Hampshire Country Club Planned Residential Development Village of Mamaroneck, Westchester County, New York Final Environmental Impact Statement

U Pest Management Plan



BEST MANAGEMENT PRACTICES FOR NEW YORK STATE GOLF COURSES



Integrated Pest Management (IPM) involves the combination of plant selection, cultural practices, pest and environmental condition monitoring, biological controls and judicious pesticide use to manage pest controls. A successful IPM Plan permits the existence of pest species at a level which will not compromise vegetative health. The implementation of regular maintenance strategies and cultural practices will facilitate the provision of optimum turf growing habitat with minimal chemical interference. Monitoring of environmental conditions will allow professionals to recognize a threshold at which chemical application is necessary to maintain acceptable turf grass and playing conditions. In the event that regular maintenance techniques fail to control pest species, treatment of infested or damaged areas along with similar areas susceptible to the same pest or disease would be initiated.

Fertilizer application can be minimized by manipulating the growing environment to retain the fertilizers in the root zone for sufficient periods. An optimal growing environment can be achieved through course design, use of acceptable turf grass and soils, and a dedicated maintenance program which ensures adequate environmental conditions persist.

Scouting practices will occur regularly to monitor pest presence and other turf stressors throughout the growing season. Regular records will be kept in order to document patterns, successes and failures.

10.1 CULTURAL PRACTICES

Almost every aspect of golf course management affects the likelihood and severity of pest problems. Although practices required for playability sometimes supersede the optimal IPM choice, manipulating cultural practices should be a key part of an IPM approach. As such, the appropriate implementation such practices have the potential to encourage environmental protection through the conservation of water and minimization of chemical application.

10.1.1 Mowing

Mowing is a basic yet important cultural practice that can greatly influence turf growth and environmental conditions. The Hampshire Country Club Superintendent will be well-educated in the most effective and modern innovations in mowing equipment, height, frequency, techniques, and patterns that can be put in practice to produce optimal turf and environmental conditions that are favorable to reduce the need for fertilizer and pesticide application. For example, Verticutting of fairways is a practice that not only provides healthier grass but also increases the effectiveness of introduced pesticides. By applying pesticides more efficiently, the amount of chemicals utilized will be reduced. Such innovative practices will be implemented to the greatest extent practicable.

10.1.2 Tree Removal and Trimming

Trimming selected trees will increase sunlight and air circulation in the turf. Excessive shade and poor air circulation not only weakens turf grass but are directly correlated with the occurrence of increased rates of disease. When the factors that enhance and contribute to turf grass disease are controlled, pesticide application is reduced.



10.1.3 Plant Conditioning

Enhancing the preventative maintenance program through an effective equipment replacement schedule will allow the turf grass to be mowed and maintained more efficiently on a daily basis. Therefore, the grass will require less fertilizer to maintain adequate growing conditions and color. For example: maintaining sharp and accurately adjusted mowing blades assists in maintaining healthy plant tissue and roots. Grass mowed by dull blades incurs significant damage due to tearing, which leaves open wounds, invites disease, and leads to shorter root systems. Damaged turf also attracts more insects and is more susceptible to cart traffic damage. Unhealthy turf will not assimilate available fertilizer and water as well as healthy turf.

Other plant conditioning involves mowing frequency. When grass is allowed to grow without frequent mowing, it suffers severe damage when finally mowed. General industry practice does not allow more than 25% of the aboveground plant to be cut at any one time. Without a proper equipment maintenance program, this would not be possible.

10.1.4 Controlling Cart Traffic

Soil compaction due to cart activity may result in poor oxygen and gas exchange, restricted water percolation and increased runoff (loss of natural irrigation potential), reduced infiltration of fertilizer / limited fertilizer effectiveness, increased weed germination, thinner, less healthy turf. In order to prevent damage and an increased need for chemical application, adequate cart paths will be maintained throughout the course and cart traffic will be controlled.

10.1.5 Drainage Improvement

Installation of drainage and sump systems throughout the course will improve drainage and decrease soil compaction and increase turf health.

10.2 COMPREHENSIVE SOIL TESTING

Through periodic soil testing an accurate prediction of turf fertility needs will prevent application of excess fertilizer. This will promote a healthier turf environment and minimize the application of fertilizers. A healthier plant (not too weak and not too lush) will require fewer pesticide applications. Specific pH testing will provide amendment recommendations that balance the soil to facilitate proper fertilizer usage.

10.3 CHEMICAL TECHNICIAN TRAINING

Chemical technicians will be required to obtain their New York Commercial Pesticide Applicator license. Certification and continual education programs will be emphasized for personnel associated with chemical application. The dedicated use of U.S. Environmental Protection Agency (EPA), and New York State Department of Environmental Agency (NYCEC)-approved chemicals and adherence to their proper method of application will be strictly observed.

10.4 IMPROVED IRRIGATION APPLICATION

A computerized irrigation system is used to enhance irrigation applications and will also aid in system optimization, reducing pesticide usage, fertilizer applications, power costs, water usage, and manpower. Reduced water usage will result in decreased soil compaction, fertilizer leaching, disease susceptibility, weed populations, and insect populations. Irrigation will occur only when necessary to provide the turf grass with an acceptable growing environment.



10.6 PEST THRESHOLD TOLERANCE LEVELS

When it is determined through scouting that a pest level has reached the threshold to cause unacceptable damage or turf loss action will be taken. The threshold levels used to make this determination have either been determined scientifically or are based on site specific experience.

To avoid unacceptable damage or loss multiple cultural, mechanical, and biological management methods will be used. Chemical control is reserved as a last option, and only used when other methods are insufficient for maintaining acceptable turfgrass quality and playability.

When chemical control is warranted, scouting and past management successes often allow for early intervention, which may result in the use of lower toxicity treatments. The course superintendent will consider all options and select the least disruptive, but effective option.

10.7 SEASONAL PESTICIDE APPLICATION

Timing is one of several critical factors that reduce pesticide applications and achieve maximum results. Seasonal pesticide applications will be directed toward the eradication of pests having season-specific turf impacts. The primary aspect of application will be dedicated to high impact areas. By targeting stressed turf locations, chemical applications will be limited to a specific location.

10.8 PESTICIDE APPLICATION TECHNIQUES AND ROTATION

Calibration and rotation of pesticide use is critical in obtaining maximum results from each chemical application. Miscalculations of pesticide quantities utilized may result in turf and environmental damage and may promote genetic pesticide tolerance(s) in pest populations. Proper rotation of pesticide(s) can significantly reduce the opportunity for a pest to genetically achieve chemical resistance to future generations. Altering the pH of the carrying agent can also dramatically increase the individual pesticide's effectiveness. For example: organophosphate effectiveness is reduced in high pH water. Tests have shown that adding citric acid to the water, which lowers the pH, can increase the pesticide's effectiveness as much as 30%-50%.

Catagory Name	Company Name	Product Name	Unit
Fungicide	Prime Source LLC	Curalan EG	LB
		Honor	LB
		Lexicon	GAL
		Xzemplar	GAL
	Bayer	26-GT	GAL
		Banol	GAL
		Bayleton Flo	GAL
		Chipco 26019 Flo	GAL



Catagory Name	Company Name	Product Name	Unit
Fungicide	Bayer	Chipco Signature	LB
		Interface Stressgard	GAL
		Signature Xtra Stressgard	LB
		Tartan	GAL
	Growth Products	Companion	GAL
	Lesco / Site One	Manicure Ultra	LB
		T-storm Flowable	GAL
	NuFarm	Strider	GAL
		Transom 4.5 F	GAL
	Phoenix	Dovetail	GAL
		Raven	GAL
		Wingman 4L	GAL
	Prime Source LLC	Chlorothalonil 82.5DF	LB
	Quali-Pro	Chlorothalonil DF	LB
		Enclave	GAL
		Mefenoxam 2 AQ	GAL
		Propiconazole 14.3	GAL
		Strobe 2L	GAL
		Strobe T	GAL
		Tebuconazole 3.6F	GAL
		TM 4.5	GAL
	Sipcam Advan	Echo Ultimate T&O	LB
	Syngenta	Appear	GAL
		Daconil Action	GAL
		Daconil Ultrex	LB
		Heritage	LB
		Heritage Action	LB
		Instrata	GAL
		Secure	GAL



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Catagory Name	Company Name	Product Name	Unit
Growth Regulator	Bayer	Proxy	GAL
	Quali-Pro	Ethephon 2 SL	GAL
		Pac-Low	GAL
		Tide Paclo 2SC	GAL
		T-NEX	GAL
		T-Nex 1 AQ	GAL
	Valent	ProGibb T&O	GAL
	Total		
Herbicide	Bayer	Acclaim Extra	GAL
		Specticle Total	GAL
	Dow	Dimension Ultra 40 WP	LB
	Gowan Company	Sedgehammer	LB
	Loveland	Kleenup Pro	GAL
		Rifle	GAL
	NuFarm	Prosedge	LB
		Prosedge 2	LB
		Sureguard SC	GAL
	PBI/Gordon	Bensumec 4LF	GAL
	Quali-Pro	3-D	GAL
		Dithiopry 40 WSB	LB
		Quinclorac 1.5L	GAL
	Syngenta	Pennant Magnum	GAL
		Tenacity	GAL
	Total		
Insecticide	Lesco / Site One	Bandit 2F	GAL
	Phoenix	Hawk-I 75WSP	LB
	Quali-Pro	Bifenthrin Golf & Nursery 7.9F	GAL
		Chlorpyrifos 4E	GAL
		Imidacloprid 2F	GAL
		Imidacloprid 75WSB	LB
		Lambda GC-O	GAL
	Syngenta	Provaunt Ins.	LB
	Total		



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10.9 PESTICIDE RECORDKEEPING

In accordance with New York regulations, records of all pesticide applications will be made within two (2) working days of the application and maintained onsite. Records will be made available upon request to NYDEC representatives, USDA authorized representatives, and licensed health care professionals. An annual pesticide report will be submitted to the NYDEC in accordance with state law. In addition, records of all pest control activity, past infestations, or other problems will be maintained on site in order to provide guidance in selecting future courses of action.

10.10 BIO-STIMULANTS AND BIOLOGICAL CONTROLS

A continuous program to provide natural alternatives will be implemented and refined in response to turf grass conditions on the course. These programs will include, but will not be limited to, the following:

10.10.1 Bio-Stimulants

Bio-stimulants are used to improve the health of the soil, increase microbial activity, and improve the cation exchange capacity. The desired result of these sources would be to provide the soil with an increased ability to store nutrients, filter pesticides, and increase the proficiency of the turf grass in assimilating fertilizers and water.

10.10.2 Biological Controls

The inclusion of naturally occurring desirable pests will be used, where practical, to provide an alternative to chemical pesticides. Proper use of such natural organisms will be monitored in order to ensure attractiveness and appropriateness.

10.10.3 Grass Carp

Lake maintenance programs may include the stocking of sterile triploid grass carp to reduce the necessity for lake maintenance chemicals.

10.11 FERTILIZER SELECTION

The use of slow-release fertilizers will be implemented. Two benefits for the use of such fertilizers include:

- a. By definition, slow-release fertilizers provide for little or no nitrate leaching.
- b. Turf grass growth is moderated throughout the period of release.

The objective of the fertilizing program on this course is to provide a healthy turf through effective management. It is the intent of the operator to maintain a verdant turf environment. This will allow for a healthy turf system while maintaining course integrity.

Company Name	Product Name	Unit
Aquatrols	Blast	GAL
	Dispatch Sprayable	GAL
	Primer Select	GAL
	Radiance	GAL
	Revolution	GAL
	Company Name Aquatrols	Company NameProduct NameAquatrolsBlastDispatch SprayablePrimer SelectRadianceRevolution



Catagory Name	Company Name	Product Name	Unit
Adjuvant	Aquatrols	Pervade	GAL
	Loveland	LI-700	GAL
		Revert	GAL
	Syntech	Eximo	LB
	Total		
BioStimulant	Floratine	Per 4 Max	GAL
	Turf Fuel	Respo Fuel	GAL
	Total		
Fertilizer	Earthworks	Replenish 5-4-5 GG	LB
	Floratine	P-48	LB
		Trical 35-SP	LB
	Grow Star	18-24-12 Starter	LB
	Growth Products	28-0-0	GAL
		Cal Mag 7-0-3	GAL
		Classic 18-3-6	GAL
		Iron Max AC 6% 15-0-0	GAL
		Restore	GAL
		Sodium Knockout 5-0-0	GAL
		ТКО	GAL
		TKO Phosphite 0-29-26	GAL
		X-Xtra Iron	GAL
	Lesco / Site One	20-20-20	LB
	Loveland	12-24-14 SIG 30%XCU	LB
		18-0-18 SIG 75% BCU	LB
		Feature Pro LQ	GAL
		Prospect	GAL
		Signature 0-0-50 Duration	LB
		SST Calcium	GAL
	Nutrite	17-0-17	LB
	Ocean Organics	NuRelease	GAL
	PBI / Gordon	Ferromec	GAL



Catagory Name	Company Name	Product Name	Unit
Fertilizer	Plant Food Co	10-10-10 Blu-Gro	GAL
		16-2-7	GAL
		18-3-4	GAL
		Adams Earth biostimulant	GAL
		DKP Extra 4-20-22	GAL
		Micro Mix	GAL
		Phosphite 30	GAL
		PHusion Calcium Sulfate	LB
		Sugar Cal 10%	GAL
	Sanctuary	12-0-12	LB
	Turf Fuel	Element 6	GAL
		Lessen 11	GAL
	Total		
Soil Catalyst	Floratine	Calphlex	GAL
	Growth Products	Essential Plus	GAL
	LidoChem	Exalt	LB

10.12 TURF GRASS SELECTION

The varieties and cultivars of turf used on the golf course will be continually evaluated. As new varieties with improved disease or insect resistance come to market they will be included in future overseeding practices. Furthermore, cultural and chemical practices will be used to promote the proliferation of desirable varieties, reducing the overall need for pesticide use in the future.

10.13 ONSITE WEATHER STATION

A weather station is used on-site to provide accurate records and allow the management of pesticides, water, and fertilizers to occur more efficiently. Weather information for the course is publicly available and is hosted on the Weather Underground website. Weather data for the golf course can be found by searching for the Orienta KNYMAMAR11 weather station.



11.1 STORAGE

Pesticides will be stored in a separate IPM Control Center. The IPM Control Center consists of a chemical storage building that will not rust and does not require routine painting. Pesticides will be stored within this structure; the building will be locked and posted as required. The chemical storage building has a solid flooring system, as opposed to a grated flooring system, to allow for easier clean up in the event of a spill and reduces the possibility of cross contamination of spilled chemicals. The wiring is moisture proof, and smash guards cover the incandescent light fixtures. An emergency eyewash and shower will be located on site. An emergency spill response kit, fire extinguishers, protective clothing, respirators, and first aid supplies are kept in an accessible area immediately inside the facility.

11.2 HANDLING AND APPLICATION

Prior to handling pesticides, applicators will be given manufacturers label sheets that include warnings and precautions on the use, mixing, and disposal of the chemical. Based on the type and nature of the chemical being used, adequate hand, eye, and face protection will be used, as well as protective clothing, rubber boots, and respirators. Applicators will be given instructions on the proper use, handling, mixing, and application of all chemicals used in the facility. Compatibility and adjuvant will be checked and determined based on the manufacturer's recommendations. Only enough chemical will be mixed for each application that can be used in the area to which it will be applied.

11.3 DISPOSAL

Empty chemical containers will be disposed of in accordance with the manufacturer's recommended instructions. When a chemical has an expired shelf life, disposal will occur as recommended by the manufacturer, supplier, or the NYDEC. Their recommendations will be followed in disposing of such chemicals and their empty containers.

11.4 RECORD KEEPING

Records of al chemicals purchased, used, and applied will be in accordance with local and state regulations. The purpose of such record keeping will be to verify proper use, comparative analysis of results of applications, and to facilitate the discovery of errors in application, mixing, or proper use.

