



Golf and the Environment: Guidelines for the 21st Century

***The United States Air Force
Golf course Environmental
Management (GEM) Handbook***

January 2008

**Planning & Compliance
Section**

This Handbook is a slightly revised version of the 2006 Comprehensive Golf course Environmental Management (GEM) Planning booklet written and copyrighted by William H. Bushman/Ecodesigns.

San Antonio, Texas



Combine the natural beauty of Kauai with Jack Nicklaus' design expertise and you get the awesome Kiele Course.

Environmental Compatibility Categories

Many diverse and complex aspects of golf course management have been revealed through the literature search conducted to compile this study. In order to simplify the process, these aspects have been summarized into eight main topics and incorporated into five distinct environmental compatibility categories.

- Planning & Compliance
- Operations & Maintenance
- Water Resource Management
- Conservation
- Pesticides & Pollution Prevention

The environmental compatibility quotient (ECQ) checklists have been compiled from several sources (Audubon International, 2000) (AFCEE, 2001) (Smart, et al, 1999). The ECQ checklists represent the best method currently available to determine the actual relative environmental compatibility of a golf course's management practices. The ECQ checklists can be completed through interviews with the golf manager and the golf course superintendent, a professional examination of the course's golf course management process, and review of the available environmental or planning documents.



Eagle Creek Golf Course, Dover AFB, DE

Planning & Compliance

In an interview, Jimmy Thomas, CGCS, environmental award-winning superintendent at Hyatt Hill Country Resort in San Antonio, Texas, stated, “Although daily maintenance practices are important, in regards to the potential for negative environmental impacts, the most significant overall issue is planning” (2003). Audubon International (Mackay, 2001) lists the following benefits of golf course environmental planning:

- “Coordinates environmental management activities
- Illustrates how conservation activities complement one another
- Paves the way for improved property management
- Facilitates communication about environmental stewardship
- Helps managers set goals and objectives
- Provides a means to evaluate progress”

Another reason superintendents should plan “is to balance the demands of golf with their responsibility to the natural environment. The resulting plan will help safeguard the quality of the environment and responsibly care for the water, land, and wildlife habitats upon which the course is sustained” (Mackay, 2002).

Successful, experienced superintendents are keenly aware of these issues and prepare required documents, reports, permits, and etc. well in advance of their submittal deadlines. Additionally, actions that may be inherently risky to the health and welfare of their customers and the environment should receive special attention from the superintendent. Water quality sampling reports, water use permits, storm water detention requirements, easements, spill plans, and pesticide use permits are just a few of the potential compliance issues facing today's golf course superintendent (Beard, 2002).

How can the superintendent possibly stay in compliance? A good question says Rory Cox, superintendent at Shaw Air Force Base's Carolina Lakes Golf Course in Sumter, South Carolina. "Not so long ago we had a lot of help from our engineering staff and few, if any, important issues other than keeping the grass green and regularly mowed. Now we worry about algal blooms killing fish in our lakes, Canada geese running into airplanes, chemical use reduction measures, and reporting requirements for everything from spray lubricant use to fuel spills. It really is a difficult job for us, since we have fewer people on staff now than ever. On top of that, it seems as if the rules are constantly being changed or reinterpreted" (Cox, 1999).

Planning & compliance action items

- Enhance ecological and economical health of the golf course property and the surrounding community
- Demonstrate that the golf course is managed with consideration for the unique conditions of the ecosystem of which it is a part
- Document management practices to promote a more environmentally-sound golf course
- Share information on the environmental challenges and the course's approach to the management of the entire golf facility with customers and the local community
- Educate all employees on the benefits of an environmentally compatible golf course management approach
- Regularly train employees on the potential health hazards associated with their duties
- Involve entire staff in ensuring a safe golfing opportunity for their customers
- Demonstrate to customers and employees the benefits of an environmentally-responsible golf course management approach and its contribution to protecting both the future of the environment and the game
- Keep abreast of changing regulatory or permitting requirements
- Maintain good records as accurate proof of past actions in case of litigation
- Be an expert on spill or health hazard notification requirements
- Always be ready to communicate with customers, owners, and the community

Planning & Compliance Environmental Compatibility Quotient Checklist

Planning & Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Has management demonstrated that environmental stewardship is an important part of their responsibilities by initiating the Comprehensive Golf course Environmental Management (GEM) Planning process?			
2	Is the GEM Plan complete, updated regularly, and readily available to employees and customers?			
3	Has the golf course adopted and posted an environmental policy?			
4	Is a map of the property highlighting environmental challenges posted for employees and customers?			
5	Are environmental challenges and their approved and implemented management practices, objectives, and targets evaluated at least annually and are they regularly communicated to employees, customers, management, and the local community?			
6	Are there signs appropriately located to warn golfers of hazards of drinking reclaimed or otherwise non-potable water?			
7	Are there signs posted to highlight key habitats or have appropriate areas been designated "Environmentally Sensitive Zones" per The Rules of Golf?			
8	Is there a general understanding by the entire course management staff of how their practices may potentially adversely impact the environment?			
9	Are the environmental impacts of pest control measures considered as part of the comprehensive GEM planning process?			
10	Are projects planned and funded for the next year that would increase the compatibility of the course's management program with comprehensive GEM planning goals and objectives?			

Planning & Compliance Checklist (continued).

#	Environmental Compatibility Indicator	Yes	Partial	No
11	Have all employees been familiarized with the GEM Plan and are they trained regularly on the importance of environmental performance and compliance with its goals and objectives?			
12	Are environmental management issues regularly discussed during staff meetings?			
13	Does the superintendent document the actual amount of each pesticide or fertilizer annually used on each major golf course feature (greens, tees, fairways, roughs, water features, and natural areas)?			
14	Has the course attained full certification in the Audubon Cooperative Sanctuary Program or similar industry-recognized environmental management program?			
15	Are employees trained in their native language on the benefits of minimizing potential negative impacts?			
16	Are comprehensive written records maintained to measure and document the environmental compatibility of the entire facility's management practices?			
17	Are there documented functional and aesthetic thresholds integrated into pest control decisions?			
18	Is there a written and regularly updated Integrated Pest Management Plan for the entire golf course property?			
19	Are employees trained on what to do in case of a spill and have spill containment kits been provided at all appropriate locations?			
20	Has course management comprehensively examined the course to determine the activities that have a potential to negatively impact an identified environmental challenge?			
Totals				

Environmental Compatibility Quotient Summary & Scoring Scale

ENVIRONMENTAL COMPATIBILITY QUOTIENT SUMMARY			
Environmental Compatibility Category	Yes	Partial	No
Planning & Compliance			
Operations & Maintenance			
Water Resource Management			
Conservation			
Pesticides & Pollution Prevention			
Totals			

- Key to checklist responses

- **Yes** = Practice is complete or ongoing and can be verified
- **Partial** = Practice has been initiated but needs improvement or completion
- **No** = Practice is not in place

ENVIRONMENTAL COMPATIBILITY QUOTIENT SCORING SCALE	
Total Yes or Partial Responses	Environmental Compatibility Level
86-100%	Advanced (Green)
70-85%	Showing progress (Yellow)
69% or less	Just started (Red)



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Please visit our Golf course Environmental Management (GEM) Program website:
<http://www.afcee.brooks.af.mil/ec/golf/>.