

SUPPLEMENTAL INFORMATION
FOR THE
LONG ISLAND
PESTICIDE POLLUTION PREVENTION
STRATEGY



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Public Health-Related Use of Mosquitocides and Other Aquatic Pesticide Use

The scope of the Long Island Pesticide Pollution Prevention Strategy does not include potential surface water and groundwater threats associated with pesticides that are directly and lawfully applied to Long Island surface waters. This activity involves application of aquatic pesticides registered for use in New York State against aquatic insects (e.g., mosquito larvae and pupa) that vector such diseases of public health significance as West Nile virus (WNV) and Eastern Equine Encephalitis (EEE). Aquatic pesticides for use on aquatic vegetation that includes such targeted invasive species as Carolina Fanwort (*Cabomba caroliniana*) and Purple Loosestrife (*Lythrum salicaria*); and undesirable fish such invasive species as the Northern Snakehead Fish (*Channa argus*).

The NYS Department of Environmental Conservation (NYSDEC), Division of Materials Management, Bureau of Pest Management is responsible for administering the aquatic pesticide permit program in New York State, under the authority granted by Section 15-0313(4) of the New York State Environmental Conservation Law (ECL), and Parts 327, 328, and 329 of Title 6 of the New York Codes, Rules and Regulations (6 NYCRR). Information about the Aquatic Pesticide Permit Program is available at the following website: <http://www.dec.ny.gov/chemical/8530.html>.

The scope of the Strategy also does not specifically include the lawful application of mosquito adulticides over Long Island surface waters by ultra-low volume/ultra low dosage (ULV/ULD) aerosol delivery systems (ground and aerial). The complexity of issues related to that pesticide use pattern has been the subject of extensive attention by the U.S. Environmental Protection Agency (USEPA) and the courts, and would therefore not be suitable for inclusion in this Strategy. The main issue relates to whether the associated incidental deposition of trace residue (microscopic droplets that exceed a certain mass median diameter) to surface waters underlying the targeted air column constitute pollutants subject to NPDES/SPDES regulation.

With regard to the mosquito adulticiding issue, on November 27, 2006, EPA issued a final regulation to codify its interpretation of the Clean Water Act (CWA) as not requiring National Pollutant Discharge Elimination System (NPDES) permits for application of pesticides to or over, including near, waters of the United States, if the applications are consistent with relevant Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requirements.

The 2006 Rule identified two specific circumstances in which NPDES permits are not required:

1. The application of pesticides directly to waters of the United States in order to control pests. Examples of such applications include applications to control mosquito larvae, aquatic weeds, or other pests that are present in waters of the United States; and
2. The application of pesticides to control pests that are present over waters of the United States, including near such waters, where a portion of the pesticides will unavoidably be deposited to waters of the United States in order to target the pests effectively; for example when insecticides are aerially applied to a forest canopy where waters of the United States may be present below the canopy or when pesticides are applied over or near water for control of adult mosquitoes or other pests.

The NYSDEC agreed with that interpretation and proceeded to regulate this activity accordingly. However, after the rule was published, petitions for review were filed in 11 Circuit Courts. On January 7, 2009 the Sixth Circuit Court of Appeals ruled in *National Cotton Council, et al. v. EPA* to vacate the CWA Pesticides Rule. On June 08, 2009 the Court granted the Department of Justice's (DOJ) request for a two-year stay of the decision, until April 09, 2011, to provide EPA and states time to develop and issue an NPDES general permit for point source discharges from the application of pesticides to U.S. waters, also known as the Pesticide General Permit (PGP), and to provide outreach to stakeholders on the implications of these actions. On March 28, 2011, the Sixth Circuit of Appeals granted EPA's request for an extension to allow more time for pesticide operators to obtain permits for pesticide discharges into U.S. waters. The court's decision extended the deadline for when permits would be required from April 9, 2011 to October 31, 2011. The Department issued the SPDES General Permit For Point Source Discharges To Surface Waters Of New York State From Pesticide Applications, which is effective from November 1, 2011 to October 31, 2016. This General Permit allows individuals to obtain coverage by submitting a Notice of Intent to the Department. Once coverage is granted they will be subject to the permit conditions and will meet the requirements of this court decision.

To a large extent, the subject matter associated with the two exceptions noted above – direct and lawful application of aquatic pesticides, and the application of mosquito adulticides via aerosol delivery over surface waters - has been the object of years of review and critical analysis involving many experts. Years of comprehensive review and analysis of the mosquito control activities performed by the Suffolk County Department of Health and the Department of Public Works' Division of Vector Control produced the *Vector Control and Wetlands Management Long-Term Plan*, which established a sustainable framework for protecting public health, reducing pesticide usage, and restoring marshes. It also produced a *Final Generic Environmental Impact Statement* (FGEIS) that is associated with the third major revision of the Long-Term Plan. That draft Plan was first issued in September, 2005, and was revised in May 2006 in response to significant environmental review and advisory committee comments. The FGEIS was formally released for public comment on May 17, 2006. A total of 114 submissions were made, resulting in 1,544 comments. The FGEIS, which was completed on November 15, 2006, further clarified the distinction between public health nuisance and disease control, modeling of West Nile virus effects in the absence of vector control, and potential impacts of methoprene.

The work of the Suffolk County Vector Control Pesticide Management Committee (SCVCPMC) keeps the information in the FGEIS current. The SCVCPMC was established by County Executive Steve Levy (Executive Order 15-2007) in December of 2007. It is composed of various county and non-county members, including the NYSDEC, who are charged with reviewing emerging literature on potential impacts of vector control pesticides and evaluating pesticide reduction alternatives in regard to vector control activities.

The Long Island Sound lobster decline that occurred concurrent with increased mosquitocide (larvicide, pupicide, and adulticide) use in response to the 1999 introduction of West Nile virus to the New York metro area raised questions about what role those mosquitocides may have played. That situation was addressed by a variety of investigations and processes that involved

multiple entities conducting investigations. In a report entitled “Responding to a Resource Disaster: American Lobsters in Long Island Sound, 1999-2004,” the following is noted:

Sixty-five scientists at 30 institutions and agencies nationwide participated in the research initiative, investigating the effects of environmental factors, mosquito control pesticides, and disease on the physiology and health of American lobsters. The results indicate that the physiology of the lobsters was severely stressed by sustained, hostile environmental conditions, driven by above average water temperatures. A new lobster disease, paramoebiasis, was identified as the proximate cause of death for the majority of lobsters examined by pathologists. Laboratory studies demonstrated that the pesticides used for mosquito control have sub-lethal or lethal effects on lobsters, based on concentration and time of exposure; however, modeling exercises indicate it is unlikely that the concentrations of individual pesticides in western Long Island Sound were high enough to cause the mortality event.¹

In light of the fact that this issue was addressed by the FGEIS, and an extensive research response, and was the subject of review and analysis seeking an answer to the question of whether mosquitocide use contributed to the decline, it appears that this particular use pattern has been adequately addressed, and will therefore not be an object of the attention of the Strategy.

¹ Balcom, Nancy and Penelope Howell. *Responding to a Resource Disaster: American Lobsters in Long Island Sound, 1999-2004 (CTSG-06-02)*. N.p.: Connecticut Sea Grant, University of Connecticut, CT Department of Environmental Protection, Marine Fisheries Division, 2006. <http://web2.uconn.edu/seagrant/publications/fisheries/>

EXISTING POLLUTION PREVENTION PROGRAMS AND ACTIVITIES

This Section of the Supplemental Information includes some additional information on the following existing pollution prevention measures that are more briefly described in Chapter 5 Existing Pollution Prevention Programs and Activities in the Strategy:

- Non-Regulatory Preventive Measures
 - Education and Training
- Management Practices
 - NYSDEC Environmental Benefit Projects
 - Be Green Organic Yards NY
 - Neighborhood Network Organic Landscaper Certification Program
- Planning at State, Local and Farm/Land Operator Levels
 - Agricultural Environmental Management (AEM)
 - Suffolk County Agricultural Stewardship Program
 - Non-point Source Management and Related Initiatives (County Water Quality Strategies)
 - Peconic Estuary Program Comprehensive Conservation and Management Plan (CCMP)
 - New York State Seagrass Task Force
- Regulatory Preventive Measures
 - Suffolk County Pesticide Phase-Out Law

Non-Regulatory Preventive Measures

Education and Training

Cornell University, PMEP and Cornell Cooperative Extension of Suffolk County

Cornell University's Pesticide Management Education Program (PMEP) provides a gateway to resources on various topics related to pesticides management and surface water and groundwater protection strategies. Its website - <http://pmep.cce.cornell.edu/> includes a wide range of information on topics including pesticide/groundwater/soil interaction, application techniques, pesticide issues, toxicology, pesticide certification information, pesticide active ingredient/New York State product registration data, pest management recommendations, and federal and New York State pesticide-related laws, rules and regulations. The PMEP also posts the following series of fact sheets pertaining to groundwater at the following website:

<http://pmep.cce.cornell.edu/facts-slides-self/Factsheets.aspx>:

- *EPA Groundwater Database Availability* (6/93)
- *Pesticide Management for Water Quality* (Harold van Es & Nancy Trautman, 10/90)
- *EPA Groundwater Survey Summary* (1991)
- *Modern Agriculture: Its Effects on the Environment*
- *Nitrate: Health Effects in Drinking Water*
- *Pesticides: Health Effects in Drinking Water*
- *Groundwater: What It Is and How to Protect It*
- *Water and the Soil*

- *Nitrogen: The Essential Element*
- *Pesticides and Groundwater: A Guide for the Pesticide User*
- *Wellhead Protection: An Overview*
- *Out-of-site, Out-of-mind*
- *Pesticide Behavior in Soil and Water*
- *Physical-Chemical Parameters*
- *Using Corn Herbicides and Protecting Water Quality* (11/95)

Cornell Cooperative Extension of Suffolk County works closely with programs and departments at Cornell University. Cooperative Extension of Suffolk County however is the locally based component of Cornell University, which is actively conducting pollution prevention programs on Long Island. The Agriculture Program is dedicated to supporting the economic viability of agriculture while working to preserve and protect our water resources. A major emphasis of Cooperative Extension's programming is devoted to research and educational extension of alternative strategies for pest management. Producers commonly adopt these best management practices once their effectiveness has been demonstrated, often shown with on-farm demonstrations.

Cooperative Extension's staff instructs growers to use the latest and most environmentally safe practices in controlling insects, diseases and weeds. The implementation of thresholds, biological and cultural practices, and judicious use of pesticides has resulted in a decreased potential for groundwater contamination.

Cooperative Extension of Suffolk County was involved in developing and implementing integrated pest management programs for most crops grown on Long Island. Most recently, the viticulture program developed a sustainable viticulture program which was adapted by several growers in 2012. Prior to this, Cooperative Extension established an organic research program at the Long Island Horticultural Research and Extension Center. This research has resulted in the development of many organic practices on Long Island.

Because Cornell Cooperative Extension of Suffolk County is generally known as a trusted source of scientifically-based information for agriculture, Cooperative Extension routinely cooperates and collaborates with many organizations and agencies in regard to water resources and environmental concerns. For instance, since the discovery of Temik in groundwater over 34 years ago, Cooperative Extension has worked closely with the Suffolk County Department of Health Services and the DEC with monitoring of groundwater and evaluating the environmental impacts of agricultural inputs.

Furthermore, Cornell Cooperative Extension publishes educational documents that relate to pesticides and water quality, available on their website or through their publications center, such as *Pesticides and Groundwater - A Guide for the Pesticide User*.²

² Cornell Cooperative Extension publications are listed at <http://www.cce.cornell.edu/store/customer/home.php>. *Pesticides and Groundwater - A Guide for the Pesticide User* can be viewed at <http://psep.cce.cornell.edu/facts-slides-self/facts/pest-gr-gud-grw89.aspx> and *Pesticide Management for Water Quality - Principles and Practices* (Van Es and Trautmann, 1990) can be viewed at <http://psep.cce.cornell.edu/facts-slides-self/facts/pestmgt-water-qual-90.aspx>.

Management Practices

NYSDEC Environmental Benefit Projects

Long Island Agricultural Pesticide Handling Facilities Environmental Benefit Projects

Long Island Agricultural Pesticide Handling Facilities Environmental Benefit Projects (LIAPHF EBPs) relate to the construction of pesticide handling facilities at agricultural establishments (as the term “agricultural establishment” is defined in Part 170 of Title 40 of the Code of Federal Regulations [40 CFR Part 170]) that are engaged in the production of agricultural plants (as the term “agricultural plant” is defined at 40 CFR Part 170) located in Nassau and Suffolk counties for the purpose of protecting Long Island’s vulnerable sole source drinking water aquifer system from releases of pesticides associated with certain pesticide handling activities, including:

- mixing pesticides, loading or filling pesticide containers, mixing equipment, loading equipment, or application equipment;
- transferring pesticides between containers, mixing equipment, loading equipment, and/or application equipment;
- rinsing (including triple-rinsing) or washing of pesticide containers, mixing equipment, or application equipment;
- disposing of pesticides or pesticide containers;
- handling opened containers of pesticides; and
- cleaning, adjusting, handling, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues.

Pesticide handling facilities are generally intended to contain and collect pesticide-related spills, rinsates, and washwaters, and allow for their lawful reuse (recycling) and/or disposal.

A LIAPHF EBP Committee consists of representatives of the NYSDEC, Suffolk County Soil and Water Conservation District (SCSWCD), Cornell Cooperative Extension of Suffolk County, Long Island Farm Bureau, and two agricultural establishments actively engaged in the production of agricultural plants. The Committee accepts written applications for participation in the program and requests that a site evaluation and ranking form be completed by a technical staff person from the SCSWC for each eligible applicant. The Committee then prioritizes applications based upon ranking criteria and considers even distribution of projects among commodity crops and geographic regions. Proposals to construct permanent facilities must comply with U.S. Department of Agriculture, Natural Resources Conservation Service (USDA, NRCS) *Conservation Practice Standard for Agrichemical Mixing Facility, New York, Code NY702* and the associated *Statement of Work*. Proposals to install portable facilities must comply with USDA, NRCS *Conservation Practice Standard, Agrichemical Mixing Facility-Portable, Interim Standard Code 703*, and the associated *Statement of Work*.



Figure 1: Agricultural Pesticide Handling Facility Installed at Starkie Family Farms, Cutchogue

Construction or installation of APHFs begins after receiving LIAPHF EBP Committee approval. Approved sites receive 75 percent cost sharing pending availability of funding, with maximum reimbursement per handling facility set at thirty thousand dollars (\$30,000.00). The LIAPHF Committee reviews and approves reimbursement of eligible expenses after receiving all required documentation. The SCSWCD administers the program and conducts all financial transactions.

During a meeting of the LIAPHF Committee on August 27, 2008, an identification decal was developed to be affixed to recycled pesticide wastewater holding tanks, and arrangements were made for the issuance of a paper certification to cooperating growers to enable Suffolk County inspectors to recognize tanks that were granted special consideration where

regulation under Suffolk County Sanitary Code (Articles 7 and 12) is concerned. Committee members and SCDHS public health engineers agreed to make the necessary arrangements for the Suffolk County Department of Health Services' Division of Environmental Quality to issue *Office of Pollution Control Technical Guidance Memorandum #2008-01, Pesticide Mixing Pads at Agricultural Facilities, Amended 9/15/08*. Item five of the resolution section of that guidance memorandum states "All properly installed facilities will be labeled with an approval sticker generated by the Soil and Water Conservation District (SWCD)."

CleanSweepNY – NYSDEC Environmental Benefit Project, Pesticide Collection and Disposal

Pesticides which are obsolete and/or improperly packaged or handled pose a significant hazard to the surface waters, groundwater, and soils of New York State. It is important to protect the state's water resources (particularly drinking water sources such as Long Island's aquifers) and soils from the leaching of unwanted pesticides. The importance of this protective role is heightened on Long Island where vulnerable underlying aquifers provide the sole source of potable water for nearly three million people. Therefore, proper disposal of unwanted pesticides is an important management practice. Proper disposal



often needs to be done through arrangements beyond the scope of routine disposal activities and can, depending upon the situation, be costly for the holder of the pesticides.

CleanSweepNY is an Environmental Benefit Project (EBP) which was initiated by the NYS Department of Environmental Conservation's Bureau of Pest Management. It describes in one word an effort to safely and economically dispose of canceled, unwanted, unusable, or otherwise obsolete pesticides and other select chemicals from agricultural or non-agricultural business operations. *CleanSweepNY* also provides for the disposal of pesticides, cleaning products, laboratory class chemicals, as well as elemental mercury, and mercury-containing devices such as thermometers and manometers from schools and other entities.

CleanSweepNY collection events do not target the general public since home and garden pesticides are accepted in Household Hazardous Waste (HHW) collection programs. See information – *Summary of Household Hazardous Waste Collection Programs* - at the following NYSDEC website for information about HHW collection programs:

<http://www.dec.ny.gov/chemical/8780.html>.

Commercially applied or larger quantities of pesticides are usually excluded from local HHW collections. In New York State this fact has created a backlog of demand for safe, lawful, and affordable disposal of obsolete pesticide products and other chemicals.



Based on the success of the *CleanSweepNY* program and its overall goal being consistent with the Strategy's goal, the Department is evaluating ways to expand the *CleanSweepNY* program. This could potentially involve regular scheduling of the pesticide collection events along with increased advertising to promote participation and the proper disposal of pesticides at these collection events.

**Fall 2002 CleanSweepNY Collection Event
Nassau and Suffolk Counties**

Target Area: Nassau and Suffolk Counties	
Total Registrants:	215
Total Agricultural:	171
Total Non-Agricultural:	44
Total Unknowns Analyzed by NYSDEC:	153
Total Obsolete Pesticide Destroyed (lbs.):	120,000
Total Empty Plastic Containers Recycled (lbs.):	4,053
Total Empty Metal Containers Recycled	37
Total Mercury Manometers Recovered	N/A
Site Information	
Number Collection Sites 5 days	4
Number Holders Serviced Directly due to Unstable Packaging	7

**Spring 2008 CleanSweepNY Collection Event
Nassau and Suffolk Counties**

Target Area: Nassau and Suffolk Counties	
Total Registrants:	233
Total Agricultural:	80
Total Non-Agricultural:	153
Total Collected (lbs.):	132,143
Total Pounds of Elemental Mercury Collected:	45
Number of Metal Containers Recycled:	13
Number of Plastic Containers Recycled:	51
On-Site Assistance Provided At:	12
Unknowns Tested At:	8
Milk Runs Conducted At:	6
Number of Participating Schools:	25
Number of Participating Towns/Govs.:	10
Number of Participating Golf Courses:	18
Number of Participating Gardens/Arboretums:	8
Number of Participating Parks/Zoos:	15
Number of Participating Vineyards:	8

Table 1: CleanSweepNY Pesticide Collection Stats, Long Island

CleanSweepNY is operated with funds paid to the Natural Heritage Trust as part of the settlement of three separate administrative enforcement actions brought against violators of pesticide-related laws, rules and regulations by NYSDEC. *CleanSweepNY* provides proper collection and disposal of cancelled, unwanted, unusable or otherwise obsolete pesticides from growers and specific non-agricultural entities as well as properly rinsed metal and rigid plastic drums, cans and bottles that formerly held pesticides. The collection of unwanted pesticide products ensures

that they will not be used or disposed of improperly, in which case they could pose a serious threat of contamination to surface water and groundwater resources.

To date, 15 collection events have taken place across New York State between the spring of 2002 and the fall of 2010. Two of the collection events were held on Long Island, and resulted in the collection of more than one-quarter million pounds of pesticides. These two events were the largest in New York State. The first *CleanSweepNY* event that took place on Long Island in 2002 set a record. The November 2002 Long Island event resulted in the collection and proper disposal of more than 120,000 pounds of unwanted pesticides and pesticide containers from the Long Island agricultural community. That record was not broken until the second Long Island event held in the spring of 2008 resulted in the collection of another 132,000 pounds of pesticides. The 2008 *CleanSweepNY* pesticide collection event held on Long Island holds the record for the greatest amount of pesticides collected in connection with *CleanSweepNY*.

This significant quantity of unwanted pesticides, if left in place and not collected for proper disposal through the *CleanSweepNY* project, could potentially leak and spill into the environment and the groundwater, especially if kept in metal drums prone to corrosion, or paper or plastic which can be punctured, ripped, and exposed to weather conditions.

In every year since the first event took place on Long Island in calendar year 2002, *CleanSweepNY* events have been held in several areas of New York State and each of the 62 counties in New York State has had an opportunity to participate. Under this program, as of the fall of calendar year 2010, statewide, more than one million pounds of unwanted pesticides and other hazardous chemicals have been collected and properly disposed and approximately 4,500 pesticide containers have been collected for recycling. For more information about *CleanSweepNY*, go to the following Internet website: <http://www.cleansweepny.org>.

Be Green Organic Yards NY

On June 7, 2010, the New York State Department of Environmental Conservation (NYSDEC) announced the *Be Green Organic Yards NY* program.



NYSDEC's *Be Green* program is designed to promote the recognition of organic landscaping practices and organic service providers. Consumers will be able to find lawn and landscape businesses that provide organic services by looking for the *Be Green* logo.

NYSDEC will work with:

- qualified trainers to offer courses in *Be Green* organic principles,
- lawn companies, landscapers and arborists to be tested to verify their knowledge of organic practices, and
- eligible organic service providers and course providers to enter into *Be Green* Service Mark agreements to use the *Be Green* logo when advertising organic services.

Consumers will be able to search a list of these *Be Green* Businesses on NYSDEC's website. Consumers will have assurance that a *Be Green* Business will not engage in practices, or use products, that are considered by NYSDEC to be inconsistent with organic principles.

The goal of *Be Green* is to help create an organically managed landscape for people, pets, wildlife and plants. The *Be Green* program recognizes that public demand for all types of organic services is on the rise as people continue to be concerned about the amounts and types of chemicals used in everyday tasks. With the *Be Green* program, New York State provides a way for qualified businesses to use the *Be Green* logo when they offer organic services. The *Be Green* logo helps connect consumers with the names of *Be Green* Businesses.

NYSDEC recognizes that lawns and landscapes maintained by repeated applications of synthetic fertilizers and conventional pesticides can expose people, pets and the environment to chemicals, especially when they are applied incorrectly. In contrast, successful organic landscaping can range from a simple regimen of planting and pruning to a big-picture approach that looks at all aspects of yard care, including plant selection and soil structure. The key is preventing pest problems before they occur and build a sustainable landscape. Consumers can choose an organic approach as a way of reducing the risk of exposure to conventional pesticides and their potential hazards.

NYSDEC encourages organizations that provide organic training to participate in the *Be Green* program by becoming *Be Green* Course Providers and offer courses to companies interested in becoming *Be Green* Businesses. Once a business employs *Be Green* trained staff, it can apply to enter into a *Be Green* Service Mark agreement that will include basic conditions for organic yard care - including avoiding the synthetic pesticides and other materials prohibited under the program.

Be Green businesses agree not to treat lawns, trees and shrubs, or other ornamental plantings, maintained according to the *Be Green Organic Yards NY* Service Mark Agreement conditions, with the following materials:

- Synthetic herbicides, insecticides, insect growth regulators, fungicides, rodenticides, or molluscicides (except those limited synthetic products allowed by the United States Department of Agriculture's National Organic Program). Examples include: organophosphate, carbamate, neonicotinoid, or pyrethroid insecticides; atrazine, 2,4-D, dicamba, MCPP, MCPA, or glyphosate-containing herbicides; fungicides such as triadimefon and thiophanate-methyl; rodenticides such as brodifacoum; and the molluscicide metaldehyde.
- Products that contain synthetic synergists, such as piperonyl butoxide.
- Products that contain inert ingredients on the United States Environmental Protection Agency's (EPA) List 1: Inert Ingredients of Toxicological Concern.
- Arsenical pesticides.
- Nicotine.
- Rotenone.
- Soil fumigants.

In addition, *Be Green* Businesses agree to not use any of the following materials when providing *Be Green Organic Yards NY* services:

- plant material or seeds derived from genetically modified organisms,
- synthetic fertilizers or fertilizers derived from sewage sludge, or
- chemically-treated wood (including pressure-treated wood) and other treated articles.

More information about *Be Green Organic Yards NY* can be found on NYSDEC's website at <http://www.dec.ny.gov/public/65071.html> .

Neighborhood Network Organic Landscaper Certification Program

The Neighborhood Network is a Long Island-based environmental organization that wrote and advocated for the 48 Hour Pesticide Notification Law, which was adopted in New York State in 2000, with opt-in provisions for counties. Neighborhood Network posts the following Guiding Purpose on their website (<http://neighborhood-network.org/organization/about.htm>):

The Neighborhood Network fills the need for professional advocates for the environment and accountable government on Long Island, fighting for the common interest rather than special interests.

The organization holds an annual Organic Turf and Tree Show. The goals of this event are to promote businesses here on Long Island that provide less toxic services and to provide professionals with the latest information for establishing healthy turf without relying upon chemical pesticides. The Show features vendor displays from leading organic suppliers and will offer workshops for DEC continuing education credits for certified applicators.

As an extension from this event and other efforts, the Neighborhood Network offers an Organic Landscaper List. The listing service presents an example of how a non-government entity can influence pest management practices on Long Island in a manner that contributes to efforts to safeguard Long Island's groundwater resources. The Neighborhood Network's Organic Landscaper Listing Program, identifies pest management professionals who:

- meet specific education and training requirements in organic horticulture methods through the Organic Turf Trade Show, Nature Lyceum, Soil Food Web classes, or equivalent.
- demonstrate knowledge via a questionnaire/exam in the use of organic pest management methods;
- sign a contract to comply with the Neighborhood Network's standard for organic horticulture that includes lists of permitted and prohibited products and practices; and
- operates transparently by agreeing to the possibility of inspections to ensure compliance.

The Neighborhood Network's Standards for APPROVED AND PROHIBITED PRODUCTS are as follows.

Determining Which Products are Approved for use:

The lists in this article are meant to be exhaustive. However, it is understood that products, which may come under consideration for use by the landscaping business, may not be included on any of the following lists. If you are not sure whether a product fits the description of organic laid out below, please compare the products to the lists of products approved by OMRI or NOFA, or request guidance from the Neighborhood Network.

Products Approved for use:

1. Beneficial insects
 2. Beneficial nematodes
 3. Bt (*Bacillus thuringiensis*)
 4. Compost [Quality may vary, use your professional judgement and know your source.]
 5. Corn gluten
 6. Fish Emulsion
 7. Garlic oil/juice
 8. Horticultural oils (preferably vegetable-based instead of petrochemical-based!)
 9. Kelp/seaweed extracts
 10. Lemon & vinegar formulations
 11. Lime
 12. Microbial inoculants
 13. Milky spore
 14. Neem
 15. 100% Organic fertilizers, with no more than 7% water-soluble nitrogen.
 16. Pheromone lures
 17. Pyrethrin / pyrethrum
 18. Rock dust minerals
- b. The products included in this list must not contain any ingredients that are prohibited from use.

We do not support the use of products that are genetically engineered (e.g. Bt, corn gluten), however it is understood that not all genetically modified (GM) products and ingredients on the market are labeled as such. An organic business will not be judged to have violated these standards if they do not have actual knowledge that a product included GM ingredients.

Products Prohibited for Use:

1. All synthetic, chemical pesticides.
2. Arsenic.
3. Biosolids (i.e. Milorganite).
4. Genetically modified products, ingredients, or seeds. Please be aware that grass seeds are not presently labeled when genetically modified. (Endophytically enhanced seed is not GM and therefore is permitted.)
5. Piperonyl butoxide and other synthetic ingredients.
6. Pyrethroids.
7. Tobacco.

Note: Participating Businesses, particularly with new construction, are encouraged to avoid the use of wood products that have been treated with creosote, pentachlorophenol or arsenic preservatives. Naturally long-lasting wood materials including cedar, locust, and redwood are recommended.

Planning at State, Local and Farm/Land Operator Levels

Agricultural Environmental Management (AEM)

Agricultural Environmental Management (AEM) is a program developed by farmers, federal, state and local governments, and farm conservation professionals to enhance the protection and improvement of important environmental resources such as the New York State's groundwater resources, rivers, lakes, streams, freshwater wetlands, and tidal wetlands, while maintaining a healthy agricultural economy. Although there are several elements involved in AEM, planning is a significant component. This section summarizes the AEM program.



AEM Five-Step Process. The essence of AEM is a five-step ("five-tiered") environmental assessment, planning and implementation process that farmers undertake voluntarily, with the help and support of a team of agricultural and environmental professionals from agricultural agencies and private industry. The AEM tiered approach takes place on the farm, with the farmer as the decision maker. Core members of the local working group - "the County Project Team" - work with the farmer to carry out the tiered approach. Qualified private consultants may also be used at appropriate points in the process. The five tiers used in AEM are shown in Figure 20.

At the **state** level, the New York State Soil and Water Conservation Committee (SWCC) is responsible for planning, coordinating and setting policy for the AEM program. The SWCC's five voting members are appointed by the Governor. Three represent specific organizations, and two serve as appointed



"representatives-at-large" (one for agricultural and one

for non-agricultural interests). The New York Association of Conservation Districts, Inc., the New York State Farm Bureau, and the New York State Grange each have a voting representative. Since its formal inception in 2000, the AEM program has grown to include nearly 8,000 farms statewide.

At the **local** level, the soil and water conservation districts are responsible for carrying out the AEM process. The Long Island Stewardship Program assists the Suffolk County Soil and Water Conservation District in carrying out the Tier One and Tier Two Worksheets. Creating the AEM Plan is the sole responsibility of the soil and water conservation district.

Long Island Agricultural Stewardship Working Group

State SWCC staff, collaborating with the Long Island Agricultural Stewardship Working Group, modified the AEM worksheets,³ which structure grower issues and solutions (pesticide use, pasture management), to address Long Island's unique crops, soils and groundwater resource concerns. Standards for nutrient and pesticide management have been developed for seven crops

³ AEM worksheets can be viewed at <http://www.agmkt.state.ny.us/SoilWater/aem/techttools.html>.

commonly grown on Long Island. The Working Group hopes to expand the pilot AEM program, with IPM elements, to a countywide program.⁴

The Suffolk County Soil and Water Conservation District (SCSWCD) is tasked by the New York State Soil and Water Conservation Committee (NYSSWCC) with implementing the AEM Tiered approach to Conservation Planning or Whole Farm Planning and is responsible for creating the AEM plans. Cornell Cooperative Extension and the USDA Natural Resources Conservation Service (NRCS) assist the SCSWCD meet with the landowner (farmer) to complete the Tier I and Tier II Worksheets. Following the needs based on the Worksheets, the SCSWCD creates an AEM Plan (Conservation or Whole Farm Plan). This is reviewed with the landowner in order to implement the Best Management Practices for the farm involved. If the practices qualify for one of the several cost-sharing plans offered by the USDA-NRCS or the SCSWCD the landowners are offered the opportunity to apply for the cost-share funding. Some of the cost-share programs are competitive with the rest of New York State or within a designated portion (division) of the state or within specific watershed boundaries.

⁴ For more information, see the 2006-2007 Annual Report at <http://www.agmkt.state.ny.us/SoilWater/aem/forms/2006AnnualReport.pdf>. The report is also available from the State SWCC at <http://www.nys-soilandwater.org/>, or by telephoning 518.457.3738. It is also available from the Long Island Agricultural Stewardship Group by contacting Cornell Cooperative Extension of Suffolk County at 631.727.7850. The 2007-2008 Annual Report is posted at <http://www.agmkt.state.ny.us/SoilWater/aem/forms/2007-08AnnualReport.pdf>.

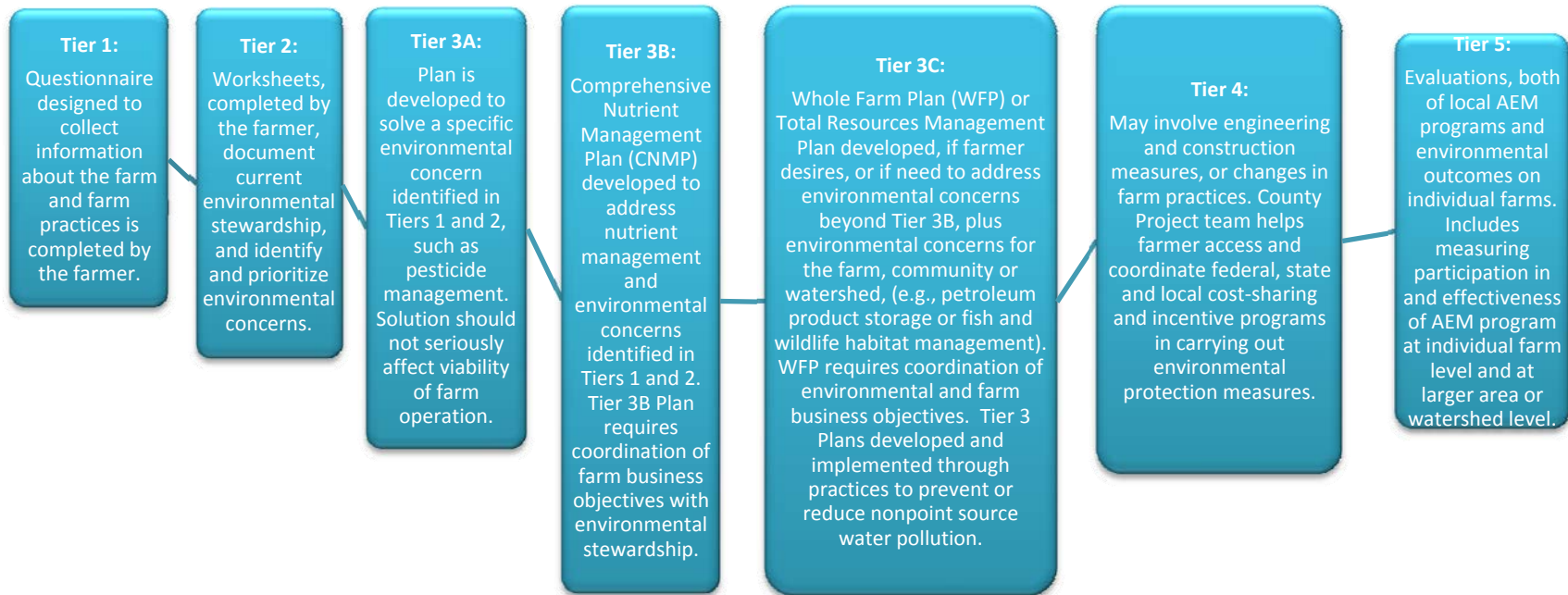


Figure 2: AEM Environmental Assessment, Planning and Implementation Process

Suffolk County Agricultural Stewardship Program

The Suffolk County Agricultural Stewardship Program was established in response to growing concerns about nitrate levels and pesticide residues in Long Island's surface waters and groundwater. Cornell Cooperative Extension, the coordinating agency of the Stewardship Program, works together with Suffolk County Soil and Water Conservation District (SCSWCD) and USDA Natural Resource Conservation Service (USDA-NRCS) to protect the island's sole source aquifer system while at the same time preserving the region's viable and sustainable agricultural industry. By taking a proactive approach and helping growers evaluate their farm management practices, they are working to stay ahead of the curve and to prevent the need for future regulatory controls.

Through a variety of services, the Stewardship Program works with local growers to incorporate better management practices that protect the quality of Long Island groundwater resources and maintain and improve crop production. Those services include the following:

- Confidential Nutrient and Pest Management worksheets (AEM Tier II Worksheets) that help growers evaluate farm management practices and address issues such as: fertilizer/pesticide storage, mixing and loading practices, calibration, nitrogen management, pesticide use, and integrated crop management practices.
- Growers receive recommendations from the USDA-NRCS and the SCSWCD for technical assistance and conservation management plans tailored to meet specific stewardship needs.
- Cost-share opportunities are available from the USDA-NRCS and the SCSWCD to assist growers in implementing changes in management practices to improve stewardship.
- Educational programs, on-farm demonstration projects, and NYSDEC continuing education credits (that can be applied toward recertification training requirements for certified applicators) are available to growers who choose to participate.

The Agricultural Stewardship Program is modeled after New York State's Agricultural Environmental Management (AEM) Program and focuses on nutrient and pest management practices as they relate to non-point source water quality issues. A brief history of the program follows:

- Long Island's Agricultural Stewardship Working Group was organized in 1999 and became a subcommittee of the Suffolk County Farmland Protection Board, which is under the umbrella of the New York State Agricultural Environmental Management (AEM) Program.
- New York State's AEM Program was signed into law in 2000. AEM is a voluntary, incentive based program that provides education, technical assistance and designs farm-specific plans to identify and manage non-point source water quality issues.
- The SCSWCD is responsible for implementation of the AEM planning process and receives assistance from the Long Island Stewardship Program in order to begin the process. Planning is then completed by the SCSWCD.
- The Suffolk County Legislature appointed an Agricultural Stewardship Task Force in 2003 to consider a program of agricultural stewardship for nitrogen and pesticide reduction.

- The Suffolk County Legislature approved the Task Force's recommendations in May of 2004 and designated Cornell Cooperative Extension to coordinate Suffolk County's Agricultural Stewardship Program.
- Since 2004, Cornell Cooperative Extension has hired a program coordinator, technicians, and support staff to assist with planning, organizing and implementing the Agricultural Stewardship Program.
- To date, the SCSWCD and the Agricultural Stewardship Program have completed the AEM Tier I and II worksheets with over 100 growers. Program staff have assisted in the design and implementation of over 50 research and on-farm demonstration projects looking at better management practices that help to reduce the environmental impacts of agriculture on Long Island. The program has developed numerous educational materials and has held several workshops for local growers.
- The Agricultural Stewardship program continues to expand in all of its program areas and will work with any interested grower.

Many opportunities are made available for the Long Island agricultural community to participate in the Agricultural Stewardship Program, including participation in on-farm demonstration projects, completion of AEM worksheets, attending summer twilight meetings, and signing up to be on a mailing list to receive program updates.

Where environmental concerns are identified through the AEM process, farmers can address them in a manner that achieves farm business objectives, yet also achieves federal, state and local environmental goals and objectives. The AEM program establishes a framework for interagency cooperation in providing farmers with the financial, technical and other assistance they need. At the local level, the AEM program begins with the soil and water conservation districts and the local working groups, which include representatives of the following entities:

- Cornell Cooperative Extension,
- Farm Service Agency, U.S. Department of Agriculture,
- Natural Resources Conservation Service, U. S. Department of Agriculture,
- NYSDEC, and
- Soil and Water Conservation Districts.

Responsibilities of the soil and water conservation districts include the following:

- Identify and prioritize natural resource concerns in the county and determine the need for AEM in local watersheds. This includes using a watershed planning process, and considering the future economic viability of agriculture in the watershed.
- Plan and coordinate the local AEM program, based on AEM guidance.
- Evaluate local AEM effectiveness, in program terms (number of farms served, plans prepared, environmental protection measures carried out, etc.) and in terms of environmental quality outcome such as a decrease in the concentration, frequency, and number of pesticides (active ingredients and degradates) in groundwater.
- Plan and carry out local outreach/education/public participation efforts.

These are the same county-level groups formed to provide guidance and set priorities for federal agricultural incentive programs. Farmers, agribusiness, non-farm interests, units of local government and other locally-identified groups are also encouraged to participate, either in the local working group, or as part of an advisory group. Since some organizations are also represented on county water quality coordinating committees, local working groups are linked to other environmental and community groups who serve on the county water quality coordinating committee as well.

Non-point Source Management and Related Initiatives (County Water Quality Strategies)

The New York State Nonpoint Source Management Program, under the direction of NYSDEC, has initiated other efforts that contribute to the pesticide-related surface water and groundwater protection methods presented in the Strategy, in addition to development of the *Agricultural Management Practices Catalogue for Nonpoint Source Pollution Prevention and Water Quality Protection in New York State* (3rd rev. May 1996).⁵ A significant initiative under that program is the establishment of County Water Quality Coordinating Committees and development of County Water Quality Strategies. Agricultural issues are one of the major concerns of these strategies. Key participants in the committees generally include personnel from County Soil and Water Conservation Districts, Cornell Cooperative Extension, the USDA Natural Resources Conservation Service, and other entities. County water quality strategies may include consideration of comprehensive watershed planning and wellhead protection. Wellhead protection planning and implementation conducted by towns and municipalities may address pesticide issues through education and technical assistance efforts.

Nassau and Suffolk county water quality coordinating committees and strategies can be very beneficial in education, technology transfer, promotion and distribution of the management practices recommendations, and in implementation and promotion of the IPM strategies. The committees can serve as valuable focal points to facilitate local participation in the strategy with NYSDEC, NYSDOH, NYSDAM, Cornell University, and Cornell Cooperative Extension.

The NYSDEC, together with the NYS Soil and Water Conservation Committee, has published guidance for such county efforts - *Guidelines for Establishing County Water Quality Strategies* (June 1990), and *Procedure for Preparing and Implementing County Water Quality Strategies* (rev. January 1992), which is intended to supplement those guidelines. Special emphasis is placed on committee organization, assessing water quality priorities, setting goals and tasks, and strategy implementation.

The Nonpoint Source Management Program in New York State is closely associated with many of the efforts described in the STRATEGY (e.g., AEM). In New York State, the definition of "point sources" is relatively narrow. 6 NYCRR 750-1.2(65) defines a "point source" as follows:

any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft, or

⁵ The Catalogue is accessible at <http://www.nysl.nysed.gov/scandoclinks/ocm36966918.htm>.

*landfill leachate collection system from which pollutants are or may be discharged.*⁶

Thus, the definition of "non-point sources" is rather expansive, comprising all other types of sources. Certain types of pesticide-related sources which are commonly considered to be point sources in other areas of the United States (e.g., storage sites, disposal sites) are classified as non-point sources in New York. The NYSDEC Division of Water coordinates activities relating to the Non-point Source Management Program.

Peconic Estuary Program Comprehensive Conservation and Management Plan (CCMP)

The Peconic Estuary is one of 28 designated "Estuaries of National Significance" under USEPA's National Estuary Program. Formally convened in 1993 at the request of the Governor of New York State, the goal of the Peconic Estuary Program (PEP) and its Management Conference was to seek to advance protection and restoration of the estuary system. The PEP, an innovative partnership of local, federal and New York State agencies, citizens and environmental user groups, and businesses, industries and academic institutions, is presently in the process of implementing a watershed based Comprehensive Conservation and Management Plan (CCMP) that was approved by the USEPA Administrator with the concurrence of the Governor. Implementation of the Peconic CCMP requires the aforementioned stakeholders to work together to carry out nutrient, pathogen, and toxic management, habitat and living resource, and critical land protection initiatives.

The CCMP includes a variety of toxic management actions to address point and non-point discharges to the Peconic Estuary. As described in the CCMP, "the proposed actions call for remediation at specific sites, enforcement of existing and new regulations, pollution prevention programs, research, and monitoring." The CCMP also addresses educational programs to enhance public awareness of toxics issues. Pesticide-related management, monitoring and educational elements could be included as part of the Post-CCMP Management Actions.⁷

⁶ For a full definition of "point sources", see 6 NYCRR Part 750 definitions at <http://www.dec.ny.gov/regs/2485.html>.

⁷ The CCMP can be viewed through a link at <http://www.peconicestuary.org/>. For information about the estuary see <http://www.dec.ny.gov/lands/31842.html>



Figure 3: Map of Peconic Estuary (Yellow line outlines estuary)

To date, the Peconic Estuary Program and its partners have made significant progress in implementing numerous priority actions in the PEP CCMP, recently including but not limited to: approval and implementation of the pathogen and nitrogen Total Maximum Daily Loads (TMDLs); Suffolk County's passage of a fertilizer management law; NYSDEC's revised Municipal Separate Storm Sewer System (MS4) permit with new pathogen and nitrogen TMDL requirements; implementation of sub-watershed stormwater management plans addressing impaired waters; intense bay scallop restoration efforts; installation of diadromous fish passage; early detection rapid response invasive species management programs; and the acquisition of a significant amount of open space.

Agricultural operations, notably vineyards, row crops, sod farms, greenhouses, and nurseries, are a vital part of the culture and economy of the East End of Long Island, which includes lands within the Peconic Estuary watershed. Residential development includes a significant amount of highly maintained lawns and landscapes. Pesticide-related pest management practices occurring on these lands may affect the quality of the sole source aquifer system and the health of the Peconic Estuary. Recognizing the threat pesticides and pesticide applications may have on the fragile and unique Peconic Estuary system, the Peconic Estuary Program CCMP included a "PRIORITY" management action in its chapter addressing such pollutants and their usage. Toxic Management Action T-4.1 states:

*Continue to pursue development/establishment of the Long Island Pesticide Management Priority Plan and enforceable Statewide agricultural pesticide program requirements under CZARA, which reduce the potential for contamination of surface water and ground water due to the application of pesticides.*⁸

⁸ Peconic Estuary Program CCMP, Ch. 6-Toxics Management Plan, T-4. Reduce Loadings of Pesticides and Herbicides within the Peconic Estuary. http://www.peconicestuary.org/CCMP_PDF/Chpt6.toxics.pdf

The following pesticide-related comments are communicated in a related report entitled *Peconic Estuary Program Environmental Indicators Report*:⁹

Pesticides can enter the Estuary with runoff, in groundwater, or by direct application. Though no causal link has been identified, low levels of pesticides (and other toxic substances) may be affecting the biota of the Peconic Estuary, especially during sensitive early life stages. To reduce the potential adverse consequences of pesticides, they must be used only when necessary, and instructions for proper use and disposal must be strictly followed. Limiting the inputs of toxic substances to the system, particularly pesticides applied for aesthetic reasons, is an important management strategy to prevent problems from occurring in the future, particularly as the population in the watershed increases. The focus of the CCMP is targeting those land uses and activities that contribute toxic substances to the system and taking steps to prevent them from getting into and adversely impacting the ecosystem.

New York State Seagrass Task Force

Acknowledging the importance of seagrass and the necessity to protect and restore this valuable natural resource, Chapter 404 of the Laws of 2006, enacted on July 26, 2006, established a New York State Seagrass Task Force chaired by the New York State Department of Environmental Conservation (NYSDEC). Chapter 285 of the Laws of 2008 extended the life of the Task Force one additional year to January 1, 2010.



The New York State Seagrass Task Force was charged with developing recommendations to restore, research, preserve, and manage seagrass. In December 2009 the task force released their *Final Report of the New York State Seagrass Task Force: Recommendations to the New York State Governor and Legislature*. A copy of the report is available at the following website: http://www.dec.ny.gov/docs/fish_marine_pdf/finaalseagrassreport.pdf.

The task force acknowledged the critical need to protect seagrass resources, improve and maintain water quality, manage seagrass resources, monitor the health and extent of seagrass, research seagrass dynamics and impacts, restore seagrass and seagrass habitat, and educate and engage New Yorkers. The task force recognized that it is imperative to ensure water quality conditions suitable for seagrass. The immediate action recommendations of the task force include the following:

- controlling and reducing nutrient, pesticide, and sediment loading to surface and groundwater, and
- protecting, enhancing and restoring coastal and marine properties, habitats (e.g., wetland and shellfish), open space, riparian corridors and natural shorelines to reduce, filter and absorb polluted runoff that may include pesticide residue.

⁹ Balla, R., L. Bavaro, C. deQuillfeldt and S. Miller. 2005. Peconic Estuary Program Environmental Indicators Report. Peconic Estuary Program. Riverhead, NY. 88 pp., <http://www.peconicestuary.org/Indicators.pdf>.

The task force noted that research is currently being conducted to evaluate the effects of groundwater discharge containing herbicides on eelgrass. Specifically, investigations into the impact of the herbicide diuron on eelgrass have demonstrated that at environmentally realistic concentrations, diuron has a measurable impact on photosynthesis. In addition, experiments have demonstrated that the impacts of this herbicide increase with other stresses such as reducing light levels or increasing temperatures.

With regard to pesticides, the task force recommended that the coastal watershed use of pesticides and herbicides proven to be toxic to seagrass and species dependent on seagrass resources be banned or restricted to ensure the protection of New York State seagrass resources. They also recommend that pesticides and herbicides and the concentrations at which they are toxic or sublethal to seagrass and seagrass habitat be identified.

Note that the results of a study published in August 2011 indicated that “seagrass seeds and seedlings have been shown to be important in creation of new patches and recovery of [seagrass] beds lost due to disturbance,” and that the results of a study “indicate that atrazine presents a potential threat to seagrass seedling functioning and that the impact is much higher than for adult plants.” The report also notes that “[i]n many aquatic species, early seedling growth is a sensitive stage for herbicide contamination stress” and that “[i]n this study, herbicide contamination was shown to cause significant stress to growth and photosynthesis.”¹⁰ The Suffolk County Department of Health Services detected atrazine in Long Island groundwater in at least 134 instances, and the U.S. Geological Survey detected its presence in at least 18 instances.

USEPA and Suffolk County Concerns Regarding Possible Negative Impacts Groundwater Discharges Containing Herbicides May Have on Algae

In addition to the concerns about seagrass exposure to pesticides in the aquatic environment, concerns also relate to the possible negative impacts groundwater discharges containing trace concentrations of herbicides may have on beneficial algae, and the possible relationship such an impact may have relative to the occurrence of Brown Tide. It has been suggested that trace levels of the herbicides alachlor and metolachlor, both of which have been detected in Long Island groundwater (and their ethane sulfonic acid [ESA] and oxanillic acid [OA] breakdown products), may contribute to brown algae blooms, referred to as Brown Tide, which has wiped out bay scallop populations and the economically important fishery associated with them, and has been shown to have adverse effects on other species of shellfish like quahogs and soft shell clams.¹¹ It is theorized that this may occur when herbicide destroys the more sensitive green algae, allowing the more tolerant brown algae an opportunity to outcompete the green algae and become the dominant algae species in the affected area. For example, consider the two statements below, which were issued by the USEPA when the herbicides alachlor and metolachlor were subject to the reregistration review process.

¹⁰ Gao, Yaping, Jianguang Fang, Jihong Zhang, et al. “The Impact of the Herbicide Atrazine on Growth and Photosynthesis of Seagrass, *Zostera marina* (L.), Seedlings.” *Marine Pollution Bulletin* 62. 2011: 1628-1631.

¹¹ New York State Department of Environmental Conservation, Peconic Estuary Program, <http://www.dec.ny.gov/lands/31842.html>.

In the Reregistration Eligibility Decision (RED) the USEPA issued for the herbicide metolachlor, they stated the following:

*No data are currently available to assess the effect of metolachlor on aquatic or terrestrial plants. However, because metolachlor is a herbicide, potential risk to non-target plants is likely. In areas where irrigation water is contaminated with metolachlor, or where ground water discharges to surface water, metolachlor residues could present a threat to non-target plants.*¹²

In the RED the USEPA issued for the herbicide alachlor, they state the following:

*Studies were required to establish toxicity to nontarget aquatic plants. The requirement is partially fulfilled by the single study submitted. However, to completely fulfill data requirements for aquatic plant testing additional studies must be submitted for acute toxicity to an aquatic macrophyte, a marine diatom, a blue-green algae and a freshwater diatom. Based upon the one study available, alachlor is highly toxic to aquatic plants. (MRID No. 42763801) Also, effects on aquatic plants are expected to result in indirect effects on aquatic animals, e.g., by habitat modification or restricted food supply.*¹³

It should be noted that alachlor and metolachlor are no longer registered for use on Long Island.

Other information is available to speak to the acute toxicity of metolachlor where green algae and blue-green algae are concerned. For example, the USEPA has stated that "metolachlor is highly toxic to vascular (duckweed) and nonvascular (algae, diatoms) aquatic plants."¹⁴

Groundwater monitoring activities conducted by the Suffolk County Department of Health Services' (SCDHS) Bureau of Groundwater Resources have raised concerns about the negative impact trace herbicides in groundwater may have on estuarine algae as well. An investigation partially funded by the NYSDEC and conducted by the SCDHS pursuant to the requirements ECL 33-0714,¹⁵ which requires a water quality monitoring program to detect and assess pesticide contamination of ground and surface waters on

¹² United States Environmental Protection Agency, "Reregistration Eligibility Decision, Metolachlor," EPA 738-R-95-006, April 1995, p. vii, <http://www.epa.gov/oppsrrd1/REDs/0001.pdf> .

¹³ United States Environmental Protection Agency, "Reregistration Eligibility Decision, Alachlor," EPA 738-R-98-020, December 1998, p. 122, <http://www.epa.gov/oppsrrd1/REDs/0063.pdf> .

¹⁴ "Metolachlor Analysis of Risks to Endangered and Threatened Salmon and Steelhead, November 29, 2002, W. Erickson and L. Turner, Environmental Field Branch Office of Pesticide Programs, <http://www.epa.gov/oppfead1/endanger/litstatus/effects/metolachlor-analysis.pdf>

¹⁵ 33-0714. Water quality monitoring for pesticides. The department, in coordination with the United States Geological Survey National Water Quality Assessment Program, the New York State Water Resources Institute, and other parties, shall conduct a water quality monitoring program to provide an adequate understanding of the health and environmental impacts of pesticide use in the state. The department shall utilize this program, as it deems necessary, in: making pesticide registration decisions; reviewing suspensions and cancellations of pesticide registrations in the state; and assessing the status, trends, and health impacts of any pesticide contamination of ground and surface waters on Long Island and throughout the state.

Long Island and throughout New York State, produced a report in which the following was noted:

The improvements made to the SCDHS's analytical capabilities this year show that the three most frequently detected pesticides are: 1) metolachlor and its OA and ESA metabolites; 2) the aldicarb metabolites B aldicarb sulfoxide and aldicarb sulfone; and, 3) alachlor and its OA and ESA metabolites. All three active ingredients have been removed from sale in Suffolk County. However, because of their persistence and mobility, these chemical compounds can be expected to continue appearing in groundwater for years to come, and will migrate with groundwater to areas far from their points of application.

Alachlor and metolachlor were widely used for two or more decades prior to the development and implementation of the SCDHS analytical method utilized to detect their respective OA and ESA metabolites. It is likely that these previously undetected degradate chemicals have been significant ground and drinking water contaminants for 20 years.

The metabolites of the herbicides alachlor and metolachlor were detected with greater frequency and generally in higher concentrations than the pesticide active ingredients (parent compounds). The two most frequently detected pesticide compounds, metolachlor OA and metolachlor ESA, were found in 207 (24.8%) and 272 (32.6%) of the samples, respectively. Comparatively, the parent compound metolachlor was detected in 42 samples (5.0%). Similarly, the OA and ESA metabolites of alachlor were detected much more frequently than the parent alachlor. Alachlor OA and alachlor ESA were found in 43 (5.2%) and 132 (15.8%) of the samples collected, while parent alachlor was detected in just 14 samples (1.7%). Metabolites of alachlor and metolachlor co-occurred in 85 (10.2%) of the wells. The frequent combined occurrence of these metabolites in drinking water is of concern because they are structurally similar chemicals (both in the class of acetanilide herbicides), and may have a common mechanism of toxicity. None of these OA and ESA degradates have specific drinking water MCLs. They are considered UOCs, and are assigned a generic MCL of 50 ug/L each.

New issues emerged as a result of the continued monitoring . . . The findings concerning the frequency and concentrations of herbicide metabolites in groundwaters in eastern Suffolk County may have implications for other areas of research. There is a potential of adverse affects to the Peconic Estuary from the presence of these contaminants in streams and groundwater discharging to surface waters. The herbicidal affect on green algae may provide the trigger mechanism that allows aureococcus anophagefferens (brown tide) to out-compete other forms of estuarine algae under certain conditions. According to the Pesticide Usage Report for Agricultural Crops in Suffolk County 1975-2000

(Cornell Cooperative Extension, January 2001) high agricultural use of the two herbicides preceded the initial brown tide bloom in 1985.¹⁶

Regulatory Preventive Measures

Suffolk County Pesticide Phase-Out Law

The Suffolk County Code Chapter 647 - Pest Control, passed in 1999, became effective on January 1, 2000. This Suffolk County Pesticide Phase-Out Law was designed to phase out the use of pesticides on County-owned properties and in County buildings by July 1, 2003. The law prohibits any Suffolk County department or agency, or any pesticide applicator employed by a Suffolk County or agency as a contractor or subcontractor for pest control purposes, from applying the following pesticides on Suffolk County property (as owner or tenant):

- any pesticide classified as Toxicity Category I by the United States Environmental Protection Agency;
- any pesticide classified as a known, likely, or possible carcinogen by the United States Environmental Protection Agency, except as provided for in Section 380-3 of the Suffolk County Pesticide Phase-Out Law;
- any pesticide classified as Toxicity Category II by the United States Environmental Protection Agency;
- any pesticide classified as restricted use by the United States Environmental Protection Agency or the New York State Department of Environmental Conservation, except as provided for in Section 380-3 of the Suffolk County Pesticide Phase-Out Law; or
- any pesticide on County property (as owner or tenant), except as provided for in Sections 380-3 of the Suffolk County Pesticide Phase-Out Law.

The Suffolk County Pesticide Phase-Out Law does not apply to the following:

- water treatment plants where pesticides are otherwise lawfully used for the purpose of maintaining a safe drinking water supply at drinking water treatment plants, waste water treatment plants, reservoirs, and related collection, distribution, and treatment facilities;
- anti-microbial pesticides;
- pesticides in containerized baits where the least toxic of the effective alternatives available are used;
- pesticides classified by the United States Environmental Protection Agency as registration-exempt minimum risk pesticides in accordance with the provisions of 40 CFR 152.25;
- biological controls and biological pesticides, such as *Bacillus thuringiensis* or milky spore;
- low-toxicity pesticides, such as boric acid, as determined by the Commissioner of the County Department of Health Services after certifying in writing that the pesticide is of such a low hazard as to have a de minimis adverse impact on the health and safety of Suffolk County residents;

¹⁶ Suffolk County Department of Health Services, Bureau of Groundwater Resources, "The Occurrence of Pesticides in Suffolk County, Water Quality Monitoring Program," date of release unknown, pp. 2 and 3, http://www.geo.sunysb.edu/lig/Conferences/abstracts_02/paulsen.pdf.

- in a situation in which a written declaration has been issued by said Commissioner of the County Department of Health Services that a public emergency exists requiring the temporary use of a particular pesticide during the period of such public emergency. The Commissioner must in such an emergency, use the least toxic approach to the health issue that the Commissioner believes is adequate to address the emergency. After taking such action, the Commissioner shall document in a report within thirty (30) days, the steps taken to resolve the emergency, the nature of the emergency, the cause and effect of this emergency, and how and why such pesticidal actions were taken. The Commissioner shall also report how the problem causing the health emergency arose and what steps and procedures the County is taking to ensure that a similar problem will not occur again;
- low toxicity pesticides used for the control of vectors capable of transmitting diseases such as the arthropod-borne encephalitis virus, as determined by the Commissioner of the County Department of Health Services;
- County-owned property leased to another party as of the effective date of this law, said exemption to apply until the expiration of such lease (exclusive of renewal periods);
- insect repellent personally applied by County employees in the course of performing County duties and/or responsibilities at County facilities; and
- pesticides used in medical treatment or practice

