



Maintenance Facility BMPs- A Self-Assessment Checklist



Taking care of the environment begins at the maintenance facility, and depends upon attitude, infrastructure, and sound BMPs.

Strict standards for protecting the environment on golf courses—including soil, water, and air quality—begin at the maintenance facility. Whether working from an old barn or a state-of-the-art natural resource management center, golf course superintendents must employ Best Management Practices (BMPs) to ensure that the hub of all maintenance activities is safe for workers and the environment.

The following checklist can be used to conduct a walk-through inspection and evaluate your management practices. It is not intended as an all-encompassing assessment or regulatory framework, since site conditions and local and state requirements vary widely.

Use the checklist as a starting point for assessing your facility and prioritizing areas that need to be addressed. In addition, you must obtain and meet specific state and local codes.

Based on your findings, seek available resources to make improvements. Upgrades may not always require a major financial investment. Best management practices and simple solutions often yield significant results.

When costly repairs or upgrades to the maintenance facility are needed, consider the cost of liability against the cost of investing in safer equipment or building features. Such arguments are often the most persuasive when trying to gain approval for capital expenditures.

▶▶ **To the checklist**

Are these BMPs required for ACSP certification?

The maintenance facility BMPs listed here are considered best for environmentally-responsible chemical storage and handling. However, because many involve *infrastructure standards*, we strongly recommend, but do not require, all items on this checklist for ACSP certification. Consult the ACSP Certification Handbook for specific certification requirements.

Maintenance Facility– General

- The maintenance facility is kept clean and orderly.
- Equipment is stored in clearly designated areas.
- A separate break/lunch/meeting room is available.
- OSHA (WHIMS in Canada) and other safety information is posted.
- An emergency response plan is filed with emergency responders. The plan should address fuel, pesticides, fertilizers, paint, and solvents.
- Staff is trained to use and maintain equipment properly and to follow emergency response procedures.

Chemical Storage

Infrastructure

- Structure meets state or provincial codes.
- Chemicals are stored in a designated chemical storage structure, separate from the general maintenance facility, that is secure and has limited personnel access. Signage clearly marks the structure.
- Structure is climate controlled (heated or properly insulated) if chemicals are stored over the winter.
- Structure is well ventilated with powered venting capable of three air exchanges per hour.
- Powered venting is on a timer for automatic venting once per day.
- Manual switch for fan is located on exterior of building or door.
- Structure includes passive venting to outside, where possible.
- Fire safety precautions are in place and response plan is on file.
- Structure has explosion-proof electrical devices, if needed, or electrical devices on the outside of facility.
- Structure has an impervious floor, such as metal or sealed concrete, that is self-contained.
- Procedure or device (*e.g.*, sump pump) is in place to clean up liquid spills, should they occur. Ideally, floor should be designed to drain to a trough or toward the door to facilitate safe clean up of spills.
- Structure has emergency wash facilities with adequate soap and water, including eye wash stations, in close proximity.

BMPs

- A spill containment kit is readily accessible and easy to open.
- Current MSDS for all storage products are readily available.
- Spill containment procedures are posted, and written in English and Spanish/French, if needed.
- Pesticides are stored away from fertilizers and in an area with proper ventilation.
- Pesticides are kept dry and away from activities that might knock over a container or rip open a bag.
- Pesticides are stored off the floor on metal or plastic shelving or, if wooden shelves, have secondary containment (*e.g.*, plastic bin or tray).
- Liquid products are stored below dry products or have secondary containment on the shelf
- A minimum amount (one season supply) of pesticides is stored.
- Storage of liquid pesticides in cold weather is considered. Usually, when a liquid pesticide freezes, the only risk is separation of the active ingredient from the solvents or emulsifiers. However, if the liquid expands upon freezing, the container holding the pesticide may crack or rupture. Avoid having excess pesticides that require winter storage.

Mix/Load Area

Infrastructure

- Meets state codes for containment; check regulations for roof, slab size and lip, sump design/volume.
- An impermeable surface, such as sealed concrete, is used for mixing and loading chemicals.
- The mixing and loading pad includes containment walling or a sump system.
- A back-siphon prevention device is installed on the well or hydrants, or an air gap is maintained between the hose and the top of the sprayer tank.
- Emergency shut off is within immediate access to the operator.
- Area has emergency shower/eye wash.
- Best if roof is over this structure to prevent rainwater contamination.

BMPs

- Sprayers are filled by a trained and licensed applicator.
- Current product labels are readily available and followed precisely.
- The spray hose is never put in the sprayer tank.
- The hose is always kept well above the water line.
- An air gap is maintained between the hose and the top of the sprayer tank.
- Mixing and filling is always done at chest level or below.
- An emergency response plan for the site is in place and includes the following information:
 - where runoff water will go,
 - how to handle your particular pesticides, and
 - who to call for help.
- Materials involved with spills are handled according to label instructions.
- Spills are reported to authorities in a timely manner, including:
 - concentrated spills greater than one quart;
 - spills of smaller quantities if they may cause damage to surface or ground water because of the specific chemical or the spill location.
- Spilled material and contaminated soil are removed no matter what the quantity and disposed of according to recommendations received when the spill is reported, or, for smaller amounts, according to label.
- Pesticide mixing and loading takes place away from water sources. (One way to do this is to use a nurse tank to transport water to the mixing and loading site.)
- Mixing and loading is not carried out on gravel or other surfaces that allow spills to sink quickly through the soil.
- Rinse water is used for mixing subsequent loads of the same pesticide. The last rinse load is applied to a labeled application site, away from water sources.
- Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), rinsing empty pesticide containers is mandatory.
 - Plastic, metal, and glass containers are triple-rinsed or pressure-rinsed immediately after use, since residue can be difficult to remove after it dries.
 - Rinse water is poured into the spray tank.
 - Metal and plastic containers are punctured and stored in a covered barrel until taken to a recycling facility or an approved public landfill.
 - Check with suppliers for a recycling program for plastic jugs.

Fuel Storage Area

- Above ground tanks are used to minimize the potential for subsurface contamination and include:
 - An impermeable surface (*e.g.*, concrete with a sealant), with a lip to minimize leaching and contain spills
 - A containment dike surrounding the tanks to catch any spills
 - A sensor to detect any leaks in the gas tank
 - Overfill protection on the tank
 - Automatic shut off device in case of hose breakage (breakaway hose)
 - A roof over the tanks to increase the longevity of the tanks
 - Emergency shut-off on electric pumps
 - Corner and side posts for traffic protection
- Based on the total quantity stored, your facility may be required to file a Spill Prevention Control and Countermeasures Plan (SPCCP) with the U.S. EPA.

Wash Pad

Infrastructure

- To protect water quality, assess options for handling wash water on-site versus installing a self-contained recycling/processing system. Invest in recycling systems, if needed, to handle facility demands.
- The wash pad is made of an impervious surface, such as sealed concrete, to control leaching of any contaminants.
- Several air hoses are located in proximity to the wash area so excessive grass clippings can be blown off prior to cleaning equipment.
- If no recycling system is available, wash water drains into a vegetated retention area or swale at least 25 feet wide, but again there should be no direct contact with a surface water body. Best if water drains to surface. Discharge to below surface drain/leach field may be permitted, check with local codes.
- Screening devices are used to prevent an excess of grass clippings from moving off the pad.
- Consider a roof over the pad to minimize excessive water from going into the recycling storage tanks.

BMPs

- Wash water from this area is not discharged to surface water either directly or through ditches, storm drains, or canals. Equipment wash water may contain soaps, fertilizer residues, solids, and lubricating oil residues, which can contaminate water sources.
- Pesticide equipment is not washed off in this area. Ideally, pesticide equipment is washed in a closed system where rinse water can be reused.
- No engine cleaning is conducted in wash station dedicated to exterior of equipment.
- Consider use of air only for several days per week to minimize water use.

Further Resources

Maintenance Facility:

- **Environmental Management Resource Manual**
<http://www.golfsupers.com/AM/Template.cfm?Section=Environment1>. Created by the Canadian Golf Course Superintendents Association, this guide is easy to use and understand. Although geared to Canadians, the information can be applied to all golf courses.
- **Best Management Practices for Golf Course Maintenance Departments**
<http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/golfbmp.pdf>. Developed by the Florida Department of Environment, the editorial outlines basic BMPs for all areas of the maintenance facility.
- **Getting It Right**
<http://turf.lib.msu.edu/2000s/2005/051112.pdf>. A first hand account of Lake Merced Golf Club's endeavor of building a new maintenance facility due to localized water constraints and the need to recycle water.
- **Turf Care Centers: The Heartbeat of Golf Turf Conditioning**
<http://turf.lib.msu.edu/2000s/2001/010701.pdf>. Written for those who are planning to build a new maintenance facility; highlights the components of a maintenance facility and layout. Schematics included.

Chemical Storage and Mix/load Pads:

- **Pesticide Storage and Mixing Facilities**
<http://pubs.caes.uga.edu/caespubs/pubs/PDF/B1095.pdf>. The University of Georgia's Cooperative Extension Service offers this excellent piece that includes numerous examples of design specifications of chemical storage structures and corresponding mix/load pads. Schematics included.
- **Pesticide Storage: One Step Ahead**
http://www.usga.org/turf/articles/environment/pesticides/pesticide_storage.html. A first hand account of a courses renovation of their maintenance facility, focusing on the chemical storage area. Schematics included.
- **Best Management Practices for Chemical Storage Areas**
<http://greenmediaonline.com/li/1998/0998/998chem.asp>. A short checklist of basic BMPs that should be taken into account when evaluating chemical storage infrastructure.

Wash Pads:

- **Wash Away your Cares**
<http://turf.lib.msu.edu/1990s/1998/981117.pdf>. A case study of the Pinehurst Course #8's simple and innovative equipment wash station that filters and recaptures the water for irrigation. Schematics included.
- **Evolving Equipment Washing Technology and What's in That Water**
http://www.usga.org/turf/green_section_record/2005/sep_oct/evolving.html. Examines modern closed-loop recycling wash systems and weighs pro's and con's using Long Island golf courses as examples.

The USGA Turf Advisory Service and The Golf Course Superintendents Association of America offer valuable guidance and resources on maintenance facilities. We thank them for their review and contributions to the development of this fact sheet.

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