

DNREC recognizes that the proposed development is in an area that already contains significant development and is in a Level 3, “Environmentally Sensitive Development Area.” But with some attention to conservation design principles, the most serious environmental impacts could have been avoided. Our concerns about the proposed “Inland Bays Community” development include the following:

- A maximum-yield site plan that eliminates much of the forestland, wildlife habitat and wetlands that make the site attractive and ecologically valuable. An environmentally sensitive design plan could protect the forested wetlands and related habitat on this site;
- Location of buildings and roads on wetlands regulated by the US Army Corps of Engineers under Section 404 of the Clean Water Act;
- Tree removal to accommodate stormwater management;
- Potential flooding created by tree removal;
- The project’s location on hydric soils that have severe limitations for development, in apparent violation of Sussex County’s building code; and
- Its location in the Inland Bays watershed, where a state regulation for nutrient reduction is in force.

Comments and recommendations by division and program follow.

Fish and Wildlife

Rare Species/Natural Communities. Our field scientists have not surveyed this project area; therefore, we are unable to provide information pertaining to the existence of State-rare or federally listed plants, animals or natural communities at this project site. In the absence of site-specific information, we offer the following comments:

This parcel contains a large area of forested wetlands which can support an array of plants and animal species. GIS data and aerial survey interpretation indicate that this forest could be a fairly mature (>50 years) example of a Red Maple-Sweetgum Swamp community and is part of a larger forest block in the near coastal area.

We have records of Cooper’s Hawk (*Accipiter cooperii*), a State-rare bird, just northeast of this site in forest contiguous with the project area. It is possible that this species also occurs on the project parcel. Cooper’s Hawk primarily nest from April to June in mature forest, but will also nest in open woodlands and forest edges.

Site Visit Request. In order to provide informed comments, our program scientists request the opportunity to conduct a survey of the property to evaluate habitat and determine the potential for species of conservation concern. Please note that our scientists have decades of experience in comprehensive survey methods. They have extensive knowledge of the flora and fauna of the state and are qualified in making species identifications. The survey will be conducted at no expense to the landowner.

Please contact Edna Stetzar at (302) 653-2880 ext. 101 or at Edna.Stetzar@state.de.us if the landowner will grant a site visit.

Forested Wetland Habitat Preservation. The proposed 3.94 acres of forest loss may be underestimated considering that this is a maximum yield site plan with most lots and infrastructure requiring tree removal. The site plan only depicts the forest remaining after initial development, not the existing forested area. Cumulative forest loss throughout the State is of utmost concern to the Division of Fish and Wildlife which is responsible for conserving and managing the State's wildlife (see www.fw.delaware.gov and the Delaware Code, Title 7). Because of an overall lack of forest protection, we have to rely on applicants and/or the entity that approves the project (i.e. counties and municipalities) to consider implementing measures that will aide in forest loss reduction.

Recommendations:

- We recommend that the applicant consider preservation of the wetland and forested resources at this site. Incentive-based programs for wildlife management are available to private landowners through our agency. Please contact Shelly Tovell at (302) 735-3600 if the landowner(s) is interested in more information.

Although leaving a forest intact is usually more beneficial to the existing wildlife and is preferential to clearing, if preservation is not going to be considered, then we offer the following recommendations which if implemented will reduce impacts to natural resources:

- A more environmentally sensitive plan could have been designed. If approved for development, we highly recommend that the site plan be reconfigured so that most of the development occurs on the west side of the parcel, specifically west of the large area of forested wetlands. This change will still result in forest removal, but access to the east side of the parcel will require tree removal, wetland filling and disturbance within 100 feet of wetlands.
- Leave at least a 100-foot buffer between wetland boundaries and lots/infrastructure and remove lots that contain wetlands. There appears to be at least 6 unit lots that contain wetlands. Buffers are an integral component of aquatic and wetland habitats, reducing the amount of sediments, pollutants, and other non-point source material that may affect the function and integrity of habitat and the condition and survivability of aquatic organisms. Upland forested wetland buffers also serve as habitat for many terrestrial species that are dependent on aquatic and wetlands habitats for a portion of their annual life cycle.
- There may be stormwater management options that do not require tree removal. We recommend the options be discussed with stormwater engineers. This is a fairly wet site and the existing trees likely function in flood abatement and erosion control. Trees take up water in their root systems for growth and survival. The root systems of trees serve to improve soil structure and enhance the infiltration of rainwater which reduces surface run-off. In addition, the leaves and branches of trees also intercept rainfall reducing erosive effects.

- To reduce impacts to nesting birds and other wildlife species that utilize forests for breeding, we recommend that clearing not occur April 1st to July 31st. This recommendation would only protect those species during one breeding season, because after trees are cleared there is an overall loss of habitat.

Nuisance Waterfowl. Wet ponds created for stormwater management purposes may attract resident Canada geese and mute swans that will create a nuisance for community residents. High concentrations of waterfowl in ponds create water-quality problems, leave droppings on lawn and paved areas and can become aggressive during the nesting season. Short manicured lawns around ponds provide an attractive habitat for these species. We recommend plantings of native plant species, including tall grasses, wildflowers, shrubs, and trees at the edge and within an adequate buffer (15-30 feet in width) around the ponds (to be planted in accordance with the Sediment and Stormwater Plan approval agency requirements). When the view of the surrounding area from the pond is blocked, geese can't scan for predators and are less likely to reside and nest in the area of the pond.

At this time, we do not recommend using monofilament grids due to the potential for birds and other wildlife to become entangled if the grids are not properly installed and maintained. In addition, the on-going maintenance (removing entangled trash, etc.) may become a burden to the homeowners association or land manager.

The Division of Fish and Wildlife does not provide goose control services, and if problems arise, residents or the home-owners association will have to accept the burden of dealing with these species (e.g., permit applications, costs, securing services of certified wildlife professionals). Solutions can be costly and labor intensive; however, with a reduction in the number of ponds, proper landscaping, monitoring, and other techniques, geese problems can be minimized.
Edna Stetzar - (302) 653-2880, Edna.Stetzar@state.de.us

Soil and Water

Sediment and Stormwater Program. A detailed sediment and stormwater plan will be required prior to any land disturbing activity taking place on the site. Contact the reviewing agency to schedule a pre-application meeting to discuss the sediment and erosion control and stormwater management components of the plan as soon as practicable. The site topography, soils mapping, pre- and post-development runoff, and proposed method(s) and location(s) of stormwater management should be brought to the meeting for discussion. The plan review and approval as well as construction inspection will be coordinated through the Sussex Conservation District. Contact Jessica Watson at the Sussex Conservation District at (302) 856-2105 for details regarding submittal requirements and fees.

Because of the parcel's location in an impaired watershed and the amount of impervious surface, green technology BMPs and low impact development practices should be considered a priority to reduce stormwater flow and to meet water quality goals.

Drainage Program. The submitted preliminary site plan depicts owner-occupied condos constructed on filled wetlands. If constructed as such, a statement should be placed on the deed informing the prospective buyers of potential drainage issues.

In periods of wet weather the wetland will expand and the surrounding ground may be too wet for normal residential use. From a drainage standpoint the site plan should be redrawn to show a 25-foot separation between the condos and wetland line.

The site plan does not show how the north-east stormwater management area will be accessed for construction or maintenance.

The Drainage Program requests that the engineer take precautions to ensure the project does not hinder any off site drainage upstream of the project or create any off site drainage problems downstream by the release of onsite storm water. The Drainage Program requests that the engineer check existing downstream ditches and pipes for function and blockages prior to the construction. Notify downstream landowners of the change in volume of water released on them.

Have all drainage easements recorded on deeds and place restrictions on obstructions within the easements to ensure access for periodic maintenance or future re-construction. Future property owners may not be aware of a drainage easement on their property if the easement is only on the record plan. However, by recording the drainage easement on the deed, the second owner, and any subsequent owner of the property, will be fully aware of the drainage easement on their property.

Sediment/Stormwater and Drainage comments provided by James Sullivan - (302) 739-9921, James.Sullivan@state.de.us

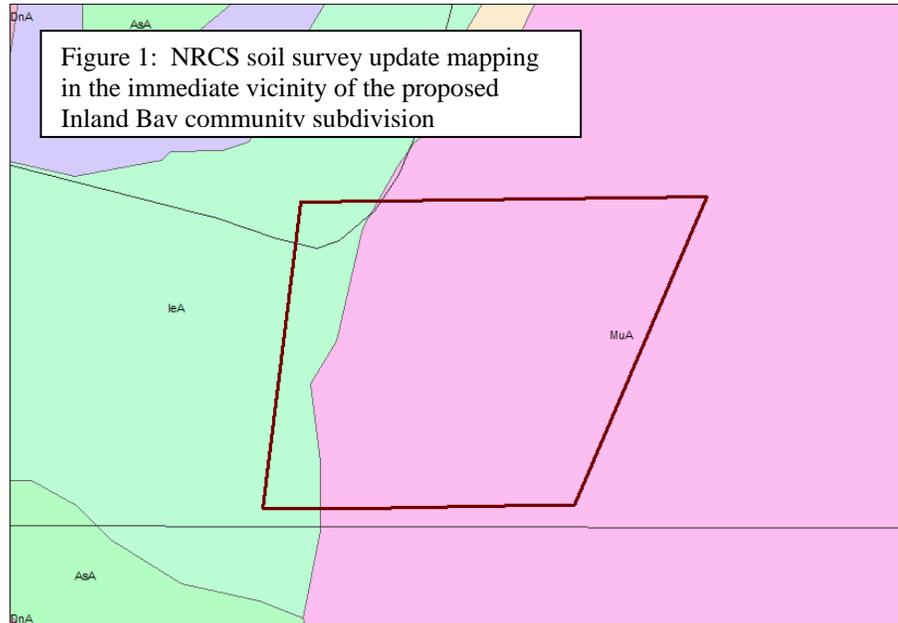
Flood Management. The site plan appears to show correctly that a majority of this site is located within a Zone X (shaded) floodplain as indicated on FEMA's FIRM panel 10005C0515J. This is considered the 500 year floodplain or 0.2% chance flood area. This floodplain area is considered a lower risk area than the 100 year or 1% annual chance flood area. Because of the wetlands on site, we recommend building to the 100-year base flood elevation on the west side of the site. *Gregory Williams - (302) 739-9921, Gregory.Williams@state.de.us*

Water Resources

Soils Assessment. Based on the NRCS soil survey update, Ingleside (IeA) and Mullica (MuA) were mapped in the immediate vicinity of the proposed construction (Figure 1). Ingleside is a well-drained upland soil that, generally, has few limitations for development. Mullica is a very poorly-drained wetland associated (hydric) soil that has severe limitations for development. Approximately 80-90% of the project area contains very poorly drained wetland associated (hydric) Mullica soils which have a seasonal high water table occurring at or near the soil surface (within one-foot of soil surface or less). Building in such soils is likely to leave prospective residents of this and adjoining properties susceptible to future flooding problems from groundwater-driven surface water ponding, especially during extended periods of high-intensity

rainfall events such as tropical storms/hurricanes or “nor’easters.” This is in addition to increased flooding probabilities from surface water runoff emanating from future created or constructed forms of structural imperviousness (e.g., rooftops, roads, sidewalks, and stormwater management structures).

Based on the Chapter 99, Section 16A of the Sussex County Code (paraphrased), lands compromised by improper drainage or flooding potential pose significant threats to the safety and general welfare of future residents and, therefore, shall not be developed. Soils mapped as Mullica fit the criterion for improper drainage or high flooding potential, and should be avoided. The Watershed Assessment Section believes permitting development on such soils would be inconsistent or counter to the above-stated regulatory guidelines in the Sussex County Code.



Wetlands. Based on the Statewide Wetland Mapping Project (SWMP) maps, palustrine forested scrub-shrub wetlands (PF01/SS3A) were throughout most of subject parcel (Figure 2).

Subaqueous Lands. A blue line water body appears to be located on the eastern boundary of the site and contours on the plan suggest another water body may be on the site. These water bodies may be regulated by the Wetlands and Subaqueous Lands Section. If any impacts are anticipated for these waterways, we suggest that the applicant request a jurisdictional determination from the Wetlands and Subaqueous Lands Section (WLS) at (302) 739-9943. Impacts to jurisdictional waterways would require a Subaqueous Lands permit. The WLS recommends that impacts to waters be avoided, if possible.

State Tidal Wetlands. There are no State-regulated wetlands on the property.

US Army Corps of Engineers Jurisdiction. The SWMP maps and the site plan indicate the presence of forested and scrub/shrub wetlands regulated by the Army Corps of Engineers (COE). Based on the site plan, the development will impact COE regulated wetlands and potentially waters of the United States. The WLS recommends that impacts to wetlands and waters be avoided or minimized. The WLS also questions whether Sussex County requires any setbacks from these wetlands.

If the impacts cannot be avoided, the applicant will need to apply for either an individual or nationwide permits from the COE. If the work requires an individual permit from the COE, or if the site is in a critical resource water, Water Quality Certification and Coastal Zone Consistency permits, issued by DNREC, may be required.

Any area of the lots within federal wetlands will be included in the total acreage of wetland impact and will affect the type of federal permit required.

Based on a review of existing buffer research by Castelle et al. (Castelle, A. J., A. W. Johnson and C. Conolly. 1994. *Wetland and Stream Buffer Requirements – A Review*. J. Environ. Qual. 23: 878-882), an adequately-sized buffer that effectively protects wetlands and streams, in most circumstances, is about 100 feet in width. In recognition of this research and the need to protect water quality, the Watershed Assessment Section recommends that the applicant maintain/establish a minimum 100-foot upland buffer (planted in native vegetation) from all water bodies (including ditches) and wetlands.

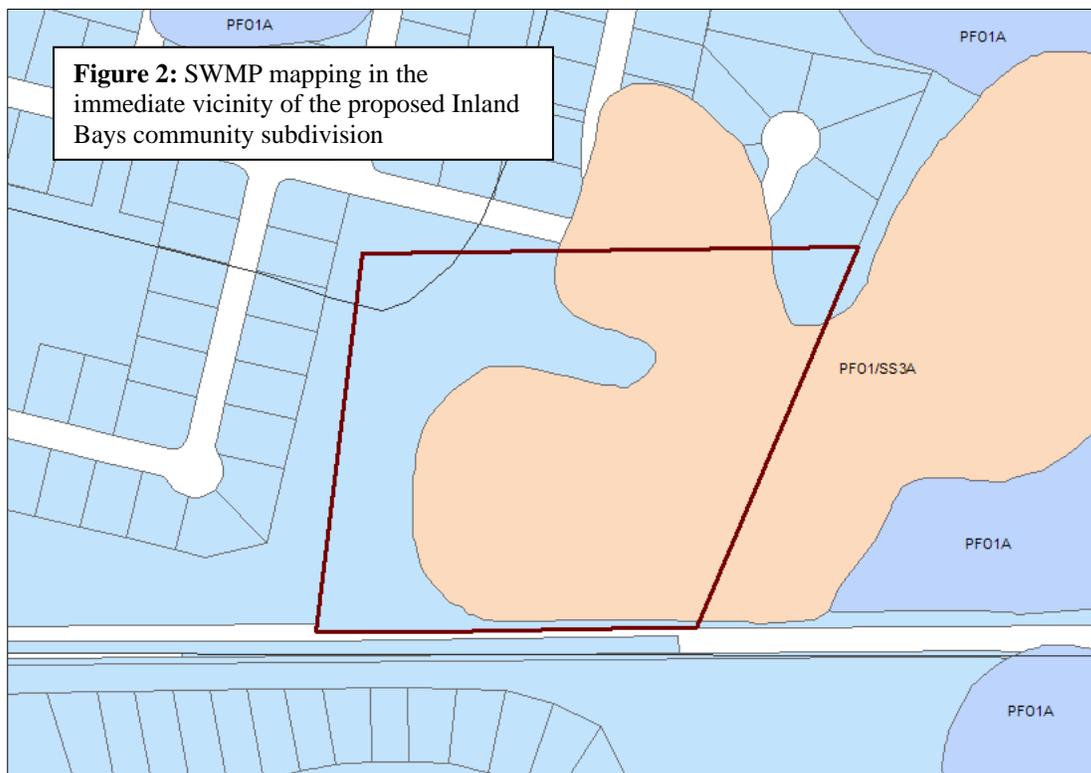


Figure 2: SWMP mapping in the immediate vicinity of the proposed Inland Bays community subdivision

Impervious Surfaces and Best Management Practices. The applicant estimates this project’s post-construction surface imperviousness to reach about 30 percent. According to the TR-55 methodology for determining impervious cover, given a townhouse development that averages 4 units/acre (gross density), impervious cover is more likely to be between 38 and 65 percent. When calculating surface imperviousness it is important to include all forms of constructed surface imperviousness, such as all paved surfaces including rooftops, sidewalks, driveways, and roads; open-water stormwater management structures and/or ponds; and community wastewater systems (if applicable); this will ensure a realistic assessment of this project’s likely post-construction environmental impacts. Surface imperviousness should be recalculated to reflect

all of the above-mentioned forms of surface imperviousness in the finalized calculation for surface imperviousness. Moreover, wetlands should be excluded from the parcel's total open space area for when calculating the parcel's total surface imperviousness.

Studies have shown a strong relationship between increases in impervious cover to decreases in a watershed's overall water quality. It is strongly recommended that the applicant implement best management practices (BMPs) that reduce or mitigate some of this project's most likely adverse impacts. Reducing the amount of surface imperviousness through the use of pervious paving materials ("pervious pavers") in lieu of asphalt or concrete in conjunction with an increase in forest cover preservation or additional tree plantings are some examples of practical BMPs that could easily be implemented to help reduce surface imperviousness.

TMDLs. Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus have been promulgated through regulation for the Inland Bays Watershed. A TMDL is the maximum level of pollution allowed for a given pollutant below which a "water quality limited water body" can assimilate and still meet water quality standards to the extent necessary to support use goals such as, swimming, fishing, drinking water and shell fish harvesting. Although TMDLs are required by federal law, states are charged with developing and implementing standards to support these desired use goals. This project is located in the low nutrient reduction area requiring a 40 percent reduction in nitrogen and phosphorus from baseline conditions. Additionally, a 40 percent reduction in bacteria is also required.

Additional nutrient reductions may be possible through the implementation of Best Management Practices such as wider vegetated buffers along watercourses (and wetlands), increasing passive, wooded open space, use of pervious paving materials to reduce surface imperviousness (i.e., pervious pavers), and the use of green-technology stormwater management technologies. A Pollution Control Strategy (PCS) is an implementation strategy that identifies the actions necessary to systematically reduce the pollutant loading rate for a given water body, and meet the TMDL reduction requirements specified for that water body. As mentioned previously, the pollutants specifically targeted for reduction in the Inland Bays watershed are nutrients (e.g., nitrogen and phosphorus) and bacteria. A variety of site-specific best management practices (BMPs) will be the primary actions required by the PCS to reduce pollutant loadings associated with nutrients and bacteria. The PCS for the Inland Bays was approved on November 11, 2008, and is now an enforceable regulatory directive.

The Department has developed an assessment tool that will help evaluate whether your proposed development meets the required TMDL nutrient reduction requirements specified by the PCS. Contact Lyle Jones at 302-739-9939 for more information on the PCS and the assessment tool.

Soils, wetlands, subaqueous lands and TMDL comments provided by Joanne Lee, Wetlands and Subaqueous Lands Section, (302) 739-9943, Joanne.Lee@state.de.us, and John Martin, Watershed Assessment Section, (302) 739-9939, John.Martin@state.de.us

Water Supply. The project information sheets state water will be provided to the project by Sussex Shores Water Company via a public water system. Our records indicate that the project

is located within the public water service area granted to Sussex Shores Water Company under Certificate of Public Convenience and Necessity 89-CPCN-02.

Should dewatering points be needed during any phase of construction, a dewatering well construction permit must be obtained from the Water Supply Section prior to construction of the well points. In addition, a water allocation permit will be needed if the pumping rate will exceed 50,000 gallons per day at any time during operation.

All well permit applications must be prepared and signed by licensed water well contractors, and only licensed well drillers may construct the wells. Please factor in the necessary time for processing the well permit applications into the construction schedule. Dewatering well permit applications typically take approximately four weeks to process, which allows the necessary time for technical review and advertising. *Ricardo Rios - (302) 739-9944, Ricardo.Rios@state.de.us*

Parks and Recreation

Natural Areas. The nine acres of forest that are currently on the site are connected to a much larger contiguous forest complex extending into the Fresh Pond Tract of Delaware Seashore State Park and is currently listed on Delaware's Natural Areas Inventory. Natural Areas contain lands of statewide significance identified by the Natural Areas Advisory Council as the highest quality and most important natural lands remaining in Delaware.

The fragmentation and loss of adjacent forested areas will negatively affect wildlife populations. Consideration should be given to protecting these resources during design and construction. The Division of Parks and Recreation would rather see the forested area on the western side of the proposed development remain as forest (a recreational amenity in its own right) rather than be removed for stormwater management or developed recreational facilities. The developer could also investigate dedicating this area as a Nature Preserve through a conservation easement or donation of land. For more information, please contact the Office of Nature Preserves at 739-9235.

Fresh Pond Tract of Delaware Seashore State Park. Aside from the recreational facilities, we appreciate the buffer between lot lines and the State's adjoining property line. This ensures that no trees will endanger homes, fences, etc. which is a common conflict when developments are built adjacent to State Parks.

Typically when developments are built next to park property, there is a demand from the residents for a pedestrian connection to the public facilities. Unfortunately, in this case, there are site limitations that preclude trail development from the proposed Inland Bays Community into the Fresh Pond Tract of Delaware Seashore State Park. *Kendall Sommers - (302) 739-9242, Kendall.Sommers@state.de.us*

Air and Waste

Air Quality. Housing developments may unnecessarily emit, or cause to be emitted, significant amounts of air contaminants into Delaware’s air, which will negatively impact public health, safety and welfare. These negative impacts are attributable to:

- Emissions that form ozone and fine particulate matter; two pollutants relative to which Delaware currently violates federal health-based air quality standards,
- The emission of greenhouse gases which are associated with climate change, and
- The emission of air toxics.

Air emissions generated from housing developments include emissions from:

- Area sources like painting, lawn and garden equipment and the use of consumer products like roof coatings and roof primers.
- The generation of electricity needed to support the homes in your development, and
- Car and truck activity associated with the homes in your new development.

These three air emissions components (i.e., area, electric power generation, and mobile sources) are quantified below, based on a per household/residential unit emission factor that was developed using 2002 Delaware data. These emissions in the table represent the actual impact the Inland Bay Community development may have.

Emissions Attributable to Inland Bays Community Subdivision (Tons per Year)

	Volatile Organic Compounds (VOC)	Nitrogen Oxides (NOx)	Sulfur Dioxide (SO ₂)	Fine Particulate Matter (PM _{2.5})	Carbon Dioxide (CO ₂)
Direct Residential	1.5	0.2	0.1	0.2	6.0
Electrical Power Generation	ND*	0.6	2.0	ND*	302.1
Mobile	2.2	2.3	0.1	0.0	1,418.6
Total	3.7	3.1	2.2	0.2	1,726.7

(*) Indicates data is not available.

Note that emissions associated with the actual construction of the subdivision, including automobile and truck traffic from working in, or delivering products to the site, as well as site preparation, earth moving activities, road paving and other miscellaneous air emissions, are not reflected in the table above.

Recommendations:

The applicant shall comply with all applicable Delaware air quality regulations. These regulations include:

Regulation 6 - Particulate Emissions from Construction and Materials Handling	<ul style="list-style-type: none"> • Using dust suppressants and measures to prevent transport of dust off-site from material stockpile, material movement and use of unpaved roads. • Using covers on trucks that transport material to and from site to prevent visible emissions.
Regulation 1113 – Open Burning	<ul style="list-style-type: none"> • Prohibiting open burns statewide during the Ozone Season from May 1-Sept. 30 each year. • Prohibiting the burning of land clearing debris. • Prohibiting the burning of trash or building materials/debris.
Regulation 1145 – Excessive Idling of Heavy Duty Vehicles	<ul style="list-style-type: none"> • Restricting idling time for trucks and buses having a gross vehicle weight of over 8,500 pounds to no more than three minutes.

Additional measures may be taken to substantially reduce the air emissions identified above. These measures include:

- **Constructing only energy-efficient homes.** Energy Star qualified homes are up to 30% more energy efficient than typical homes. These savings come from building envelope upgrades, high performance windows, controlled air infiltration, upgraded heating and air conditioning systems, tight duct systems and upgraded water-heating equipment. Every percentage of increased energy efficiency translates into a percent reduction in pollution. The Energy Star Program is excellent way to save on energy costs and reduce air pollution.
- **Offering geothermal and/or photo voltaic energy options.** These systems can significantly reduce emissions from electrical generation, and from the use of oil or gas heating equipment.
- **Providing tie-ins to the nearest bike paths and links to any nearby mass transport system.** These measures can significantly reduce mobile source emissions.
- **Funding a lawnmower exchange program.** New lawn and garden equipment emits significantly less than equipment as little as 7 years old, and may significantly reduce emissions from this new development. The builder could fund such a program for the new occupants.

Additionally, the following measures will reduce emissions associated with the actual construction phase of the development:

- **Using retrofitted diesel engines during construction.** This includes equipment that are on-site as well as equipment used to transport materials to and from site.
- **Using pre-painted/pre-coated flooring, cabinets, fencing, etc.** These measures can significantly reduce the emission of VOCs from typical architectural coating operations.

- **Planting trees at residential units and in vegetative buffer areas.** Trees reduce emissions by trapping dust particles and by replenishing oxygen. Trees also reduce energy emissions by cooling during the summer and by providing wind breaks in the winter, whereby reducing air conditioning needs by up to 30 percent and saving 20 to 50 percent on fuel costs.

This is a partial list, and there are additional things that can be done to reduce the impact of the development on air quality. The applicant should submit a plan to the DNREC Air Quality Management Section which address the above listed measures, and that details all of the specific emission mitigation measures that will be incorporated into the Inland Bay Community development. Air Quality Management Section points of contact are Phil Wheeler and Deanna Morozowich, and they may be reached at (302) 739-9402. *Deanna Morozowich - (302) 739-9402, Deanna.Morozowich@state.de.us*

Hazardous Waste Sites. DNREC's Site Investigation and Restoration Branch (SIRB) has reviewed the proposed project. No SIRB sites or salvage yards were found within a ½-mile radius of the proposed development. However, based on the previous agricultural use of the proposed project site, which may have involved the use of pesticides and herbicides, SIRB recommends that a Phase I Environmental Site Assessment be performed prior to development. In addition, should a release or imminent threat of a release of hazardous substances be discovered during the course of development (e.g., contaminated water or soil), construction activities should be discontinued immediately and DNREC should be notified at the 24-hour emergency number (800-662-8802). SIRB should also be contacted as soon as possible at 302-395-2600 for further instructions. *Krystal Stanley - (302) 395-2644, Krystal.Stanley@state.de.us*