

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BROOKLYN-QUEENS AQUIFER FEASIBILITY STUDY

CITIZENS ADVISORY COMMITTEE MEETING: October 2, 2003

MINUTES

The 15th meeting of the Brooklyn-Queens Aquifer (BQA) Feasibility Study Citizens Advisory Committee (CAC) was held on Thursday, October 2, 2003 at the Hillside Manor Comprehensive Care Center. (See Attachment A for Attendance List.)

Helen Neuhaus, Helen Neuhaus & Associates (HNA), opened the meeting by asking for a moment of silence for James Davis, CAC member and Chairman of Queens Community Board (CB) #12, who passed away in September.

In response to her request for comments on the Minutes of the September 4, 2003 meeting, Dr. Len Lion noted an inaccuracy on page 4. In the 4th bullet, it is implied that the chemical methyl tert-butyl ether (MTBE) is not able to bond with manganese because it is an organic compound. Dr. Lion explained that some organic molecules bond strongly; however, MTBE cannot because of its specific molecular structure. After a brief discussion, it was agreed that the Minutes would be amended to remove the reference to MTBE as an organic compound. Following adoption of the September Minutes without further changes, Ms. Neuhaus facilitated a discussion of follow-up items from that meeting. These included the following:

- Using a PowerPoint presentation and a handout (see Attachment B), Mark Lenz, Malcolm Pirnie, Inc., addressed a question from the June CAC meeting regarding the costs of nanofiltration (NF) versus reverse osmosis (RO). He stated that several factors were taken into consideration when assessing each system: which produces “better” water; which produces “more” water; and the costs involved (capital, operating and maintenance). After extensive evaluation, it was determined that RO more effectively removes the targeted compounds and produces more water. In response to Mr. Lenz’s comment that the RO system is more efficient than NF, Dr. Jack Caravanos added that water processed through RO requires less treatment and produces higher quality water. Mr. Lenz also noted that although RO is 30% more expensive than NF, higher water quality and better recovery make it the preferred system. In response to a question from Dr. Gil Hanson, he clarified that if the total cost of each system is measured in dollars per thousand gallons produced, RO is only 15% more expensive than NF. Linda Caleb Hazel asked if the additional cost would be passed on to consumers. Bill Yulinsky, New York City Department of Environmental Protection (DEP), suggested that this question be deferred to next month’s CAC meeting, when Deputy Commissioner Doug Greeley, DEP, would be present. In response to a question from Peter Richards, Mr. Lenz replied that the lifespan of RO and NF are approximately the same.

- Ms. Neuhaus reported that, in order to reflect the CAC’s input, additional footage was added to the Station 6 Pilot Plant video. She noted that the biggest change was in response to Debora Hunte’s comment that the flooding problems in her neighborhood have not yet been resolved. Other sections of the video were also clarified and credits were added. Ms. Neuhaus stated that every CAC member will receive a copy of the video, along with a glossary of terms to use when sharing the video with organizations or neighbors.
- In response to questions raised at the September CAC meeting, members of the Scientific Review Panel (SRP) were asked to review and comment on the Technical Memorandum relating to Volatile Organic Compounds (VOCs). Ms. Neuhaus stated that comments were received from Dr. Lion, Dr. Paul Lioy and Dr. Alan Rabideau; these would be discussed during a presentation later in the meeting.
- In response to a question from Ms. Hazel at the September CAC meeting regarding the recent increase in water rates, a brochure—“How Your Water and Sewer Fees Serve You”-- was distributed (see Attached).
- Ms. Neuhaus noted that there were two long-range items on the follow-up list: contacting CB #12 regarding the demapping of streets at the Station 6 site; and inviting the participation of parochial and private school students, as well as public school students, in future phases of the project. She indicated that both items will be addressed as work moves ahead.

Project Update

Don Cohen, Malcolm Pirnie, Inc., reported that meetings have been held with the New York State Department of Environmental Conservation (DEC) regarding clean-up of the West Side Corporation (WSC) site. The effect of discharging treated water from Station 24 into Bergen Basin and other surface waters has been analyzed by DEC’s Albany office and will be discussed at a meeting next week. The project team has also met with DEC staff in Long Island City regarding the projected discharge from the Station 6 Demonstration Plant; the data relating to Station 6 discharge will be forwarded to DEC’s Albany office for review. Mr. Yulinsky added that one of the two inter-agency agreements relating to WSC remediation has been finalized and is awaiting signature.

In response to a question from Manuel Caughman, Mr. Yulinsky stated that he has been “playing phone tag” with Con Edison’s representative regarding negotiations to supply power to the WSC/Station 24 site but hopes to meet with him next week. He indicated that Con Edison was not aware of the houses under construction in the vicinity of the site and will have to move its poles.

Kenneth Gill asked if DEP will be reimbursed for its work now that the State Superfund has been reauthorized. Mr. Cohen replied that DEP will not be repaid for Station 6 Pilot Plant testing. Mr. Yulinsky added that although the contract with DEC does not specify

reimbursement, either DEP or DEC could pursue funding from the responsible parties for clean-up of the WSC site.

In response to a question from Ms. Hunte regarding the effort to demap the streets at Station 24, Mr. Cohen stated that a surveyor has been hired. He explained that, as part of the process, two maps will be submitted to the New York City Department of City Planning (DCP): the first—an application map—is very detailed and must conform to strict DCP standards. Once the application map is approved, an alteration map must be prepared that shows DEP’s plan for the site. Mr. Cohen observed that after the maps are completed (in 1-2 months), the application will go through the city’s Uniform Land Use Review Procedure (ULURP). Although ULURP can take up to a year, other permits can be secured during that time. However, no construction can begin until the process is complete. In response to a follow-up question from Yvonne Reddick, Mr. Cohen confirmed that DEP is the applicant. In response to Dr. Caravanos’ question about expediting the application, Mr. Cohen explained that the project team is working with DEP’s Office of Environmental Planning and Assessment, which has not indicated that there is any way to expedite the process.

Continued Discussion re: VOC Removal Technologies

Ms. Neuhaus noted that at last month’s presentation regarding VOC removal, Dr. Liroy observed that the presentation focused on the selected technology and did not provide information on the other techniques that were analyzed. Dr. Liroy and other SRP members also felt that the environmental impacts related to air stripping (i.e. noise, aesthetics, air quality, etc.) merited further discussion. In response, a PowerPoint presentation and handout regarding these topics was prepared. (See Attachment C.)

Mr. Lenz began the discussion by describing the four treatment technologies analyzed: Advanced Oxidation Process (AOP), Granular Activated Carbon (GAC), Vacuum Air Stripping, and Packed Tower Air Stripping.

He explained that AOP is a chemical process that breaks down the chemical bonds of the VOCs and converts them to different compounds. Ozone and hydrogen peroxide were the chemicals considered for the AOP at the Station 6 Plant. Mr. Lenz further explained that the advantage of this technology is that it does not generate any waste streams such as off-gas or spent carbon that would require additional treatment. However, AOP has several disadvantages: it forms chemical by-products that subsequently need to be removed from the water, and it requires a large amount of space. In addition, AOP is a technology that is best suited for small flow, high VOC concentration applications. The Station 6 Plant will be a high flow, low VOC concentration project, for which this technology is not well suited.

Mr. Lenz described GAC as a physical filtration process that passes water with VOCs through a filter. The VOCs adsorb or ‘stick’ to the carbon, which results in clean water exiting the filter. An advantage of GAC is that it is a relatively simple process that has been used in a large number of drinking water applications for removal of MTBE and perchloroethylene (PCE or PERC). Its primary disadvantage is that the GAC needs to be

continually replaced. This would require frequent truck deliveries (every 2-3 days), which would be disruptive to the surrounding neighborhood.

Two types of Air Stripping systems were considered for the Station 6 Plant. In both, large volumes of air are mixed with water to transfer the VOCs from water to gas. The gas that is formed (off-gas) is then further treated using GAC.

Mr. Lenz explained that vacuum air stripping creates a vacuum that induces the PCE and MTBE to enter the gas phase. Its advantage is that it produces a smaller volume of air that must be treated before being discharged to the atmosphere. However, for the Station 6 Plant, this advantage is offset by the facts that, similar to AOP, vacuum air stripping is intended for low flow, high concentration applications and that it has not been previously used for MTBE removal.

Packed tower air stripping is a proven, simple and reliable technology that uses “wiffle ball” type packing inside a tower to draw the VOCs from the water. It produces a higher volume of air than vacuum air stripping and therefore requires more off-gas treatment. However, because treatment of air using GAC is much more efficient than treatment of water, truck deliveries would occur only once every 2-3 months. Other advantages of this process include the fact that it has been used for many years to remove VOCs (including PCE and MTBE) from drinking water. In addition, it is a flexible process that would allow successful attainment of treated water targets even if raw water concentrations increase in the future. Because of its operational flexibility and ‘tried and true’ reputation, **packed tower air stripping is the selected technology for the Station 6 Treatment Plant.**

Mr. Lenz then reviewed three disadvantages of packed tower air stripping that must be addressed during Station 6 design: visual impacts (40-50 foot high towers), noise, and air quality. In describing how these might be mitigated, he explained that, in terms of height, the four towers could be treated architecturally to blend in with the adjacent plant and with the surrounding neighborhood. They could also be sunk into the ground. Noise from the blowers and from the movement of air and water through the towers could be reduced by enclosing the blower motors inside the building and by treating the back side of the architectural screen with acoustical panels to absorb any sound coming from the tower itself. And finally, use of GAC to treat the off-gas would result in discharge of clean air to the atmosphere.

In a final comment, Mr. Yulinsky noted that three air stripping facilities have been operating in New York City for at least ten years. In response to a request from Mr. Caughman, Mr. Yulinsky agreed that a field trip to these sites could be arranged.

The following questions and comments were raised during the presentation:

- Responding to Mr. Lenz’s statement that the frequency of carbon deliveries for a GAC system could increase if VOC levels rise, Dr. Liroy observed that VOC levels should decrease over time. Mr. Lenz concurred, but noted that there is a

possibility of upward risk. He added that with MTBE levels rising in one of the wells, a conservative approach is appropriate. Following Ms. Hazel's remark that the sight of trucks marked "hazardous waste" coming and going every day would have a negative psychological impact on local residents, Dr. Lioy and Dr. Lion concurred that GAC would not be a good choice for this project.

- Dr. Caravanos questioned why it was determined that packed tower air stripping was an effective means of VOC removal if vacuum air stripping was found to be ineffective. In response, Mr. Lenz explained that although vacuum air stripping has been used for water treatment in other parts of the country, these have largely been low flow, high concentration systems. He added that the Lawrence Livermore Laboratory in California evaluated various technologies to determine which most effectively removed MTBE and found that packed tower air stripping ranked the highest.
- In response to a question from Dr. Lion, Mr. Lenz confirmed that the air to water ratio would be approximately 10%-20% lower for vacuum air stripping than for packed tower air stripping.
- In response to a question from Dr. Caravanos, Mr. Lenz indicated that all equipment will be electrically operated, rather than diesel fueled.
- In response to Dr. Lion's question about the decision-making process for VOC removal, Mr. Lenz indicated that all permitting issues must be resolved before design is initiated. Mr. Cohen added that a secondary layer of review will be provided by the City's "value engineering" (VE) team, a group of independent experts (in this case, architects and engineers) working under the auspices of the New York City Office of Management and Budget. Mr. Lenz explained that all major capital projects in the City must undergo a detailed VE assessment that includes evaluation of their resource-effectiveness, appropriateness in meeting the City's needs, and potential community impacts.
- Dr. Hanson and Dr. Lion asked about the possibility that calcium carbonate will precipitate during air stripping and how this might affect operations in the tower. Mr. Lenz responded that the project team is confident that this issue can be successfully addressed during design. In addition, Mr. Yulinsky indicated that high hardness levels at the three previously referenced air stripping facilities have not resulted in operational problems in the towers.

Continued Discussion re: Public Information Meeting

Ms. Neuhaus discussed details of the Public Information Meeting that has been scheduled for Wednesday, October 22nd in the Small Theatre of York College. She indicated that the meeting will begin with an Open House at 6:30 p.m., followed by presentations at 7 p.m. Letters of invitation, signed by DEP Commissioner Christopher Ward, will be mailed to all persons on the project mailing list; display ads will appear in several citywide and local newspapers; and flyers will be distributed at churches and other community

facilities. Ms. Neuhaus also encouraged CAC members to distribute flyers, which were available at the meeting.

After asking the CAC to consider how it might actively participate in the meeting, she outlined the following possible meeting agenda: Welcome and introduction of Deputy Commissioner Greeley (preferably by a CAC member); introduction of Commissioner Ward by Deputy Commissioner Greeley; remarks by Commissioner Ward; project overview and introduction of video by Deputy Commissioner Greeley; screening of video; introduction of CAC members; discussion of Scientific Review Panel (SRP) and introduction of its members (preferably by a CAC member); presentation of Pilot Plant testing results and future activities by Malcolm Pirnie; and a question and discussion session. Ms. Neuhaus also suggested that CAC and SRP members participate by answering questions during the open house and that they sit in a designated area of the auditorium during the presentation and discussion portions of the meeting.

During the ensuing discussion, CAC members provided the following input:

- Ms. Reddick suggested that the President of York College be introduced at the beginning of the meeting. Acknowledging that the College has a new President, Ms. Neuhaus noted that he and his predecessors have been invited to participate in the CAC but have not attended to date. She added that the team would make a special effort to reach out to Dr. Robert Hampton regarding the public meeting. In response to Ms. Reddick's question regarding outreach to the York College High School for the Sciences, Ms. Neuhaus indicated that her office would contact the school principal.
- Ms. Hazel recommended that, in addition to the larger newspapers, the display ad be placed in free community publications such as the Southeast Queens Press. Ms. Neuhaus acknowledged that this will be done, adding that flyers will also be sent to churches and libraries. Tracey Bowes asked if the flyers would be translated into French Creole and Spanish, in order to reach the Haitian and Spanish-speaking populations in the community. During a brief discussion, during which Ms. Reddick noted that Jamaica is a very diverse community, it was decided that the flyers would be translated and that Spanish and Creole speaking translators would be sought for the meeting. Debora Hunte offered to assist with Spanish translation, if needed.
- Ms. Reddick expressed concern that Commissioner Ward would receive questions unrelated to the project. Ms. Neuhaus stated that the project team is prepared for that possibility. Mr. Gill asked if the Commissioner planned to stay for the entire meeting. Ms. Neuhaus replied that he has been asked to do so.
- In response to Mr. Caughman's question about outreach to elected officials, Ms. Neuhaus reported that she has spoken with a few and is attempting to reach others. She added that Commissioner Ward is sending a special letter of invitation to elected officials who represent the area.

- In response to a question from Dr. Caravanos, Ms. Neuhaus indicated that the project team has not yet decided if press kits will be prepared.
- In response to a question from Ms. Hazel, Ms. Neuhaus stated that although the presentations will include general information on the Station 6 Treatment Plant, the architectural model will not be presented as it has not yet been discussed with residents of the surrounding community.

The discussion concluded with a CAC endorsement of the proposed agenda. Ms. Reddick volunteered to introduce Deputy Commissioner Greeley and Ms. Hazel offered to introduce the SRP and its members.

New Business

Referring to the September 4, 2003 CAC meeting Minutes, Ms. Hunte requested further information regarding DEP testing of contaminated wells. In the discussion that followed, Mr. Yulinsky indicated that, in the past, the wells were tested either quarterly or monthly, depending on the parameters being tested. In response to Ms. Hunte's concern that contaminants might be overlooked during quarterly testing, Mr. Yulinsky stated that the distribution system, which includes water from all sources, is monitored on a daily basis. If any of the testing shows a spike in contaminants, it is detected immediately and the water diverted from the supply system.

Dr. Lion followed up on Ms. Hunte's comment by noting that since well water in the area is not pristine, it should receive greater scrutiny than other sources of water in order to minimize any risk to public health. He requested specific information regarding the locations and times of water quality monitoring. In response, Mr. Yulinsky indicated that he would look into DEP's current testing protocol and report back to the CAC at the November meeting. After adding that the real concern is VOC levels, which are not extraordinarily high, he emphasized that the Treatment Plant will be specifically designed to effectively remove these contaminants.

Ms. Hazel observed that it would be good for the community to understand DEP's testing protocols and how they fit into the general framework of protecting public health and the aesthetic quality of drinking water. After Ms. Neuhaus suggested that this subject be addressed at a number of meetings throughout planning and design, Dr. Lioy reiterated the importance of emphasizing DEP's commitment to providing high quality drinking water at the October 22nd Public Meeting in order to enable the public to feel comfortable with the project.

Ms. Hunte asked how DEP plans to control the spread of MTBE if the source is unknown. Mr. Cohen answered that the suspected source is two gas stations in the area. He added that the project team is encouraging DEC to investigate and begin remediation through its Spills Program. After Mr. Caughman suggested that DEP take the lead in determining the source of the MTBE (similar to its proactive stance on other aspects of the project), Mr. Yulinsky indicated that Deputy Commissioner Greeley must be involved

in any discussion relating to a potential partnership with DEC on this issue. Assemblyman William Scarborough offered a final comment, recommending further discussion of the MTBE problem.

Dr. Caravanos expressed concern that mention of the WSC hazardous waste site at the Public Meeting might divert attention from the Pilot Plant results. Ms. Neuhaus replied that the public is already well aware of this site and that DEP will be able to present a positive update on progress related to the clean-up.

Follow-Up Items

1. Revise Minutes of September 4th CAC meeting to reflect comment provided by Dr. Len Lion on page 4. Responsibility: HNA.
2. Consider scheduling visit to DEP air stripping facilities currently in operation. Responsibility: DEP, Malcolm Pirnie, HNA.
3. Contact President of York College to encourage attendance at October 22nd Public Meeting. Responsibility: HNA.
4. Invite Science High School, located on campus of York College, to attend October 22nd Public Meeting. Responsibility: HNA.
5. Distribute flyers announcing October 22nd Public Meeting to churches within the “Southeast Cluster.” Responsibility: HNA.
6. Consider having flyers translated into Spanish and French (Creole). Responsibility: HNA.
7. Investigate possibility of having translators (Spanish and French) available at October 22nd Public Meeting. [Debora Hunte volunteered to serve as Spanish translator, if necessary.] Responsibility: HNA.
8. Determine if press kits will be prepared for media attending October 22nd Public Meeting. Responsibility: DEP, Malcolm Pirnie, HNA.
9. Present current DEP sampling protocol for drinking water at November CAC meeting. Responsibility: DEP, Malcolm Pirnie, HNA.
10. Respond to question about whether higher costs associated with selection of RO system would be passed on to consumers. Responsibility: Doug Greeley.
11. Investigate if DEP can be reimbursed for costs associated with clean-up of the West Side Corporation site. (Kenneth Gill) Responsibility: DEP.
12. Make copies of video, when complete, along with accompanying glossary of technical terms, available to members of the CAC and the community. Responsibility: HNA.

The next CAC meeting is scheduled for **Thursday, December 4th at 7 p.m.** at the Hillside Manor Comprehensive Care Center, 188-11 Hillside Avenue, Jamaica Estates.

Brooklyn-Queens Aquifer Feasibility Study
Citizens Advisory Committee
Thursday, October 2, 2003

Attendance List

CAC Members/Alternates

Tracey Bowes
Community Board #12

Linda Caleb Hazel
A Better Day Inc./St. Benedict The
Moor/
St. Bonaventure

Manuel Caughman
Community Board #12/Brinkerhoff
Action
Association

Kenneth Gill
Addisleigh Park Civic Association

Irving Hicks
Brinkerhoff Action Association

Debora Hunte
Brinkerhoff Action Association

Yvonne Reddick
Community Board #12

Peter Richards
Community Board #13

William Scarborough
New York State Assembly

Guests

Sarah Hicks
Resident

Scientific Review Panel

Jack Caravanos
Hunter College

Gilbert Hanson
State University of New York at Stony
Brook

Leonard Lion
Cornell University

Paul Lioy
Environmental and Occupational Health
Sciences Institute

Project Team

Nicole Brown
Malcolm Pirnie, Inc.

Don Cohen
Malcolm Pirnie, Inc.

Natasha Harper
New York City Department of
Environmental Protection

Helen Neuhaus
Helen Neuhaus & Associates Inc.

Denise Woodin
Helen Neuhaus & Associates Inc.

Anita Wright
Helen Neuhaus & Associates Inc.

Bill Yulinsky
New York City Department of
Environmental Protection

Slide 1

Comparison of NF & RO Systems

- **Water quality**
 - ◆ Which system produces "better" water?
- **Water production**
 - ◆ Which system produces "more" water?
- **Cost**
 - ◆ Which system costs more to buy (capital cost)?
 - ◆ Which system costs more to operate (O&M)?

Slide 2

Water Quality

	RO	NF
Total Hardness (mg/L as CaCO ₃)	80	80
Chloride (mg/L)	55 – 73	77 – 88
Sodium (mg/L)	19 – 28	38 – 39
Nitrates (mg/L as N)	1.3 – 2.5	1.8 – 2.6
Total Dissolved Solids (mg/L)	156 – 208	196 – 218

- RO is better at removing all compounds of concern

Slide 3

Water Production

- Better water quality with RO
 ➔ more water bypassed
- RO System produces more water

NF System

RO System

Slide 4

Cost

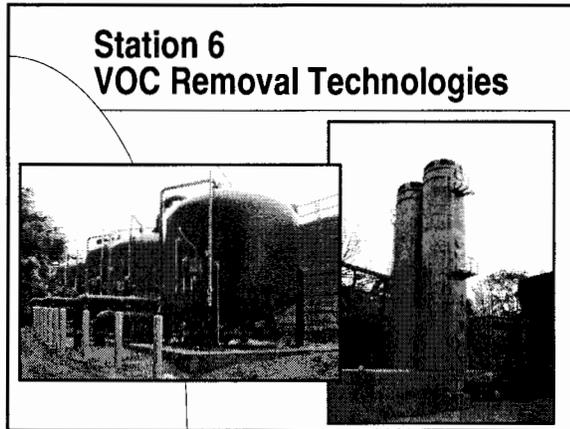
	Average Capital Cost	Average Annual O&M Cost	Total Annualized Cost
RO	\$4.0 Million	\$670,000	\$2.1 Million
NF	\$2.5 Million	\$640,000	\$1.5 Million

Slide 5

Conclusions

RO Advantages <ul style="list-style-type: none">Produces more waterBetter water qualityLess waste	NF Advantages <ul style="list-style-type: none">Lower operating costLower capital cost
--	--

While RO is 30% more expensive than NF, higher water quality and better recovery makes it the preferred system.

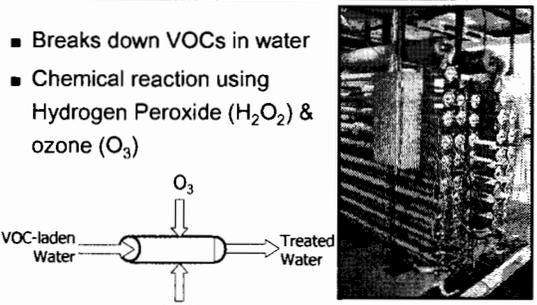


Outline

- VOC Treatment Technologies
 - Advanced Oxidation Process (AOP)
 - Granular Activated Carbon (GAC)
 - Vacuum Air Stripping
 - Packed Bed Air Stripping

Advanced Oxidation Process (AOP)

- Breaks down VOCs in water
- Chemical reaction using Hydrogen Peroxide (H_2O_2) & ozone (O_3)



Advanced Oxidation Process (AOP)

- Advantages
 - No transfer of VOCs
 - ⇒ less waste
- Disadvantages
 - By-products formed
 - GAC still needed
 - High costs
 - Large footprint required
 - Intended for low flow-high concentration systems

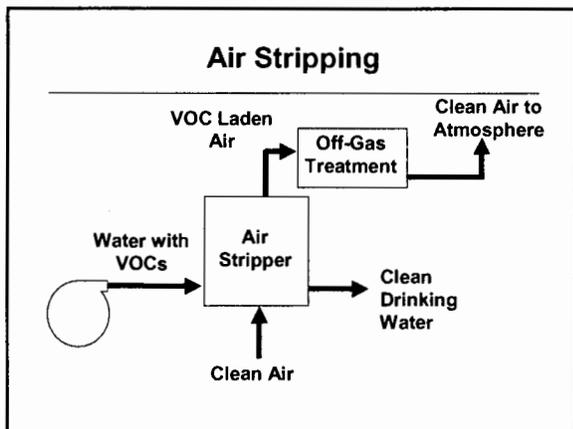
Granular Activated Carbon (GAC)

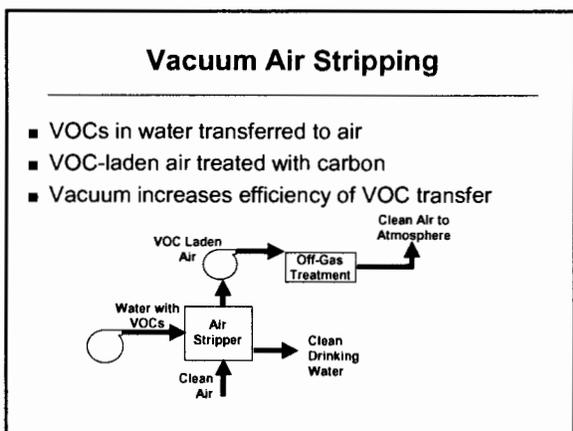
- VOCs in water absorbed to carbon grains
- Carbon is disposed of off-site periodically

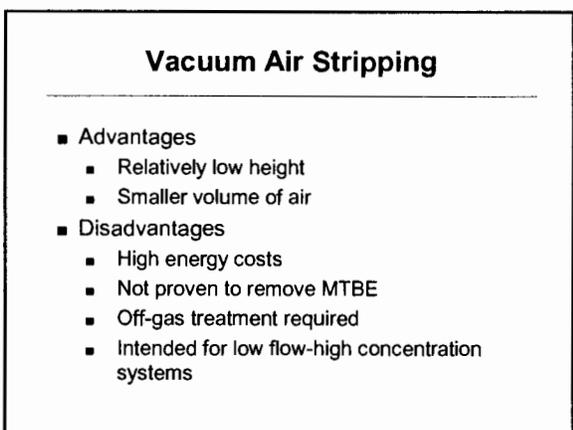


Granular Activated Carbon (GAC)

- Advantages
 - Simple process (No off-gas treatment needed)
 - Proven technology
 - Flexibility
- Disadvantages
 - Large footprint required
 - Frequent truck deliveries
 - Potentially high operating costs

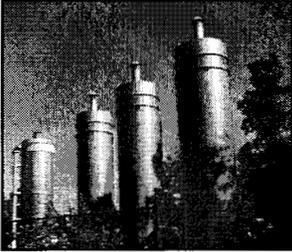






Packed Bed Air Stripping

- VOCs in water transferred to air
- VOC-laden air treated with carbon



Packed Bed Air Stripping

- Advantages
 - Proven and reliable VOC removal technology
 - Simple process
 - Flexibility
- Disadvantages
 - Height
 - Noise
 - Air Emissions

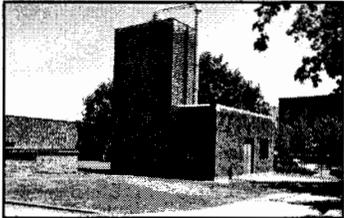
Comparison of Technologies		
Technology	Advantages	Disadvantages
AOP	<ul style="list-style-type: none"> ■ No transfer of VOCs 	<ul style="list-style-type: none"> ■ By-products formed ■ GAC still needed ■ High costs ■ Large footprint required ■ Intended for low flow-high concentration systems
GAC	<ul style="list-style-type: none"> ■ Simple process (No off-gas treatment needed) ■ Proven technology ■ Flexibility 	<ul style="list-style-type: none"> ■ Large footprint required ■ Frequent truck deliveries ■ Potentially high operating costs
Vacuum Air Stripping	<ul style="list-style-type: none"> ■ Relatively low height ■ Smaller volume of air 	<ul style="list-style-type: none"> ■ High energy costs ■ Not proven to remove MTBE ■ Off-gas treatment required ■ Intended for low flow-high concentration systems
Air Stripping	<ul style="list-style-type: none"> ■ Proven & reliable VOC removal technology ■ Simple process ■ Flexibility 	<ul style="list-style-type: none"> ■ Height ■ Noise ■ Air Emissions

Air Stripping Concerns

- Height
- Noise
- Air Emissions

Air Stripping Concerns – Height

- Relative height – Adjacent to new building
- Architectural finishes



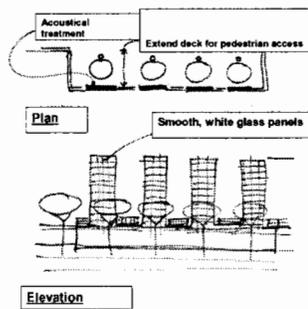
Air Stripping Concerns – Height



Air Stripping Concerns – Noise

- Sources of noise
 - Large blowers
 - Moving air and cascading water
- Noise control measures available:
 - Acoustical louvers on air intakes
 - Enclose blowers in the building
 - Block sound from tower

Air Stripping Concerns – Height & Noise



Air Stripping Concerns – Air Emissions

- GAC removes VOCs from air to carbon
- Carbon is disposed of off-site periodically
- Clean air discharged from off-gas treatment through stacks

311

Dial 311 for all non-emergency
City services
For emergencies dial 911



www.nyc.gov/dep

Michael R. Bloomberg, Mayor
Christopher O. Ward, Commissioner

New York City Department of Environmental Protection
59-17 Junction Blvd • Flushing, NY 11373-5108

HOW YOUR WATER AND SEWER FEES SERVE YOU



New Croton Dam



City Tunnel No. 3 Construction



North River Wastewater Treatment Plant



Paerdegat Basin CSO construction



Staten Island Bluebelt



Water and sewer fees are being used to make important investments in our future – investments that will guarantee clean drinking water and cleaner harbors for future generations of New Yorkers.

Many of the investments that water and sewer fees are used for are mandated by the federal or state government to ensure the public health. This includes watershed protection, sewage treatment plant upgrades and a new filtration plant for the City's Croton water system.

In addition to the following capital projects, water and sewer fees also pay for the continuing maintenance of the water and sewer systems. These maintenance costs include over \$100 million a year to upgrade and replace old water mains, and \$200 million a year to upgrade and install new sewers.

Among the capital investments to be made over the next ten years (2004 - 2013) are:

- **\$1.6 Billion to protect our upstate watersheds.** The City is supporting a number of watershed protection programs in its Catskill and Delaware watersheds. These programs, which include everything from rehabilitating upstate septic systems to buying the land surrounding our system of reservoirs, helps to ensure that the high quality of New York City's source waters remains that way for years to come.
- **\$1.7 billion to continue building the Third Water Tunnel and to begin construction of the Kensico Aqueduct.** The City relies on infrastructure that is, for the most part, almost 100 years old to bring water from its upstate reservoirs. These two projects will allow the City to inspect and repair its older tunnels, while providing redundancy in the water supply system in case of emergency.
- **\$1.3 billion to build a filtration plant for the Croton water system.** Ten percent of the City's water comes from more populated sections of Westchester and Putnam counties, where pollution is more common and more difficult to control. The Croton filtration plant will ensure that water from these areas continues to meet New York City's high standards of quality.
- **\$5.6 billion to upgrade sewage treatment plants in the City.** The water in New York Harbor is the cleanest it has been in over 90 years. To continue that progress and to meet the requirements of the federal government, the City must upgrade its older sewage treatment plants. Almost \$2 billion of this amount will be used to meet federal requirements to improve Long Island Sound by reducing nitrogen, which will help improve the environment for the fish and shellfish native to these waters.
- **\$714 million to decrease the amount of raw sewage that flows from combined sewers into New York Harbor almost every time it rains.** The City is building facilities to capture the overflow from combined sewers before it can reach the Harbor and damage our beaches and our environment.
- **\$450 million to build the Staten Island Bluebelt system and the new sewers that will connect to it.** The Bluebelt alleviates the need for even more expensive storm sewer networks in parts of Staten Island by preserving natural open spaces for stormwater management.

For more than 150 years, New Yorkers have invested heavily in the infrastructure that provides us with clean drinking water and the means by which to dispose of wastewater properly. DEP is continuing that tradition by taking meaningful steps to protect and improve upon this valuable legacy for generations to come.