



Windy Trails Golf Course
Environmental Baseline Assessment
Altus AFB, OK May 04





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Executive Summary

U. S. Air Force GEM Program

The U. S. Air Force Golf Course Environmental Management (GEM) program is a proactive Air Force Center for Environmental Excellence (AFCEE) initiative to foster a better understanding of the environmental challenges facing our golf courses worldwide. Armed with the support and approval of the Air Force Services Agency golf program, AFCEE's goal is to facilitate the creation of an environmentally friendly golf course facility while supporting the installation mission.

The primary tenets of the GEM Program are to minimize or eliminate potential negative environmental impacts, attain and maintain daily compliance with all appropriate regulations, and constantly examine all aspects of golf course management to achieve the highest standards of environmental excellence.

GEM Program process

There are five steps in the GEM program process.

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision

Environmental challenges

The following environmental challenges were identified during the GCEBA process:

- Nesting migratory birds
- Installation Restoration Program sites
- Potential airfield expansion
- Wetlands
- Bird/Wildlife Aircraft Strike Hazard (BASH)

Where do we go from here?

Once the environmental challenges are identified, it is paramount that the golf course staff should determine their preferred management approach in the context of their ongoing, long-term goal of providing the best golfing experience for their customer's dwindling recreation resources.

Armed with this well-conceived, golf facility-based management approach, the golf staff should then coordinate with the environmental staff to ensure that there is consistency and compatibility with installation-wide natural resource and environmental management goals and objectives.

Finally, the staff should proceed with the next steps in the GEM Program process documented in this study.

Introduction

The golf course environmental baseline assessment (GCEBA) is the initial step in the process of creating a successful ecosystem-based Golf Course Environmental Management (GEM) Plan.

The intent of the program is to provide an efficient, customer-driven management tool that will free up course managers and superintendents to devote more of their efforts to caring for their customers and the golf course. Properly designed and implemented, the GEM Plan will keep the entire golf facility in compliance with the constantly changing environmental requirements while contributing to the installation's vital recreational opportunities.



The new maintenance complex as observed from the course.



Goal of the GEM Program

The goal of the U. S. Air Force GEM program is to facilitate the creation of an environmentally friendly golf course facility for its customers while supporting the installation mission. The Air Force Center for Environmental Excellence (AFCEE) is dedicated to helping to identify ways that more rounds can be played on better-conditioned courses while minimizing or eliminating negative impacts to the environment. In most cases, the U. S. Air Force's golf courses are being managed compatibly with the environment. The GEM program is the vehicle to document our successes while communicating directly with our customers, commanders, and local community.



"Wide-open spaces" typify the recently constructed 9-hole addition.

GEM Program Process

Efficient implementation is the most important aspect of any initiative where practices and procedures are examined and may undergo significant change. This is especially true of the GEM Plan process. The latest requirements for the GEM Plan components are described and outlined on the AFCEE golf course environmental management program website: <http://www.afcee.brooks.af.mil/ec/golf/>. Detailed explanations and directions for completing the GEM Plan will be delineated in AFCEE's proposed handbook ***Golf and the Environment, Guidelines for the 21st Century***.

The GEM Program is derived from many diverse environmental regimes such as the National Environmental Policy Act, the Environmental Compliance Assessment and Management Program, and the ISO 14001 environmental management system. There are five basic steps in the implementation of the GEM Program process:

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision



The original nine holes are characterized by small greens and lush, tree-lined fairways.



Entry from the “front” parking area could possibly be more inviting.

Analysis

Experienced environmental managers realize the importance of assembling all of the data relevant to a problem prior to determining its best solution. Analysis is the first and most important task of the golf course environmental baseline assessment (GCEBA) and the GCEBA is the initial step in the process of creating an ecosystem-based Golf Course Environmental Management (GEM) Plan. Properly completing the GCEBA is paramount to the long-term compatibility of an installation’s golf course management practices with the GEM Program, and more importantly, the U. S. Air Force’s natural resource and environmental management goals and objectives.

GCEBA COMPONENTS

The GCEBA is comprised of the following components:

- Site visit, interviews, and data collection
- Course specific analysis
- Miscellaneous facility review
- Environmental compatibility quotient checklists
- Identification of environmental management challenges
- Summary report

Documentation

It is not enough just to know how to create a successful golf course environmental management program. There must be a written record documenting existing site data, maintenance practices, pesticide applications, and other historical golf course activities. By documenting what we know, we will be able to determine how to make better decisions in the future. The completed GEM Plan will assist in the daily management of the course while providing a convenient vehicle to communicate to commanders and customers alike the environmental issues that challenge us on our golf course as well as our plans to deal with them. In order to reach the environmental stewardship goals set by the U. S. Air Force, we must consistently employ only those management practices that minimize or eliminate potential negative impacts to the environment.

GEM PLAN COMPONENTS

The GEM Plan will be comprised of the following components:

- GCEBA report
- Map of the entire golf course facility grounds depicting locations of the significant environmental management challenges and the golf course facilities
- Booklet that describes the environmental management challenges on the GEM Plan map
- Specific practices that will be employed by the golf course staff to deal with each environmental management challenge after coordination with and approval by the installation environmental staff
- Compilation of best management practices employed at the golf course in their implementation of the GEM program recommendations

Implementation

Positive and decisive action is the only true measure of the success of a GEM Program. By implementing new practices, whether to knowingly improve the course's role in the environmental stewardship of the installation or to just try new ideas to determine their value, will the golf staff and golfers benefit. The Tinker staff should adopt the GEM Program Environmental Policy and immediately begin finding ways to minimize or eliminate any and all negative impacts to the environment.

Evaluation

In order to ensure the highest quality of customer service and environmental stewardship, there must be continual self-evaluation and improvement. There also should be consistent, on-going measurement of the reduction or elimination of environmental impacts the newly implemented practices have on the course. For example, documenting the reduced use of inputs such as fertilizers, pesticides, and irrigation can be used to demonstrate the increased environmental stewardship of the golf course management practices as well as the overall value of the GEM Program. It is important for U. S. Air Force golf courses to show improvement over time. This can be easily accomplished by regularly evaluating golf course maintenance methods, practices, and management approaches to day-to-day issues and changing when appropriate.

Revision

The very nature of a superior GEM program implies that all documents be regularly maintained to represent the most current conditions. U. S. Air Force golf course managers and superintendents should be constantly looking for ways to improve their environmental stewardship. Acting on lessons learned is right behind initial implementation as the most important aspect of a successful GEM Program. The GEM Plan should be kept as current as possible at all times. Ideally, it should be completely updated at least every three years.

Course Specific Analysis

One of the most pragmatic and enjoyable tasks in the GCEBA process is the course specific analysis. From a general overall description of the course to the details of the course's history and makeup to the various observations on the way the course plays, looks, and is managed, the course specific analysis sets the stage for the rest of the GCEBA report. It is comprised of the following tasks:

- Course description
- Course details
- Miscellaneous facilities examination



The green at the 4th is typical of the newest nine.



When trees don't fit into your budget, call it a "links" course.

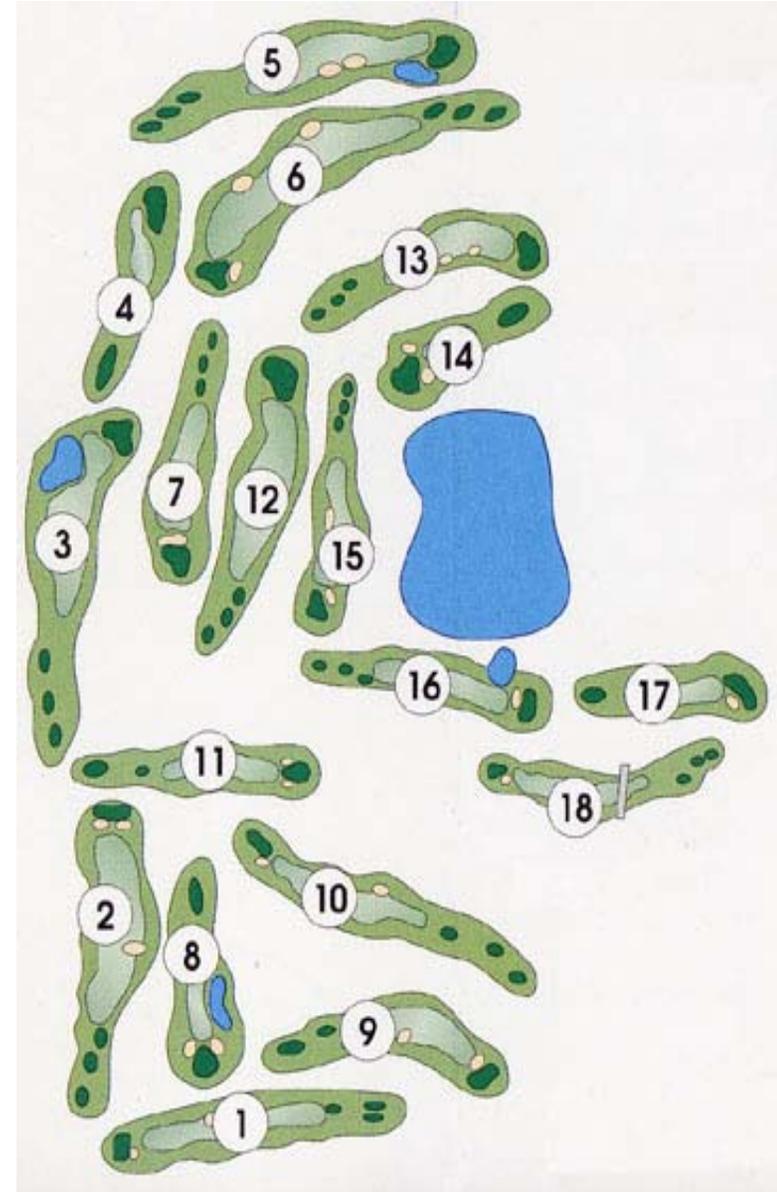
Course description

Altus AFB's Windy Trails Golf Course provides a quality recreational opportunity for its customers despite being handicapped with relatively featureless land, poor soils, and a severely limited plant palette. The western Oklahoma climate is just not conducive to the type of rolling, verdant fairways flanked by self-sustaining and stately forests that we all desire on our golf courses. There are two things that contribute positively overall to the experience at Altus' golf facility – an incessant wind usually much stronger than a breeze and an abundant supply of friendly people. The newest nine holes are split between the two sides and cause a little mental discomfort while contributing greatly to the facility.



Course details

Architect	Unknown/Niva Engineers
Year constructed	1960/1997
Climate	Droughty and windy
Average annual rainfall	6-8 inches
Average growing season	210 days per year
Elevation	1360' ASL
Winds/Prevailing Direction	North/South
Total Facility Acreage	227 acres
Par	36-36-72
Yardage/Rating/Slope	Blue- 6963/72.8/120 White- 6334/69.7/118 Silver- 5772/67.4/111 Red- 5382/71.7/122
Turfgrass	Common Bermudagrass
Tees-	Common Bermudagrass
Fairways-	Penncross/Cato-Crenshaw
Greens	Common Bermuda/mix
Roughs-	



Routing map of Windy Trails Golf Course, Altus AFB, OK.



Windy Trails Golf Course Aerial Photo

Miscellaneous Facility Review

Although the course is primary to the enjoyment and eventual return of most of Course Name' customers, the support facilities play a huge role in the overall success of the operation. This section of the GCEBA will examine the following facilities for their aesthetic, functional, and environmental values:

- Clubhouse/pro shop/snack bar
- Maintenance complex
- Practice areas
- Pesticide mixing and storage
- Cart barn
- Infrastructure



The clubhouse looks out over the practice green and the first tee.



Everything an avid U.S. Air Force golfer may need to enjoy a round.

Clubhouse

Built in 1972 and opened the next year, the Windy Trails clubhouse is well appointed and comfortable. The snack bar was closed in Jan 2000 ironically coinciding with an actual increase in their net income after depreciation (NIAD) for the year. The facility has plenty of storage space and comes equipped with locker rooms for both men and women. The manager's office is somewhat cramped and the entire facility could do with an interior upgrade. All in all, golf manager Rusty Wortham extracts every available penny out of his quality operation at Altus AFB.

Maintenance complex

Recently constructed (2003), the maintenance complex is an attractive, architecturally compatible facility. The seemingly large, yet curiously somewhat cramped facility features huge steel girders to keep the roof from blowing away in the typical western Oklahoma windstorm and minimal storage space. The “open” side of the facility may need to be enclosed in the near future to make the complex fully functional for superintendent Robert Payne and his crew.



The interior space is relatively roomy and functional.



Designed to survive WWII, this is one fine architectural memorial.



A wash rack was installed but has never been operational.



The practice green accommodates putting and minimal chipping while being fairly representative of the condition of the original course.

Practice areas

The Windy Trails Golf Course facility is outfitted with a putting green located just outside the clubhouse near the first tee. Somewhat minimally sized, the green is most likely adequate in most all situations except large tournaments.

In contrast, the driving range is severely limited on space to the point that there is an on-going safety hazard for vehicles on either side. Although not a good situation, it may be better than not having a range at all.

Pesticide mixing and storage

The Windy Trails pesticide storage facility complies with all applicable regulations. The “environmental center” was eliminated from the recent maintenance complex construction project forcing all pesticide mixing operations off site. Transporting mixed chemicals from installation entomology shop to course is undesirable at best and may add unnecessary risks to the operation. Suggest a plan to program and acquire funds to alleviate.



Compliant, yet not quite right, that is, for a brand new facility.

Cart barn

Well located and predominantly functional, the cart barn is an unattractive facility that just seems to fit in somehow. The facility is barely large enough for a portion of manager Rusty Wortham’s relatively small fleet of carts. The facility is a good example of the difficulties with the U.S. Air Force golf “reality” some of our managers are forced to contend with. We must do whatever we do as well as we should...the first time, every time!



Aesthetic quality is lacking at the Windy Trails cart storage facility.



Cart paths and surrounds on original nine are in poor condition.

Infrastructure

This section examines important elements of a quality golf course that are difficult to group into another category. Cart paths are poor on the original nine and good on the new addition. The parking lot is in fair condition and is barely large enough to satisfy the regular demands of Windy Trails’ customers. Landscape development attempts have been relatively unsuccessful. There is an inconsistent quality and supply of the standard site amenity group near most teeing areas and the course signage could be improved. The irrigation system is functional but could be improved on the original course.

Determining the Baseline (ECQ)

The following is a brief compilation of some of the responses in each of the ten Environmental Compatibility Quotient (ECQ) categories obtained in an interview with the superintendent and the manager conducted during the site visit.

ECQ Categories

- Overall Management Philosophy & Documentation
- Safety, Training, And Awareness
- Compliance
- Pesticide Use, Storage, & Handling
- Pollution Prevention
- Conservation Practices
- Water Resources
- Maintenance Practices
- Customer Relations & Education
- Miscellaneous Special Projects & Activities

Key to checklist responses

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

ECQ Checklists

The Environmental Compatibility Quotient (ECQ) checklists are a convenient method of assessing the overall performance, implementation, and completeness of an installation's Golf Course Environmental Management Plan. The checklists can be used in many ways including:

- As an analytical tool while compiling a Golf Course Environmental Baseline Assessment like this one.
- As a self-assessment tool for the golf course manager or superintendent.
- As an award nomination evaluation by a Golf Course Assessment Team (GCAT).



This small pond left of the 3rd fairway was not part of the design.

Interpreting the ECQ

The ECQ compiled for an installation's course is a snapshot of the overall performance and compliance with the GEM Plan. There are two measures obtained as a result of using the ECQ checklists to determine the status or quality of the environmental management program: 1) determining the actual and; 2) potential environmental compatibility quotients.

- **Actual ECQ-** the total percentage of "Yes" responses for all ten checklists. This number represents the current level of the golf course management practice compatibility with the environment
- **Potential ECQ-** the total percentage of "Yes" responses plus the total percentage of "Partial" responses for all ten checklists. Maybe the most significant measure; the potential ECQ represents a level of compatibility that could be reached by finalizing or fully implementing a particular practice or procedure.

ECQ Scoring Scale

Percent Responses Yes or Partial per Category	Level
93-100%	Advanced
83-92%	Getting there
73-82%	Showing progress
63-72%	Early stages
Less than 62%	Just started



Windy Trails Golf Course Environmental Policy



In concert with the Altus AFB mission, the staff at **Windy Trails Golf Course** pledge to employ only those management practices that minimize or eliminate the potential for negative impacts to the environment and the surrounding community, ensure compliance with all appropriate regulations, and to constantly reevaluate our processes to achieve the highest standards of environmental excellence.

Overall Management Philosophy & Documentation				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Has management demonstrated that the environment is an important part of their responsibilities by initiating the GEM Planning process?	✓		
2	Has the golf course adopted and posted an Environmental Policy?			✓
3	Is the GEM Plan underway or completed, available, and updated regularly?		✓	
4	Is a map of the property highlighting environmental opportunities or constraints such as wildlife habitat, water resources, sensitive landscapes, special management zones, etc. used in the environmental management decision-making process and is it posted for customers?			✓
5	Environmental goals, objectives, issues, projects, and progress are evaluated at least annually and are regularly communicated to employees, customers, management, and the local community?		✓	
6	Are written records of water quality monitoring activities, results, and control measures readily available?		✓	
7	Is there an inventory of bird and mammal species documented, maintained, and readily available?		✓	
8	Is there a general understanding of how course management practices may positively enhance or adversely impact the environment?	✓		
9	Are the environmental impacts of pest control measures such as leaching and runoff potential, toxicity to non-target organisms, soil absorption capacity, pesticide persistence, water solubility, and effects on soil microorganisms and non-target species considered as part of the course management planning process?	✓		
10	Are records of pest treatments employed and their effectiveness maintained and used to guide future pest control decisions?	✓		
	Point totals for each column	4	4	2

Safety, Training, & Awareness				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	All employees are familiar with the overall GEM Plan and are trained on the importance of environmental compliance with the goals and objectives of the program?			✓
2	All appropriate employees are trained to be familiar with U. S. Air Force, federal, OK, and OSHA regulations that apply to storage, handling, and disposal of chemicals used on the property?	✓		
3	All employees are aware that chemical use, storage, and disposal and their potential risks to human health and the environment?	✓		
4	All employees are trained to understand that poor management practices may adversely impact worker health, on- and off-site water quality, local soil health, and wildlife species and their habitats?	✓		
5	A current copy of all Material Safety Data Sheets (MSDS) for all chemicals used anywhere on the golf course property is maintained and readily available for use by employees?	✓		
6	All employees receive regular, documented training on all potential OSHA issues?	✓		
7	Are all golf course pesticide applicators active participants in a local respiratory and pulmonary testing program?	✓		
8	Pesticides, fertilizers, and other chemicals are stored on appropriate shelving in an approved storage facility?	✓		
9	Are golfers notified in the pro shop and on the first and tenth tees about the day's planned or recently completed spraying of any chemical or fertilizer that may be hazardous to human health and safety?		✓	
10	Are key staff members trained regarding water quality and conservation issues?			✓
	Point totals for each column - Response percentage	7	1	2

Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is fuel storage/delivery managed in accordance with federal, OK and local regulations?	✓		
2	Are installation environmental staff members included in on-going course management discussions and plans at regularly scheduled meetings?			✓
3	Are there regularly scheduled golf course staff meetings to discuss environmental management issues?		✓	
4	Does the director of golf and the superintendent attend ESOHCAMP in-briefings and out-briefings?			✓
5	Does the director of golf and/or the superintendent coordinate with installation environmental staff on the various management plans that affect or include the golf course?		✓	
6	Have all necessary permits been secured and/or updated and their requirements satisfied in a timely manner?	✓		
7	Has appropriate impact analysis (NEPA) been performed on all proposed actions on or affecting the golf course property?	✓		
8	Are containers used to store used oil in good condition, not leaking, and clearly labeled?	✓		
9	Has the golf course staff submitted their proposed management approach to the identified environmental challenges to the installation environmental staff for coordination and review?			✓
10	Were there less than two major golf course facility-related findings during the last official ESOHCAMP visit?	✓		
	Point totals for each column - Response percentage	5	2	3

Pesticide Use, Storage, & Handling				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there trained scouts on staff other than the superintendent to monitor turf and plant health and pest populations using scouting forms to record the type, severity, location, and treatment of pest problems and organized into a report or guide so that they can be used for future pest control solutions?		✓	
2	Are there written pest profiles of common pest species with a variety of potential control measures pre-evaluated including alterations in cultural management, biological, physical, and mechanical controls prior to treating the problem on the course?			✓
3	Are there established and documented aesthetic and functional thresholds for all managed areas to effectively manage pest populations and reduce chemical use?		✓	
4	Is there a specially designed pesticide mixing area where all mixing is performed by appropriately trained personnel?			✓
5	Has a list of pesticides and other chemicals stored or used at the golf facility been provided to the appropriate Fire Department(s)?			✓
6	Is there a written Integrated Pest Management Plan readily available and updated regularly in use at the facility?		✓	
7	Are scouting forms collected, processed and mapped to aid decisions for control?			✓
8	Are written and readily available records maintained of all applications of pesticides made by certified applicators, including the following? <ul style="list-style-type: none"> - the quantity of each pesticide used - the chemical or common name of the active pesticidal ingredient(s) (not the product name) - the pest or purpose for which the pesticide was applied --the date and place of application. 	✓		
9	Is the chemical storage structure/area locked, well ventilated, fire proof, and access is limited to select personnel?	✓		
10	Are food storage and prep areas properly cleaned to reduce the likelihood of pest infestations and required pesticide applications?	✓		
	Point totals for each column - Response percentage	3	3	4

Pollution Prevention				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there designated "no-mow" areas (other than ponds) and "no spray zones" and buffer areas around pond, river, stream, or lake edges and have they been communicated to mower operators and pesticide applicators?		✓	
2	Has the Installation Spill Plan been amended to include the golf course facility and is there a spill containment kit at each required location and are spill containment procedures in place?	✓		
3	Does the chemical storage area have a sealed metal or concrete floor and are all pesticides handled over an impermeable surface?	✓		
4	Does the chemical storage area have a lip along the edges to contain spills?	✓		
5	Are liquid products stored below dry products and are dry materials stored on pallets or shelves to keep them off the floor?	✓		
6	Have all the golf facility employees regularly received documented and approved HAZCOM and safety and health training?	✓		
7	Are grass clippings blown off equipment with compressed air instead of or prior to washing?			✓
8	Are gasoline, motor oil, brake and transmission fluid, solvents, and other chemicals used to operate or maintain equipment and vehicles prevented from directly or indirectly entering water bodies?	✓		
9	Has the watershed in which the course resides and contributes runoff to been identified and mapped to aid the golf course staff in the management of their facility?			✓
10	Are appropriate quantities of fertilizers applied during weather conducive to reducing the potential for leaching and runoff?		✓	
	Point totals for each column - Response percentage	6	2	2

Conservation Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are recycling containers conveniently provided for customer and employee use throughout the golf course facility?		✓	
2	Are there officially and appropriately designated minimally maintained areas on the golf course facility grounds?	✓		
3	Has the irrigation system or its components recently been upgraded to reduce inefficiency, malfunction, and overall water use?	✓		
4	Has all "non-target" irrigation (ponds, natural, or out of play areas, etc.) been eliminated or minimized?	✓		
5	Have flow meters been installed to monitor water use and detect potential waste?		✓	
6	Has the entire golf course facility property been examined for critical habitats, threatened or endangered species, wetlands, floodplains, and historical/cultural resources?	✓		
7	Are employees encouraged to minimize their trips around the course to conserve on the use of fossil fuels?	✓		
8	Does the snack bar utilize reusable plates and silverware for use by customers throughout the facility's operating hours?			✓
9	Have all potential wildlife habitat maintenance practices been coordinated with the installation BASH officer and environmental management personnel?	✓		
10	Are all motorized golf course equipment checked regularly for excessive air polluting emissions?			✓
Point totals for each column - Response percentage		6	2	2

Water Resources				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are water features regularly monitored for algae, erosion, excessive aquatic plant growth, fish kills, and sedimentation?	✓		
2	Are wash and wastewater kept from making direct contact with surface water and are they recycled or allowed to filter through a vegetative area when cleaning and maintaining equipment?	✓		
3	Outdoor irrigation of non-golf course landscape areas are regularly monitored and maintained for leaks and efficient performance?	✓		
4	Has the golf course staff been provided with stormwater management planning requirements from the installation's environmental staff?			✓
5	Have part circle irrigation heads been installed where possible to preserve water resources and reduce maintenance while minimizing potential negative impacts to surrounding minimally maintained areas?	✓		
6	Are all water feature maintenance tasks coordinated with the installation natural resource manager and bird/wildlife aircraft strike hazard officer?		✓	
7	Has the irrigation system been completely checked for proper water distribution in all irrigated areas and are water leaks fixed in a timely manner?	✓		
8	Are moving water bodies such as streams or creeks that pass through the golf course regularly monitored for water quality both upstream and downstream of the course?	✓		
9	Does the facility have a Drought Management Plan written, ready, and available if, or when, irrigation restrictions may be instituted and required by the community or the installation?			✓
10	Are water quality problems immediately reported to supervisors or regulatory agencies (if required) for appropriate action?	✓		
	Point totals for each column	7	1	2

Maintenance Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is there a written, regularly updated, and readily available Golf Course Maintenance Plan?	✓		
2	Does the Maintenance Plan include individual plans to include Integrated Pest Management, Tree Management, Hazard Communication, Drought Management, Water Feature Management, and a Site-Specific Spill Prevention Response Plan?		✓	
3	Are green, tee, and fairway mowing heights maintained at reasonable levels without continually stressing turf or maximizing chemical inputs?	✓		
4	Are there regular procedures in place to continually improve soil health such as topdressing, organic amendments, aeration, and drainage?	✓		
5	Is there a map of the course's "hot spots" requiring special care or regular attention?			✓
6	Is all maintenance equipment maintained and cleaned in a manner that eliminates the potential for spreading of pest or disease contamination?	✓		
7	Has there been a complete examination for potential negative environmental impacts of all aspects of the golf course facility operation including the snack bar and grill, clubhouse, pro shop, and maintenance complex?	✓		
8	Is contour mowing used to conserve fuel and increase playability and aesthetics?	✓		
9	Have all playing surfaces been inventoried and mapped for soil types including soil structure, nutrient levels, organic content, compaction, and water infiltration?		✓	
10	Are soil tests and plant tissue analysis used to determine nutritional requirements?	✓		
Point totals for each column - Response percentage		7	1	2

Customer Relations & Education				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are the course manager and superintendent involved in a regularly updated, documented, and on-going customer educational program?		✓	
2	Is there a conveniently located and highly visible place at the course or clubhouse where golf course environmental management notices and informational messages are regularly posted for customers?			✓
3	Do the course manager and superintendent actively communicate with customers to determine and document their points of view?	✓		
4	Is there active and regular communication with the golf management staff, civil engineering, environmental management, the Services manager, and commanders by course management?	✓		
5	Does the golf staff regularly survey their customers on how they rate the various elements of the golf course facility?	✓		
6	Is there consistent and attractive signage around the course and grounds that would increase the awareness of the average golfer to the environmental management practices employed?			✓
7	Are there signs appropriately located to warn golfers of hazards when drinking reclaimed or otherwise non-potable water?	✓		
8	Are there interpretive signs posted to highlight key habitats or have appropriate areas been designated "Environmentally Sensitive Zones" per USGA rules?	✓		
9	Are course staff members trained regularly on how to improve their dealings with customers?	✓		
10	Are there clinics provided to teach beginning golfers the basics of the game and to teach all levels of golfers the rules of the game?	✓		
	Point totals for each column	7	1	2

Miscellaneous Special Projects & Activities				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there projects planned and funded for the next year that would communicate the compatibility of the course's management methods with protection of the environment?			✓
2	Are there projects planned and funded to reduce the course's potential negative environmental impacts?			✓
3	Are there tournaments or other events planned that may educate customers on the environmental challenges faced by the golf staff at this installation?			✓
4	Are there regular field trips for local students or other local community groups hosted at the course?			✓
5	Are there projects planned to eliminate or minimize a potential erosion problem?			✓
6	Does the course have a native tree installation program complete with planting plan and maintenance schedule?			✓
7	Are any of the local schools or universities involved in educational or research activities at your course?			✓
8	Are there special facility-wide recycling programs underway?	✓		
9	Is your course an active participant in the USAF Golf Environmental Management Program?	✓		
10	Has your facility been nominated by your MAJCOM for the golf course environmental management award in the last 3 years?			✓
	Point totals for each column	2	0	8

ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	4	4	2
2	Safety, Training, & Awareness	7	1	2
3	Compliance	5	2	3
4	Pesticide Use, Storage, & Handling	3	3	4
5	Pollution Prevention	6	2	2
6	Conservation Practices	6	2	2
7	Water Resources	7	1	2
8	Maintenance Practices	7	2	1
9	Customer Relations and Education	7	1	2
10	Miscellaneous Special Projects & Activities	2	0	8
	Composite point total/response percentage	54	18	28

GCEBA Results

Σ Windy Trails Golf Course, Altus AFB, OK

- Actual ECQ (# of “Yes”) = 54 or “Just started”

- Potential ECQ (Actual ECQ plus “Partial”) = 72 or “Early stages”



Conclusion

Windy Trails Golf Course succeeds despite its location in a harsh climate in a small windswept, western Oklahoma town. Quality employees like Director of Golf and manager Rusty Wortham and his superintendent, Robert Payne, make the operation at Altus AFB succeed from their sheer desire and love for the game of golf. Without exemplary folks like these, golf facilities like Windy Trails Golf Course at Altus AFB would not have a chance under the current rules and regulations they are forced to function under.

The new holes are a marvelous addition to the facility and the installation and could be the forerunner of another matching nine and possibly new clubhouse, cart storage facility, and practice areas to the west as the installation grows. Dream or not, it is people like Mr. Wortham and his staff that can make these type of improvements happen. If Altus AFB survives the next closure round, as it is predicted to do, then we must take every opportunity to improve the golf facility so they too can adequately support the Altus AFB mission as the only large-frame aircraft pilot training base in the U.S. Air Force.

Observations

- Need to compile and document actions already taken to create “continuity” document
- Implement planned improvements to all aspects of the golf facility management
- Utilize installation environmental management geographic information system and civil engineering digital aerial photographs for mapping requirements
- Secure computer hardware and software upgrades to increase overall efficiency and provide high speed internet access
- Find a location inside clubhouse to present environmental information to customers
- Expanded training for all employees a must to completely realize GEM goals
- Ensure employee’s health is prime consideration
- Demonstrate genuine concern for player health and safety through actions
- Consider using AFCEE for on-site golf course environmental management training
- Lack of funding hinders training plans
- Business tempo and training scheduling makes it difficult to involve much of the staff at one time
- Ensure ECAMP results are outstanding
- Further reduce solid waste streams from clubhouse operations
- Increase the use of slow release fertilizers

- Regularly provide training for all employees on the specifics of pollution prevention and how they can help
- Although pesticide facility is functional, consider purchasing state of the art facility and locating inside maintenance complex
- Continue contour mowing procedures
- Continue building relationships with installation natural resources manager and other environmental professionals through the creation of an environmental management committee
- Compile written pest profiles of common pest species
- Improve water hazard care to eliminate unwanted vegetation while improving aesthetics and playability
- Increase number of trained scouts on the maintenance staff
- Continue to involve installation youth through rules and instruction clinics
- Consider conducting field trips at the course for local school children
- Enlist the assistance of local city and county officials on golf course environmental planning initiatives
- Initiate Earth Day environmental awareness golf tournament
- Educate customers about the benefits of an environmentally friendly golf course

Areas needing improvement

The ECQ Summary on the previous page highlights the following areas for relative improvement at Altus AFB:

- Overall Management Philosophy & Documentation
- Pesticide Storage, Use, & Handling
- Miscellaneous Special Projects & Activities

The gallery

This section of the report will be where some of the more revealing photographs (of the literally hundreds taken during the site visit) of pests, maintenance practices, and other areas where improvements may be made to create the best possible golf facility.



The 2nd hole at Windy Trails Golf Course is one of the quality originals.



Emergent vegetation is just beginning to take in one of the new ponds.



"Natural" area maintenance is coordinated through BASH office.



Shelter is a fine example of good construction and design.



Many of the old trees on the original course need not be replaced.

Environmental challenges

One of the important results of the GCEBA process is the identification of significant environmental challenges to be addressed in the long-term GEM Planning process. Ideally, the golf staff will address each issue from the best way to satisfy the goals of the golf facility and acceptable levels of course playability and customer satisfaction. The golf staff's preferred management approach for these issues should then be coordinated with the installation's environmental staff for refinement, coordination, and approval.

The GEM Plan would then consist of the environmental challenges, the approach to their management, a map showing where these challenges occur on the golf course, a booklet that describes the mapped challenges, goals and objectives for future years, and a set of best management practices.

The following environmental challenges were identified during the GCEBA process at Windy Trails Golf Course, Altus AFB, OK:

- Nesting migratory birds
- Installation Restoration Program sites
- Potential airfield expansion
- Wetlands
- Bird/Wildlife Aircraft Strike Hazard (BASH)

NESTING MIGRATORY BIRDS

The Integrated Natural Resources Management Plan (INRMP) indicates that the Mississippi kite has

become a problem at the golf course as they dive at golfers and maintenance workers during nesting season. Mississippi kites are migratory birds (south to Brazil/Argentina) that return annually to where they were born. The pest management and environmental staffs coordinate efforts to gain what results in limited relief for Windy Trails Golf Course customers. According to the INRMP, harassment (noise, etc.) of birds while they are building nests is acceptable. Once eggs have been laid, they can be removed from nests and relocated to another nest. The parents get aggressive after eggs have been laid and fledglings emerge. Fledglings can be removed and taken to a rehabilitator. Bottom line is the long-term issue - the birds return to where they were born.



A Mississippi kite circles overhead as it searches for a nesting site.

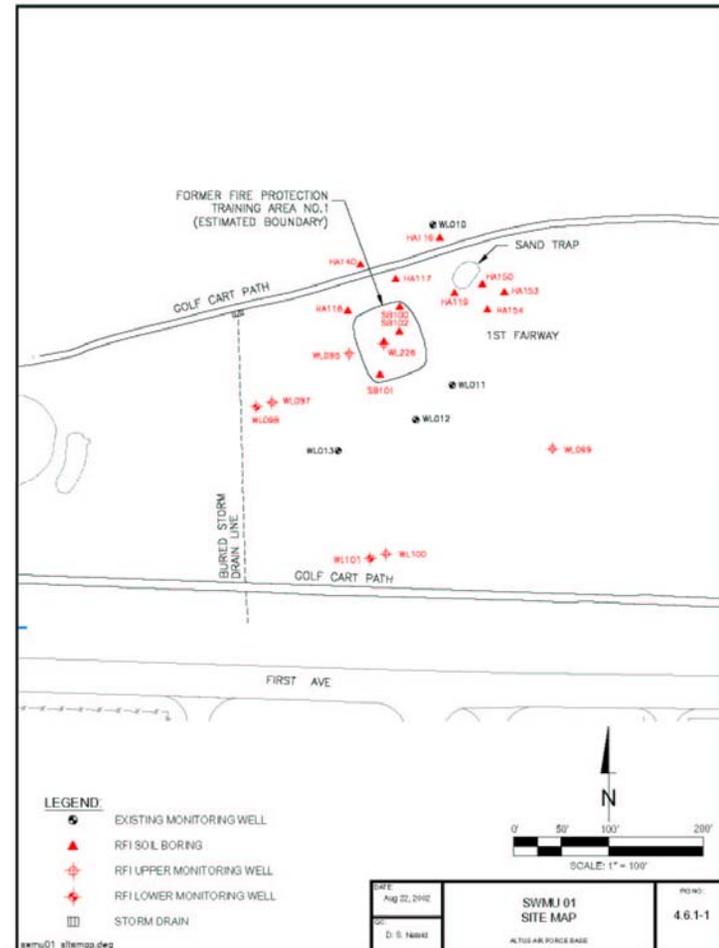


A small, concreted disc marks the IRP site in the 1st fairway.

INSTALLATION RESTORATION PROGRAM (IRP)

There is one active installation restoration program (IRP) site on the golf course property. Unfortunately, it is located just short of the landing area on the first hole not far removed from the clubhouse. The site has been designated SWMU 01 and is the location of the former fire protection training area. Plans are to excavate and dispose of the dioxin/furan-contaminated surface soil at an off-Base licensed facility. This will necessitate action from the golf staff as to protect customers from the proposed restoration action and associated equipment while still functioning as a golf course. Care should be given as to how the action is conducted as well as how the area will be restored as the first fairway at Windy Trails Golf Course.

EXISTING MONITORING WELL



The drawing above is an excerpt of the Executive Summary of the RCRA Facility Investigation Study Report.

POTENTIAL AIRFIELD EXPANSION

During the site visit data collection and interview activities, the possibility that the airfield ramp could be expanded, thereby destroying the 17th and 18th holes was discussed. Several alternatives were observed. Long-term, this expansion would be a huge plus for the installation and the community. Short-term, the golf course would greatly suffer. Regardless, the rebuilding of these holes should be an integral component of the possible expansion concepts so that the golf facility can continue to support the installation's mission. AFCEE will be available to assist any way possible to ensure a quality rebuild of the course.



Drainage basin left of the 3rd fairway is rapidly becoming a wetlands.



The 17th green is in jeopardy if the airfield ramp is expanded at Altus.

WETLANDS

Design and construction of golf courses is a specialized business. Successful projects are a result of expertise and diligence in both design and construction. Field decisions can overcome difficulties to improve the process for the owner/developer. In the case of the recent addition to Windy Trails GC, some details were not dealt with prior their construction, and now, long-term maintenance and management. One of these is the basin to the left of the 3rd fairway. This area is wet or at least moist nearly year round. Vegetation typical of wetlands is beginning to establish themselves on banks and in the shallow, ever changing shoreline. Eventually, this area will be officially designated as a wetlands, greatly affecting how the golf staff can

maintain it. Action should be taken to ensure that if this water hazard is a desirable component of the golf course, that it be properly graded to minimize the potential for emergent vegetation. Also, willow trees are just beginning to get large enough to be a removal problem. If these trees are undesirable as a long-term playability component at Windy Trails GC, then action should be taken soon.



Windy Trails' Director of Golf stands in one of Windy Trails' new "minimally-maintained" areas.



Loafing Canada geese are frequently observed on the course.

BIRD/WILDLIFE AIRCRAFT STRIKE HAZARD (BASH)

Windy Trails is located in relative close proximity to the airfield at Altus AFB. The actual runways are much farther removed yet are still within sight of the golf course facility. Golf managers must be cognizant of the potential hazard to the flying missions on their installation from golf course maintenance practices. Each and every action that could possibly contribute to the increase of birds and wildlife on the golf course must be coordinated with the environmental and flying safety offices prior to their implementation.



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<http://www.afcee.brooks.af.mil/ec/golf/>