Organic Turf Management Plan

Introduction

The following Organic Turf Management Plan has been prepared by Vineyard Golf Partners LLC pursuant to the Martha's Vineyard Commission ("MVC") Decision for the proposed Vineyard Golf Club ("VGC") dated July 8, 1999 (the "MVC Decision"). Condition 1(c) of the MVC Decision states:

> *That the Applicant shall develop an organic management plan and that said management plan shall be submitted to the full Martha's Vineyard Commission for consideration and approval...*

The term organic, as defined in the previous condition of the MVC Decision, is "derived from plant materials or biological organisms or mined from natural deposits". Accordingly, in addition to describing construction and operational strategies to maintain acceptable turf quality, this organic management plan presents information relative to those organic compounds which may be used in conjunction with mechanical and biological turf management practices.

The developer has publicly committed to permitting authorities and the Island community that the developer will "raise the bar" in environmental golf course management, design and construction. Specific strategies to meet this goal are described by the text that follows this introduction. This proactive stance builds upon an increasingly widespread understanding of potential cumulative effects of golf course management and a subsequently higher tolerance on the part of golfers for turf which has optimal surface texture, but which may not be emerald green. Further, to meet the demand for environmentally responsible golf courses, several golf professionals have focused their practice on low-impact design and turf management strategies, and such noted professionals have been retained by the developer to ensure that environmentally sound practices are fully incorporated into the Vineyard Golf Club, rather than applied 'after-the-fact'.

This Organic Management Plan is presented under four subheadings:

- Planning and Design Strategies,
- Construction Techniques,
- Grow-in Program, and
- Established Turf Maintenance.

A. Planning and Design Strategies

VGC has been sited on a 235 acre parcel which, relatively speaking given the geology of Martha's Vineyard, is removed from areas adjacent to significant surface waters. Further, the VGC proponents specifically selected the "Vineyard Acres II" planned subdivision, recognizing that single ownership of the 235 acre parcel, coupled with the present organic management plan, would have less impact on water quality and native flora than 148 individually-owned and 'managed' houselots.

In addition to thoughtful siting of the golf course, the VGC routing plan has been developed by the Donald Steel Company, Ltd., a British golf design firm noted for their low-impact approach. Donald Steel has designed numerous courses, and was the first golf course architect permitted to work at St Andrew's in Scotland in 50 years (a golf course "that owes more to the hand of God than that of man,...). The links golf courses that Donald Steel's practice focuses on are all low impact type courses that feature vast windswept areas of native grasses that have traditionally relied more on Nature than nitrogen to enhance their layouts.

To further improve upon the sensitivity of the golf course design, VGC has also retained Wild Side Golf Management & Consulting Inc., the president of which, Jeff Carlson, has personally received both regional and national awards for his environmental stewardship. In 1995 Mr. Carlson was nominated by the Brewster Conservation Commission for the Massachusetts Environmental Award in Rare Plant Habitat Management; in 1998 Mr. Carlson was the first New England National Environmental Steward award winner for his work at the Widow's Walk Golf Course in Scituate, Ma. Mr. Carlson is part of a national golf course evaluation team put together by the Utah based Center for Resource Management (a Robert Redford organization dedicated to finding common ground between the golf industry and national environmental groups). Finally, Mr. Carlson has recently contributed to an article about Widow's Walk that appeared this spring in the Massachusetts Audubon magazine. Mr. Carlson has played an integral role in the numerous iterations of the VGC routing plan, and will continue to serve as Project Manager during the construction and initial operation of the golf course.

Subsurface Drainage Considerations and Soil Specifications

Due to the excessively well-drained nature of the Carver soils which are predominant throughout Martha's Vineyard and on the VGC site, the single most important aspect of working with these highly droughty subsurface conditions is to lessen their porosity.

In accordance with the "MVC Decision Conditions" and project commitments, no native soils will be removed from the site, and the course has been designed to work with existing topography, thus reducing the extent of earthwork and resultant changes in drainage patterns. As a relatively flat site and given the commitment to work with existing topography, construction of the golf course will not substantially alter surface

drainage patterns on the site. As previously stated, the well-drained soils have led the VGC design team to develop means to retard drainage, which will be accomplished by supplementing the native sandy soils with organic compost. The compost will improve soil structure; nutrient circulation and disease resistance without compromising the natural drainage and compaction resistance characteristic of sand based greens. In addition, greens will be treated in the pre-plant stage with a granular seaweed extract and natural organic fertilizer to improve germination rates.

In-situ soils will be tested upon completion of clearing activities, and rates of application of the compost supplement will be determined based upon the results of soil analyses. The compost product (All-gro) meets all EPA "Exceptional Quality" standards.

Construction Techniques

During the clearing process, all root balls will be removed by excavators rather than root rakes in an effort to save more of the topsoil. Topsoil will be removed with bull dozers rather than "pans" again in an effort to maximize topsoil retention. Existing topsoil will be combined with ground-up forest litter in order to increase the volume and enhance the micro-nutrient characteristic of the soil. This soil will then be stockpiled and screened at each golf hole. This two step process mimics the oxygenation process essential to the development of compost.

All greens mix will be blended so that a uniform distribution of sand and peat will occur throughout the soil profile. Beneath this mix will be a 4" layer of specifically sized pea stone thereby allowing the available water to perch and flush in a manner consistent with proper soil aeration and efficient use of water and nutrients.

Irrigation will be designed with individual head control, a component of full and part circle sprinkler heads for precise watering patterns and each head will have specially designed low-trajectory nozzles to maximize coverage in the wind. In addition the entire system will be driven by a central computer for maximum efficiency and attached to weather stations capable of developing site specific evapo-transpiration rates to further enhance operational efficiency.

The topsoil will only be spread immediately prior to seeding in order to minimize any possibility of runoff. Particular attention will be paid to weather events and any seeding or topsoil spreading will be halted in the event that tropical rains are forecasted.

Seeding will be at the recommended rates and spread with a brillion type spreader that ensures good soil-seed contact. Futerra matting will be used extensively in the late fall and/or early spring. Seeding will begin in early September; greatly reducing competition from weeds, reduced water consumption and reduce disease pressure.

Grow-in Program

Because a golf course is grown in once, special techniques are used during this time period. In New England the most successful grow-in period begins in late summer and ends in mid to late fall. As outlined previously in the seeding section, late summer grow-in avoids many of the climactic pressures of summer heat and humidity that would necessitate extensive chemical applications to protect seedling grasses from disease, insect and weed development. In addition, by September the less direct angle of the sun and shorter day decreases the demand for irrigation.

During grow-in the turfgrass must be continually damp until the seeds have germinated. Irrigation is gradually lessened as the plants root and shoot systems mature. The management of water is the single most critical step in a successful grow-in program. By scheduling the grow-in at VGC in the late fall, water demands will be minimized.

As with irrigation, fertilizer techniques are customized to the grow-in time period. Seedling plants require a 1:1:1 balance of Nitrogen (N), Phosphorus (P) and Potassium (K) during grow-in. The applications are frequent (weekly) and light (1/4 to ½ #/ M). Unlike the irrigation cycle these post planting applications do not begin until after significant germination has taken place. Natural organic fertilizers are uniquely suited granular products for grow-in because they can be applied evenly in very small amounts. Synthetic organic and slow release fertilizers have such high concentrations of nutrients that it is not practical to apply them at less than ½ #/M rates. Excessive application of nutrients before a thatch layer has developed in the turf is the primary cause of nitrate nitrogen leaching.

Established Turf Maintenance

Given carefully designed and constructed tees, greens, and fairways, maintenance of playing surfaces will consist primarily of occasional fertilization, routine mowing, irrigation as needed (based upon climatic factors, rather than pre-set time intervals), and monitoring and spot treatment of pest and disease incidences.

1. Fertilizer Application

Natural organic fertilizers will be applied to the greens and fairways on an as-needed basis with the yearly total not exceeding 3 lbs. per thousand square feet per year. The superintendent will monitor soil temperatures and match those with the historical growth stages of the turfgrass to determine exactly when to apply fertilizer. But as a general rule he or she will follow this guideline.

- One-half pound of Nitrogen in the spring (one application total).
- One-half pound of Nitrogen in the summer (two to four applications total).
- One pound of Nitrogen in the fall (two applications total).

The spring application will not be made until soil temperatures are optimum for nutrient uptake. Because of the moderating effect of the surrounding ocean, it can be assumed that these applications will not be made until late May.

Because of their low nutrient (N,P,K) analysis, Natural organics can and will be applied at extremely low rates throughout the growing season (1/8 and ¼ pound rates will be the norm.) Natural Organic fertilizers have a high organic matter content that stimulates microbial activity and enhances nutrient holding capacity in new, somewhat infertile soils characteristic of this site. Application of natural organics with the intention of building soil structure and root mass, will be the primary component of the fall fertilization program.

Examples of types of fertilizers:

- Pro-Gro- distributed by North Country Organics
- Nature Safe- distributed by Turf Partners
- Sustane - distributed by Lesco
- Milorgonite- distributed by Lebanon Industries

2. *Mowing Schedule*

Outlined below is a mowing schedule for turfgrass during the peak growing season (summer). As a general rule mowing schedules in the shoulder seasons (spring and fall) operate at 50% of the summer schedule ramping up from once per week to daily on some areas.

Greens: Greens are the most intensively managed areas on the course. They will be mowed daily during the summer at 1/8" (0.125) with clippings removed and composted.

Tees: Tees will be mowed four (4) times per week at 1/4-3/8" (0.250-0.3750) with clippings removed and composted. This composted mix will be reused on the tees to repair and reseed areas damaged by play.

Fairways: Fairways will be mowed two to three (2-3) times per week at 3/8-9/16" (0.375-0.562"). Fairways will be mowed when the grass is dry (no dew) and clippings will be returned to the turf in order to promote thatch development. Fairways will be mowed less frequently and maintained at the higher height of cut during the shoulder seasons. This technique will result in lower water and fertilizer use as more shoot tissue and its related nutrients are available to the plant.

Roughs: Rough areas adjacent to the fairways will be mowed weekly at a height of two inches (2"). Clippings will be allowed to return to the turfgrass in order to develop thatch. The rough areas beyond that will be mowed once per season. These hay-like areas will receive very little irrigation and nutrient and provide a transition to the native areas.

Native/ Wild Grass Areas: These areas, when matured, will be mowed at the most once per year, the time of said mowing to be determined in consultation with Sheriff's Meadow. For the first two or three seasons these grasses will not be mowed at all to allow for full establishment. These areas will not receive any irrigation or nutrient applications.

3. *Monitoring and Spot Treatment of Insects, Disease, and Weed Infestations*

a.) Scout for insects, disease and weed occurrences and only treat when infestation exceeds established thresholds:

The Vineyard Golf Club will incorporate forecasting tools into its IPM plan that will identify factors contributing to disease pressure. We will locate areas of the course that have high disease susceptibility (e.g., low areas with poor air circulation, high water

retention or limited sun.). Finally we will scout these areas daily looking for early stages of the insects, diseases, and weeds.

b.) Use cultural practices as first line of defense:

Mowing: To the extent practicable, VGC will only mow turf when it is dry and return clippings to the thatch. Clippings will only be removed at the greens, and will be incorporated into compost at the Turf Maintenance complex.

Verti-cutting: This will be done to the thatch to allow for the incorporation of topdressing and to thin the thatch.

Aerifying: This process will be done on an annual basis to remove thatch, decrease compaction and relieve anaerobic layering.

Topdressing: This process is the incorporation of a mixture of sand, soil amendments and compost into/or below the thatch layer of the turfgrass.

c.) Incorporate soil amendments if warranted:

Many of the potential soil amendments to be used in the event of insect, disease, or weed infestation (refer to list below) will be incorporated during construction and grow-in of the golf course and in subsequent cultural practices such as aerification and topdressing. Some of these amendments are microbes that attack fungi in the soil.

d.) Spot Application of Organic Compounds for Insects and Diseases:

In the event that mechanical and cultural practices have not satisfactorily arrested incidences of insects and diseases, VGC will spot treat, with organically derived pesticides, effected turfgrasses for fungus diseases and insect damage. Our first and primary line of defense against all these turfgrass problems is through proper water and nutrient management. By judiciously applying fertilizer and watering thoroughly but infrequently we will minimize disease pressure.

Organically derived fungicides will be used only after the disease has gone beyond established thresholds.

Organically derived insecticides will be applied to infected areas only after insect damage has exceeded observed thresholds.

The Vineyard Golf Club will not apply any herbicides for weed control.

4) Reseeding or Sodding of Severely Infected Areas.

In the event of a severe disease outbreak and subsequent damage from a fungus disease, insect damage or weed encroachment, the Vineyard Golf Club will re-sod or seed the

areas with turf from its nursery. We will develop nursery areas at the turf management building site and the driving range for each of the grass species used for playing surfaces.

5) Selected Product Information

Soil supplements:

- Sand-Aid- distributed by Turf Partners
- All-Gro- distributed by Read Sand and Gravel
- North Country Compost- distributed by North Country Organics
- Gypsum- distributed by North Country Organics
- Sulfur- distributed by North Country Organics
- Recharge- (microbial stimulant)- distributed by Ecosoils Systems Inc.
- Spot-less- (biological product)- distributed by Ecosoils Systems Inc.

Organically derived **Insecticides:**

- Milky Spore Powder- distributed by North Country Organics
- Neem- distributed by The Scott's company

Organically derived **Fungicide:**

- VGC will submit an approved list of organically derived fungicides to the MVC Review Committee.

Examples of **Herbicides:**

- VGC will not use any herbicides.

Vineyard Golf Club Grassing Plan

11/1/00

Greens:	A-1 Creeping Bentgrass	
Tees:	Southshore Bentgrass-	50%
	L-93 creeping Bentgrass-	50%
Fairways:	SR 5100 Chewings Fescue-	50%
	SR 7100 Colonial Bentgrass-	25%
	L-93 Creeping Bentgrass-	25%
Roughs:	SR 5100 Chewings Fescue-	20%
	SR 3100 Hard Fescue-	20%
	Award Kentucky Bluegrass-	15%
	Odessy Kentucky Bluegrass-	15%
	Reliant Hard Fescue II	15%
	Jamestown II Fescue	15%
Native:	Little Bluestem	