:

- the creation of new surface water supply reservoirs, i.e., Ambrey Pond Reservoir
- the desalination of brackish Hudson River water.
- additional groundwater supplies,
- reuse of wastewater,
- increased use of Lake DeForest, and
- use of the Suffern Quarry

Several of these alternatives, upon evaluation, were determined not to be viable long term water supply solutions. The two viable long term supply projects, Ambrey Pond Reservoir and Hudson River desalination, were further evaluated with the following criteria:

- Drought tolerance
- Perceived Dam Safety Concerns
- Expandability

- Permitting requirements
- Complexity of construction
- Cost

After an extensive review of potential alternatives, UWNY is convinced that the health, safety and quality of life water needs of its Rockland County customers will be best served by the timely implementation of the Hudson River Desalination Project. The project represents a safe, sustainable, resilient, and cost effective source of water for decades to come.

# Section 2 PURPOSE AND OBJECTIVE

This document was prepared pursuant to Section XI, paragraph 3 of the Joint Proposal approved by the Commission on December 14, 2006, as part of a three-year rate plan for UWNY in Case 06-W-0131 (the " Rate Case"). As part of the Joint Proposal, UWNY agreed to file with the New York State Public Service Commission (the "Commission"), and the parties to the Joint Proposal ("Parties"), on or before January 15, 2007, a project description ("Project Description") for a long term major water supply project ("LTWSP") that the Company will build. Among other things, this filing includes: a description of the project, an explanation of why this project (in lieu of alternative projects) was selected, the rationale for including cost recovery of this project in the new water supply source surcharge ("NWSS"), and the disposition of the existing land associated with Ambrey Pond, and the treatment of proceeds when sold.

It is important to note that this document is intended solely to respond to the above referenced directive of the Commission. The Project Description will initiate the extensive approval process, which will review and address matters that are beyond the scope of this document. The selected long term water supply project will be considered by a number of government entities as part of the permitting and environmental impact review process. While these matters are beyond the scope of the filing of the Project Description with the Commission, UWNY will work cooperatively with all applicable government entities to address their respective approval processes. Upon the filing of this document, UWNY will begin an extensive consultation and outreach process with regulators, stakeholders and the public. This process is intended to inform, educate and solicit feedback as the project moves towards the formal approval process.

The objective of the LTWSP is to place UWNY in a position to satisfy the health, safety and quality of life water needs of its Rockland County customers by providing a safe, sustainable, resilient, and cost effective source of water for decades to come.

# Section 3 BACKGROUND

UWNY supplies drinking water from a variety of surface water and groundwater sources to approximately ninety percent (90%) of Rockland County's residents. The existing water supply is composed of: 1) the Ramapo Valley Well Field ("RVWF") in Ramapo; 2) 47 active system wells located throughout the County; 3) the Lake DeForest Water

Treatment Plant ("LDWTP") in Clarkstown; and 4) the Letchworth Village Water Treatment Plant ("LVWTP") in Haverstraw. The distribution system is composed of approximately 1,000 miles of pipe and 14 storage tanks. The average day demand for the UWNY system is approximately 30 million gallons per day (mgd). As shown in Exhibit 1, the system's peak sustainable supply capacity is 45.5 mgd, and the short term peak supply capacity is 48.5 mgd.

Of the supplies listed in Exhibit 1, RVWF is the most susceptible to periodic dry spells or short term droughts and prolonged water shortage since its available supply is linked to the flow in the Ramapo River. UWNY has taken efforts to bolster the reliability of the RVWF by purchasing Potake Pond, which is used to supplement flow in the Ramapo River; however, the available flow from Potake Pond does not provide sufficient volume to ensure the reliability of the RVWF.

The northeast typically experiences a short-term drought (i.e., a drought with a duration of one to three months) once every two or three years on average; and experiences longer droughts (i.e., greater than three months) only once every 20 or 30 years. Due to changes in the climate, the frequency of drought conditions is predicted to increase.[1] Over the past 25 years Rockland County residents have faced water use restrictions five (5) times.

UWNY's available supply has worked hard to keep pace even with the use of water conservation programs which have been in place for over 20 years. Moreover, it is estimated that water demand will increase over the next 20 years. UWNY and the Parties to the Joint Proposal have agreed that by 2015 the estimated peak day water demand will be 52.6 mgd. Comparing this projected peak day demand with the available peak supply capacities shown in Exhibit 1, it is clear that new sources of water supply are needed to meet the increased demand in Rockland County.

As part of the Joint Proposal, UWNY agreed to meet specific Peak Volume Commitments, Yearly Average Day Volume Commitments, and Long Term Major Water Supply Project Milestone Commitments by dates certain.[2] To keep pace with projected demands and to satisfy the peak supply commitments, UWNY must develop new sources of supply. UWNY has implemented a two-tiered approach to meet the supply commitments and projected water demand. The first tier, a near term strategy, will be implemented to develop new supplies and improve and maximize the use of existing sources. Near term improvements may include the conversion of test wells to production wells, expansion of the LVWTP, the installation of new wells, well optimization, Potake Phase 2, and aquifer storage and recovery.

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1 The Changing Northeast Climate Our Choices, Our Legacy, Union of Concerned Scientists, Two Brattle Square, Cambridge MA 02238-9105, www.ucsusa.org, 2006.

2 State of New York Public Service Commission, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of United Water New York Incorporated and United Water South County Inc. for Water Service (Case 06-W-0131) and Joint Petition of United Water New York Incorporated for Approval of Certificate of Merger, with United Water New York Inc. being the Surviving Corporation (Case 06-W-0244), Joint Proposal, September 29, 2006 and Exhibit 11 of the Joint Proposal.

The first tier improvements will assure that the available water supply is adequate to satisfy the projected peak demands through 2015.

The second tier of the strategy, the focus of this document, is the development of a long term water supply project, a tremendous undertaking that will be costly, time consuming, and resource depleting. The project is anticipated to have an ultimate capacity of 7.5 mgd; however it would be implemented incrementally to keep pace with water demands for the next 20 years.

In sum, it is imperative that UWNY immediately move forward with this project in order to meet the water needs of Rockland County residents in the coming decade. The failure to immediately undertake the planning, design and permitting process carries with it the potential risk of severe water use restrictions, as well as compromised supply pressure that potentially impacts water quality and fire fighting capabilities.

# Section 4 LONG TERM WATER SUPPLY ALTERNATIVES

As discussed above, prudent planning compels UWNY to undertake a long term water supply project that will be in service by the end of 2015 to meet projected demands. There are a number of potential long term sources of supply available to UWNY, including the creation of new surface water supplies, additional groundwater supplies, reuse of wastewater, increased use of Lake DeForest, use of the Suffern Quarry, and the desalination of Hudson River water. UWNY has investigated and evaluated these potential sources, to identify a viable long term source of supply, which are discussed below, followed by a discussion of the non-viable supply alternatives, which were dismissed.

## 4.1 Viable Long Term Water Supply Alternatives

The two most viable long term water supply alternatives for UWNY are: 1) the construction of a new reservoir, i.e., Ambrey Pond, and 2) desalination of Hudson River water. These alternatives are discussed in detail below.

### *4.1.1 Ambrey Pond Reservoir*

UWNY has studied and planned for the development of a 300 million gallon (MG) to 2,000 MG reservoir in the Town of Stony Point, known as the Ambrey Pond Reservoir, for many years.[3] As a result of recent studies conducted by UWNY, it has been determined that a 2,000 MG reservoir is not needed, and a 600 MG reservoir would adequately meet the long term needs of UWNY.

Over the years UWNY has purchased property in the Stony Point section of Rockland County, and owns almost all of the land that is required for the construction of the Ambrey Pond Reservoir.

[3] The original Ambrey Pond reservoir was designed to hold 2 billion gallons, with a dam elevation set at 316'. During the planning stages of the project it was determined that a reservoir of this size was not needed.

In 1987 the New York State Department of Environmental Conservation ("NYSDEC") conditionally approved the water supply application of the Spring Valley Water Company Inc., the predecessor to UWNY, for the Ambrey Pond Reservoir and determined that the obligations of the State Environmental Quality Review Act ("SEQR") had been met (1987 DEC Final Decision).[4] At that time, the project was opposed by the County of Rockland, Town of Stony Point, and numerous non-government organizations. The reasons cited for opposition included the need for the project, its impact on fisheries, wetlands and marshes, the "trigger" mechanism in the decision that would activate the conditional approval, as well as the seismic risks associated with constructing dams in close proximity to the Ramapo Fault. The NYSDEC Commissioner's conditional approval of the project was challenged in court and ultimately upheld by the Supreme Court of New York, Appellate Division, Third Department in 1988.

While the NYSDEC approval for the Ambrey Pond Reservoir project was secured in the late 1980s, UWNY has never secured Army Corps of Engineers ("USACE") approval for the project. The NYSDEC approval contained a "trigger" mechanism that only allowed construction permits to be issued when demands on UWNY's system reached a designated level. If UWNY were now to pursue the Ambrey Pond Reservoir project, it would be required to secure an USACE permit for the project and undertake the requisite environment impact review in support of its application. Likewise, it is unlikely that the NYSDEC would allow UWNY to rely upon its 1987 conditional approval of the water supply application or the Final Environmental Impact Statement adopted pursuant to SEQR. In seeking approval from the NYSDEC and the USACE, there are several issues that would need to be addressed, including but not limited to: 1) the construction of the reservoir on a trout production stream; 2) possible impacts to endangered species; 3) perceived dam safety concerns; 4) the potential disturbance of wetland areas; 5) the potential impacts related to the disturbance of a natural forested area for the creation of the reservoir; 6) impacts to the marshlands on the western shore of the Hudson River; 7) construction vehicle traffic; and 8) other potential impacts on the community.

In the addition to the SEQR review, the permits and approvals that are anticipated for this project are: a NYSDEC State Pollutant Discharge Elimination System Permit (SPDES), a NYSDEC Stream Protection Permit, a NYSDEC Water Quality Certificate, a NYSDEC Water Supply Permit, a NYSDEC Freshwater Wetlands Permit, an USACE wetlands permit, local planning board siting plan approval, NYSDOH/RCDOH completed works approval and all applicable dam permits.

The Ambrey Pond project would be implemented in stages to meet the projected demands for future years. The project is anticipated to have an ultimate capacity of 7.5 mgd; however it would be implemented incrementally to keep pace with water demands. For cost estimating purposes, it was assumed that the project would be phased as follows:

[4] In the Matter of the Applications of the Spring Valley Water Company, Inc. (Ambrey Pond Project) for permits to construct a reservoir, diversion pipelines and a water treatment plant, all known as the Ambrey Pond Project in the Town of Stony Point, Rockland County, DEC Project No. 334-06-0059 Water Supply Application No. 6971, New York Department of Environmental Conservation, January 6, 1987, Decided, Final Decision of the Commissioner.

- **Phase 1:** UWNY would purchase any remaining land needed to construct the reservoir, the Stony Point Dam would be constructed at an elevation of 280', which results in a 300 MG reservoir; a 2.5 mgd WTP would be constructed at the former Stony Point WTP site; and Cedar Pond Brook would be diverted to fill the Ambrey Pond Reservoir.

- **Phase 2:** UWNY would upgrade the WTP from 2.5 mgd to 5.0 mgd.

- **Phase 3:** (Complete Build-out) UWNY would purchase any land required to finish the reservoir construction, the height of the Stony Point Dam would be increased to elevation 290, which results in a 600 MG reservoir; a second auxiliary dam would be constructed; several roads would be relocated; and the WTP would be expanded to 7.5 mgd; all of which are estimated to cost $72,000,000.

The Ambrey Pond WTP treatment system would be designed to produce a drinking water source capable of meeting all applicable Federal and State Drinking Water Standards.

The estimated cost for the three phases of the Ambrey Pond Reservoir is $169,400,000. A summary of the Phase 1 and 2 Ambrey Pond Reservoir costs are presented in Exhibit 2.

The operating costs for the Ambrey Pond Reservoir have been estimated to be $0.70/1,000 gallons produced, and are presented in Exhibit 3.

### *4.1.2 Hudson River Desalination*

The second viable long term water supply alternative for UWNY is the use of the Hudson River as a drinking water source. However, brackish water, pollutants, and environmental concerns must be addressed prior to using this potential water source. Current treatment technologies (e.g., desalination) have made producing drinking water from Hudson River water possible. As desalination costs have decreased over the years (i.e., for advanced treatment systems such as reverse osmosis), the process has become a more widely accepted and utilized water treatment option. The Hudson River provides a significant and extremely drought resistant water supply source for UWNY's Rockland County customers.

The desalination facility will only withdraw a small fraction of the river's total flow and the majority of this water will be returned to the Hudson River via local wastewater treatment plant discharges. An additional benefit to the use of a desalination facility is that it will only withdraw the water needed to meet the drinking water demand, whereas a reservoir must divert and store a much larger volume of water to assure supply is available when needed.

Similar to the Ambrey Pond Reservoir, the SEQR process will need to be completed for the Hudson River Desalination Project. There are several issues that will need to be addressed in the SEQR process, including but not limited to: 1) construction of an intake structure within the Hudson River; 2) the potential impact of the intake structure on the biota of the river; 3) potential impacts to freshwater and/or tidal wetlands; 4) brine

disposal; 5) potential site contamination; 6) energy use and greenhouse gas emissions, and 7) other potential impacts on the community.

In the addition to the SEQR review, the permits and approvals that are anticipated for this project are: a NYSDEC SPDES Permit, a NYSDEC Stream Protection Permit, a NYSDEC Water Quality Certificate, a NYSDEC Water Supply Permit, NYSDEC Freshwater & Tidal Wetlands Permits, an USACE wetlands permit, local planning board siting plan approval, NYSDOH/RCDOH completed works approval, NYSDEC Coastal Erosion Permit, and potentially a Coastal Zone Management Act consistency determination.

The Hudson River Desalination Project would be implemented in stages to meet the projected demands for future years. The project is anticipated to have an ultimate capacity of 7.5 mgd; however it would be implemented incrementally to keep pace with water demands. For cost estimating purposes, it was assumed that the project would be phased as follows:

- **Phase 1:** Acquire property near the Hudson River; construct a raw water intake structure; and construct a 2.5 mgd WTP. In addition, system improvements will be completed to connect the new WTP to the distribution system.

- **Phase 2:** Expand the WTP to 5 mgd and complete distribution system improvements.

- **Phase 3:** (Complete Build-out) Expand the WTP to 7.5 mgd and complete distribution system improvements, all of which are estimated to cost $19,000,000.

The proposed state-of-the-art treatment system will utilize proven technologies that can treat, among other contaminants, dissolved salts, organic material, pesticides, PCB's, mercury, radionuclides, and emerging contaminants such as endocrine disrupting chemicals.

The estimated cost for the three phases of the Hudson River Desalination Project is $98,000,000. A breakdown of the Phase 1 and 2 costs are presented in Exhibit 4.

The operating costs for the Hudson River Desalination Project have been estimated to be $1.79/1,000 gallons of water produced, and are presented in Exhibit 5.

## 4.2 Non-Viable Long Term Supply Alternatives

Several alternatives, upon evaluation, were determined to not be viable long term water supply solutions. These alternatives, discussed below, are: 1) additional groundwater supplies, 2) reuse of wastewater, 3) increased use of Lake DeForest, and 4) the use of the Suffern Quarry.

### *4.2.1 Additional Groundwater Supplies*

UWNY operates 47 system wells and the RVWF, which in total provide a peak capacity of 24.5 mgd[5]. At first glance, groundwater would seem to be one of the most viable long term supply alternatives. Notwithstanding, preliminary results of a study being conducted by the United States Geological Survey ("USGS") call into question the sustainability of significantly increased withdrawals from the sedimentary bedrock aquifer beneath Rockland County as a long term supply. The USGS study references a Rockland County Health Department report claiming that in 2000 and 2001 withdrawals from the aquifer approached or exceeded estimates of aquifer recharge.[6] The USGS is currently investigating the groundwater resources in Rockland County and it anticipates the development of a guidance document that will establish guidelines for the use of the aquifer that will ensure its long term sustainability.

UWNY is investigating groundwater management strategies to maximize the supply from the available groundwater sources, such as conjunctive use, that can be employed to assist with the recharge of the aquifer so that groundwater is available during peak demand periods. Unfortunately, this strategy does not apply to the RVWF because its supply is linked to the flow in the Ramapo River. While the use of this strategy is not anticipated to result in significant additional capacity, it is expected that this strategy will help to sustain, and perhaps, increase the available groundwater resources in the short term. Therefore, the extensive use of groundwater resources to provide the long term water supply for UWNY has not been further considered.

### *4.2.2 Reuse of Wastewater*

The use of highly treated wastewater effluent that otherwise would be discharged to the environment from wastewater treatment plants ("WWTP") is receiving more attention as a potential source of drinking water.[7] UWNY considered multiple options for using wastewater as a drinking water source, including: 1) the discharge of wastewater effluent into Lake DeForest to increase the safe yield of the reservoir; and 2) the expansion of the Western Ramapo WWTP ("WRWWTP"), from 1.5 mgd to 5.0 mgd.

Wastewater reuse was determined not to be a viable alternative for the following reasons:

- There are numerous concerns related to the direct discharge of treated wastewater effluent into a reservoir, specifically the accumulation of compounds whose effect on health and safety are unknown; and

- The expansion the WRWWTP from 1.5 mgd to 5 mgd would potentially increase the peak capacity of the RVWF, which is linked to the flow in the Ramapo River, from 4 mgd to 9.4 mgd. While this increase would provide up to 5.4 mgd to

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5 As shown in Exhibit 1, the system wells provide 20.5 mgd Peak Supply Capacity and the RVWF provides 4 mgd during peak demand periods.

6 Assessment of the Water Resources of Rockland County, NY, with Emphasis on the Sedimentary Bedrock Aquifer, United States Geological Survey, http://ny.water.usgs.gov/projects/rockland/rockland.htm

7 Wastewater Engineering, Treatment, Disposal, Reuse, Third Edition, Metcalf & Eddy, Inc., McGraw-Hill, Inc., 1991.

address short term peak day demands, it only provides 1.4 – 2.4 mgd[8] to address average day demands. In the near future, the demands will exceed available supply that the WRWWTP expansion provides, therefore, not making this a viable long term supply option. In addition, this option is not incrementally expanded and cannot be expanded beyond 1.4 – 2.4 mgd for average demands and 5.4 mgd for peak demands. It also requires extensive infrastructure improvements to convey water from the RVWF.

### *4.2.3 Increased use of Lake DeForest*

Several options to increase the storage capacity of Lake DeForest have been investigated by UWNY, including dredging the reservoir and increasing the height of the dam. These options are expensive; provide a minimum increase in storage capacity, since the watershed stays the same; and would only minimally increase the yield from Lake DeForest.

### *4.2.4 Use of the Suffern Quarry*

In 2004 - 2005 UWNY and the County of Rockland evaluated using the Suffern Quarry as a water resource. After extensive review, it was determined that the project was not feasible because: 1) the available yield of 2.5 mgd; 2) limited expansion capabilities beyond a yield of 2.5 mgd; 3) significant infrastructure improvements were needed to convey the water; 4) potential conflict in its use as a water supply or flood mitigation by the USACE; and 5) the project was not cost competitive with other potential alternatives.

# Section 5 ALTERNATIVE EVALUATION AND SELECTION

The two viable long term supply projects, Ambrey Pond Reservoir and Hudson River Desalination, are compared and discussed below. The projects were compared using a variety of factors to identify the best alternative.

## 5.1 Drought Tolerance

The northeast experiences a short-term drought (i.e., a drought with a duration of one to three months) once every two or three years on average; and experiences longer droughts (i.e., greater than three months) only once every 20 or 30 years. Due to changes in the climate, the frequency of drought conditions is predicted to increase.[9] Therefore, it is important to consider the ability of the viable alternatives to handle drought conditions.

The Ambrey Pond Reservoir would be filled by diverting, via pumps, water from Cedar Pond Brook when surplus water is available, providing for a larger watershed to fill Ambrey Pond. The water supply for Ambrey Pond would be controlled by the water available from this brook, the physical limitations of the diversion pumps, and would be subject to natural weather fluctuations. The Ambrey Pond alternative is anticipated to

[8] The annual average production of the RVWF is 7 – 8 mgd. Therefore, an additional 9.4 mgd from the WRWWTP will provide 1.4 – 2.4 mgd additional supply from the RVWF.

[9] The Changing Northeast Climate Our Choices, Our Legacy, Union of Concerned Scientists, Two Brattle Square, Cambridge MA 02238-9105, www.ucsusa.org, 2006.

have an average tolerance to handle drought conditions, similar to any surface water reservoir, despite provision of the Cedar Pond Brook diversion.

The Hudson River desalination alternative, however, is expected to be excellent at handling drought conditions due to the substantial and almost drought proof supply of water available from the Hudson River.

## 5.2 Perceived Dam Safety Concerns

While the dams required for the Ambrey Pond Reservoir alternative would be designed in accordance with all applicable standards, there will always be the concern for a potential of dam failure by local residents. It is also anticipated that the public would likely present significant opposition to this alternative during the review process since many homes have been build downstream of the proposed dam site. The Hudson River Desalination alternative would have no such dam safety concerns.

## 5.3 Expandability

Designing, permitting and constructing a water supply project is a tremendous undertaking that is costly, time consuming and resource intensive. Therefore, prudent engineering compels a water supplier to, when possible, undertake projects that can be expanded efficiently and cost effectively. For both alternatives, the WTP can be modularized so it can be efficiently and cost effectively expanded to its ultimate capacity of 7.5 mgd.

The Ambrey Pond Project would require a significant initial capital investment to construct the reservoir and dam so that the WTP could be efficiently and cost effectively expanded. In comparison, the Hudson River Desalination Project would only require constructing an intake that is sized for the ultimate capacity of the WTP.

## 5.4 Permitting Challenges

Both projects present multiple permitting challenges. The Ambrey Pond Reservoir has several potential impacts that will be thoroughly evaluated through the permitting and environmental impact review process. In addition, the Ambrey Pond Reservoir will require various permits for the dam structures.

The Hudson River Desalination Project also has several potential impacts that will be thoroughly evaluated through the permitting and environmental impact review process. Nevertheless, many of the anticipated impacts associated with the Hudson River have already been reviewed and effective mitigation measures are available to address these potential impacts. A comparison of the anticipated permits/approvals need for each project is presented in Exhibit 6.

## 5.5 Complexity of Construction

The Ambrey Pond Reservoir would be a major civil works project that would require a substantial amount of earthwork to shape the reservoir and concrete to construct the dams, in addition to a WTP. The Ambrey Pond Reservoir would also require road

relocation and stream diversion. Comparatively, the Hudson River Desalination Project consists of a WTP, an intake in/on the Hudson River, and possibly an outfall on the Hudson River.

## 5.6 Cost

In order to perform an objective cost comparison of the viable long term water supply alternatives, the project must be evaluated with both, the capital and operating costs, over a fixed time period. This evaluation results in the net present value ("NPV") of the project.

NPV is a standard method for financial evaluation of long term projects. NPV compares the value of a dollar today to the value of that same dollar in the future, taking inflation and returns into account. The NPV analysis for the viable long term water supply alternatives was performed with the following base criteria:

- Both alternatives would be constructed in two (2) 2.5 mgd phases, Phase 1 in 2014 and Phase 2 in 2020, to achieve a total capacity of 5.0 mgd;
- The average production of both alternatives over a 20 year period is 2.0 mgd;
- Inflation is 2.5%;
- Energy costs have been treated in two ways to develop a range of costs:
    - annually escalate at 0.4% over inflation (based on an average increase in energy costs over the last 30 years), to establish the lower range
    - annually escalate at 0.4% over inflation (based on an average increase in energy costs over the last 30 years) with a 50% increase in 2014
- The proceeds from the sale of the Ambrey Pond Reservoir properties, for the NPV analysis have been assumed to be $20M (gross) and are invested in the Hudson River Desalination Project.

The results of the NPV analysis show that NPV of the revenue requirements for the Ambrey Pond Alternative will range from $161 million dollars to $163 million dollars, while the NPV of the Hudson River Desalination Alternative will range from $131 million dollars to $136 million dollars. In terms of the revenue required when the project is put into operation in 2015 (assuming the permitting milestones are met), the Ambrey Pond Alternative has a 2014 revenue requirement of between $16.2 and $16.3 million dollars, and the Desalination alternative has a 2014 revenue requirement of between $11.5 and $11.9 million dollars.

The NPV analysis contemplates the sale of the Ambrey Pond properties to help offset the financial impact of the Hudson River Desalination Project on UWNY's customers. UWNY has acquired and maintained the Ambrey Pond properties throughout the years with the full expectation that the Ambrey Pond Project would be built when needed. Once construction of the Hudson River Desalination River Project commences, however, it

would be imprudent to keep these properties because it is highly improbable that they will ever be used for utility purposes. As such, once the Hudson River Desalination Project is permitted, UWNY will work closely with the Commission, the Palisades Interstate Park Commission, and local government officials to develop a disposition plan for the properties that balances UWNY's fiduciary responsibility to its customers with the environmental stewardship goals of the company and the communities it serves.

Apart from the land purchase, which would probably occur far sooner for Ambrey Pond, and is also more expensive, the costs for developing both alternatives have the same order of magnitude; however, the NPV analysis, which takes into account the development, construction and operating costs, shows that the Hudson River Desalination Project is significantly less costly than the Ambrey Pond Reservoir, and will have the smallest financial impact on our customers.

## 5.7 Selected Alternative

After an extensive review of potential alternatives, UWNY is convinced that the health, safety and quality of life water needs of its Rockland County customers will be best served by the timely implementation of the Hudson River Desalination Project. The project represents a safe, reliable, sustainable, resilient, and cost effective source of water for decades to come.

# Section 6 PROPOSED COST RECOVERY MECHANISM

A project of this size, cost, complexity, duration to completion coupled with many uncertainties lends itself to the gradual phase-in of the costs as incurred. A gradual phase-in avoids the rate shock that would otherwise occur under traditional cost recovery methods and reduces the ultimate cost of the project. A mechanism that allows a surcharge for these costs as they are incurred will accommodate this uncertain schedule and will protect the Company and its customers from the harmful financial consequences caused by delayed recovery. Under such a mechanism, customers will save substantial amounts of Allowance for Funds Used During Construction ("AFUDC") that might otherwise be charged to the project and increase its total cost. Additionally, it effectively phases in a substantial increase rather than the rate shock associated with the in service cost being included all at one time. By commencing the surcharge as costs are being incurred, customers will avoid approximately $25 to $30 million of AFUDC on the project based on early estimates of when costs will be incurred. A mechanism such as this already exists and has been approved by the New York State Public Service Commission for United Water New Rochelle's Delaware Interconnection Project. Additionally, this Commission has approved an identical mechanism in the recent UWNY rate case for smaller water supply projects. In Case No. 06-W-0131, the Commission approved the use of a New Water Supply Source (NWSS) surcharge for precisely this purpose. That surcharge can be utilized for this project with no modification to the formula or components.