

Tennessee Valley Clean Marina Guidebook



**A product of the Tennessee Valley
Clean Marina Initiative**

**Prepared by
Tennessee Valley Authority
Chattanooga, Tennessee**

**2001
(updated 1/2005)**





The Tennessee Valley Authority developed and authored this guidebook to support marina operators and owners who are voluntarily striving to protect the water resources of the Tennessee Valley. This manual is intended as an educational tool and reference for reducing water pollution and erosion from marina and boating activities. It does not constitute a complete reference to State, Federal, or local laws. Relying on the information in this book will not protect you legally. It is not intended to be legal advice, and should not be relied upon as such. This book may not be relied upon to create a right or benefit substantive or procedural, enforceable at law or in equity by any person.

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For more information on the Tennessee Valley Authority, please visit the website: www.tva.gov.

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NOTE: ALL applicable federal, state, and local regulations identified as required by the symbol .



Acknowledgments

The Tennessee Valley Clean Marina Guidebook was developed by Linda B. Harris with support from the people and publication resources of the Maryland Clean Marina Initiative, the Florida Clean Marina Program, EPA's National Management Measures to Control Nonpoint Source Pollution From Marinas and Recreational Boating, and the expertise available through the National Clean Boating Campaign.

A special thank you goes to the many subject area experts in Tennessee Valley Authority and within our supporting agencies and organizations who provided their time and effort to review, edit, and discuss the Guidebook. Special thanks also to the TVA Watershed Team members who helped assure that the program was appropriate and applicable from one end of the Valley to the other.

Agencies and organizations working cooperatively to support development and implementation of the Tennessee Valley Clean Marina Initiative include:

Alabama Department of Environmental Management
Alabama Marina Police
The Assistant United States Attorney General
Boone Lake Association
Boone Watershed Partnership
Environmental Crimes Joint Task Force
Federal Bureau of Investigation, Knoxville Division
Friends of Norris Lake
Johnson City Clean Team
Johnson City Power Squadron
Keep Bristol Beautiful
Kentucky Marina Association
Norris Lake Dock Owners Association
Project R.O.S.E. (Recycled Oil Saves Energy)
Tennessee Basin Clean Water Partnership
Tennessee Marina Association
Tennessee Wildlife Resources Agency
Tim's Ford Council
Tim's Ford State Park
TVA Police
United States Coast Guard
USDA Forest Service

And numerous marina managers and owners committed to protecting the water resources of the Tennessee Valley.

Introduction

The Tennessee Valley Clean Marina Initiative (TVCMI) is a voluntary program developed and implemented by Tennessee Valley Authority (TVA) and its watershed partners to promote environmentally responsible marina and boating practices. This program, established in support of the National Clean Boating Campaign, will help marina operators protect the very resource that provides them with their livelihood: clean water. It is designed as an ongoing program to reduce water pollution and erosion in the Tennessee River watershed. The effort will encourage boater education, coordination among state agencies and better communication of existing laws, as well as offer incentives for creative and pro-active marina operators.

The TVCMI includes seven *management measures* that were identified by marina operators as priorities:

- Sewage management
- Fuel Management
- Solid Waste and Petroleum Recycling and Disposal
- Vessel operation, maintenance, and repair
- Marina siting, design, and maintenance
- Stormwater management and erosion control
- Public education

Each management measure is discussed in detail in one of the sections of this guide. Each section offers several *best management practices* (BMPs), individual activities or structures that can be used alone or in combination to achieve the management measures. The BMPs include both pollution prevention practices and source reduction practices.

TYPES OF PRACTICES ADDRESSED THROUGH THE CLEAN MARINA INITIATIVE

Pollution prevention practices occur at the spot where the pollutants are created or used. Pollution prevention measures include all practices that can prevent pollution from either being created or being released into the environment. They are often the first, best, least costly, and most effective ways to prevent contaminants from entering the water.

Source reduction practices occur after pollutants have been created and entered the environment. Source reduction practices are those used between where pollutants are released and the surface water. They include practices that capture, filter, screen, trap, contain, absorb, chemically neutralize, or divert to municipal sewer lines any pollutants before they can get into the water. Recycling is a form of source reduction.

The scope of this guide is broad, covering diverse nonpoint source pollutants from marinas and recreational boating. Because all waterbodies and marinas are different, not all practices and techniques described in this guide will be applicable to all situations. Also, BMPs are continually being modified

and developed as a result of experience gained from their implementation and the innovation of marina owner and operators across the country.

This guide can assist marina owners and managers in identifying potential sources of nonpoint source pollution and offer potential solutions. Finding the best solution to any nonpoint source pollution problem at a marina requires taking into account the many site-specific factors that together comprise the setting of a marina.

BENEFITS OF ACHIEVING CLEAN MARINA DESIGNATION

By participating in the TVCMI your marina can demonstrate its commitment to addressing water quality issues. If successful, it could help the marine industry avoid new regulations. Marina operators, who depend on boaters for their income, have the utmost interest in protecting the resource upon which they rely so heavily. Studies have shown that the most important aspect in a marina for boat owners is cleanliness. By operating a clean, safe marina and flying the Clean Marina flag, you have an advantage in attracting new customers. Chances are, the new customers you attract will be more environmentally responsible, thus reducing your liability from careless boaters.

You also have opportunities for new revenue sources such as selling and promoting the use of “green” products in your marina store. Renting equipment such as vacuum sanders to your customers also presents a new source of revenue. Additionally, by reducing, reusing and recycling, marina operators can cut the costs of waste disposal/removal while encouraging environmentally sensitive behavior. Using non-disposable products and products that allow re-use can also save on the cost of supplies. These practices are mutually beneficial for your marina and the resource on which it depends.

STEPS TO BECOMING A TENNESSEE VALLEY CLEAN MARINA

The first step toward Clean Marina designation is to sign the pledge card included in the introductory material delivered to your marina. These are also available at your nearest TVA Watershed Team Office. In signing the pledge card, you commit “to controlling pollution and erosion at your facility and to promoting water-protective behavior with the boating public” as you work toward attaining Tennessee Valley Clean Marina status. Return a copy of the pledge card to the appropriate TVA Watershed Team and keep the original to display at your marina. Watershed Teams will provide you with a Clean Marina Checklist and a *Tennessee Valley Clean Marina Guidebook* to get you started.

The second step is to review the Clean Marina Checklist carefully to understand the goals and objectives of the initiative. If you have any questions, the Watershed Team and their partners for your reservoir is on hand to provide assistance.

Make a preliminary assessment of your marina using the Clean Marina Checklist. You may want to reference the guidebook as you do this, as it includes recommended actions to address the various checklist items. At the same time, consider which actions you need or want to select in order to reach Clean Marina status. When you have completed your marina assessment, contact your TVA Watershed Team to schedule a visit. With your checklist to guide you, review your assessment with the team member who visits, identify areas where improvements are indicated, and work with them to develop a plan of action for attaining Clean Marina status.

TVA and its partners can provide assistance, help you find needed resources and answer, or help find the answer, to any of your questions. The goal is to have all Valley marinas who wish to participate successfully certified as a Clean Marina within two years of committing to be a part of the program. When your marina has succeeded in implementing the agreed to actions on the checklist, contact the Watershed Team to schedule an endorsement visit.

After the successful endorsement visit, you will receive a Tennessee Valley Clean Marina certificate acknowledging your commitment and authorization to use the Clean Marina logo. You will also receive a Clean Marina flag to fly from your property. Your marina will be recognized in press releases, on the TVA Web site, and in other Clean Marina promotions and events.

Sustaining your Clean Marina status is easy. Simply complete a new self-assessment once every two years using the Tennessee Valley Clean Marina Guidebook and Checklist. When it is time for your self-assessment, call your Watershed Team to receive the most current checklist. Complete the self-assessment and set up a meeting with a TVA Watershed Team member for a visit to reaffirm your Clean Marina status. As rules and regulations are not static, you will be notified if there are any changes in the contents of the guidebook and checklist. You will also receive fact sheets on new technologies and products as they become available.

CONTACT INFORMATION FOR TVA WATERSHED TEAM OFFICES

Holston-Cherokee-Douglas Watershed Team

***Boone, Bristol Project, Fort Patrick Henry,
South Holston, Watauga, and Wilbur***

106 Tri-Cities Business Park Drive, WTR 1A-GRT
Gray, Tennessee 37615
423-467-3800

***Cherokee, Douglas, Nolichucky,
and French Broad***

3726 E. Morris Boulevard, MOC 1A-MOT
Morristown, TN 37813-1270
423 585-2120

Watts Bar-Clinch Watershed Team

***Clinch, Great Falls, Melton Hill, Norris, Powell,
and Watts Bar***

260 Interchange Park Drive, LCB 1A-LCT
Lenoir City, TN 37772-5664
865-632-1320

Little Tennessee Watershed Team

***Fontana, Fort Loudoun, Tellico,
and Little Tennessee***

260 Interchange Park Drive, LCB 1A-LCT
Lenoir City, TN 37772-5664
865-632-1300

Chickamauga-Hiwassee Watershed Team

Chickamauga and Nickajack

1101 Market Street, PSC 1E-C
Chattanooga, TN 37402-2801
423-876-6706

***Apalachia, Blue Ridge, Chatuge, Hiwassee,
Nottely, and the Ocoees***

221 Old Ranger Road, MLO 1A-MRN
Murphy, NC 28906
828-837-7395

Guntersville-Tims Ford Watershed Team

Guntersville, Normandy, and Tims Ford

3696 Alabama Highway 69, CAB 1A-GVA
Guntersville, AL 35976-7196
256-571-4280



Pickwick-Wheeler Watershed Team
*Bear Creek, Cedar Creek, Duck, Elk, Little Bear
Creek, Normandy, Pickwick, Upper Bear Creek,
Wheeler, and Wilson*

P.O. Box 1010, SB 1H-M
Muscle Shoals, AL 35662-1010
256-386-2560

Kentucky Watershed Team
*Beech River Project, Kentucky,
and Lower Duck*

2835-A East Wood Street, WTB 1A-PAT
202 West Blythe Street
Paris, TN 38242-5948
731-641-2000

Using the Guidebook

*“Helpful Hint:
As you read
through the
Guidebook,
you will find
that the prac-
tices listed in
each section
correspond to
the items
listed in the
Checklist.”*

The *Tennessee Valley Clean Marina Guidebook* is a reference tool complementing the self-assessment checklist. The sections in the checklist correspond to the sections in the guidebook. As you work through the checklist, refer to the applicable guidebook section for background information and recommended actions. The section called “Programs to Control Nonpoint Pollution” summarizes the requirements of TVA, local, state and federal agencies and is referred to in applicable chapter items.

Two other publications will provide further support and details important to successful implementation of the Clean Marina program:

- *Sewage Systems for Recreational Boats* - a joint publication of Tennessee Wildlife Resources Agency and Tennessee Valley Authority that offers the text of the state and federal laws and provides detailed information on sewage system design, and equipment selection, installation and maintenance, and
- *2001 Guide for the Safe Operation and Maintenance of Marinas* – by the National Water Safety Congress, the recommendations in this publication provide a guide for minimum safety requirements for the operation and maintenance of marinas to assure adequate protection of the public from mishaps, encouraging compliance with applicable state and local codes, the National Fire Protection Association Codes, the National Electric Code, and Code of Federal Regulations, Title 40, Subchapter I Solid Wastes, Part 280.

All actions required by regulation and law are not negotiable and must all be implemented in order to achieve Clean Marina status.

Section 1 Sewage Management

Background

Raw or improperly treated boat sewage is harmful to human health and water quality. Sewage contains nutrients that can stimulate pathogens (fecal coliform bacteria and viruses) and plant growth (algae and aquatic plants).

Gastroenteritis, hepatitis, and other waterborne diseases may be passed directly to people who swim in contaminated waters. Pathogens can affect health directly through contact in the water or indirectly through the consumption of contaminated shellfish.

Microorganisms present in sewage need oxygen. When sewage is discharged to waterways it reduces the amount of oxygen available to fish and other forms of aquatic life. The heavy nutrient load in sewage encourages excessive algal growth, which in turn blocks life-giving sunlight from reaching subsurface vegetation providing habitat for aquatic life. When the algae die, the bacteria active during the decomposition process reduce the levels of dissolved oxygen.

Progress has been made toward eliminating discharges of sanitary waste from boats through designation of no discharge zones, installation of pumpouts nationwide, and the growing number of boater education programs. Efforts to reduce sewage discharges and to educate boaters about the impacts caused by sewage discharges needs to continue, and marinas can play a direct and important role in these matters.

1. Comply with federal, state and local wastewater outfall and septic system regulations.

It is illegal to discharge raw sewage from a vessel within U.S. territorial waters. Discharge of any pollutant from a point source (outfall) into waters of the U.S. requires a National Pollutant Discharge Elimination System (NPDES) permit from the state. In addition, written permission (permit or other appropriate document) from the municipality must be obtained for discharging into a municipal sewer; written permission from the state and local groundwater/drinking water authorities must be obtained for discharging into the groundwater; and all septic systems must be permitted by the county and inspected for proper installation by the county health department.

For example, if a marina in Tennessee has, or plans to install, a holding tank for wastewater and therefore needs to obtain a State Operating Permit and have the engineering plans approved, the manager should contact the Tennessee Division of Water Pollution Control at the nearest Environmental Assistance Center (1.888.891.TDEC). A marina can also contact the Tennes-

“Consider including information about the MSD regulations in your lease agreements with boat owners.”

see Division of Groundwater Protection at this number if such information is needed as a septage/wastewater hauler licensed in Tennessee.

A TVA Section 26a permit may also be required for activities subject to wastewater permits. Check with your Watershed Team. TVA may request copies of other federal, state, and local permits, licenses, and approvals required for your facilities when you apply for a TVA 26a permit.

2. In “No Discharge” reservoirs, require that marine sanitation device (MSD) Type III holding tanks be pumped into sewage treatment systems and no sewage be discharged overboard. ®

A “No Discharge Area” (NDA) is an area of water that requires greater environmental protection and where even treated sewage cannot be discharged from a boat. In NDAs, Type I and Type II systems must be secured so no discharge can be released. All freshwater lakes, reservoirs, and rivers not capable of interstate vessel traffic are defined by the Federal Clean Water Act as NDAs. With the approval of the U.S. Environmental Protection Agency, states may establish other NDAs in waters of the state.

The most common form of a TYPE III system is a holding tank. Type III systems do not allow sewage to be discharged. If an overboard discharge system (“Y” valve) is installed after the holding tank, the “Y” valve must be secured to prevent overboard discharge of raw sewage in all U.S. waters.

Good plumbing is the key to controlling holding tank odors. Fiberglass and metal tanks are highly resistant to permeation. Specially labeled flexible “sanitation hoses” and PVC piping are also highly impermeable. Hoses should be run the shortest route possible and be as straight as possible. Wherever it is practical, rigid pipe should be used below the level of the holding tank and wherever sewage will tend to accumulate. Seals should be tight and the number of connections kept to a minimum. Odors can be further controlled by use of enzyme-based deodorizing products in the holding tank.

Other forms of Type III systems include recirculating and incinerating systems. A Coast Guard label is not required.

3. Keep inventory records of all sewage pumpout users, dates, and volumes pumped. ®

A sign-in sheet at your pumpout enables you to measure usage and monitor users.

4. In “Discharge” reservoirs, require that no untreated or improperly treated sewage be discharged overboard. ®

The Federal Clean Water Act requires that any vessel with an installed toilet be equipped with a certified Type I, Type II, or Type III MSD. Whatever

“Check with your state about grant funding for installation of pumpout facilities.”

system is utilized, it is illegal to release untreated sewage in U.S. territorial waters. When MSD I's and II's are used, it is critical to disinfect the waste appropriately in order to be in compliance with the regulation.

Type I systems macerate, or mechanically cut, solids, disinfect the waste with a chemical additive or with chlorine disassociated from salt water with an electronic jolt, and discharge the treated sewage overboard. To be in compliance with the law, the fecal coliform bacteria count of the effluence (waste being released) may be no greater than 1,000 per 100 milliliters and may not contain any floating solids.

Type II systems are similar to Type I systems except that the Type II's treat the sewage to a higher standard, require more space and have greater operating energy requirements. In Type II systems the effluent fecal coliform bacteria levels may not exceed 200 per 100 milliliters and total suspended solids may not be greater than 150 milligrams per liter.

Deodorizing agents may or may not be used in both these systems. Most products available to control odors do not disinfect. Labels must be read carefully and directions followed to assure that appropriate chemicals are being used to reduce bacteria count to acceptable levels.

Boats 65 feet in length or less may install a type I, II, or III device. Vessels over 65 feet must install a Type II or III device. Type I and Type II systems must display a certification label affixed by the manufacturer.

5. Have a pumpout system that meets the needs of your marina users either free or at a reasonable cost, or have an agreement with a mobile pumping service for servicing boats in your marina.

Four types of onshore sewage collection systems to handle sewage from boat holding tanks and portable toilets are available—fixed point systems, dump stations, portable/mobile systems, and dedicated slipside systems.

- *Fixed-point collection systems* include one or more centrally located sewage pumpout stations. The stations are usually located on the fueling dock, so that fueling and pumpout operations can be done at the same time.
- A *dump station or a wand attachment* for a fixed-point system may be a satisfactory disposal facility in a marina where boats use only small portable toilets.
- *Portable/mobile systems* are similar to fixed-point systems. A portable unit includes a pump and a small storage tank. The unit is moved where the boat is docked. Portable pumpout facilities might be the most feasible, convenient, accessible, regularly used, and affordable way to ensure proper disposal of boat sewage.

- *Dedicated slipside systems* provide continuous wastewater collection at select slips in a marina. Slipside pumpouts are particularly suited to large houseboats and other extended use vessels. Dedicated slipside pumpout points could be provided to slips designated for boats receiving heavy use, while the rest of the marina could still be served by either a fixed point or mobile pumpout system.

Provide pumpout services at convenient times and either free or at a reasonable cost. Pumpout stations should be available to all boats that are able to access them and cannot be restricted to marina members. Keeping fees low or offering pumpouts for free encourages boaters to use pumpouts. Remember that no more than \$5.00 may be charged if Clean Vessel Act grant funds were accepted to purchase and/or install your system.

The presence of a pumpout station promotes a public perception that you are environmentally responsible. With increased emphasis on the need for holding tanks to be pumped out regularly throughout the Valley, more customers will also be drawn to your dock. Each arriving vessel represents an opportunity to sell fuel, hardware and food items.

6. Have a dump station or a wand attachment to empty portable toilets.

MSD requirements do not apply to vessels with portable toilets. Portable toilets must be properly emptied on shore. Remind boat owners with portable toilets that it is illegal to discharge raw sewage to any U.S. waterway. This may be accomplished through signs or other methods.

7. Keep pumpout stations clean and easily accessible, and/or have marina staff do pumpouts.

Free pumpouts are certainly an attraction for customers, but cleanliness and ease of use are popular features as well. Customers are more likely to use pumpouts if they are kept clean and neat. It is especially important to periodically disinfect the suction connection of a pumpout station by dipping or spraying it with disinfectant, in order to control bacteria and odors.

The ability of a pumpout station to attract new customers is magnified when pumpouts are done by marina staff. Consider installing a buzzer or paging system so that boaters at the pumpout station can easily locate the attendant. If the station is unattended, be sure that clear instructions for use are posted.

Post highly visible signs for passing boaters, making them aware of your pumpout facility or directing them to the nearest public pumpout if you do not have one available.

8. Regularly inspect and maintain your sewage facilities.

A pumpout system that is well maintained will run more efficiently, saving on repair costs in the future. Regular inspections of the pumpout system help insure that any problems are repaired immediately, before they become more serious problems. A regular maintenance schedule and a maintenance log ensure a septic system operates efficiently. It is advisable to establish a maintenance agreement with a qualified contractor for service and repair of pumpout facilities if one is available in your area.

Marina workers should handle waste collection with care, taking precautions to avoid coming into direct contact with sewage. Make rubber gloves and respirators available to workers who maintain or repair your pumpout system or MSDs and encourage their use.

Do not allow rinse water or residual waste in the hoses to drain into the reservoir or river. Keep the pump running until it has been re-primed with clean water.

Dispose of collected waste in the most environmentally sound way possible. One of the best options for disposing of the collected waste is to connect directly to a public sewer line. If sewers are not available a holding tank is usually the option available to you.

The contents of the tank must be pumped periodically and trucked to a treatment plant. Holding tank size and location is generally determined by the local health department. Selection of a well-qualified, licensed, dependable hauler is key to effective disposal of collected waste from a holding tank system.

9. Hold MSD inspections periodically at your marina, assuring that MSDs are properly installed and functioning; appropriate chemicals are being used in MSD Types I and II if they are approved for use in your reservoir; and "Y" valves are tied down so no raw sewage may be released into the water.

Malfunctioning marine sanitation devices (MSDs) are a cause of nonpoint source pollution. Marina operators can help boat owners discover the MSD malfunctions by offering Type I and II MSD inspections free or for a small charge. Follow-up maintenance service can remedy any problems found during inspection. Environmental audits and retrofits on engines, bilges, fuel systems, and MSDs can be an additional revenue source for your marina.

It is strongly recommended that holding tanks equipped with Y-valves have the valves in the closed position to prevent accidental discharge into boating waters. Marina operators can provide Y-valve lock downs to patrons to ensure that the valves remain in the closed position.

In the Tennessee Valley you may request the assistance of the U.S. Coast Guard Auxiliary, state wildlife or natural resources officers, or TVA Police to assist with this effort.

Boaters may be encouraged to run dye tablets through their Type I and Type II systems outside of the marina basin. If a system is operating properly, no dye will be visible. Maintenance is required if dye can be seen in the discharge.

10. Maintain records of MSD inspections, noting boat owners, registration numbers, and all violations identified on date of inspection.

Maintaining records of MSD inspections will help you identify repeat violations and provide you with documentation of warnings issued.

11. Designate your marina as a “No Discharge” marina and prohibit sewage discharges within your marina basin/harbor limits.

Federal law prohibits discharge of untreated sewage into all TVA reservoirs, but does allow, in “discharge” reservoirs, the use of Type I and II marine sanitation devices (MSDs) which pre-treat boat sewage before it is discharged overboard. A marina operator may prohibit sewage discharges altogether within the marina with the addition of a clause to the slip rental contract stating that sewage discharge is not permitted.

To go further, you can state that failure to comply with the MSD laws and marina policy will result in expulsion from the marina and forfeiture of fees. In follow-through, if a customer fails to observe the law or honor your contract:

- Discuss the matter with the customer,
- Mail a written notice asking that the offending practice stop immediately and keep a copy for your records, and
- If this does not get desired results, evict the boater.

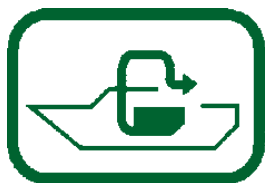
If a tenant is discharging raw sewage, you may report him to your state agency with jurisdiction over boating waste. Provide as much information as possible: name of owner, ID number, location, etc.

12. Establish equipment requirement policies that prohibit the use of “Y” valves on MSDs, such as installation of tie-downs.

Only the relatively few boats that do travel out beyond the 3-mile limit may use a “Y” valve to discharge overboard. Yet the reality is that many boats that never enter the ocean have “Y” valves, seacocks, and thru-hulls installed. “Y” valves (also called cheater valves) have no purpose except to bypass the holding tanks or release untreated sewage. This is clearly illegal and not good for water quality.



“The national pumpout symbol is an easy way to advertise the availability of pumpout facilities.”



A number of marinas, nationally, are no longer allowing “Y” valve use or thru-hull fittings. Many states provide “Y” valve tie downs that are numbered for distribution and tracking purposes. For example, in the state of Tennessee, marina operators may request tie-downs from the Boating Division of the Tennessee Wildlife Resources Agency. “Y” valves may also be locked closed using small locks, wire or tie-downs purchased from a variety of suppliers, but use of the state-supplied tie-downs is the preferred option when they are available. Their use allows you to match the tie-down to a specific boat and identify if the seal has been broken in order to release untreated sewage.

Thru-hull fittings may be plugged solid before allowing boats with holding tanks to sign a lease agreement for space in your marina.

13. Have clean, functioning restrooms available 24 hours a day.

Clean, dry, brightly lit restrooms in marinas will generally be used instead of boat toilets, especially if easy to get to. Restrooms are the best way to reduce boat toilet use, especially when they are pleasant, functional, and safe. Keep dock, paths, and restroom/shower areas well lit at night for safety and security.

Section 2 Fuel Management

Background

Fuel is easily spilled into surface waters from the fuel tank air vent while fueling a boat, and oil is easily discharged during bilge pumping. Because of the properties of oil, a cup of oil can spread as a very thin oil sheen over more than an acre of calm water. Small amounts of oil spilled from numerous boats can accumulate to create large oil sheens. Gasoline spills are also a safety problem because of gasoline's flammability.

Spread over the surface, oil creates a barrier to oxygen movement across the water surface and to animals that must breath at the surface. At and below the surface oil attaches to plant leaves, decreasing their respiration, and to bottom sediments.

Petroleum spills can also cause structural damage at marinas, such as discoloration on boat hulls, woodwork, and paint, and deterioration of white styrofoam in floats and docks, since petroleum dissolves this material. Small spills can escape the attention of many people and marina owners and operators can play an important role in bringing the importance of controlling this form of pollution to the attention of their patrons.

1. Comply with all federal, state, and National Fire Protection Association (NFPA) petroleum handling and storage requirements.

- Be sure hydrants are available to allow for fighting fires throughout your facility.
- Install smoke detectors.
- Have available and maintain adequate, readily accessible, and clearly marked fire extinguishers throughout the marina, especially near the fuel dock.
- Inspect and test all fire fighting equipment and systems regularly, and test all fire extinguishers annually.
- Train personnel on fire safety and response: who to call, location of hydrants, use of portable extinguishers. Post contact numbers for easy access.
- Provide ready access to all piers, floats, and wharves for municipal fire fighting equipment.
- Ask the local fire marshal to visit your marina each year to train employees and to familiarize himself with your facility.

2. Operate an underground storage tank (UST)? If yes, do you have an annual state permit for your UST posted at your facility and are you in compliance with all UST federal and state regulations?

A UST is a tank or combination of any underground piping connected to the tank used to contain an accumulation of regulated substances that has at

"A single pint of oil released onto the water can cover one acre of water surface area (Buller 1995)."




least 10% of its combined volume underground. Various state regulatory agencies have referred to the Federal regulations as a basis for their UST regulations. Marinas with one or more stationary fuel storage tanks, above or below ground, with a combined storage capacity of 1,100 gallons or more of petroleum products are subject to federal and state bulk storage regulations for registration, testing, monitoring, replacement, reconditioning, closure, and removal. Underground tanks with a capacity of 110 gallons or more are subject to federal UST regulations. Federal UST regulations can be viewed on the EPA web site at www.epa.gov/swrust1/fedlaws.

When a tank is buried it is not easily accessible for inspection, maintenance, and painting. Because visual inspection of underground tanks is impossible, minor leaks may go undetected for some time, particularly if inventory control is inadequate. Escaping liquid may travel underground for some distance, polluting both soil and water resources. The labor of replacing an underground tank is often much greater than the cost of installation or the replacement value of a new tank, in addition to the fines which may be levied for violations. USTs should include corrosion protection and spill and overflow prevention equipment, with a leak detection system and readily accessible shut-off valve installed. All motor fuel USTs must meet federal financial responsibility requirements (i.e., insurance) for environmental pollution liability. Because of the potential problems associated with USTs, some marinas are changing from underground storage tanks to above ground, lined tanks.

An aboveground storage tank (AST) is any storage tank whose total volume, including piping and tank, is less than 10% underground. No one set of federal regulations covers ASTs. Various air, water, and oil pollution regulations affect ASTs. The result of having these various regulations is that knowing and complying with the applicable regulations is difficult. All states do endorse certain guidelines for tank installations and maintenance: that they are installed and maintained following the guidelines set forth in the National Fire Protection Association Codes, and that the State Fire Marshal or local fire code representative inspect the AST at installation time. Contact your appropriate state agency for more information.

Except in unusual circumstances, TVA does not approve storage tanks on TVA lands. Such tanks should be located on land owned by the applicant.

3. Operate an aboveground storage tank (AST) larger than 660 gallons or a UST larger than 42,000 gallons? If yes, do you have a Spill Prevention, Control, and Countermeasure (SPCC) Plan that was prepared within the past 3 years and has been signed and stamped by a professional engineer (PE)? 

A Spill Prevention, Control, and Countermeasures (SPCC) plan is a first line of defense against petroleum pollution and should be developed by all marinas, whether required by regulations or not. An SPCC plan should be written to apply to all locations in the marina where fuel or oil is stored or

“The person fueling the vessel, generally the boater, is liable for all penalties associated with spilled fuel.”



transferred, and it should clearly explain spill emergency procedures, including health and safety, notification, and spill containment and control measures. The plan should include the following:

- *Who:* Clearly identify who is responsible for taking what action. Action items will include deploying the equipment and contacting the emergency agencies and additional clean-up services. The plan should contain a list, updated periodically, of emergency phone numbers to be used if a spill occurs.
- *What:* Define what actions should be taken if a fuel spill occurs and, based on likely threats, what equipment should be deployed. Include information on the type of spill equipment available on site and its characteristics and capabilities. Make sure dispersants are *not* used on any spill.
- *When:* Clearly state when additional resources such as spill control services, should be called for assistance. Plan when the marina’s spill control equipment will be inspected and replaced, if necessary.
- *Where:* Show where the spill control material is located. Make sure storage lockers are clearly marked and easy to access. Identify sources where additional spill response equipment can be obtained quickly if necessary. Sources may include commercial spill response companies, fire departments, or neighboring marinas.
- *How:* Explain how the spill control equipment should be used and disposed. To be sure that the crew understands the response plan, regularly conduct drills that simulate a fuel spill.

4. Prohibit the use of detergents and emulsifiers on fuel spills. R

Soaps, detergents, and emulsifying products will hide a spill and seemingly make it disappear, but they actually cause petroleum products to sink into the water where the combination of fuel and detergent can harm aquatic life and make the pollutants difficult to collect. Use of detergent bilge cleaners is illegal and subject to a high fine from the U.S. Coast Guard.

5. Regularly inspect, maintain, repair, and replace fuel hoses, pipes, and tanks. R

Regularly scheduled preventive maintenance is the best source control for fuel loss from the fuel storage and delivery system, and it is often less costly than cleanup costs and fines levied for spills. Preventative maintenance projects such as replacing hoses and connections before they become problematic can help ensure that this equipment is not responsible for gas and oil in the water and can save time and money on extensive repairs in the future. Maintenance projects should be scheduled and recorded in a maintenance log.

6. Use automatic shutoffs on fuel lines and at hose nozzles to eliminate fuel loss. R

Fuel expands as it warms, and the temperature in a boat fuel tank usually is much higher than that in the storage tank. While fueling, a distinctive change in sound occurs when a tank is almost full, and filling can be stopped at this time. This leaves a small amount of space in the tank to allow for expansion of the fuel with temperature changes.

Fuel delivery equipment can be altered to help prevent overflow. Installing shut-off nozzles that automatically stop the flow of fuel before overflow occurs can stem problems with overfilling.

7. Remove old style fuel nozzle triggers that are used to hold the nozzle open without being held. 

The use of any automatic nozzle with a latch-open device is prohibited unless automatic shut-off overrides trigger so no fuel overflows with its use.

8. Have a pump delivery rate of less than 10 gallons per minute.

Setting the pump delivery rate at 10 gallons per minute or less allows patrons ample time to stop fueling before overflow occurs.

You can also promote the installation and use of fuel/air separators on air vents or tank stems of inboard fuel tanks to reduce the amount of fuel spilled into surface waters during fueling. Attachments for vent lines are available commercially and are easily installed on most boats. Marinas can make these units available in their retail stores and post notices describing their spill prevention benefits and availability.

9. Have easy-to-read signs on the fuel dock that explain proper fueling, spill prevention, and spill reporting procedures.

Boaters need to understand that whenever they spill even a few drops of oil or fuel, the environment is harmed. There are simple steps they can take to prevent fuel loss:

- Don't top off the tank,
- Use an oil absorption pad to catch drops when the fueling nozzle is removed from the boat,
- Install a fuel/air separator on the air vent line,
- Place an oil-absorbing pad in the bilge.

Signs with easy-to-follow instructions, perhaps using pictures, can encourage a cleanup if a spill occurs. It is helpful to have signs that state the following information:

- Step-by-step way to fuel a boat,
- Requirements of the law and spill reporting numbers,
- What to do in case of a spill,
- Warnings against the use of detergents or emulsifiers,
- Locations of absorbent materials for cleaning up spills,
- Proper use and disposal of fuel absorbent materials.

"All marina staff should be trained in proper spill handling."



Spills should be immediately reported to either the U.S. Coast Guard or EPA. Oil spills can be reported 24 hours a day at 1.800.424.8802. On navigable waters, any oily slick or sheen must be reported. More information on laws and regulations related to spills can be obtained at the U.S. Coast Guard web site: <http://www.uscg.mil/>.

Marinas posting signs which educate boaters and offering the products referenced at a reasonable cost can help protect the water resources while increasing revenue through boater purchases.

10. Have personal watercraft (PWC) floats at fuel docks to help drivers refuel without spilling.

Special docking facilities for PWCs can be installed to stabilize them while they are at a fuel dock. Docking PWCs while fueling reduces fuel loss caused by the craft rocking on the water while fueling. These docks have proven popular with PWC operators and do reduce spillage. Consider placing the PWC fueling area at the end of the fuel dock to reduce conflict with larger boats.

11. Provide "gas guzzlers," nozzle rings, or small petroleum absorption pads to patrons for use while fueling to catch splashback and drips.

A doughnut placed over the fuel nozzle or a small absorbent pad in hand to catch any splashback when the fuel tank is full and any drops that fall while the handle is being replaced on the pump is an excellent and easy way to prevent the small spills that can add up to big problems. A small absorbent pad temporarily attached to the hull with suction cups below the fuel tank air vent during fueling provides an added precaution against fuel spilling directly into surface waters. Used absorption pads can be air-dried and reused or disposed of in accordance with petroleum disposal guidelines.

Consider keeping a pole with a small floating absorption boom attached at one end on the fuel dock to be used quickly and effectively by staff to sweep and mop the water surface if any small spills occur during boat fueling.

The disposal of used oil absorbent material depends on what type of product it is and how it was used. Standard absorbents that are saturated with gasoline may be air dried and reused. Standard absorbents saturated with only oil or diesel may be wrung out over oil recycling bins and reused. Alternatively, they should be double bagged with one plastic bag sealed inside of another and tossed in the regular trash. Bioremediating bilge booms may be disposed in the regular trash as long as they are not dripping any liquid. Because the microbes need oxygen to function, do not seal them in plastic bags.

12. Have staff pump fuel during regular operating hours.

Marina staff who are fully educated and trained on all of the environmental management practices used at a marina and most familiar with the equipment will not only become skilled at preventing spills, but will also present the image of an environmentally proactive marina. By their actions and their conversations, they will encourage environmentally-friendly behavior among the patrons of your facility.

Ideally, fuel handling facilities should be operated ONLY by trained marina employees. This practice would account for fewer spills, eliminate carelessness, and be safer for marina employees and patrons. If this is the practice at your marina, be sure to post signs that specify "Fuel Pumping by Employees ONLY". All staff members should know the location of absorbent materials and how to use them to remove the fuel immediately from the water or the ground. Regular practice drills ensure that staff are familiar with the proper use of these materials.



Section 3 Solid Waste and Petroleum Recycling/Disposal

Background

“Never dispose of any hazardous substance by dumping it into a sink, floor drain, storm drain, or onto the ground.”



The purpose of this management measure is to prevent solid and liquid waste from polluting reservoirs. Solid waste from boat cleaning, maintenance, and repair might contain harmful substances such as antifouling paint chips or solvents used to clean or polish metal or wood parts. Solid waste from general activities and marina use, such as plastic bags, cups, cigarette butts, and food containers also pollutes surface waters and degrades the habitats of aquatic animals and plants. The simple act of picking up and properly disposing of trash goes a long way toward preventing this form of nonpoint source pollution.

Liquid waste can also pollute streams and reservoirs unless it is properly handled. Small quantities of many liquid wastes, including antifreeze, waste oil, pesticides, cleaners, solvents, and paints, can be harmful or deadly to people, wildlife, pets, fish and other aquatic organisms. Discharge of these materials into marina waters is not only environmentally damaging, but also destroys the overall clean, healthy environment that a marina can provide to its patrons.

1. Store, use, and dispose of non-recyclable hazardous waste in accordance with state and federal regulations. R

Liquid materials for sale or use at the marina, such as fuels, oils, solvents, and paints, should be stored in a manner that minimizes the chance of a spill and contains a spill should one occur. Liquid wastes, such as waste fuel, used oil, spent solvents, and spent antifreeze, should be similarly stored until they can be recycled or disposed of properly.

Build curbs, berms, or other barriers around areas used for liquid material storage and permanently close any drains present to contain spills. Storage and disposal areas for liquid materials should be located in or near repair and maintenance areas, undercover, and away from flood areas and fire hazards.

Provide clearly labeled, separate containers for the disposal of waste oils, fuels, and other liquid wastes.

2. Provide trash cans, bins, and dumpsters that are covered, well marked, and convenient.

Many people don't want to put their trash anywhere except in a trash receptacle. For these people, and to encourage those who might otherwise consider dropping trash on the ground to use trash receptacles, locate waste

disposal facilities near repair and maintenance areas, in parking lots, on docks, and in heavy-use areas. Trash receptacles placed on the dock should have lids and be emptied regularly to keep trash from blowing into the water. A well lighted trash receptacle area that is safe and easy to use after dark encourages liveaboards to manage their waste effectively.

Boaters can be encouraged to bring all of the trash they generate while boating back to shore by providing them with a plastic bag or other suitable trash container. Imprinted with the marina's logo, the bag will carry the clear message that your marina cares about the environment.

3. Minimize the use of hazardous products and replace them with more environmentally protective alternatives at your marina.

Products that carry safety warnings about the harm they can cause to people can harm the environment as well. One way to help ensure that fewer of these hazardous products end up in surface water is to purchase these products in small quantities. Storing these products safely is easier when the quantities are manageable.

Hazardous wastes are ignitable, corrosive, reactive, and/or toxic. There are now many biodegradable, environmentally friendly products on the market to replace hazardous materials. Effective nontoxic and "phosphate-free" cleaners and solvents are readily available. Adopt alternatives to solvent-based parts washes such as bioremediating systems that take advantage of microbes to digest petroleum. Bioremediating systems are self contained; there is no effluent. The cleaning fluid is a mixture of detergent and water. Microbes are added periodically to "eat" the hydrocarbons. Or use soy-based solvents and other similar products with no or low volatility. If you use a solvent to clean engine parts, do so in a container or parts washer with a lid to prevent evaporation of the volatile organic compounds. Reuse the solvent. Once the solvent is totally spent, recycle it.

4. Have and enforce a policy for handling polluters.

While educating patrons on the ways they can reduce their impacts on the environment will certainly limit the number of polluters a marina operator has to deal with, there may still be a few patrons who continue to pollute. Confronting a polluting patron requires a great deal of tact so that at the end of the conversation the patron sees an alternative to polluting that he or she is willing to consider and still feels welcomed at the marina. Having a written plan for handling polluters can make encounters less stressful and ensure that marina staff are consistent in dealing with polluters. The plan might include suggested language marina staff can use when approaching patrons so that the patrons do not feel offended or unwanted, and a list of polluting behaviors and their alternatives.

“Encourage boaters to add stabilizer in the winter to prevent fuel from becoming stale or an octane booster in the spring to rejuvenate it.”



5. Provide materials needed for spill-proof oil changes.

Invest in a non-spill pump system to draw crankcase oils out through the dipstick tube. Use the system in the boat shop or, if you do not have a boat shop and/or allow boaters to perform their own oil changes, require that the non-spill pump be used.

Slip a plastic bag over used oil filters prior to their removal to capture any drips. Hot drain the filter by punching a hole in the dome end and draining for 24 hours. Recycle the collected oil. Recycle the metal canister if practical. If not, dispose in your regular trash.

6. Provide facilities for collecting recyclable liquids (e.g., oil).

Where liquid recycling is available through the municipality, it can be a cost-effective way to decrease trash disposal costs. Public education is necessary if a recycling program is to be effective, though today many people recycle at their homes and already have a “recycle” consciousness.

CHECK WITH YOUR RECYCLER TO LEARN WHAT MATERIALS MAY BE MIXED. Generally speaking, engine oil, transmission fluid, hydraulic fluid, and gear oil may all be placed in a waste oil container, but this varies in different locales. DO NOT allow patrons to pour gasoline, solvents, paint, varnishes, or pesticides into the oil or antifreeze recycling containers. The introduction of these materials creates a hazardous waste which must then be disposed of as hazardous waste: a very expensive undertaking!

Although recycling is a preferred disposal method for reusable liquid materials, not all municipalities provide the service free of charge. Recycling can be performed in-house, but private service providers are often costly. In such a case, the quantity of waste produced can be lessened by reusing materials and sharing leftover cleaning and maintenance supplies (e.g., excess varnish and paint) among customers. You can encourage boaters to exchange excess liquids by providing a bulletin board where boaters can post notices that they are seeking particular materials or have an excess of a substance.

7. Provide facilities for collecting solid recyclables.

Recycling of non-hazardous solid waste such as scrap metal, aluminum, glass, wood pallets, batteries, paper, and cardboard is recommended wherever feasible. When recycling is available through the municipality, it can be a cost-effective way to decrease trash disposal costs.

Placing recycling receptacles for commonly recycled material such as glass, plastic, aluminum, tin, cardboard, and newspaper near trash receptacles makes it just as convenient for patrons to recycle as it is for them to dispose of trash. Recycling containers should be marked with the specific types of material accepted and tightly covered. Use green receptacles or in some

way make them appear “different” so patrons will easily distinguish them from trash receptacles.

Reduce waste in daily operations at your marina. Although a reduction in the amount of waste a single marina produces during one day may not seem significant, producing less waste each day adds up over time to make a real difference. There are many relatively simple ways to reduce the waste produced in each facet of operation. Here are some examples: make double sided copies, use recycled paper, recycle toner cartridges from copiers and printers, use a reusable coffee filter instead of disposable filters, bring a reusable mug to work, use cloth towels and sponges instead of paper towels, repair durable goods instead of throwing them away when they fail, buy products with minimal packaging, and stop receiving unwanted mail (call the organizations sending the mail and ask to be taken off their mailing lists).

8. Conduct routine trash pick-up within your marina and along your shoreline.

Even if waste and recycling receptacles are available, some trash is bound to end up loose on the marina grounds. Having regularly scheduled trash pick-ups helps to ensure that this trash does not end up in the water.

9. Confine fish scrap disposal to areas and methods that do not impair water quality.

Fish waste can create water quality problems at marinas where a lot of fish are landed. The waste from fish cleaning shouldn't be disposed of into a marina basin because of the chance of overwhelming the natural ability of the waterbody to assimilate and decompose it.

Fish cleaning stations located away from the water provide convenient places for marina patrons to clean fish and dispose of their waste material, and help keep the rest of the marina clean. They typically have a cutting table large enough to accommodate a few to many people, a hose or other form of running water, and a receptacle for the waste. Marina managers often find that once a good fish cleaning station is available, patrons gladly use it because gutting fish at a fish cleaning station avoids the mess created on a boat or dock.

The fish waste collected at the cleaning station can be treated as waste like any other and deposited in trash containers or be composted. A local extension service can be contacted for information on locally applicable composting procedures and equipment and where supplies can be purchased.

“Consider printing clear trashbags with your marina name or logo for distribution to your patrons, to emphasize the importance of solid waste management.”



Section 4 Vessel Operation, Maintenance and Repair

Background

Any debris that is on the ground and light enough to be swept away by flowing rainwater or snowmelt can end up in reservoirs, rivers, and streams. Sanding dust, paint chips, metal filings, and other such solids that might be carelessly or inadvertently allowed to drop to the ground while maintaining or repairing a boat can be swept up by the runoff of the next rainstorm. Oils, grease, solvents, paint drippings, and fuel spilled or dripped onto the ground can also be carried away in the runoff.

Chemicals, petroleum products, and other toxic materials used in maintaining and repairing boats can contribute to pollution if not controlled. Cleaning products and solvents are typically toxic and harm aquatic life. Many cleaners also contain nutrients that, if washed into waters, cause excess algae growth which reduces the amount of dissolved oxygen necessary for aquatic life.

Maintaining boat hulls by sanding and pressure washing has the potential to release heavy metals. If they reach the water, heavy metals can affect the entire food chain of a reservoir, including humans who consume fish caught in polluted waters.

1. Ensure that the boats in your harbor meet the TVA regulations for navigability.

Navigable houseboat, as defined in Title 18, Code of Federal Regulations, subpart 1304.201 means any self-propelled houseboat having maneuverability which is (a) built on a boat hull or on two or more pontoons; (b) equipped with motor and rudder controls located at a point on the houseboat from which there is forward visibility over a 180 degree range; and (c) in compliance with all applicable State and Federal requirements relating to watercraft.

Existing nonnavigable houseboats may remain in TVA reservoirs if they have approved flotation devices, are properly moored and are numbered by TVA. These houseboats may not be structurally modified or expanded, nor may they be replaced, rebuilt, or returned to the reservoir when they have been abandoned, destroyed or removed from the reservoir or have deteriorated or been damaged so as to be unusable and unreparable.

2. Restrict engine maintenance activities to designated work areas where pollutants are contained and properly disposed.

“Call your county or state for locations of recycling centers and information about hazardous waste collection days”.



At the very least, boats should be removed from the water for maintenance activities. One of the simplest and most effective ways to prevent pollutants from boat repairs from entering storm water runoff is to perform as much maintenance work as possible on an impervious surface under a roof.

Where feasible, consider performing maintenance work and storing engine parts in a fully enclosed building to contain potential pollutants. The inside of a building provides the most protected space, protecting the work area from wind and containing the spills and debris produced during the work, so it is much easier to clean up afterward. Employing a dry cleanup method for petroleum waste using absorbent materials is recommended over use of hazardous solvents.

3. Contain dust from sanding. R

If a large enough interior space is not available, a suitably sized outdoor area, preferably covered and with an impervious surface, should be designated for sanding and protected with tarps. Tarps, screens, and filter cloths can be used to capture and filter pollutants. Tarps can be placed on the ground, before a boat is placed in a cradle or stand for sanding and painting. Semipermeable filter cloths can be more effective than solid cloth or plastic tarps for collecting debris where wind is a problem, where tarps are not always cleaned each day after work is completed, or where work is continued during light rains. The filter cloths hold onto debris better and allow water to pass through while retaining debris for later disposal.

Consider using vacuum sanders to remove paint from hulls and to collect paint dust. Vacuum sanders have proven very effective at capturing paint dust during boat hull and bottom sanding. Immediate capture prevents paint dust from entering the marina basin, makes cleaning up the work area easier, and increases the speed at which a boat bottom can be completely sanded.

4. Contain debris from blasting. R

Tarps will help prevent residue from abrasive blasting and sanding from drifting to non-work areas of the marina and into surface waters. Scheduling work on calm days will help ensure that wind won't carry debris and pollutants to other area of the marina property and the marina basin.

If a facility is large enough, one section of the yard, well away from the shore, can be designated for boat sanding, blasting, and painting. Mark the area well with signs, post a list of boat owner responsibilities, indicate the rules for use of the work area, and do not permit work outside of the designated areas.

Largely for environmental liability reasons, an increasing number of marina owners are restricting do-it-yourself boat repair work of the "dirty" kind, such as exterior sanding and painting.

“Avoid detergents that contain ammonia, sodium hypochlorite, chlorinated solvents (bleach), petroleum distillates, and lye.”



5. Buy and use detergents and cleaning compounds that will have minimal impact on the aquatic environment.

Many cleaning solvents contain harsh chlorine, ammonia, phosphates, and other caustic chemicals that can harm fish and other aquatic life. When possible, use “nontoxic” and “phosphate-free” cleaners, such as water-based solvents with low volatility, in place of more toxic products. Although “biodegradable” sounds good, it does not mean that a product is nontoxic. Biodegradable products are those which can be broken down by bacteria, other organisms, or natural processes. The degradation of “biodegradable” products in water uses dissolved oxygen, and therefore these products can lower dissolved oxygen levels. Also, some products might not biodegrade in aquatic environments, whether freshwater or marine.

Using the smallest amount of solvent possible can help prevent the solvent from reaching surface waters. Solvents used for vessel maintenance should be stored in covered, approved containers and, when appropriate, reused until solvents are spent. Used solvents should be disposed of appropriately.

6. Minimize the impacts of wastewater from pressure washing by providing an area with pervious surface or drain wastewater to sewer system.

One of the preferred methods for managing wastewater from pressure washing is to perform this maintenance activity on a pervious surface such as pervious concrete, pervious asphalt or pervious formed concrete mats, sited as far from the water’s edge as is feasible. Wastewater will then filter through the surface into the underlying gravel and soil, eliminating most of the runoff and allowing bacterial action to breakdown the pollution into less harmful components. After drying, paint chips and particles left on the surface can be vacuumed.

There are several other ways to treat the wastewater from pressure washing:

- *Settling.* Trap the water in a container and allow it to sit long enough after washing to permit any particles to settle out of the water. This method will remove only the particles large enough to settle out of solution.
- *Filtration.* Wastewater can be passed through one or more filters that screen out particles. A filter cloth used at the sash site can be effective for straining out visible particles. Additional filtration is achieved by using a series of filters with smaller and smaller mesh sizes.
- *Treatment.* Chemical or biological cleaning technologies can be used to treat the wastewater and remove contaminants. Treatment can remove oil and grease, metals, or other contaminants. Once wastewater has been treated, it can be discharged into marina waters or a sanitary sewer.

7. Use long-lasting and low-toxicity or nontoxic antifouling paints.

Antifouling bottom paints that contain pesticides such as cuprous oxide or tributyl tin harm fish and other non-target species, such as shellfish, as the pesticides leach out. Considerable progress has been made in antifouling

paint technology in recent years, and more improvements are expected that will reduce and effectively eliminate the toxicity of hull paints and increase their ability to keep hulls free of fouling growth for longer periods.

Nontoxic coatings such as teflon, polyurethane, and silicone paints are now available. All deter fouling with hard, slick surfaces which reduce the need to repaint boat bottoms as often as the older, more toxic products. There are also several water-based ablative paints on the market that are up to 97% solvent free. As a result, levels of volatile organic compounds are substantially reduced as compared to solvent-based paints. The use of nontoxic, high-bonding, low volatile organic compound (VOC) content, easily cleaned coatings can be encouraged among marina patrons.

8. Change engine oil using non-spill vacuum-type systems for spill-proof oil changes and suctioning oily water from bilges.

Purchase a no-spill pump system that draws crankcase oils out through the dipstick tube. Invest in a portable or stationary oil/water separator to draw contaminated water from bilges, capture hydrocarbons in a filter, and discharge the clean water. Use the system in the boat shop and rent it to those that perform their own oil changes.

Oil is easily discharged during bilge pumping. Encourage boaters to avoid pumping any bilge water that is oily or has a sheen. Promote the use of materials that either capture or digest oil in bilges. Marina operators can advertise the availability of bilge socks and other oil-absorbing materials or can include the cost of installation of such material in yearly dock fees. A clause can be inserted in leasing agreements that requires boaters to use oil-absorbing materials in their bilge. Bioremediation pads and biosocks with natural oil-eating bacteria are available. See the Resource List for more information.

9. Use antifreeze and coolants that are not hazardous (pink) and less toxic to the environment.

Winterize safely. When antifreeze is needed, use propylene glycol antifreeze for all systems instead of the very toxic ethylene glycol antifreeze, and use the minimum amount necessary for the job. Add stabilizers to fuel to prevent degradation. Stabilizers are available will protect gasoline and diesel fuels as well as crankcase oil. These products protect engines by preventing corrosion and the formation of sludge, gum, and varnish. Also, the problem of disposing of stale fuel in spring is eliminated. Be sure fuel tanks are 85-90% full to prevent flammable fumes from accumulating and to minimize the possibility of corrosion due to condensation. All gas and oil caps should be closed tightly to prevent leakage.

10. Discourage in-water maintenance such as pressure washing or hull scraping.

Where feasible, remove boats from the water and clean them where debris can be captured and properly disposed. For boats that are in the water, cleaning operations should be performed to minimize the release to surface waters of harmful cleaners and solvents and paint from in-water hull cleaning. If work is done sensibly, chemicals and debris from washing boat topsides, decks, and wetted hull surfaces while boats are in the water can be kept out of the water.

Management practices associated with this management measure are easily implemented, practiced by boat owners and marinas alike, and they do not interfere with the need to keep boats clean. The key is:

- Avoiding in-the-water hull scraping or any abrasive process that is done underwater that could remove paint from the boat hull,
- Using "nontoxic" and "phosphate-free cleaners",
- Washing boat hulls above the waterline by hand, and
- Properly disposing of the containers of wash and rinse water on shore when the cleaning is completed.

11. Clean hull maintenance areas immediately after any maintenance activity to remove debris, and dispose of collected material properly.

Frequently vacuuming hull maintenance areas can effectively prevent pollutants from reaching the marina basin and non-maintenance areas of the marina property. Scheduling vacuuming and adhering to the schedule make this a particularly effective management practice.

12. Establish and enforce no-wake zones in your harbor limits to decrease turbidity, shore erosion and damage to marinas.

No wake zones, motorized craft restrictions, and sign and buoy placement are proven, widely used practices for protecting marinas and shallow-water habitats. Important aquatic vegetation should be protected from damage due to boat and personal watercraft propellers, because of its ecological importance and value in preventing shoreline erosion. Boat traffic (including personal watercraft) through shallow-water areas and in nearshore areas at wake-producing speeds can resuspend bottom sediment, uproot submerged aquatic vegetation, erode shorelines, and harm some animals.

Resuspended sediment and erosion along shorelines increases turbidity, blocking photosynthesis and limiting aquatic plant growth, which leads to less dissolved oxygen being produced. The sediments also continually coat plant leaves and bottom-dwelling organisms, degrading fish habitat and choking out aquatic insects and other important fish foods. Resuspended sediment can also contain harmful chemicals trapped in the sediment which can be ingested by fish and shellfish, and work their way up the food chain, possibly to someone's dinner table.

To protect these habitats, shallow-water areas can be established as “off limits” to boat traffic of any type, including personal watercraft (PWCs). Signs or buoys in the water around the edges of these areas can help the public comply with shallow habitat protection efforts. Distribution of flyers with maps that show shallow areas and indicate permanent landmarks, so boaters can easily determine whether they are near shallow areas, is another effective tool.

No wake zones are more effective than speed limits in shallow surface waters for reducing turbidity and erosion caused by boat passage. Hull shape strongly influences wake formation, allowing some boats to go faster than others without producing a wake.



Section 5 Marina Siting, Design, and Maintenance

Background

“Check with your appropriate federal, state, and local agencies BEFORE any site work begins and make certain you have all the permits required.”

Marina siting and design play important roles in determining how good water quality within a marina basin will be. Marina location affects circulation in a marina basin, and, therefore, how well it flushes. Marina design, especially the configuration of the basin and its orientation to prevailing winds, waves, and currents, affects the retention of pollutants in the marina and the movement of pollutants out of a basin.

Existing marinas can improve water and habitat quality in the marina basin through application of BMPs. A marina designed with the important points of the management measures in mind will probably have better water quality and fewer water-pollution-related problems during its life of operation, and economic benefits may result from making such improvements. Simple yet effective forms of monitoring that provide valuable information about the conditions in the water can be done by someone knowledgeable of the marina and the surrounding waterbody. Visual inspections of the abundance and appearance of aquatic plants in and around the marina, use of the marina and surroundings by ducks and geese, the appearance of bottom sediments, the general clarity of the water near docks, and the abundance of fish can provide all the information necessary to judge the health of the water. All of these characteristics are indicators of the health of the waters.

Water quality assessments are generally done as a part of marina development or significant expansion. The widespread use and proven effectiveness of water quality assessments in determining the suitability of a location for marina development, the best marina design for ensuring good water quality, and the causes and sources of water quality problems make this management measure broadly applicable to marina management.

This management measure also includes assessments of how marinas can incorporate natural habitats into their siting and design. If a marina is properly designed and located, aquatic plants and animals should be able to continue to use the marina waters for the same activities that occurred in the waters before the marina's presence.

1. Have accessible, current, written emergency response plans for likely threats.

Assess hazards, and then plan what should be done and who will do it. Consider:

- Fuel spill
- Holding or water tank filled with gas

- Spill at the storage area of used oil, antifreeze, solvents, etc.
- Fire
- Health emergency
- Tornado, etc.

Develop emergency response plans for the hazards you identify. Plans should be clear, concise, and easy to use during an emergency. Each emergency response plan should contain the following information:

- *Where* – include a site plan of your facility showing valves, pipes, tanks, structures, roads, hydrants, docks, power and fuel shutoffs, hazardous material storage locations, and telephones; and describe where the appropriate response material is located.
- *Who* – identify who is responsible for taking what action, e.g., deploying equipment, contacting emergency agencies, being the official spokesperson, etc.
- *Emergency Phone Numbers* – include U.S. Coast Guard’s National Response Center 1.800.424.8802, your state and local Emergency Response Division, local fire and police departments, TVA Police, owner, neighboring marinas that have emergency response equipment, and spill response contractors in your area.
- *What* – create a sequential plan of the specific actions to be taken, what equipment should be deployed from your site and where other needed equipment will come from if needed. Characterize the marina’s waterfront and vessels and describe the type, amount, and location of hazardous materials stored on site.
- *How* – explain how the equipment should be used and disposed.
- *When* – Indicate when additional resources should be called for assistance.

Review and update the plans annually to include new technology or equipment and to confirm phone numbers.

Train your employees to implement these plans and review the plans and response procedures with them at the beginning of each boating season.

Note: A Spill Prevention, Control, and Countermeasures (SPCC) plan is a first line of defense against petroleum pollution and should be developed by all marinas, whether required by regulations or not. Maintain enough oil spill response equipment to contain the greatest potential spill at your facility or to encircle the largest vessel in your facility (vessel length X 3 = required length of boom). Store the equipment where the greatest threat of an oil spill exists: fuel receiving and fuel dispensing areas. Mark the storage site with a sign reading “Oil Spill Response Kit”, include instructions for use and the USCG and local notification numbers.



"Carefully read TVA lease and contract agreements to assure you are in compliance."



2. Maintain files of material safety data sheets as required by the Occupational Safety and Health Act (OSHA) for any chemicals kept on site? R

OSHA requires that a file of material safety data sheets for chemicals used and stored at your marina be maintained away from material storage areas and in an easily accessible location. Signs should be posted identifying the location of this information and encouraging periodical review of the potential hazards and correct emergency responses in case of an accident.

3. Comply with TVA and other federal flotation devices and material regulations. R

Flotation for all docks, boat mooring buoys, and other water use facilities shall be of materials commercially manufactured specifically for marine use. Any flotation within 40 feet of a line carrying fuel should be 100 percent impervious to water and fuel. Use encased styrofoam flotation. Reuse of plastic, metal, or other previously used containers for encasement or flotation is prohibited.

4. Keep boats, marina facilities, and other moored craft within harbor limits designated by TVA at times when the reservoir is at or near summer pool. R

The outward reservoir limits of marina harbors are developed on the basis of size and extent of facilities, navigation and flood control requirements, optimum use of lands and environmental considerations. Land rights of the dock operator determine the landward limits. These limits must be observed even during times of heavy use.

5. Keep marina structures and facilities in good condition, repairing or removing dilapidated facilities. R

TVA 26a and other documents routinely contain language requiring that all structures and facilities be maintained in a good, safe, substantial condition. TVA requires that unsafe and dilapidated structures on lands in the custody or control of TVA be removed or repaired within ninety (90) days of written notice.

6. Have TVA permits for all structures and facilities in your harbor. R

Please contact the TVA Watershed Team in your area if you cannot document that this requirement has been met.

7. Have a clean environmental record with all applicable agencies (no pending citations or Notices of Violation)? R



8. Use environmentally neutral materials that will not leach toxins into the water for new marina construction and additions.

Additions to existing marinas and new marinas should be constructed with materials for docks and pilings that not will leach toxins into the water. Exotic woods for docks, pilings, and other building should also be avoided.

9. Minimize adverse effects to aquatic life and habitats during construction and expansion by maintaining a vegetation buffer and using appropriate BMPs such as silt booms.

Unnatural erosion often occurs where soil, streambanks, or shorelines have been disturbed. Elimination of vegetation from any shoreline exposes soil to the erosive energy of waves and currents. Many processes important to the health of aquatic systems occur in vegetated riparian areas adjacent to rivers and reservoirs, including the following:

- Large quantities of nutrients are absorbed by the vegetation as runoff passing through.
- Eroded soils and other pollutants are filtered out of the water by water-front vegetation.
- As it moves through the vegetation, runoff is slowed down and the impacts of the runoff on the shoreline are reduced.
- Native grasses and shrubs shade the water and keep water temperatures cooler in the shallow areas along the shoreline. Oxygen in the water is reduced as temperatures rise.

Vegetation is a relatively low-cost means to stabilize a shoreline, and it can add a natural, attractive element to an otherwise engineered environment. Protect and maintain existing vegetation during construction and expansion, and then enhance its attractiveness by planting wildflowers, native grasses and flowering shrubs. Costs of mowing will be reduced and ducks and geese find these areas less attractive.

The use of silt booms in the water, hay bales and silt fences on land, and temporary cover crops all play an important part in keeping sediment out of the water during active construction.

10. Maximize the flushing effects of currents to renew water regularly.

Water quality with a marina basin depends largely on how well the basin is flushed, which depends in turn on how well water circulates within the marina. Studies have shown that adequate flushing improves water quality in marina basins, reduces or eliminates water stagnation, and helps maintain biological productivity and aesthetic appeal. Flushing can reduce pollutant concentrations in a marina basin by anywhere from 70 percent to almost 90 percent over and 24-hour period.

In a poorly flushed marina, pollutants tend to concentrate in the water and/or sediments. Pollutants and debris can collect in poorly flushed corners or secluded or protected spots. Stagnant, polluted water—with little biological activity, lifeless shorelines, and offensive odors—can be the consequence. Flushing rates in marinas can be improved by using an open design instead of a semi-enclosed design. Wave attenuators such as a sloping beach or a natural wetland dissipate wave energy and filter pollutants out of the water and stormwater. Establishing two openings at opposite ends of the marina promotes flow-through currents.

11. Maintain your marina basin during the drawdown to remove hazards, accumulated litter, and potential pollutants.

The winter drawdown provides you with the opportunity to remove stumps, logs, metal drums, tires, and other debris that have washed into the shallow areas of your marina and create a potential hazard to boats and boaters. It's also a good time to remove bottles, cans, and other solid waste which is visually displeasing and can sometimes entrap fishes and other wildlife.

It also allows you to inspect your shoreline, place riprap along areas of shoreline which are eroding, and perhaps plant water willow or other native aquatic plants to dissipate wave action and provide fish habitat.

12. Use mechanical aerators to improve flushing and water quality where basin and entrance channel configuration cannot provide adequate flushing.

Mechanical aerators add oxygen to the water, and by doing so, speed up decomposition of organic material and wastes which can sometimes accumulate. They also help cool the water and, if incorporated into a fountain effect, are visually attractive to patrons.

13. Practice water conservation.

Even a very slight leak in a marina water system can waste a lot of water if not fixed within a reasonable amount of time. Regularly inspecting for leaks and repairing them immediately ensures that water and money is not being wasted. Low-flow faucets, shower heads, and toilets can be installed for extra savings in water use. Some equipment needs only a simple alteration to reduce the amount of water used, such as installing automatic shutoff nozzles on hoses.

14. Use upland and inland areas for storage and maintenance.

Designating and operating a hull maintenance work area with a focus on pollution prevention is an excellent way of preventing dangerous pollutants from reaching the marina basin. Refer to Section 4 of this guide, Vessel Operation, Maintenance, and Repair, for more information on this management measure.

15. Use environmentally friendly lawn and garden products or avoid chemicals altogether.

Planting or conserving existing hardy native plants along the marina shoreline makes the use of pesticide and fertilizers far less necessary than planting nonnative species, which typically need more care since they are often not adapted to the Tennessee Valley climate. Toxic pesticides and fertilizers are especially worth avoiding. If chemicals become absolutely necessary, only the smallest amount possible should be used.



Section 6 Stormwater Management and Erosion Control


“Get creative... Harbour Towne Marina in Florida modified its yard storm drains to hold an ordinary air conditioner filter, which effectively stops suspended solids from passing through.”



Background

The best way to minimize the polluting effects of stormwater is to use pollution prevention activities and proper design of hull maintenance and mechanical repair and maintenance areas, and otherwise reduce, as much as possible, the amount of pollution that gets on the ground in the first place.

Any debris that is on the ground and light enough to be carried in flowing rainwater can end up in the reservoirs and streams of the Tennessee Valley. Sanding dust, paint chips, metal filings, and other solids created during boat maintenance and repairs can be swept along by runoff and end up in the water. Oil, grease, solvents, and fuel spilled or dripped onto the ground can also be carried away in the runoff. When they reach the marina basin, they create unsightly surface films or float until they adhere to surfaces like boat hulls or docks. Some of these pollutants sink with the eroding soil to the bottom, are eaten by bottom-feeding fish or filter-feeding shellfish, or settle onto the leaves of aquatic vegetation and clog their pores. Stormwater that is treated in some way to remove these pollutants before they can reach the marina basin will not result in these problems.

- 1. Have a general National Pollutant Discharge Elimination System (NPDES) permit for (stormwater runoff) discharges from marinas related to sanding, painting, repairing or maintaining boats. **

EPA's management measure for stormwater runoff is to reduce the average annual loadings of total suspended solids (TSS) in runoff from hull maintenance areas by 80 percent. The 80 percent removal of TSS is applicable to hull and engine maintenance areas only because runoff from these areas contain higher levels of toxic pollutants than runoff from other parts of the marina property. The goal is achieved by eliminating, through source reduction and pollution prevention, 80 percent of the total annual load of suspended materials produced in an average year of work. Most marinas use some management practices already and are already collecting some or all of this 80 percent.

Visit the EPA website at <http://www.epa.gov/owm/npdes.htm> for more information. Your state or local environmental agency can be contacted for additional stormwater guidance and for information pertaining to stormwater regulation and permits.

- 2. Use native herbs and grasses, wetlands, and aquatic vegetation wherever possible to protect shorelines, dissipate wave energy, filter pollution, and provide wildlife habitat. where space allows.**

Vegetative plantings and wetland enhancements or preservation of existing vegetation can be the most effective means of protecting shorelines and filtering pollution from stormwater.

3. Have a stormwater management system in place.

There are a number of BMPs to prevent pollution and reduce the sources of pollution that are carried in stormwater. Many of these are listed in Section 4, Vessel Operation, Maintenance, and Repair. These BMPs, if well implemented, should significantly reduce the load of total suspended solids in your stormwater runoff and should be included as part of your stormwater management system.

Wastewater can be chemically treated by the addition of certain chemicals that cause small solid particles to adhere together to form larger particles, which are then filtered from the water. This type of treatment system can remove more than 90 percent of the suspended solids and 80 percent of most toxic metals associated with pressure washing. The degree of treatment is determined by how much of the chemical is added and the porosity of the filter used, and can be altered to meet municipal standards. Since the chemicals used require disposal themselves, this method of pollutant removal should only be considered where other methods prove ineffective.

4. Use riprap revetment or biostabilization instead of a solid vertical bulkhead where shorelines need structural stabilization and where space and use allow.

Where shorelines need structural stabilization and where space and use allow, riprap revetment is preferable to a solid vertical bulkhead. Riprap is a common and economical revetment that can withstand substantial wave energy. Natural rock is the best material. Gabions and sloping revetments also dissipate incoming wave energy and usually reduce the scouring effect of bulkheads. Vegetation can often be added at the edges of these structural elements to control erosion from runoff and to serve as a landscaping element. Some concrete revetments have open areas which allow vegetation to reestablish along the shoreline.

5. Plant grass, herbs, or shrubs between impervious areas and the marina basin to retain and filter pollutants.

Directing stormwater to a grassed area instead of to drains, pipes, or cement channels is an effective way to prevent the pollutants in runoff from reaching the marina basin, whether the runoff originates from parking lots, maintenance areas, rooftops, or any other impervious surface.

The technical term for a channel or ditch planted with grass and used for stormwater treatment is "grassed swale". Grassed swales are low-gradient channels that can be used in place of buried storm drain pipes. To effectively remove pollutants, grassed swales need to have only a slight slope and

"All types of filters will need periodic maintenance, cleaning or replacement."



should be long enough to filter out all of the pollutants. Because some storms in the Tennessee Valley are occasionally strong, erosion-resistant vegetation such as deep-rooted native grasses works best. The vegetation filters out pollutants and absorbs nutrients while the runoff infiltrates into the ground as it is slowed by the grass in the swale.

6. Have limited areas of impervious pavement and use pervious pavement or pavement tile where feasible.

Pervious pavement has a coarse, permeable top layer covering an additional layer of gravel. Runoff infiltrates through the porous layer and into the ground. As storm water passes through the pavement, the gravel, perhaps through a perforated underground pipe system, and on into the underlying soil, pollutants are naturally filtered out. Porous pavement helps recharge ground water and provides excellent pollutant removal (up to 80 percent of sediment, trace metals, and organic matter).

7. Have oil and grit separators installed in storm drains to capture petroleum spills and coarse sediment.

Some storm drain designs will permit a filter to be inserted in them to screen solid materials out of runoff. If oil is typically contained in runoff, an oil absorption pad can be inserted into the water pool or trap beneath the filter as well, where it can remove much of the oil and grease contained in runoff. Absorbent material products can remove 10 to 25 times their weight in oil.

8. Use catch basins where stormwater flows to the marina basin in large volumes.

Catch basins with flow restrictions are used to keep large pulses of stormwater from entering the marina basin at one time. Particulates and soil settle to the bottom of a catch basin, in which the bottom of the basin is typically 2 to 4 feet below the outlet pipe (the pipe through which the trapped water moves out of the basin). The traps in catch basins require periodic cleaning and maintenance, but if properly maintained, a catch basin should last about 50 years.

Catch basins can have a separate chamber filled with sand. With this design, runoff first enters an open chamber where coarse particles that could clog the sand filter out. The runoff then flows into a second chamber where it filters through the sand. These catch basins with sand filters work well in areas with a high percentage of impervious surface, where other BMPs would be ineffective. The top layer of sand will need to be removed periodically and replaced with fresh, clean sand.

Section 7 Public Education

Background

Public education is one of the most effective ways to reduce pollution in and around marinas. A boating public that understands the causes and effects of pollution is more likely to want clean waters and healthy aquatic environments. If the public is told about the simple and effective ways that they can reduce their impacts on the environment, they are usually willing to do their part. One of the primary factors in the success of any pollution prevention program is widespread support for the program by an educated public.

Public education is a low-cost, effective, proven method to improve and reinforce environmentally conscious behavior in all segments of the public, including the boating public. The availability of a variety of public education materials on virtually all environmental issues and for all segments of the public makes this management measure easy to implement.

1. Have bulletin boards for environmental education messages and idea sharing.

Bulletin boards are convenient places to post notices about the availability of dustless sanders for rent, environmentally friendly cleaners and antifouling paints, new practices and programs at the marina for reducing pollution, water quality monitoring results, engine maintenance to keep emission output low, or any other positive clean boating message. It can also provide a mechanism for patrons to communicate availability of free leftover paints and other products. If it is attractive and regularly updated, boaters will become accustomed to checking it out when visiting your facilities.

2. Educate and train marina staff to do their jobs in an environmentally conscious manner and to be a good role model for marina patrons.

Marina staff who are fully educated and trained on all of the environmental management practices used at the marina can set an example for patrons, and with your encouragement, become friendly, courteous advocates for needed changes in boater behavior. An informed staff also presents the image of an environmentally proactive marina and will make casual visitors to your marina more aware and appreciative of what your marina has to offer.

3. Use signs and/or hand out pamphlets or flyers, send newsletters, and add inserts to bill mailings with information about how your patrons can protect the environment and practice clean boating behavior.

Interpretive and instructional signs placed at marinas and boat-launching sites are a key method of providing information to the boating public. Boater cooperation can be substantially increased at modest expense by using

“Encourage marina staff to pass along pollution prevention information in conversations with patrons and contractors.”



signs. Common topics for marina signage include solid waste disposal, pumpout locations and instructions, and spill response instructions.

4. Have language in customer contracts to ensure that tenants use designated areas and clean boating techniques when maintaining their boats and will comply with the marina's best management practices.

When a marina has established procedures for keeping the grounds and waters clean, cooperation from patrons is absolutely essential.

5. Have signs posted that require proper usage of your pumpout system or dump station (or have signs posted directing them to the nearest pumpout facility).

6. Teach boaters how to fuel boats to minimize fuel spills and have easy-to-read signs on the fuel dock that explain proper fueling, spill prevention, and spill reporting procedures.

Boaters need to understand that whenever they spill even a few drops of oil or fuel, the environment is harmed. There are simple steps boaters can take to prevent fuel loss. Teach them with a sign and staff encouragement:

- Don't top off the tank when fueling,
- Use an oil absorption pad to catch drops when the fueling nozzle is removed from the boat,
- Install a fuel/air separator on the air vent line, and
- Place an oil-absorbing pad in the bilge.

Have your staff explain to boaters that when they top off a fuel tank from an underground storage, the cool fuel expands as it heats up, and will overflow through the air vent into the water because there is not enough expansion space in the fuel tank.

7. Have signs on storm drains instructing patrons not to dump waste in or around the drains.

Storm drains painted with phrases like "Dump no waste—Drains to reservoir" grab people's attention at a marina and help control disposal of solid and liquid wastes in inappropriate places. Inexpensive stencils can be purchased for use with road marking paint. With a little ingenuity, this can be incorporated into a enjoyable activity for the marina's boating families. It is something that kids REALLY have fun doing.

8. Educate boaters about good fish cleaning and disposal practices.

Some boaters need to be educated about the problems created by discarding fish waste into marina waters and the importance of using good disposal practices at your marina. Teach boaters about the ecological advantages of cleaning fish offshore, freezing fish parts to reuse then as bait or chum, and practicing catch and release fishing. Make it fun by involving your marina

“Get free copies of clean boating materials from organizations such as the Center for Marine Conservation and Boat US/ Clean Water Trust, from agencies with jurisdiction over boating and marina activities, and from numerous websites available through use of appropriate key words.”

fishermen in a “show and tell” demonstration at the beginning of a marina fish fry.

9. Recommend vessel bottom coatings with minimal environmental impacts.

People learn best by demonstration and example. If there are boaters in your marina utilizing the newer, more environmentally friendly coatings, ask them to share their experience with others at a marina gathering or through your newsletter. Or expose several appropriately prepared coating samples placed on typical boat surfaces to the water over time and let patrons observe the results for themselves.

10. Sell a full line of environmentally sound products in your company store, and educate/encourage your marina users to select them over products that have greater potential for harm.

As acceptance and usage increases, discontinue availability of the more harmful products.

11. Hold Clean Boating Campaigns at your marina, or offer fun-directed contests, quizzes, etc. for marina patrons which reinforce desired behavior, and award prizes such as absorbent pads, MSD chemicals, etc. which encourage the behavior you seek.

Programs to Control Nonpoint Source Pollution

Background

This chapter highlights federal and state agencies and regulations as they apply to boaters and marina operators. One goal of the Tennessee Valley Clean Marina Initiative is to provide marina operators with the opportunity to demonstrate their commitment to improving water quality and addressing water quality issues. If successful, it could help the marine industry avoid new regulations. The discussion of laws and regulatory agencies in this chapter is not intended as a comprehensive clearinghouse for local, state and federal laws and regulations affecting marina operators. Complying with applicable laws and regulations is ultimately in the hands of the marina owners and management.

OVERVIEW OF SELECTED FEDERAL AGENCIES

Environmental Protection Agency (EPA)

The Environmental Protection Agency (EPA) is responsible for environmental protection and pollution control in the United States as it relates to economic growth, energy, transportation, agriculture, industry, international trade and natural resources. Of particular interest to marina operators, the EPA is responsible for administering the Clean Water Act, Clean Air Act, Oil Pollution Act, Resource Conservation and Recovery Act and Marine Plastics Pollution Research and Control Act.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce, is charged with the mission of describing and predicting changes in the earth's environment and conserving the nation's coastal and marine resources. NOAA has developed a wide range of strategies to address marine issues in coastal and inland waters.

United States Army Corps of Engineers (USACE)

The United States Army Corps of Engineers (USACE) is made up of civilian and military men and women who work hand in hand as leaders in engineering and environmental matters including flood control, hydropower production, navigation, water supply storage, recreation, wetlands, and fish and wildlife habitat. Biologists, engineers, geologists, hydrologists, natural resource managers and other professionals meet the demands of changing times and requirements as a vital part of America's Army. On the Tennessee River system USACE operates locks for commercial and recreational use.

United States Coast Guard (USCG)

The United States Coast Guard (USCG), a branch of the U.S. Department of Transportation, is responsible for maritime safety and law enforcement, marine environmental protection, maintaining federal navigation aids and regulating recreational and commercial vessels and waterfront facilities.

Tennessee Valley Authority (TVA)

The Tennessee Valley Authority (TVA) was created by an act of congress in 1933 with the charge of building a series of dams along the Tennessee River and its major tributaries to provide flood control, improve navigation and generate hydroelectricity. TVA's responsibilities have broadened since 1933 to include the areas of land use, water quality and recreation. In carrying out its activities, TVA cooperates and consults with the public and environmental regulatory agencies at the local, state and federal level.

OVERVIEW OF SELECTED FEDERAL LAWS

Clean Water Act (CWA)

The Clean Water Act (CWA) is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of pollutants into waters of the United States. The law gives EPA the authority to set effluent standards on an industry basis and continues the requirements to set water quality standards for all contaminants in surface waters. The CWA makes it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit (NPDES) is obtained under the Act. The 1977 amendments focused on toxic pollutants. In 1987, the CWA was reauthorized and again focused on toxic substances, authorized citizen suit provisions, and funded sewage treatment plants under the Construction Grants Program. The CWA provides for the delegation by EPA of many permitting, administrative and enforcement aspects of the law to state governments. In states with the authority to implement CWA programs, EPA still retains oversight responsibilities.

Clean Air Act (CAA)

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from area, stationary and mobile sources, including marine vessels. This law authorizes the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The goal of the act was to set and achieve NAAQS in every state by 1975. The setting of maximum pollutant standards was coupled with directing states to develop state implementation plans (SIP) applicable to appropriate industrial sources in the state. The act was amended in 1977 primarily to set new goals for achieving attainment of NAAQS since many areas of the country had failed

to meet the deadlines. The 1990 amendments to the CAA in large part were intended to meet unaddressed or insufficiently addressed problems such as acid rain, ground-level ozone, stratospheric ozone depletion and air toxins. Part of the 1990 amendments established manufacturer emission standards for new spark-ignition gasoline marine engines. Outboard engines and gasoline marine engines used in personal watercraft and jet boats are included in the rule.

Oil Pollution Act of 1990 (OPA)

The Oil Pollution Act (OPA) of 1990 streamlined and strengthened EPA's ability to prevent and respond to catastrophic oil spills. A trust fund financed by a tax on oil is available to clean up spills when the responsible party is incapable or unwilling to do so. The OPA requires oil storage facilities and vessels to submit to the federal government plans detailing how they will respond to large discharges. EPA has published regulations for aboveground storage facilities; the Coast Guard has done so for oil tankers. The OPA also requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale.

Resource Conservation and Recovery Act (RCRA)

The Resource Conservation and Recovery Act (RCRA) gives EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future facilities and does not address abandoned or historical sites. HSWA – The Federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that required phasing out land disposal of hazardous waste. Some of the other mandates of this strict law include increased enforcement authority for EPA, more stringent hazardous waste management standards and a comprehensive underground storage tank program.

Marine Plastic Pollution Research and Control Act (MPPRCA)

The Marine Plastic Pollution Research and Control Act (MPPRCA) of 1987 restricts the overboard discharge of refuse, specifically plastics. It is illegal for any vessel to dump plastic materials into any navigable U.S. waters. Included in the law is a provision stating that ports, terminals and recreational marinas must have appropriate and convenient garbage "reception facilities" for their customers.

OVERVIEW OF SELECTED PROVISIONS FROM THE TVA ACT AND TVA REGULATIONS

TVA Act - Section 26a

Section 26a of the TVA Act requires that TVA approval be obtained prior to the construction, operation or maintenance of a structure or construction activity affecting navigation, flood control or public lands along the shoreline of TVA reservoirs or in the Tennessee River or its tributaries. It is designed to ensure that construction along the shorelines and waters of the Tennessee River system and TVA reservoirs does not adversely impact TVA's responsibility for managing the river system. Permit approvals for construction under Section 26a are "federal actions" and therefore subject to the requirements of the National Environmental Policy Act and other federal laws. Typical structures requiring TVA review and approval include: boat docks, piers, boat ramps, bridges, culverts, commercial marinas, barge terminals and mooring cells, water intake and sewage outfalls, and fill or construction within the floodplain.

Nonnavigable Houseboats

All approved nonnavigable houseboats must be equipped with a properly installed and operating Marine Sanitation Device (MSD), or Sewage Holding Tank and pumpout capability. Nonnavigable houseboats moored on "Discharge Lakes" must be equipped with a Type I or Type II MSD. Nonnavigable houseboats moored on " No Discharge Lakes" must be equipped with holding tanks and pumpout capability. If a nonnavigable houseboat moored in a "No Discharge Lake" is equipped with a Type I or Type II MSD, it must be secured to prevent discharge into the lake.

Marine Sanitation Device—Requirements at Commercial Marinas and Boat Docks

This section states that no person operating a commercial boat dock shall allow the mooring of a watercraft or floating structure equipped with a marine sanitation device (MSD) unless such MSD is in compliance with all applicable statutes and regulations, including the Federal Water Pollution Control Act , and where applicable, statutes and regulations governing " no discharge zones". All new slip rental arrangements shall contain a written provision implementing this requirement.

No Discharge Zones

The EPA has designated certain TVA reservoirs as "No Discharge Zones." "No Discharge Zones" are areas of water that require greater environmental protection and where the discharge of treated sewage could be harmful. Whenever a vessel equipped with a Type I or Type II MSD (these types discharge treated sewage) is operating in an area of water that has been declared a "No Discharge Zone," the MSD cannot be used and must be

secured to prevent discharge. Generally, all freshwater rivers and reservoirs not capable of interstate vessel traffic are by definition considered “No Discharge Zones.”

TVA No Discharge Zones include:

Appalachia
Bear Creek Projects
Beech River Project
Blue Ridge
Boone
Cherokee
Douglas
Fontana
Ft. Patrick Henry
Hiwassee
Nolichucky
Normandy
Norris
Nottely
Ocoee 1, 2, 3
Tim’s Ford
Watauga
Wilbur

Wastewater Outfalls and Septic Systems

Applicants for a wastewater outfall may be asked to provide to TVA copies of all Federal, Local, and State permits, licenses and approvals required for the facility prior to applying for TVA approval, or shall concurrently with the TVA application, apply for such approvals. A section 26a permit shall not be issued until other required water quality approvals are obtained. TVA reserves the right to impose additional requirements. Septic tank and sewage disposal systems associated with commercial facilities must be approved by local health department or state agency with regard to site, slope, percolation rate, and soil conditions. The system must be installed with a 2-foot vertical, and 50-foot horizontal setback between all portions of the subsurface disposal field and the normal summer lake elevation.

Marina Sewage Pumpout Stations and Holding Tanks

All new marina pumpout facilities located on TVA reservoirs must meet certain minimum design and operating requirements as designated by TVA. These requirements deal with spill-proof holding tanks, alarm systems, access, disposal methods and other provisions.

Flotation Devices and Material

TVA has established standards for flotation devices on docks, boat moorings and other water-use structures and facilities. Flotation for all docks, boat mooring buoys, and other water use facilities shall be of materials commercially manufactured specifically for marine use. Any flotation within 40 feet of a line carrying fuel shall be 100 percent impervious to water and fuel. Styrofoam flotation must be encased for all applications. Reuse of plastic, metal, or other previously used drums or containers for encasement or flotation purposes is prohibited.

Commercial Marina Harbor Limits

The landward limits of commercial marina harbor areas are determined by the extent of land rights held by the dock operator. TVA designates the outward reservoir limits of marina harbors on the basis of the size and extent of facilities at the dock, navigation and flood control requirements, optimum use of lands, and environmental effects associated with the use of the harbor. Mooring buoys or slips and permanent anchoring are prohibited beyond the reservoir extent of harbor limits. "No Wake Zones" are generally not permissible where marina harbor limits front the commercial navigation channel.

Underground and Aboveground Storage Tanks

An underground storage tank (UST) is any one or combination of tanks used to contain a regulated substance, such as petroleum products, which has 10% or more of its total volume beneath the surface of the ground. The total volume includes any piping used in the system. A UST may be a buried tank or an aboveground tank with buried piping if the piping holds 10% or more of the total system volume including the tank.

An aboveground storage tank (AST) is any storage tank whose total volume (piping and tank) is less than 10% underground.

TVA has developed requirements for installing USTs and ASTs on TVA reservoirs or regulated tailwaters.

For information on specific Section 26a requirements and permitting processes, contact your TVA Watershed Team listed in the introduction.

STATE AGENCY CONTACTS

In addition to federal regulations most states have enacted laws to protect the natural resources within their jurisdiction. State regulations can be no less stringent than federal regulations but can be more restrictive. It is important that you communicate with the appropriate Tennessee Valley state agencies listed below to ensure compliance with federal and state regulations. Please contact your state agencies for help in identifying and complying with applicable laws and regulations for your marina.

Alabama

Department of Environmental Management

PO Box 301463
Montgomery, AL 36130-1463
334.271.7710

Division of Wildlife and Freshwater Fisheries

Alabama Department of Conservation and Natural Resources

64 N. Union Street, Room 584
Montgomery, AL 36130
334.242.3465

Georgia

Environmental Protection Division

Department of Natural Resources

205 Butler Street, SW
Atlanta, GA 30334
404.656.3500

Georgia Fisheries Management

Rt. 3 Box 75
Ft. Valley, GA 31030
912.825.6151

Kentucky

Department for Environmental Protection

Frankfort Office Park

14 Reilly Road
Frankfort, KY 40601
502.564.2150

Department of Fish and Wildlife Resources

1 Game Farm Road
Frankfort, KY 40601
502.564.3596

Mississippi

Department of Environmental Quality

PO Box 20305
Jackson, MS 39289
601.961.5000



Department of Wildlife, Fish and Parks

PO Box 451
Jackson, MS 39205
601.364.2202

North Carolina

**Division of Environmental Management
Department of Environment, Health and Natural Resources**

PO Box 29535
Raleigh, NC 27626
919.733.7015

North Carolina Wildlife Resources Commission

512 N. Salisbury Street
Raleigh, NC 27604
919.733.3391

Tennessee

**Bureau of the Environment
Department of Environment and Conservation**

401 Church Street, 21st Floor
Nashville, TN 37243
615.532.0220

Wildlife Resources Agency

PO Box 40747
Nashville, TN 37204
615.781.6552

Virginia

Department of Environmental Quality

629 E. Main Street
Richmond, VA 23219
804.698.4000

Department of Game and Inland Fisheries

4010 W. Broad Street
Richmond, VA 23230
804.367.9231



Resources

Information

American Boat and Yacht Council

3069 Solomons Island Road
Edgewater, MD 21037
410.956.1050
Information about holding tank retrofits and vessel standards

Boat/U.S. Clean Water Trust

880 S. Pickett Street
Alexandria, VA 22304
703.461.9550
Clean boating educational materials

Center for Marine Conservation

1725 DeSales Street, NW
Washington, DC 20036
202.429.5609
Marine debris educational material, Storm drain stenciling information and materials

Marina Operators Association of America

1819 L St., NW, Suite 700
Washington, DC 20036
202.721.1630 or www.moaa.com

Marine Environmental Education Foundation

National Clean Boating Campaign

214 Hillcrest Drive
Fredericksburg, VA 22401
540.891.8181 or e-mail meef@meef.org

Maryland Department of Natural Resources

Waterway Resources Division

Annapolis, MD 21401
410.260.8770
Maryland Clean Marina Guidebook

Minnesota Sea Grant College Program

University of Minnesota
St. Paul, MN 55108
612.625.1253
Information on composting fish waste

National Fire Protection Association

1 Batterymarch Park

P.O. Box 9101

Quincy, MA 02269-9101

800.344.3555

Copies of NFPA standards (copies may be available from your local fire marshal)

National Marine Manufacturers Association

200 E. Randolph Drive, #5100

Chicago, IL 60601-6528

Educational materials

National Technical Information Service

5285 Port Royal Road

Springfield, VA 22161

703.487.4600

Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices

Rhode Island Sea Grant

Communications Office

University of Rhode Island

Narragansett, RI 02882-1197

Environmental Guide for Marinas: Controlling Nonpoint Source and Storm Water Pollution in Rhode Island

United States Coast Guard**National Response Center**

2100 Second Street, SW

Washington, D. C. 20593

800.424.8802

U.S. Environmental Protection Agency**Nonpoint Source Control Branch**

1200 Pennsylvania Avenue, NW, (4503-F)

Washington, D. C. 20460

202.260.7009

www.epa.gov/owow/nps/bestnpsdocs.html

U.S. Environmental Protection Agency**Region IV**

61 Forsyth Street, SW

Atlanta, GA 30303

www.epa.gov



U.S. Fish and Wildlife Service

1875 Century Boulevard
Atlanta, GA 30345
404.679.7113

Docks, Piers, and Flotation Products**Dock Operations & Marine Equipment**

127 River Rd.
Hendersonville, TN 37075

Floating Docks Manufacturing Co.

6041 Guion Rd.
Indianapolis, IN 46254
800.969.3625

Formex Floats

601 Hurricane Shoals Road, N W
Lawrenceville, GA 30045
770.962.3125

Follansbee Dock Systems

State Street, P. O. Box 640
Follansbee, WV 26037

Lakeside Docks

5335 Lynchburg Rd.
Winchester, TN 37398
931.967.9493

Redd Team Manufacturing, Inc.

6587 S. R. 21
P. O. Box 658
Keystone Heights, FL 32656

Selective Construction, Inc.

3900 Lee Pike
Soddy Daisy, TN 37379
423.332.6312

Tennessee Docks and Decks

260 W. Main Street, Suite 105
Hendersonville, TN 37076
615.824.9811



Environmental Products

American Delphi

7110 Fenwick Lane
Westminster, CA 92683
714.894.0515
Fish and game cleaning stations

EnviroMarine, Inc.

100 Lewis Drive 10A
Greenville, SC 29605
864.242.5799
Complete line of Bio-Remedy and oil and fuel absorbent products

Nolan Bio Labs, Inc.

P. O. Box 870631
Stone Mountain, GA 30087-0016
770.469.8316
Bio-enzymatic holding tank/septic tank products and Nature Safe marine cleaning products

Petrol Rem, Inc.

2275 Swallow Hill Road, Bldg. 2500
Pittsburg, PA 15220
800.246.2275 or 412.279.9745
PRP (Petroleum Remediation Product), BioSok and BioBoom products for oil spill cleanup

Marine Sanitation Equipment and Products

EMP Industries, Inc.

3284 Morris Street, North
St. Petersburg, FL 33713
800.355.7867
Sanisailor marine pumpout systems

Kingscote Chemicals

Division of Bright Dyes
3334 South Tech Blvd.
Miamisburg, OH 45342
937.886.9100
Harbor Bosun water marking products

Mariner Technologies, Inc.

P.O. Box 58272
Tierra Verde, FL 33715-8272
877.866.1186
Peristaltic pumpout systems

Sealand Technology, Inc.

P.O. Box 38

Big Prairie, OH 44611

330.496.3211

SaniService pumpout systems and dump stations, MSDs, waste treatment systems and accessories

Oil and Gas Management Products

American Textile and Supply, Inc.

623 South 32nd Street

Richmond, CA 94804

510.236.7424

Wiping cloths, sorbents, haz-mat equipment and spill kits

Envirotech Industries L.L.C.

299 Old Forks Road

Hammonton, NJ 08037

800.847.4302

Gas Guzzler and No-Spill containers for refueling without spills

