



Par 3 Golf Course
Environmental Baseline Assessment
Hickam AFB, Hawaii Jun 03



Executive Summary

U. S. AIR FORCE GEM PROGRAM GOALS

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 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 our processes on 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

This report is the result of the analysis step.

PAR 3 GOLF COURSE HICKAM AFB, HAWAII ENVIRONMENTAL CHALLENGES

The following environmental challenges were identified during the GCEBA process:

- Installation Restoration Program (IRP)
- Invasive exotics

Further information on the environmental challenges can be found in the Conclusion of this Golf Course Environmental Baseline Assessment.

WHERE DO WE GO FROM HERE?

The golf course staff should determine their preferred management approach for the challenges above in context with their ongoing goals of providing the best golfing experience for the money. They should then coordinate these practices with the installation environmental staff to ensure their compatibility with installation wide natural resources and environmental goals and objectives followed by implementation.

Table of Contents

Introduction	1
Program Process.....	2
Course Specific Analysis	4
Miscellaneous Facility Review	7
Environmental Compatibility Quotient Checklists	11
ECQ Summary	23
GCEBA Results	23
Conclusion.....	24
Bibliography	27



Another perfect day in paradise...

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 ultimate intent of the program is to provide a foolproof, 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 course. Properly designed and implemented, the GEM Plan will keep the facility in compliance with the ever-changing environmental rules and regulations while providing a vital recreational opportunity for the installation.



The Par 3 course is a wonderful place for a little exercise.



Lighting creates a unique recreational opportunity for Hickam golfers.

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 the golfers, our commanders, and the local community.



Turf quality is limited at times to how well the irrigation system is working.

Program Process

Implementation is the most important phase of any initiative where practices and procedures are examined and may undergo significant change. This is especially true of the GEM Plan process. The specifics for the GEM Plan components and directions for their completion will be delineated in AFCEE's ***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 14000 environmental management system. 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 our processes on all aspects of golf course management to achieve the highest standards of environmental excellence. There are five basic steps in the implementation of the GEM Program process:

- Analysis
- Documentation
- Implementation
- Evaluation
- Revision



Due to limited space, much of the equipment must be stored outside.

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 has to be a written record of 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 be a comprehensive report with a map that will assist in the daily management of the course while providing a convenient vehicle to communicate to our customers the environmental issues that challenge us on our golf course and 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 Mamala Bay 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:

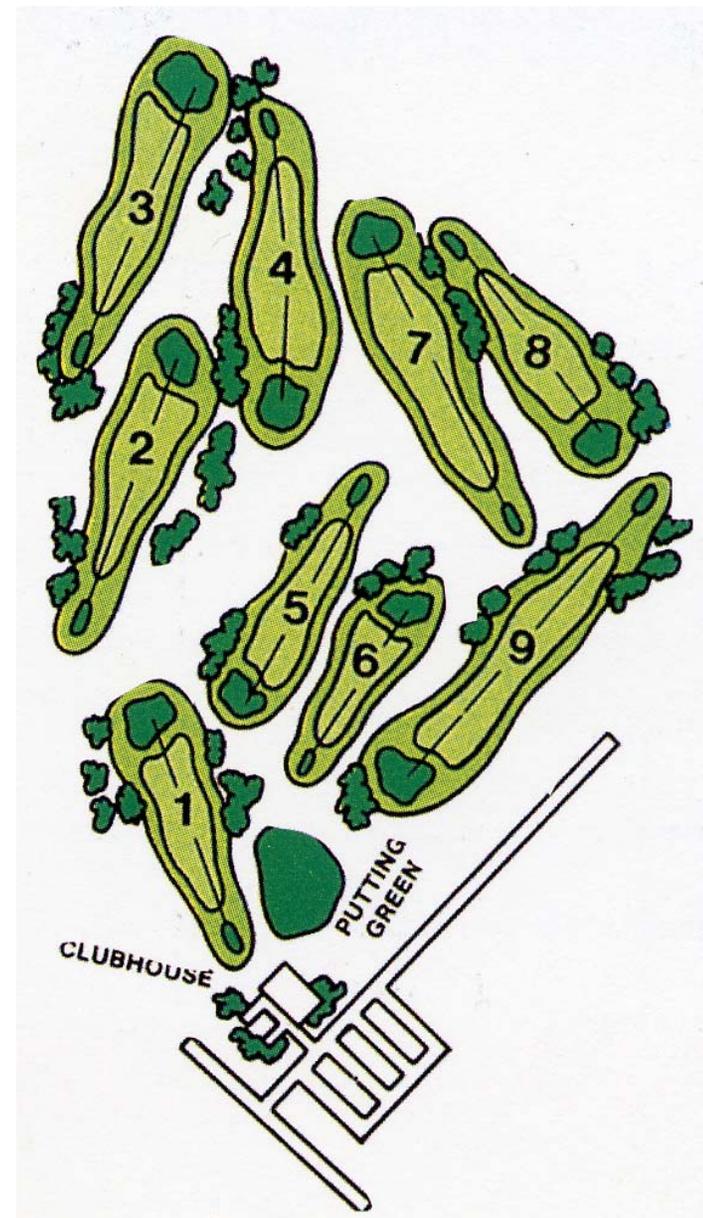
- Course description
- Course details
- Maintenance facility evaluation
- Miscellaneous facilities examination

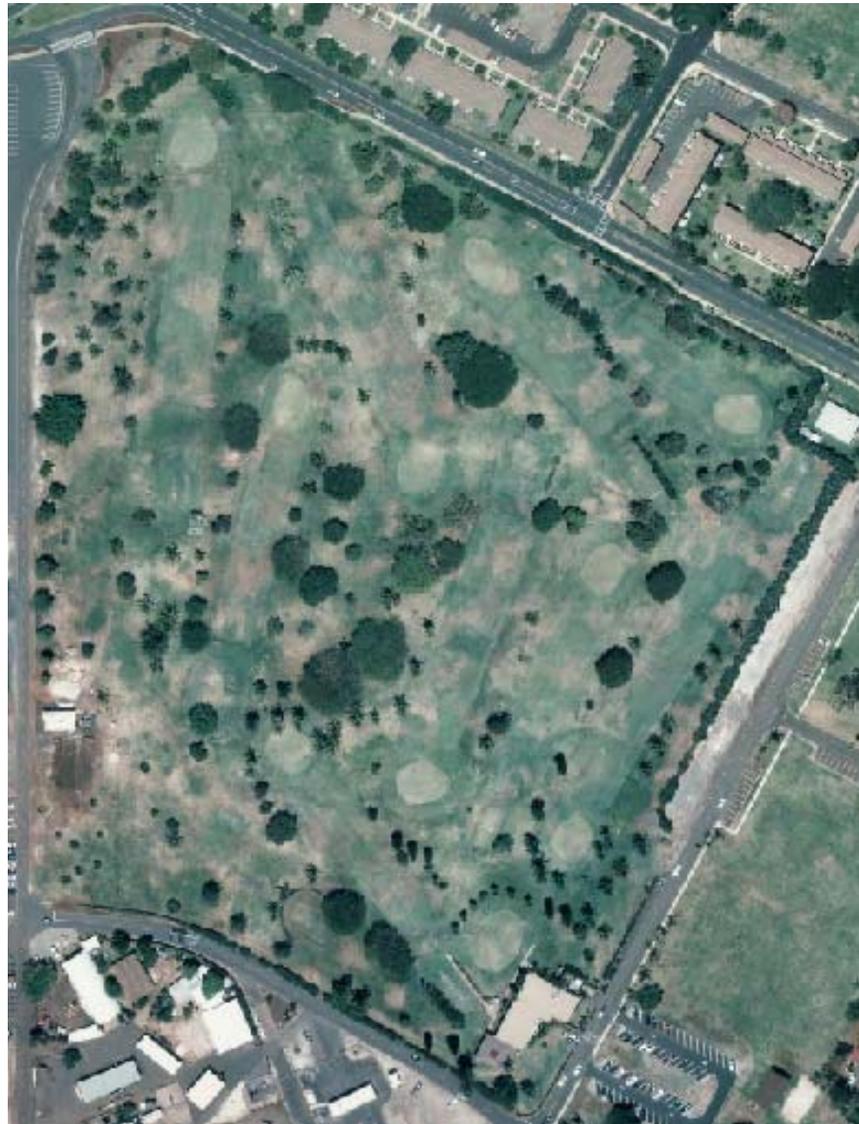
Course description

Hickam AFB's Par 3 provides a unique opportunity for beginners, seniors, and others either looking to test their short game prowess or for just playing a round of golf in a short time. The course occupies a 22-acre parcel neatly located in proximity to family housing and a new club facility and features lights for night golf. The course reportedly has accommodated over 60,000 rounds in a year's time. The 10th Puka bar alone draws hundreds of Hickam residents and employees where they too become part of the family on their first visit. The 9-hole course is replete with mature trees and a tedious topography with unexplored potential.

Course details

Architect	Unknown
Year constructed	1961
Climate	Mild & tropical all year
Average annual rainfall	Varies 10-22 inches
Average growing season	Relatively year round
Winds/Prevailing Direction	Trades from NNE
Total Facility Acreage	22 acres
Par	27
Yardage/Rating/Slope	Blue/Red- 1406/NA/NA
Turfgrass	Tees- Bermudagrass Fairways- Bermudagrass Greens- Tif 328 Roughs- Common, mixed





Par 3 Golf Course, Hickam AFB, HI

Miscellaneous Facility Review

Although the course is primary to the enjoyment and eventual return of most of the Par 3's 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
- Practice areas
- Maintenance complex
- Pesticide mixing and storage
- Cart barn
- Infrastructure



The recently constructed Par 3 Golf Course clubhouse.



The Par 3 pro shop is packed with good deals.

Clubhouse

The Par 3's clubhouse represents an architectural design solution that really is three separate buildings that share a roof. On the south side of the clubhouse are the pro shop and the manager's office. In the middle is the world famous 10th Puka lounge. The Puka is a beehive of activity nearly every evening during happy hour. On the north side of the clubhouse "complex" is the BBQ restaurant. Built in 1999, the clubhouse works well for its customers and employees. Management is proud of his accomplishments in getting the facility built as well in how well business has been for the Par 3 over the years. Good ideas plus good employees usually equals good profits.

Practice areas

One of the distinct disadvantages of the Par 3 Golf Course site is its limited empty space. At least near the clubhouse. Specific area for practicing is confined to the putting green. But, since the course offers no hole over 210 yards long, the entire facility becomes a short game practice area for many of Hickam AFB golfers.



The putting green is usually in great condition.



The first tee is tight against the clubhouse and the practice green.

Pesticide mixing and storage

Mamala Bay Golf Course Superintendent and his staff mix, store, and apply all of pesticides for the Par 3 Course. Please see this section of the Mamala Bay Golf Course Environmental Baseline Assessment for more information.

Cart barn

There are no carts at the Par 3 Golf Course.



Course irrigation system has provides near full coverage yet its wiring system continually fails.



Lighting system needs upgrading to minimize maintenance and repairs.

Infrastructure

This section examines important elements of a quality golf course that are difficult to group into another category. There are no carts or cart paths at the Par 3 Golf Course. The parking lot is across the street but is large enough for the Par 3's customers. Landscape development attempts have been relatively successful. There are few site amenity groups near most teeing areas and the course signage could be greatly improved. Lighting system wiring needs major repair as it breaks down regularly. Irrigation system wiring is another recurring maintenance headache. A new system is forecast for FY07-09 timeframe.



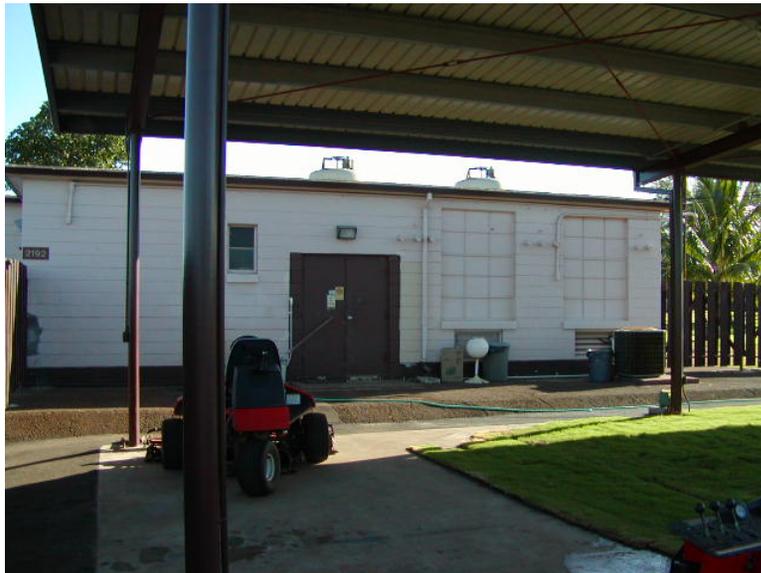
Large trees are abundant creating overly shady conditions for turf.

Maintenance complex

The maintenance complex at the Par 3 Golf Course is really nothing more than a reused building and a fenced area...and it works! Of course, a new facility with all the amenities would be desired by all but the Par 3 course superintendent has demonstrated one of the best traits possible in his field; making due with what you have. The maintenance complex is functional yet interior equipment storage space would greatly enhance their longevity. Although there are no specific plans to build a new complex, Hickam AFB planners and managers should initiate consideration of an upgrade.



A paved yard with plenty of space functions well.



Covered, but no walls. Works great as a place to store sod awaiting installation but not high-priced mowing equipment.



Screen fence hides most of what's behind it from golfing customers.

Environmental Compatibility Quotient Checklists

The following is a brief compilation of some of the observations in each of the ten Environmental Compatibility Quotient (ECQ) categories 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

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).



Constant effort is expended in improving the quality of the course.



Tree shades tee box making turf thin, weak, and slow to recover.

Determining the Environmental Compatibility Quotient

The ECQ compiled for an installation's course is a snapshot of the overall performance and compliance with the GEM Plan. There are two ways to use the ECQ checklists to determine the status or quality of the environmental management program: determining the actual and potential environmental compatibility quotients.

- **Actual ECQ-** the total percentage of "Yes" responses for all ten checklists.
- **Potential ECQ-** the total percentage of "Yes" responses plus the total percentage of "Partial" responses for all ten checklists.

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 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

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. 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 wildlife species and their habitats?	✓		
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	0	6

Safety, Training, & Awareness				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	All employees are familiar with the GEM Plan and are trained regularly on the importance of environmental performance and compliance with the goals and objectives of the program?			✓
2	All appropriate employees are trained to be familiar with USAF, federal, state, and OSHA regulations that apply to storage and handling of chemicals used on the property?	✓		
3	All employees are aware that chemical manufacturing, use, storage, and disposal may pose 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	Chemical applicators are encouraged to apply for continuing education programs and receive regular training to maintain currency?	✓		
7	Are all golf course pesticide applicators active participants in the local respiratory and pulmonary function testing program?	✓		
8	Pesticides, fertilizers, and other chemicals are stored on plastic or metal shelving?	✓		
9	Are golfers notified in the pro shop and on the first tee 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		8	0	2

Compliance				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is fuel storage/delivery managed in accordance with federal, state, 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 staff meetings to discuss environmental management issues?			✓
4	Does the director of golf and the superintendent attend ECAMP 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 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	Are oil/water separators operating properly and correctly maintained?	✓		
10	Are projects planned and funded for the next year that would increase the compatibility of the course's management methods with the environment?		✓	
	Point totals for each column - Response percentage	7	1	2

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 occurs by only 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 food storage and prep areas properly cleaned to reduce the likelihood of pest infestations and required pesticide applications?	✓		
8	Are scouting forms collected, processed, and mapped to aid decisions for control?			✓
9	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 	✓		
10	Is the chemical storage structure/area locked, well ventilated, fire proof, and access is limited to select personnel?	✓		
	Point totals for each column - Response percentage	6	3	1

Pollution Prevention				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are there designated "no-mow" areas and established "no spray zones" and buffer areas around pond, river, stream, or lake edges and have they been communicated to mower operators and technicians?	✓		
2	A spill containment kit is readily available and spill containment procedures are 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	Has the Installation Spill Plan been amended to include the golf course facility?	✓		
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	Does the fuel storage and delivery area comply with local, state, and federal regulations?	✓		
10	Are slow-release fertilizers used to reduce the negative potential for runoff?	✓		
Point totals for each column - Response percentage		8	0	2

Conservation Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are all motorized golf course equipment checked regularly for excessive air polluting emissions?			✓
2	Are there designated non-maintained or minimally maintained buffers around core wildlife habitats?	✓		
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, 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 property been examined for critical habitats, threatened or endangered species, wetlands, and floodplains?	✓		
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 habitats and their maintenance practices been coordinated with the installation BASH officer and environmental management personnel?			✓
10	Are recycling containers conveniently provided for customer and employee use throughout the golf course facility?	✓		
Point totals for each column - Response percentage		6	0	4

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	Wash and wastewater is kept from making direct contact with surface water and is recycled or allowed to filter through a vegetative area when cleaning and maintaining equipment?	✓		
3	Outdoor irrigation of non-golf course areas and indoor plumbing are regularly monitored and maintained for leaks?	✓		
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 natural 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 the parking lots for customers and employees at least partially constructed with permeable surfaces and are they drained through an area of turfgrass or vegetation prior to discharge into a water feature?	✓		
9	Does the facility have a Drought Management Plan written, ready, and available when, or if, irrigation restrictions may be instituted?			✓
10	Are water quality problems immediately reported to supervisors or regulatory agencies (if required) for appropriate action?	✓		
Point totals for each column - Response percentage		8	0	2

Maintenance Practices				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Is contour mowing used to conserve fuel and increase playability and aesthetics?		✓	
2	Are there designated non-maintained or minimally maintained buffers around core wildlife habitats?	✓		
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 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 contamination?	✓		
7	Has there been a complete examination for potential negative environmental impacts of all aspects of the operation including snack bar/grill, clubhouse, pro shop, and maintenance complex?		✓	
8	Are green, tee, and fairway mowing heights maintained at reasonable levels without excessively stressing turf?	✓		
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		5	3	2

Customer Relations & Education				
#	Environmental Compatibility Indicator	Yes	Partial	No
1	Are the course manager and superintendent involved in a long-term customer educational program that is regularly updated and documented?		✓	
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?			✓
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 Council, Civil Engineering, Environmental Management, the Services manager, and commanders by course management?		✓	
5	Are there warning signs posted near parking lots to make highly sensitive individuals aware of the potential danger to their health and are all state posting requirements being met?			✓
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	3	4	3

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 planned that may increase awareness of the facility's specific environmental-challenges?			✓
4	Are there 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	1	3	6

ECQ Summary

#	Environmental Compatibility Quotient Category	Yes	Partial	No
1	Overall Management Philosophy & Documentation	4	0	6
2	Safety, Training, & Awareness	8	0	2
3	Compliance	7	1	2
4	Pesticide Use, Storage, & Handling	6	3	1
5	Pollution Prevention	8	0	2
6	Conservation Practices	6	0	4
7	Water Resources	8	0	2
8	Maintenance Practices	5	3	2
9	Customer Relations and Education	3	4	3
10	Miscellaneous Special Projects & Activities	1	3	6
	Composite points & response percentage	56	14	30

GCEBA Results

Σ Par 3 Golf Course, Hickam AFB, HI

- Actual ECQ (# of “Yes”) = 56 “Just started”

- Potential ECQ (Actual ECQ plus “Partial”) = 70 “Early stages”

Conclusion

The Par 3 Golf Course represents a unique resource among Hickam AFBs impressive and diverse stable of recreational activities and facilities. It offers opportunities such as a teaching facility for youth and beginners, nighttime golf, a place where senior's can still walk an entire round, and a place for those customers that cannot commit five or more hours to a round of golf. If the current land use is desirable in its current location, then a comprehensive master plan should be accomplished to delineate, quantify, and prioritize the work. AFCEE would be more than happy to provide these services if requested.

Areas needing improvement

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

- Overall Management Philosophy & Documentation
- Maintenance Practices
- Customer Relations & Education
- 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.



Nicely vegetated property is relatively flat and featureless.



The Par 3 course is ideal for seniors and beginners.



Mature trees are in need of pruning.



Pro shop features a wide assortment of necessary items.



The 10th Puka Bar heat up nearly every day with loyal customers.



The superintendent performs all necessary tasks.

Environmental challenges

One of the important results of the GCEBA process is the identification of significant issues or challenges that should 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 the Par 3 Golf Course, Hickam AFB, HI:

- Installation Restoration Program (IRP)
- Invasive exotics



Water quality monitoring sites are located throughout the course.

INSTALLATION RESTORATION PROJECT (IRP)

There is one IRP site on the Par 3 Golf Course. "SS15 is a POL-contaminated site". "Limited POL removal with monitored natural attenuation is planned". Scheduled completion of the over \$2M project is set for December 2010.

Also, there have been old tanks and/or boilers found and removed along the northern edge of the property with some actually under the 8th green.

INVASIVE EXOTICS

For the discussion of this environmental challenge at the Par 3, please consult the Mamala Bay Golf Course Environmental Baseline Assessment report.

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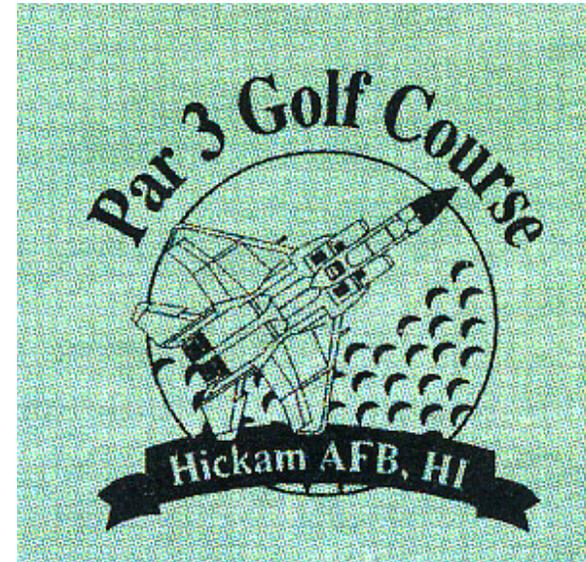
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<http://www.afcee.brooks.af.mil/ec/golf/>