EXECUTIVE SUMMARY

We are proposing an effective Croton Watershed Management Plan (Plan) that provides a cohesive program in response to the current inadequate and insufficient programs proposed by the NYC Department of Environmental Protection (DEP) in their White Paper of May 23, 2003. It is our position that all the signatories of the 1997 Memorandum of Agreement (MOA) - the Coalition of Watershed Towns, federal, state, county and municipal agencies, and some environmental groups, bear the responsibility to maintain the high quality of Croton water. Our management plan is a reflection of that position. It offers a series of recommendations for strong, meaningful, watershed protection, the core of any program that purports to deliver safe, clean and affordable drinking water to New Yorkers.

The original management plan was submitted in 2004, in *CWCWC's* May/June 2004 newsletter. Since then, *CWCWC* has been involved in further issues pertaining to phosphorus in stormwater runoff, inflow and infiltration (I&I), the impacts of widening Route 22, and the role of wetlands buffers. These issues were included in the 2007 Croton Watershed Management Plan many portions of which are part of this report.

The 2009 Management Plan has entirely new sections on -
1. Impact Fees - the need for financial contributions from a developer to compensate for the extra financial burden imposed by the development on the community;
2. Groundwater Drawdown - a discussion of the impacts to groundwater associated with the lucrative bottled water industry, as well as the threats from potential hydrofracturing or "fracing" for natural gas in the NYC watershed portion of the Marcellus shale;
3. An update on the management of septic systems in Putnam and Westchester Counties.

The naturally high quality of Croton water can be attributed to the Croton's "immune system" - a combination of a profusion of wetlands, glacial till left over from 10,000 years ago when the area was covered with a mile-thick deposit of ice, and abundant reforestation after the gradual disappearance of farming, starting in the early 20th century. Among other important attributes, both forests and wetlands cleanse polluted water, prevent flooding and soil erosion, and regulate streamflow; glacial till is often a good source of groundwater. Over half the wetlands of New York City's close to 2000 square-mile watershed lie in the East of Hudson (EOH) 380 square-mile watershed of which the Croton Watershed comprises 330 square-miles (it does not include the Boyds Corner, West Branch and Kensico reservoirs that are part of the Cat/Del system). These functions are prohibitively expensive if replaced by engineered systems such as filtration plants. And yet, as this management plan will demonstrate, it is this "immune system" that is being compromised as town and planning boards in the Croton Watershed routinely approve development proposals and issue variances to developers that devastate wetlands, infringe on wetland buffers, pollute streams and destroy forests. These insults to the Croton's "immune system" compromise its ability to filter out particulate and dissolved phosphorus carried by stormwater runoff originating from impervious surfaces. Indeed, according to an April, 2001 report prepared jointly by the DEP and DEC, over 85% of phosphorus found in reservoirs originates from these non-point sources.

Over-development in the Croton Watershed, and a huge disparity in allocation of funds for watershed protection compared to those set aside for the Catskill/Delaware system resulted in NYS Department of Health (DOH) ordering Croton waters to be chemically treated and filtered. Originally estimated at $800 million, the cost of the plant has now risen to over $3 billion. The correlation between the cost of the plant and the quality of the source water has been amply demonstrated.

The Plan analyzes the impacts on water quality arising from various developments within the watershed. It shows how to minimize those impacts for the important reason that high quality source water curtails the cost of treatment needed in order to comply with present and possibly future federal regulations.

The Plan is based on the premise that Croton water is high quality and that it can be improved even further by implementing the various components of the program.

For example, levels of *Giardia* and *Cryptosporidium* in the Croton System remain extremely low as confirmed, on a weekly basis, on the DEP's own website. Croton levels compare favorably with either the Catskill or Delaware system.

However, levels of phosphorus are too high. Excess phosphorus can have severe consequences:

- an increase in water turbidity caused by algae;
- an increase in total organic carbon from algae that can lead to an excess of disinfection byproducts;
- taste and odor problems;
- decreased dissolved oxygen, which is necessary for a healthy ecosystem.

Phosphorus levels could be significantly lowered by adhering to the stricter Phase II state and federal Stormwater Regulations.

The Croton Watershed Management Plan calls for the following actions:

Land Acquisition -

"Purchasing private land is one of the most important nonstructural tools used to protect a watershed." This statement by the National Research Council echoes the beliefs but not the actions of the regulators of the Croton watershed.

Even though Croton water is to be chemically treated and filtered, it is critical for the long-term, smooth-functioning of the plant that the source water be of high quality. In order to achieve this, the DEP should aim for similar high source water standards as for unfiltered water. Of the total 243,000 acres of the Croton Watershed, 25% or 60,750 acres should be protected. Since 1997, the total land acquired in the Croton has been a slim 700+ acres. In stark contrast, close to 4,000 acres are controlled by developers

We recommend that within the next three years, the City should set a goal to protect, either by outright purchase, alone or in partnership, or though conservation easements, approximately 10,000 acres that still need protection. With public sentiment running high against development, with residents in Westchester willing to expend tax dollars for preservation and with county officials in Putnam disposed to use of East of Hudson (EOH) funds for land acquisition, the City would find the strong moral and financial support among the citizenry, and the political will among its public officials that would make such protection a reality.

Controlling Stormwater Runoff from Nonpoint Sources -

Stormwater runoff carries with it a heavy load of phosphorus, 85% of which originates from nonpoint sources. Stormwater runoff increases with the fraction of surface area that is impervious to surface water: a fraction of impervious surface area as little as 10% can cause streambank erosion. Headwater streams constitute at least 80% of the nation's stream network; therefore watershed protection should begin at the headwater stream level rather than allow these streams to be eroded, thereby resulting in sediment being carried downstream and treated in large, maintenance-heavy stormwater devices.

Site-specific data should be used when estimating pollutant removal capabilities of proposed stormwater abatement devices. Site-specific data should also be used as input to the pre-development contaminant levels of the land. Levels of phosphorus runoff should be kept at pre-development levels or below, in order to comply with the Phase II stormwater regulations that apply to the whole Croton Watershed. Active involvement by DEP and DEC is essential in assisting municipal lead agencies to review site plans.

Control of Phosphorus Pollution to the Croton Reservoirs -

DEP has evaluated and collated measurements throughout the watershed to ascertain how much phosphorus emanates on an annual basis from different land uses such as urban, farm, forest etc. – the so-called "export coefficients". Since most of the undeveloped land in the Croton Watershed is forested, this export coefficient is of special significance. DEP has derived a figure of .0446 lbs/acre-year (or .05 kgs/hectare-year) for forested lands. Based largely on these figures, and on the maximum allowable value for phosphorus concentration in the reservoirs, DEC has established phosphorus reduction targets for each reservoir.

We should all be concerned that the phosphorus export coefficients for forests that cover over 50% of land being presently developed is incorrect. The coefficient being used by developers in the Croton Watershed, a coefficient that has been derived for forests in the Pacific Northwest and West Virginia, and accepted by the regulatory authorities, is actually twice as high as DEP's results would indicate. This makes it twice as easy for a developer to comply with the regulations and, obviously, promotes more expansive development.

Appropriate, site specific standards should be used by DEP and DEC in stormwater calculations for the Croton Watershed whenever possible.

Reduction of the Impacts of Widening Route 22 -

The water quality of the source waters within the Croton watershed can only be preserved by a joint effort between NY City, the watershed localities, and New York State. There are other state departments besides DEC that must cooperate for excellent water quality to be sustained. The project to widen NY Route 22 in Brewster is an excellent case in point:

Within the Croton Watershed, the NYS Department of Transportation (DOT) is a regulated MS4 that is required to comply with the Phase II Stormwater Regulations. These regulations prohibit any increase in phosphorus from construction or other activities to a phosphorus-impaired reservoir.

Even if DOT were granted a permit, in this exceptional case, to widen Route 22,this will only be a short-term solution to the problem, a solution that would also lead to significant degradation of water quality starting in the reservoirs closest to construction. Moreover, widening the road will merely attract more traffic. In a few years, the same intolerable traffic congestion will re-occur.

A regional plan that limits development must be an integral part of the package so that the same situation does not repeat itself after the improvements have been made. What is needed for this particular example is for NY State DOT and DEC to work with Connecticut DOT and DEP to develop a sustainable solution to the problems that the traffic from these two states jointly cause. The result of a comprehensive solution will benefit air and water quality in addition to enhancing the quality of life for people going to and from work.

Protection of Wetlands -

Wetlands are invaluable resources in the watershed, purifying water by absorbing pollutants, controlling floodwaters, and recharging the groundwater aquifers that, in turn, replenish the streams and reservoirs. New York State's third largest wetland, the Great Swamp of Putnam County is a freshwater wetland of approximately 4,800 acres. It stretches 20 miles along Route 22 through the eastern portion of Putnam and into Dutchess County. The Swamp controls the headwaters of the East Branch Croton Reservoir whose waters are connected through a daisy chain of reservoirs downstream to the New Croton Reservoir, the terminal reservoir of the Croton system. The Great Swamp is ninety-five percent privately owned, and is threatened by residential and commercial development.

On Dec. 5, 2001, Governor Pataki designated the entire East of Hudson Watershed as Critical Resource Waters (CRW); the Army Corps of Engineers approved that designation in January 2002. All waterbodies in the area including The Great Swamp, will be the beneficiaries of this extra protection.

On January 9, 2001, the U.S. Supreme Court rendered the Solid Waste Agency of Northern Cook County (SWANCC) decision. The Court ruled that the U.S. Army Corps of Engineers lacked

statutory authority to regulate activities in non-navigable, isolated intrastate water. The ruling is being challenged. Therefore, whether the CRW designation includes isolated wetlands remains to be decided in the courts.

We recommend that the safeguards against wetland impacts that are implicit in the CRW designation should be fully enforced by the lead agency during the site plan review of any application where wetlands, or other water bodies are involved.

Maintenance of Effective Buffer Widths -

Wetland and stream buffers remove soluble nutrients; reduce thermal impacts to streams and water bodies as well as to wetlands. They also provide infiltration thereby restoring the chemical, physical and biological integrity of these water resources. According to the National Conservation Service, water quality benefits are significant when buffers exceed minimum of 100 feet, and 150 feet for forested buffer strips. We recommend that buffers should remain thickly vegetated, that 150 feet should be the minimum buffer width, and that stormwater devices be prohibited within buffers in order to maintain maximum buffer efficacy.

Wetlands Mitigation -

Until the success rate of man-made wetlands is much improved, we recommend that such wetlands not be permitted to mitigate the destruction of natural wetlands.

Protection of Forests -

Watershed forests, together with wetlands and wetland buffers, help the Croton watershed to withstand the insults and assaults resulting from development. Laws such as The State Reforestation Law of 1929 and the Hewitt Amendment of 1931 were originally promulgated to give primacy to reforestation as a significant watershed protection measure. The law has slowly devolved to relegating watershed protection to an afterthought. Through the Park and Recreation Land Acquisition Act of 1960 and the Environmental Quality Bond Acts of 1972 and 1986, reforestation included multiple purposes such as recreation and scenic-area preservation, while watershed protection took second or third place. Compounding the de-emphasis on watershed protection, 480-a of the Real Property Tax Law resulting from the 2002 Farm Bill, gave landowners license to view their forests as crop production.

We strongly recommend that town planners should be encouraged and given technical assistance by DEC to incorporate strong tree protection ordinances into their town codes.

A campaign to protect forests that are privately-owned is underway. Legislation to be introduced at the NYS level is presently under discussion.

Prevention of Groundwater and stream contamination -

Pharmaceuticals could contaminate the streams and reservoirs because of failure to upgrade wastewater treatment plants to tertiary levels, including microfiltration. Septics should also be inspected on a regular basis and repaired or replaced as needed. DOH would greatly serve the watershed if it helped to set up a systematic way of increasing good septic management. So far, no pharmaceuticals have been detected in NYC tap water, but it would be best to preempt such pollution by maintaining groundwater quality. Contamination can also reach the streams and reservoirs through stormwater runoff that carries with it pesticides and lawn fertilizers. Excessive use of road salt is also a threat to the integrity of the water. DEP and DEC could work with watershed towns to help raise awareness of methods to mitigate these problems.

Waterfowl Management Program -

Although the Waterfowl Management Program is one of the DEP's most successful programs, it nevertheless falls short of the mark. The DEP has embarked on a program to minimize fecal coliform loads resulting from birds roosting on the reservoirs during the migratory and winter seasons. DEP has expanded the program beyond the Kensico Reservoir to three additional Cat/Del reservoirs: Rondout, Ashokan, West Branch, and two Croton Watershed reservoirs: Croton Falls, and Cross River. The reason the latter are included is because, in times of drought, their waters are diverted to the Delaware aqueduct which supplies unfiltered water to New York City's metropolitan area. In order to maximize protection for these reservoirs, the DEP has accorded them its highest rating, a AA(T) designation, leaving the other Croton reservoirs - Amawalk, Titicus, Bog Brook, Diverting, Middle Branch, Muscoot and East Branch - with the lower "A" designation offering less protection and no waterfowl management plan.

We recommend that DEP equalize protection and expand their Waterfowl Management Plan to *all* reservoirs.

Wastewater Treatment Plant (WWTP) upgrades or diversion -

At the strong urging of *CWCWC* and other organizations, DEP decided to upgrade its Hallock's Mill WWTP in Yorktown to the tertiary levels required by the 1997 Watershed Agreement. This plan will be even more successful if Yorktown can successfully reduce the rate of inflow and infiltration (I&I) into its sanitary sewer system. I&I represents a large fraction of the flow into the Hallock's Mill WWTP.

There are other localities where sewage threatens water quality and the projects to avoid sewage problems have not begun. For instance the decision whether to upgrade various sewage treatment facilities in New Castle or to divert their effluent to the county-owned WWTP in Yonkers has yet to be made.

CWCWC recommends that there be no increases to sewage discharge into the watershed reservoirs until I&I has been reduced to the maximum extent practicable.

A non-segmented, comprehensive study of the effects of upgrades and/or diversion on Westchester County's environment, development patterns, demographics and economy should be carried out prior to deciding which path to follow: diversion or upgrades of WWTPs and individual septic systems, with a special emphasis on the growth-inducing potentials of each.

According to the Croton Watershed Report – WWTP Upgrade Program Progress Report 7/29/08, "66% of flow has begun upgraded operation."

Infrastructure Repairs -

Although not an intrinsic component of the Watershed, the Croton distribution system in the City itself has a critical role in maintaining water quality. The ancient, rusty pipes in the distribution system will undoubtedly contribute to the color and turbidity problems of Croton water. In addition, their proximity to the deteriorating sewer pipes creates a serious threat of contamination. Rehabilitating the distribution system is essential since the treated water from the plant, as it travels through these pipes, will otherwise pick up the pollution.

Impact Fees –

Impact fees are charges assessed against new development that attempt to cover the cost of maintaining capital facilities needed to serve the development.

As land suitable for development becomes scarce, developers have turned to building on unsuitable land. It is now common practice to build on steep slopes and erodible soils, or to render the land buildable by the use of extensive blasting and reconfiguration. However, a price has to be paid in terms of extra, complex devices that are needed to mitigate the resulting storm water runoff. The question is: who shall pay that price?

Contrary to a commonly-held belief, there is no NYS law that prohibits levying impact fees.

Groundwater Drawdown –

Companies that extract municipal groundwater for selling as bottled water, or that provide water for private uses, such as swimming pools, do not encounter any major legal obstacles. NYS does not have any legislation that effectively protects a community from having its groundwater sucked out of the ground and depleted for such purposes.

A major threat to the integrity of the drinking water supply of over half of NYS's population is the proposed extraction of natural gas from the Marcellus shale, a portion of which includes the Cat/Del Watershed that supplies, at least, 90% of NYC's water.

Septic System Management -

Failing septics can contaminate groundwater with dangerous bacteria, toxins and carcinogens. The groundwater can then transmit these contaminants to connecting wells. Most residents of northern Westchester County and Putnam County depend on wells for their drinking water.

Putnam County had committed $3.3 million of its EOH funds to a Septic Repair Program. It remains to be seen whether funding will be continued.

Westchester County is now seriously addressing the issues of septic repair, maintenance and databasing, largely due to the efforts of Peter Harckham, County Legislator for District 2.

We cannot survive without clean, safe and affordable water. We are fortunate to live in an area where water is high quality and abundant. However, we should not take it for granted because it is so easily available by simply turning on the tap. As we show in this Management Plan, there are many threats to our drinking water. Fortunately, with awareness and immediate action, it is still possible to maintain this excellent natural resource. If we delay implementing these measures, it is quite possible that our water will be degraded beyond recovery. The result will be far inferior water and at greater expense.