Rhode Island
Clean Marina Guidebook

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Clean Marina

Coastal Resources Management Council
2006

Rhode Island Clean Marina Guidebook

Prepared for the
Rhode Island Coastal Resources Management Council
by

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The preparation of this publication was financed in part by a grant from the National Oceanic and Atmospheric Administration, under the provisions of the Coastal Zone Management Act of 1972 (Public Law 92 583), under Grant #NA05NOS4191076. The U.S. Government is authorized to produce and distribute reprints for governmental purposes not withstanding any copyright notation that may appear hereon.

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Published May 2006.

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Acknowledgements

The *Rhode Island Clean Marina Guidebook* was prepared by Elizabeth Fuller Valentine with contributions from the Rhode Island Clean Marina Working Group:

Kevin Cute	Coastal Resources Management Council
Gerry DiSchino	The Hinckley Company (Portsmouth)
Grover Fugate	Coastal Resources Management Council
Mike Keyworth	Brewer Cove Haven Marina (Barrington)
Virginia Lee	Rhode Island Sea Grant
Joseph Migliore	Rhode Island Department of Environmental Management
Chris Ruhling	Brewer Yacht Yard Cowesett, (Warwick)
Tracy Silvia	Coastal Resources Management Council
John Torgan	Save the Bay
Larry Wells	U.S. Environmental Protection Agency, Region 1
Jeff Willis	Coastal Resources Management Council

Staff members of the Rhode Island Department of Environmental Management also contributed to the document: Eric Beck, Ronald Gagnon, Doug McVay, and Beverly Migliore.

CRMC
Coastal Resources Management Council

Table of Contents

Acronyms

COE	U.S. Army Corps of Engineers
CRMC	Rhode Island Coastal Resources Management Council
DEM	Rhode Island Department of Environmental Management
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
MSDS	Material Safety Data Sheet
MSGP	Multi-Sector General Permit
NFPA	National Fire Protection Association
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
ODS	Ozone Depleting Substance
OSHA	U.S. Occupational Safety and Health Administration
RIPDES	Rhode Island Pollutant Discharge Elimination System
RIRRC	Rhode Island Resource Recovery Corporation
USCG	United States Coastal Guard
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Introduction

The Rhode Island Clean Marina Program is designed to recognize and promote environmentally-responsible marinas, boatyards, and yacht clubs. For simplicity, all three types of facilities are referred to as "marinas" throughout this *Guidebook*. The *Guidebook* and other program materials are intended to assist marina operators to identify, address, and, ultimately, exceed their legal obligations to protect the quality of Rhode Island's waterways.

By participating in the program, marina operators will help to ensure that recreational boating remains a defining characteristic of the Ocean State. Boaters are, after all, drawn to the water by the quality of the boating experience: everything from the natural, unspoiled beauty of an area to the cleanliness of shoreside facilities and the attentiveness of marina staff. This *Guidebook* describes Best Management Practices (BMPs) that help marina operators to manage an inviting, efficient and profitable facility. At the same time, they will be preventing pollution and conserving resources, implementing more efficient and effective work procedures, and reducing operational costs. Once certified as a Clean Marina, a facility can expect positive publicity and will likely attract new, environmentally-responsible boaters.

Pursuit of Clean Marina certification does not necessarily require a large financial investment. Rather, marina operators must be willing to dedicate their time and commit themselves to making thoughtful choices. The cumulative effect of choices made throughout every day, week, month and year have an impact—for better or worse—upon the health of local environments.

Steps to Clean Marina Certification

Step 1: Sign the Clean Marina Pledge

By signing the Clean Marina Pledge included with this *Guidebook* you are making a commitment to achieve Clean Marina certification within one year. If, after a year, your facility is not a Clean Marina, you can renew your commitment by signing a new Pledge. Clean Marina staff will release a press release acknowledging each facility that signs a Pledge.

Step 2: Conduct a Self-Assessment

Use the Clean Marina Certification Checklist (see front pocket) and this *Guidebook* to evaluate your facility against the award criteria. As you go through the Checklist you will notice that each question is followed by a page number. The page number indicates where in the *Guidebook* to find additional information about each subject.

The Guidebook provides a full menu of options for controlling pollutants associated with various marina activities. It is not expected that every marina will adopt every BMP described within the *Guidebook.* Rather, each marina operator must determine which BMPs are applicable and appropriate for his or her operation. To assist with this determination, each BMP is preceded by a symbol indicating that it is a law or regulation (●), highly recommended (⦿), or recommended (O).

Step 3: Develop a Clean Marina Strategy

The self-assessment will likely reveal areas where you will need to make improvements in order for your facility to be certified as a Clean Marina. The next step is to develop a strategy to address these short-comings. This strategy could be as simple as a "to do list" or as elaborate as a formal Environmental Management Plan that helps one to track environmental management activities and to implement them in an organized and streamlined manner. The US Environmental Protection Agency (EPA) published a book called *Marina Environmental Management Plan: A Workbook for Marinas, Boatyards and Yacht Clubs in New England* (EPA 901-B-05-001) that describes a nine-step "recipe" for developing an Environmental Management Plan (EMP):

1. Establish an environmental policy
2. Set goals
3. Assign responsibilities
4. Establish and document standard operating procedures
5. Track information
6. Maintain communication
7. Conduct training
8. Monitor and take corrective action
9. Create a master calendar

The publication is available at www.epa.gov/Region1/marinas/pdf/MarinaEMPJuly05.pdf. A benefit of choosing an EMP over a "to do list" is that the EMP sets up a system to continually track and improve upon a facility's environmental activities. Another especially useful feature of an EMP is the use of a master calendar to plan regularly recurring activities such as annual training and regulatory deadlines.

Whether or not you adopt a formal EMP, begin your pursuit of Clean Marina certification by addressing regulatory requirements. Once the facility is in compliance, prioritize additional improvements based on which will provide the biggest return for the invested effort.

Step 4: Seek Technical Assistance

The Coastal Resources Management Council (CRMC) and the Rhode Island Marine Trades Association (RIMTA) are available to answer questions, provide referrals, conduct informal site visits, and otherwise provide assistance as needed. Contact CRMC at 401-783-3370 or www.crmc.ri.gov or RIMTA at www.rimta.org.

Step 5: Schedule a Verification Visit

Submit a completed copy of the Clean Marina Certification Checklist to CRMC once you feel confident that your facility meets the Clean Marina award criteria. CRMC will then assemble a team composed of representatives from CRMC, DEM, and RIMTA to visit the marina. The team's evaluation will include a tour of the facility and document reviews (*e.g.,* SWPP and SPCC Plans). The document review is to verify the existence of required plans: it is not the team's responsibility to evaluate the plans themselves.

Verification team members will discuss their impressions following a site visit and will reach a consensus regarding certification. Within a few days, the marina operator will know whether or not the facility has been certified. If for some reason the verification team does not recommend Clean Marina certification, the marina operator will receive a letter outlining issues that must be addressed. Depending on the nature of the short-comings, the marina operator may need to submit additional information or another site visit may need to be scheduled. There is no penalty for failing to achieve Clean Marina certification during the first (or any subsequent) verification visit.

Step 6: Enjoy the Rewards of Clean Marina Certification

Following a successful verification visit, the marina operator will receive a formal letter notifying him or her of the facility's designation as a certified Clean Marina. The letter will be part of a package that includes a clean marina flag, draft press release, and a copy of the clean marina logo on disk. The marina operator may use the logo to promote the facility, *e.g.,* in advertising, on letterhead, in newsletters.

Step 7: Maintain Clean Marina Certification

You will be asked to affirm in writing each year that you continue to meet the Clean Marina award criteria. CRMC will contact you at least every third year to schedule a re-certification visit. Re-certification visits may occur more frequently if there is a change in ownership, significant changes to the facility, or there is a complaint made against the marina.

Permits, Plans, Records, and Forms

This chapter begins with an introduction to federal and state agencies with jurisdiction over marina and boatyard operations. It also provides an overview of regulations related to the following topics, including requirements for emergency planning, staff training, and record-keeping:

- CRMC Assent
- Dredging
- Storm water
- Oil pollution
- Underground storage tanks
- Air pollution
- Refrigerant gases
- Tributyltin paint
- Hazardous waste
- Floor drains

The review of regulations is not comprehensive. The intent, rather, is to help marina operators to understand their general obligations and to provide a point of contact—either phone number or web address—for more detailed information.

The subject of emergency response is expanded upon in a separate section designed to help marina operators identify their emergency preparedness obligations and to streamline their planning process.

Selected Federal Agencies and Their Jurisdictions

The mission of the **Environmental Protection Agency** (EPA) is to protect human health and the environment. EPA leads the nation's environmental science, research, education and assessment efforts. The agency develops and enforces regulations that implement environmental laws enacted by Congress. For additional information about EPA's mission and programs, visit www.epa.gov.

The **National Oceanic and Atmospheric Administration** (NOAA) is an agency of the U.S. Department of Commerce. NOAA guides the nation's use and protection of ocean and coastal resources, conducts research to improve understanding and stewardship of the environment, warns of dangerous weather, and charts the seas and skies. NOAA provides these services through five major organizations: the National Ocean Service, National Marine Fisheries Service, NOAA Research, National Weather Service, and the National Environmental Satellite, Data and Information Service. In addition, NOAA research and operational activities are supported by the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft and serve in scientific and administrative posts. NOAA provides grant funding to Rhode Island's coastal zone management program and, in partnership with EPA, implements the Coastal Zone Act Reauthorization Amendments of 1990. For additional information about NOAA's mission and programs, visit www.noaa.gov.

The Federal **Occupational Safety and Health Administration** (OSHA) regulates health and safety in the workplace. OSHA's mission is to assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. Issues such as chemical exposure, hazard communication, respiratory protection, lockout/tagout, hearing protection, personal protective equipment, forklift operation, confined space entry, bloodborne pathogens, and emergency action plans are all strictly regulated by OSHA. For additional information about OSHA's mission and programs, visit www.osha.gov.

The **United States Army Corps of Engineers** (COE) is responsible for ensuring adequate flood control, hydropower production, navigation, water supply storage, recreation, and fish and wildlife habitat. The Corps contracts and regulates coastal engineering projects, particularly harbor dredging and beach renourishment projects. They also review and permit coastal development and artificial reef projects. A joint permit from the Rhode Island Department of the Environment and the Army Corps of Engineers is required for all dredging projects. For additional information about the COE's mission and programs, visit www.usace.army.mil.

The **United States Coast Guard** (USCG) is a military, multimission, maritime service and one of the nation's five Armed Services. Its mission is to protect the public, the environment, and U.S. economic interests in the nation's ports and waterways, along the coast, on international waters, or in any maritime region as required to support national security. The Coast Guard promotes maritime safety and marine environmental protection, enforces maritime law, tends all federal navigation aids, and regulates and monitors recreational and commercial vessels and waterfront facilities. For additional information about the USCG's mission and programs, visit www.uscg.mil.

Selected State Agencies and Their Jurisdictions

The **Coastal Resources Management Council** (CRMC) was established by the Rhode Island General Assembly in 1971 to "...to preserve, protect, develop, and where possible, restore the coastal resources of the state for this and succeeding generations." The CRMC is authorized to formulate policies and plans, to adopt regulations necessary to implement its various management programs, and to coordinate its functions with local, state, and federal governments on coastal resources issues. It is also responsible for the designation of all public rights-of-way to the tidal water areas of the state. The CRMC is administered by a council composed of appointed representatives of the public and state and local government, and a staff of professional engineers, biologists, environmental scientists, and marine resources specialists. The CRMC is responsible for oversight of the Rhode Island Clean Marina Program. For additional information about the CRMC's mission and programs, visit www.crmc.state.ri.us.

The **Department of Environmental Management** (DEM) is committed to preserving the quality of Rhode Island's environment, maintaining the health and safety of its residents, and protecting the natural systems upon which life depends. Together with many partners, DEM offers assistance to individuals, businesses and municipalities, conducts research, finds solutions, and enforces laws created to protect the environment. Their work fosters clean air, clean water, livable communities, healthy ecosystems, viable natural resource-based industries, abundant open space, and recreational opportunities. DEM issues permits and enforces regulations concerning a variety of issues including wash water discharges, petroleum storage, hazardous wastes, application of TBT paint, and air pollution. DEM is also responsible for boating safety and investigating recreational boat accidents. For additional information about the DEM's mission and programs, visit www.dem.ri.gov.

The Occupational Safety Division of the **Department of Labor and Training** is responsible for enforcing mandated health and safety standards. Occupational Safety protects the public and private sector by enforcing health and safety standards for all state agencies, public buildings, and city and town educational facilities. This is the division to which EPCRA Tier II forms are submitted (see Additional Documentation Requirements later in this chapter). For additional information about the Department's mission and programs, visit http://www.dlt.ri.gov/occusafe/.

The **Rhode Island Department of Health** provides compliance assistance related to workplace health and safety (e.g., OSHA requirements), including free, confidential consulting services. The Consultation Program is completely separate from OSHA enforcement operations. The consultant will not issue citations or impose penalties for violations of federal or state OSHA statutes which may come to light during a consultation visit. Your only obligation in exchange for this service is to commit to correcting any serious job safety and health hazards. For additional information, contact the OSHA consultative branch at 401-222-2438 or visit http://www.health.ri.gov/environment/occupational/index.php.

The **Rhode Island Resource Recovery Corporation** (RIRRC) is the state environmental agency dedicated to providing the public with environmentally-sound programs and facilities to manage solid waste. The agency funds and manages the state's recycling program, and owns and operates the Central Landfill and Materials Recycling Facility in Johnston, Rhode Island. For additional information about the RIRRC's mission and programs, visit www.rirrc.org.

Selected Regulations, Permits and Rules that Apply to Marinas and Boatyards

CRMC Assent

The Coastal Resource Management Council (CRMC) generally requires a permit for any construction or alteration in the coastal region or tidal waters of Rhode Island. Also, permits are required for work that is within 200 feet of the mean high water mark; within 200 feet of a coastal feature (*e.g.,* beach, dune, cliff, bluff, ledge, salt pond or wetland); and/or has a reasonable probability of conflicting with CRMC goals, management plans or programs. Permits may also be required for inland activities that have the potential to change the environment of the coastal region.

Help discerning regulatory requirements is just a phone call away.

The DEM Office of Technical and Customer Assistance (OTCA) will assist business owners to determine which regulations apply to their operations. OTCA will also assist business owners to perform voluntary self-evaluations and, thereby, improve compliance with statutes and/or regulations without fear of retaliation.

Contact OTCA at 401-222-6822.

Anybody proposing work to be conducted within the jurisdiction of the CRMC must submit an application. Permit application forms and checklists are available online at http://www.crmc.state.ri.us/permits/index.html. For more information, contact the Coastal Resources Management Council at 401-783-3370.

Requirements for Dredging and Dredged Material Disposal Activities

Dredging and the disposal of dredged materials fall under the regulatory purview of CRMC, DEM and COE. The regulations are intended to protect surface and groundwater quality and fish and wildlife resources; balance the need to prevent environmental degradation with navigational needs; and encourage beneficial use of dredged material.

CRMC and DEM have developed a State of Rhode Island Dredging Application package that includes an application form suitable for both CRMC and DEM (available online at http://www.crmc.state.ri.us/permits/index.html). In addition to the form, applicants must submit a detailed site plan, a project narrative, local approvals for on-site or upland disposal (if applicable), proof of property ownership, and the application fee.

Prior to submitting an application, potential applicants should:

- Initiate a pre-application consultation with CRMC, DEM and other agencies with jurisdiction by submitting a preliminary proposal to dredge to CRMC,
- Submit a proposed Sediment Sampling Plan to CRMC at least seven days prior to the pre-application meeting,
- Characterize the dredged material, and
- Identify a disposal or beneficial use location.

Rhode Island Pollutant Discharge Elimination System

As this *Guidebook* is being prepared, DEM is developing a Rhode Island Pollutant Discharge Elimination System (RIPDES) Multi-Sector General Permit (MSGP) for Storm Water Discharge Associated with Industrial Activity. It will replace the General Permit for Storm Water Discharge Associated with Industrial Activity issued in March 2003. Facilities that meet all of the following criteria must apply for coverage under the MSGP.

- Marinas identified by Standard Industrial Classification (SIC) 4493. Facilities with this classification include marinas, boating clubs with marinas, sailing clubs with marinas, yacht clubs with marinas, and boatyards that provide storage and incidental repair.
- Conduct vessel maintenance and/or equipment cleaning operations exposed to storm water (*i.e.,* outdoors), such as fueling, engine maintenance/repair, vessel maintenance/repair, pressure washing, sanding, blasting, welding, metal fabrication, and liquid storage in tanks or other containers (*e.g.,* waste oil and gasoline).
- Storm water from the facility flows through a point source into waters of the Unites States. A ramp or railway at a marina is a point source under this regulation, as are pipes, ditches, swales, and channels.

To obtain coverage under the MSGP, marina operators must:

- Submit a Notice of Intent (NOI) to DEM within thirty days of the effective date of the permit.
- Prepare and execute a Storm Water Pollution Prevention Plan (SWPPP) including requirements to implement good housekeeping measures (*i.e.,* best management practices), preventive maintenance procedures, monthly inspections, employee training, and annual comprehensive site compliance evaluations. Refer to outline in Appendix 2. Also, DEM expects of post a SWPPP template on their web site (see below) in spring 2006. Facilities not previously permitted under the baseline Industrial Storm Water permit or covered by the EPA Group Application are required to submit a copy of the SWPPP with the NOI.

Marine facilities covered under the MSGP must also conduct benchmark storm water monitoring of aluminum, iron, lead and zinc. Monitoring must be conducted once per quarter for monitoring Years 2 and 4 of the permit. Year 2 is November 1, 2006 to October 31, 2007 and Year 4 is November 1, 2008 to October 31, 2009. Depending on the results of the 2006-2007 monitoring year, the permittee may not be required to conduct benchmark monitoring in the 2008-2009 monitoring year.

In addition to the MSGP, marinas that discharge "process water" to surface waters are required to obtain a separate RIPDES individual permit. Process waters include:

- Pressure wash water,
- Bilge and ballast water,
- Sanitary waste, and
- Cooling water originating from vessels.

For additional information about RIPDES permits, contact DEM at 401-222-4700 x7202 or visit http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/index.htm.

Oil Pollution Control Regulations

The State's oil pollution control regulations are intended to prevent the discharge, escape or release of oil into the waters of the State and to preserve and protect the quality of these waters. The regulations govern, among other things, above ground storage facilities (*i.e.,* tanks), spill response, storage and removal of oil spill cleanup debris, and spill prevention and emergency plans.

Above Ground Storage Facilities

All above ground oil storage tank facilities with a combined storage capacity of over 500 gallons must be designed and managed to include the following features:

- Overfill Protection
- Secondary Containment Systems for Above Ground Tanks
  - The minimum capacity of the containment system shall be 110 percent of the volume of the tank or 110 percent of the largest tank in a multiple tank containment system.
  - Storm water which collects within the secondary containment system must be removed by a manually operated pump or siphon, or a gravity drain pipe which has manually controlled dike valves. Gravity drain pipes must be locked in a closed position except when the operator is in the process of draining clean water from the diked area.

No person shall place oil or pollutants into the waters or the land of the State or in a location where they are likely to enter the waters of the State.

Oil Pollution Control Regulations, Sect. 6(a).

- Facility Inspections
  - Monthly inspections: inspect exterior surfaces of tanks, pipes, valves, and other equipment for leaks and deficiencies; identify cracks, areas of wear, corrosion and thinning, poor maintenance and operating practices, excessive settlement of structures, separation or swelling of tank insulation, malfunctioning equipment and structural and foundation weaknesses; and inspect and monitor all leak detection systems, cathodic protection monitoring equipment, or other monitoring or warning systems.
  - Ten year inspections: Any above ground tank with a capacity of ten thousand gallons or more must be inspected at ten years of age and every ten years thereafter. A ten year inspection must consist of an appropriate tightness test of the tank and connecting piping or an inspection which consists of cleaning the tank, properly disposing of sludge, inspecting the shell for soundness and testing all welds and seams on the tank bottom for porosity and tightness, visual inspection of the internal surface of the tank, inspection of internal coatings for any sign of failure, and a tightness test of any connecting underground pipes.
  - Inspection reports: Reports for each monthly inspection and ten year inspection must be maintained and made available to DEM upon request for a period of at least ten years. An annual report comprised of the monthly inspection reports and any ten year inspection report completed in the previous twelve months, shall be submitted by December 31 of each year to DEM's Division of Groundwater and Freshwater Wetlands.

Rules and Regulations for Underground Storage Facilities Used for Petroleum Products and Hazardous Materials

Except as noted below, the underground storage tank (UST) regulations apply to all proposed, new and existing underground storage tank facilities at which petroleum product(s) and/or hazardous material(s) are, or have been, stored underground in a tank or tank system.

These regulations DO NOT apply to:

- Hydraulic lift tanks;
- Storage tanks located entirely within structures, such as a basement or cellar provided that:
  (a) The structure allows for physical access to the storage tank;
  (b) The structure is not part of a secondary enclosure; and
  (c) The tank is situated upon or above the surface of a concrete floor;
- Septic tanks;
- Pipeline facilities regulated under the Natural Gas Pipeline Safety Act of 1968 or the Hazardous Liquid Pipeline Safety Act of 1979;
- Flow through process tanks;
- Underground storage tanks storing propane or liquefied natural gas;
- Underground storage tanks used for the temporary storage of raw materials or products by industry (so called "intermittent" or "fill and draw" tanks);
- Emergency Spill Protection and Overflow tanks;
- USTs connected to floor drains or other piping outlets which serve residential structures of a one, two or three family dwelling;
- Oil water separators with a planned discharge required to be regulated under the Clean Water Act.

Marina operators must be particularly cognizant of the rules regarding facility registration, financial responsibility, operation and maintenance requirements, record keeping, and leak and spill response.

Facility Registration and Notification (Rule 6)

All USTs must be registered with DEM. To apply for a certificate of registration, the facility owner/operator must complete, certify and submit to DEM the application form available from the Department by calling the UST section at 401-222-2797 (or by visiting http://www.dem.ri.gov/programs/benviron/assist/usterp/index.htm and scrolling to Appendix I in "Final UST Compliance Workbook"). There is a registration fee of $75 per tank. Certificates of registration must be renewed annually. Note that receipt of a registration certificate DOES NOT necessarily indicate compliance with all applicable rules of these regulations. Owners or operators that fail to register their USTs may be ordered by DEM to immediately implement temporary or permanent closure procedures.

Financial Responsibility (Rule 7)

The owner of any UST system must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases from an underground storage tank system.

An owner/operator may satisfy the Financial Responsibility requirement by purchasing private insurance or by being eligible for the Rhode Island UST Financial Responsibility Fund established by the *Rhode Island Underground Storage Tank Financial Responsibility Act* (RIGL Chapter 46-12.9). The law established a petroleum clean up account to help meet the financial responsibility obligations of tank owners and operators in the state. The account is funded by a portion of the tax on gasoline sales. The RIUST Review Board, directed by a Board comprised of 13 members, is responsible for overseeing the administration and implementation of the fund; reviewing submissions and claims received from eligible parities; and approving, modifying or denying claims to eligible parties. Additionally, the Board helps to insure that environmental and public health impacts of the underground storage tank (UST) leaks are addressed in an effective and timely manner.

Private parties, the State, and cities and towns are potentially eligible for reimbursement of costs that have been incurred as a result of a leaking underground storage tank. In order to receive funds from the Review Board, one must be in compliance with the Department of Environmental Management's UST rules and regulations and must exhibit to the Review Board that he or she has spent the $20,000 deductible on eligible costs and expenses. An owner/operator may receive up to one million dollars of eligible costs and expenses.

The application process for private owners begins with a Compliance Application. This simple one page application and a $150 dollar application fee will start the process. Forms and other information are available at www.riustreviewboard.org or by calling 401-273-6570.

Minimum UST Operation and Maintenance Requirements (Rule 8)

All owners or operators of USTs must satisfy the following general requirements for operations and maintenance (Rule 8.02).

- All USTs shall be maintained and operated by trained personnel and in compliance with applicable national codes of practice for the handling and storage of petroleum or hazardous materials.
- Facilities subject to leak detection requirements shall post or otherwise provide the operators of UST systems with written instructions pertaining to the operation of leak detection equipment, as well as spill response procedures.
- Facilities subject to inventory record-keeping requirements shall comply with rules governing Inventory Record-keeping and Leak Reporting (see below).
- All gasoline dispensing facilities (including retail, commercial, and municipal stations) subject to Stage I and Stage II vapor controls shall comply with the RI DEM Office of Air Resources Air Pollution Regulation No. 11: Petroleum Liquids Marketing and Storage.
- Compatibility: All new or replacement tank and/or piping systems shall be made of, or lined with, materials that are compatible with the substance(s) stored. The owner/operator shall not introduce, or allow to be introduced, any material into a UST system that is incompatible with the UST system.
- Correct Filling Practices: All UST facilities shall establish procedures for determining the available storage capacity of each of its tanks and shall comply with those procedures and communicate the available capacity to delivery personnel before allowing any product to be delivered to the facility's tank(s). Facilities shall also establish procedures to monitor deliveries in order to prevent tank overfills and product spills.

Furthermore, owners/operators of UST must meet standards related to the following subjects, as applicable, and described fully in the regulations.

- Rule 8.03: Every two years, all operators of USTs must conduct a compliance inspection by completing and submitting to DEM a *Compliance Certification Checklist and Forms Booklet* (*i.e.,* the Environmental Results Program (ERP) Certification Booklet). The ERP workbook and checklist are available online at http://www.dem.ri.gov/programs/benviron/assist/usterp/index.htm. The workbook clearly explains record keeping and compliance requirements and best management practices that apply to UST systems.
- Rule 8.04: Mandatory deadlines for permanent closure of single-walled UST systems.
- Rule 8.05: Mandatory corrosion protection requirements for tank systems.
- Rule 8.06: Interior lining inspections.
- Rule 8.07: Cathodic protection.
- Rule 8.08: Leak detection for existing tanks.
- Rule 8.09: Leak detection for piping.
- Rule 8.10: Tank and line tightness requirements.
- Rule 8.11: Line leak detectors.
- Rule 8.12: Shear/crash/impact valves.
- Rule 8.13: Anti-siphon valves.
- Rule 8.14: Check valves.
- Rule 8.15: Operation of leak monitoring equipment.
- Rule 8.16: Spill containment and overfill protection.
- Rule 8.17: Submerged fill tube.
- Rule 8.18: Fill pipe labeling.
- Rule 8.19: Groundwater monitoring wells and UST pad observation wells.
- Rule 8.20: Record-keeping.

Maintaining Records (Rule 11)

All owners/operators of USTs are required to maintain three types of records: permanent, routine, and inventory control.

Permanent records consist of the following and must be maintained for three years beyond the operational life of the facility.

- All data used to complete the application for the certificate of registration;
- All records of modifications or repairs to pipes, fittings or other components of underground storage tank systems;
- Annual test results of equipment or systems used for leak detection and inventory control;
- Results of monitoring well checks as referenced in Rules 8.19(D) and 9.18 (C);
- Records of closure activities;
- Records of leaks, spills, releases, overfills, site investigations, and remedial response activities taken;
- Tank and/or line tightness test results including all of the information required in Rule 8.09;
- All records pertaining to the operation and maintenance of approved corrosion protection methods as required in Rule 8.06 and 8.07;
- Equipment warranties and manufacturers' checklists.

The follow records made during **routine** operations should be maintained for a minimum of three years from the date made, or for such longer periods as required by the Director of DEM in the resolution of enforcement actions.

- Records of all calibration and standard maintenance performed;
- Records of strip charts, electronic recall device and/or manual recordings for any continuous monitoring instrumentation;
- Records of monthly tests of continuous monitoring systems as required in Rules 8.15 (E) and 9.17 (E).
- Daily and monthly inventory record keeping, as described in Rule 11.03 below.
- Records of annual shear valve tests.

All product **inventory, record-keeping, and leak reporting** must be managed in accordance with the following procedures:

- Inventory volume for regulated substance inputs, withdrawals, and the amount still remaining in the tank shall be measured and recorded each operating day;
- Any unusual occurrences that might affect the inflow, outflow, or volume on hand, shall be recorded each operating day, along with any adjustments that were made to the records.
- All inventory gauging equipment shall be capable of measuring the level of product over the full range of the tank's height to the nearest one-eighth of an inch;
- All inputs of regulated substance shall be reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;

- All deliveries shall be made through a drop tube that extends to within six (6) inches of the tank bottom;
- Product dispensing shall be metered and recorded within the local standards for meter calibration or an accuracy of six (6) cubic inches for every five (5) gallons of product withdrawn, whichever is more accurate;
- All tanks shall be gauged for the presence of water in the bottom of the tank at least once each month and a measurement of any water present shall be recorded to the nearest one-eighth of an inch;
- If inventory record keeping indicates a discrepancy of 1% or more of the flow-through plus 130 gallons on a monthly basis, then the owner/operator shall report such discrepancy in accordance with Rule 12 Leak and Spill Response (see Oil Spill Response later in this chapter).

Rhode Island Air Pollution Control Regulations

DEM issues three types of permits to sources of air pollution: preconstruction permits pursuant to Regulation No. 9, air toxics operating permits pursuant to Regulation No. 22, and operating permits under Regulation No. 29. The operation of gasoline dispensing facilities (*i.e.,* fuel docks) is controlled by Regulation No. 11.

Air Pollution Control Regulation No. 9

Air Pollution Control Regulation No. 9 requires operators to obtain a permit prior to constructing or installing certain types of facilities that generate air pollution. Used oil furnaces and spray painting booths are potentially subject to this permit. A permit is required for the construction, installation or modification of the following:

9.3.1 Applicability

(a) Any fuel burning device designed to burn:
  (1) Residual oil or solid fossil fuels having a heat input capacity of one million Btu or more per hour;
  (2) All other liquid fuels having a heat input capacity of five million Btu or more per hour;
  (3) Gaseous fuel having a heat input capacity of ten million Btu or more per hour; or
  (4) Alternative fuels, including but not limited to, wood chips, hazardous wastes or waste oil having a heat input capacity of one million Btu or more per hour.

(b) Liquid petroleum storage tanks, reservoirs and containers with a capacity of forty thousand gallons or more used for the storage of petroleum liquids having a true vapor pressure greater than 1.52 psia at 69°F;

(c) Any incinerator, except as exempted in Subsection 9.3.2(b);

(d) Any stationary source that emits or has the potential to emit, in the aggregate, 25 tons per year or more of any combination of hazardous air pollutants.

(e) Any stationary source which has the potential to increase emissions of a listed toxic air contaminant by greater than the minimum quantity for that contaminant, as specified in Appendix A of this regulation.

(f) Any other stationary source or process except for those outlined in Subsection 9.3.1 (a) having the potential to emit one hundred pounds or more per day, or ten pounds or more per hour of any air contaminant or combination of air contaminants into the atmosphere, including but not limited to the following categories:
  (1) Surface coating, spray and dip painting, roller coating, knife coating and electrostatic depositing;
  (2) Metal cleaning or surface preparation, degreasing, bright dipping, stripping, galvanizing and chrome plating;
  (3) Textile dyeing and finishing, including tenter frames, dryers, printers and solvent dyers;
  (4) Glass or fiberglass manufacturing, including melting furnaces, forming lines, curing ovens and product cooling lines;
  (5) The production of asphalt concrete, including rotary dryers, screening and conveying systems and mixers;
  (6) The production of metal castings, including cupolas, reverberatory furnaces, electric furnaces, crucible furnaces and sand handling systems; and
  (7) The transfer of petroleum products having a true vapor pressure greater than 1.52 psia at 69°F from the storage facility to or from a mobile vessel.

(g) Any air pollution control system and appurtenances.

The application is available from DEM at http://www.dem.ri.gov/pubs/forms.htm#air.

Under the terms of the permit, Best Available Control Technology (BACT) must be applied to limit the release of each pollutant the source (*e.g.,* spray booth) would have the potential to emit. Additional permit conditions describe emission limits and require compliance with all applicable state and federal air quality standards, rules, and regulations.

Air Pollution Control Regulation No. 22

An Air Toxics Operating Permit pursuant to Air Pollution Control Regulation No. 22 is required for emissions that exceed regulatory thresholds for listed toxic contaminants. Refer to Table III of the regulation in Appendix 3 for a complete list of regulated pollutants and minimum quantities. If a source emits a listed toxic air contaminant in an amount greater than the minimum quantity for that substance, the operator must register with DEM according to the following requirements.

Requirement for Registration

22.4.1 The owner or operator of a stationary source which emits a listed toxic air contaminant in an amount greater than the Minimum Quantity for that substance specified in Table III during a calendar year shall register in writing with the Department on or before 15 April of the following calendar year. The registration shall be signed by the owner or operator of the stationary source.

22.4.2 Registrations shall include, at a minimum, the following information:
  (a) The name and address of the facility;
  (b) The name and telephone number of the owner or operator of the facility and of a technical contact person for the facility; and
  (c) For each of the listed toxic air contaminants emitted by the facility in an amount greater than the Minimum Quantity for that substance during the previous calendar year:
    (1) The name of the substance;
    (2) The process that emitted the substance;

(3) The amount of the substance used at the facility during the previous calendar year,
(4) The amount of the substance emitted by the facility during the previous calendar year, and
(5) The method used to calculate emissions from the facility.

22.4.3 Any listed toxic substance that is present in a mixture shall be included in the registration provided that:

(a) The substance is listed on the Material Safety Data Sheet (MSDS) for that mixture prepared pursuant to the OSHA Hazard Communication Standard (29CFR1910.1200). If the chemical manufacturer claims on the MSDS that the content of the mixture is proprietary information, it is the responsibility of the owner or the operator of the facility using that mixture to determine whether the mixture contains listed toxic substances. A certification from the manufacturer shall be deemed an acceptable determination of whether the mixture contains listed toxic substances; or
(b) For a mixture which does not have a MSDS, the concentration of the listed toxic substance in the mixture is at least 1%. A listed toxic substances that is a carcinogen, as defined in this regulation, shall be included in the registration if the concentration of that substance is at least 0.1% of the mixture.

After registering, a source is not required to file an application for an air toxics operating permit until they are notified by the Department.

Air Pollution Control Regulation No. 29

Operating permits under Air Pollution Control Regulation No. 29 are required of major sources. Most marinas do not generate the quantity of air pollution to be considered a major source. Some boat builders, however, may be subject to Air Pollution Control Regulation No. 29. Major sources are defined in the regulation (section 29.1.20) as any of the following:

(a) For pollutants other than radionuclides, all of the pollutant-emitting activities located within a contiguous area and under common control that emits or has the potential to emit, in the aggregate, 10 tons per year (tpy) or more of any hazardous air pollutant which has been listed pursuant to Section 112(b) of the Act, 25 tpy or more of any combination of such hazardous air pollutants, or such lesser quantity as the Administrator may establish by rule. Notwithstanding the preceding sentence, emissions from any oil or gas exploration or production well (with its associated equipment) and emissions from any pipeline compressor or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control, to determine whether such units or stations are major sources; or
(b) For radionuclides, "major source" shall have the meaning specified by the Administrator by rule.
(c) All the pollutant-emitting activities, which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties and are under control of the same person or persons under common control, that emits or has the potential to emit, 100 tpy or more of any air pollutant including any fugitive emissions, to the extent they are quantifiable; or Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same two-digit code as described in the Standard Industrial Classification Manual, 1987.
(d) All the pollutant-emitting activities, which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties and are under control of the same person or persons under common control, that emits or has the potential to emit 50 tpy or more of volatile organic compounds or oxides of nitrogen including any fugitive emission, to the extent they are quantifiable. Pollutant-emitting activities shall be considered as part of the same industrial grouping if they belong to the same two-digit code as described in the Standard Industrial Classification Manual, 1987.

Air Pollution Control Regulation No. 11

Air Pollution Control Regulation No. 11 applies to marina operations that sell gasoline. All gasoline dispensing facilities must have a Stage I Vapor Control System in place to capture vapors displaced when fuel is transferred from a delivery vehicle into a storage tank, unless one of the following exceptions applies:

- Stationary gasoline storage vessels of less than 550 gallons capacity used exclusively for the fueling of implements of husbandry, provided the containers are equipped with submerged fill pipes, or
- Stationary storage vessels located at a gasoline dispensing facility with a capacity of less than 2000 gallons which was in place before 1 July 1979, or
- any stationary storage vessels located at a gasoline dispensing facility with a capacity of 250 gallons or less which was installed after 5 July 1979.
- Any gasoline dispensing facility that is solely serviced by account trucks owned or under the control of bulk gasoline plants that are exempt from Section 11.4 of this regulation.
- Any gasoline dispensing facility with an annual throughput of 120,000 gallons or less, a rolling 30 day throughput of less than 10,000 gallons, certified by the Division of Air and Hazardous Materials. The owner/operator of the affected facility shall submit tax records, sales slips or any other material to certify the quantity of the rolling 30 day throughput is less than 10,000 gallons for the most recent calendar year.

Any facility required to have a Stage I Vapor Control System must also keep the following records:

- Scheduled date for maintenance or the date a malfunction was detected.
- Date the need for maintenance or malfunction of major system components was reported to the owner.
- Date the maintenance was performed or the malfunction corrected by either the operator or the owner.
- Records of daily throughput quantities.

These records must be maintained for a period of three (3) years and should be accessible for review by DEM.

Stage II Vapor Recovery refers to systems that capture vapors at the point where gasoline is dispensed from the storage tank to a vehicle or vessel. Marinas that dispense fuel solely to watercraft are not required to have Stage II vapor controls.

Air Pollution Control Regulation No. 11 also places conditions on the design and operation of petroleum storage tanks of more than 40,000 gallons.

Federal Requirements Related to Refrigerant Gases

Title 40, Part 82 of the U.S. Code of Federal Regulations implements the Montreal Protocol on Substances that Deplete the Ozone Layer and sections of the Clean Air Act Amendments of 1990. The purpose of Subpart F (40 CFR 82.150-169) is to reduce emissions of class I and class II refrigerants and their substitutes to the lowest achievable level by:

- maximizing the recapture and recycling of refrigerants during the service, maintenance, repair, and disposal of appliances and
- restricting the sale of refrigerants consisting in whole or in part of a class I and class II ozone depleting substances (ODS).

This first objective is achieved, in part, by requiring that all technicians be certified by an approved technician certification program. Certified technicians must keep a copy of their certificate at their place of employment. Wholesalers of refrigerants may sell their products only to entities that employee at least one certified technician. The regulations also stipulate reporting and recordkeeping requirements.

Rules and Regulations Relating to Marine Antifoulant Paints Containing Tributyltin

Owners or employees of a commercial boatyard may apply antifoulant paints containing tributyltin only to the following three categories of vessels or portions of vessels:

- Vessels in excess of sixty-five feet in length,
- Vessels with aluminum hulls, or
- Vessels less than sixty-five feet in length if it is applied only to the outboard or lower drive unit.

A private individual may distribute, sell or apply a marine antifoulant paint containing tributyltin if the paint is distributed or sold in a spray can in a quantity of sixteen ounces avoirdupois or less and is commonly referred to as outboard or lower unit paint.

With the exception of the uses described above, it is illegal to distribute, possess, sell, offer for sale, apply, or offer for use any marine antifoulant paint containing tributyltin compounds.

During and after paint removal and/or application of new paint containing tributyltin, measures must be taken to prevent the introduction of tributyltin into the aquatic environment: all paint chips and spent abrasives, paint containers, unused paint, and any other waste products from paint removal or application must be disposed of in a sanitary landfill.

Rules and Regulations for Hazardous Waste Management

Hazardous materials are ignitable, corrosive, reactive and/or toxic and are hazardous to public health and the environment when not handled properly. Raw materials with health or safety hazards are regulated under OSHA requirements for Hazard Communication and Personal Protective Equipment. They may also be subject to local regulations and fire codes.

Hazardous materials become hazardous waste when they are no longer needed or have been kept past their expiration date. Hazardous waste is regulated under the Federal Resource Conservation and Recovery Act (RCRA) and the Rhode Island Rules and Regulations for Hazardous Waste Management.

Boatyards that use flammable materials, solvents, hydrocarbon-based cleaning materials or thinners probably generate hazardous waste. The following commonly-generated waste materials may be hazardous wastes:

- Waste engine fluids
- Waste solvents and thinners
- Waste machining oils, coolants, and hydraulic fluid
- Waste paint (unused or expired)
- Sludge or "bottoms" from a solvent recycling unit
- Waste methylene chloride paint stripper and sludge

A waste product is a hazardous waste if it exhibits any of the characteristics of hazardous waste (*i.e.*, ignitibility, corrosivity, reactivity or toxicity) or if it is listed in 40 CFR 261 Subpart D or if it meets the description of a Rhode Island Hazardous Waste as listed in Section 3 of the Rhode Island Rules and Regulations for Hazardous Waste Management. As a generator, you are required to determine if your waste falls into any of these categories. You can make this determination based on your knowledge of the materials and information gathered from Material Safety Data Sheets or by having a representative sample tested by an industrial laboratory. Contact DEM's Office of Technical and Customer Assistance for further assistance: 401-222-6822.

A generator must keep records of any test results, waste analyses, or other determinations made in accordance with its identification of hazardous waste for at least three years from the date that the waste was last sent to an on-site or off-site treatment, storage, or disposal facility.

If you determine that you have hazardous waste on site, you must apply to DEM for an EPA Identification Number. Call DEM's Office of Compliance and Inspection at 401-222-1360 and request an EPA Identification Number for Hazardous Waste Generators.

Accumulation

Up to 55 gallons of hazardous waste (or 1 quart of acutely hazardous waste) may be collected at a work station (*i.e.*, "satellite accumulation") with no time limit, provided that the container is:

- At or near any point of generation where the waste initially accumulates;
- Under control of the operator of the process generating the waste;
- In good condition;

- Kept closed except when adding or removing waste;
- Handled or stored so as not to cause a rupture or leak;
- Arranged to accommodate the storage of chemically incompatible wastes; and
- Labeled with the words "Hazardous Waste" and other information that identifies the contents of the container.

Storage

When filled, the generator must move the container to a designated hazardous waste storage area within 3 days and meet the complete labeling requirements described in the next section. Containers may be stored for no more than 90 days and must be managed according to 40 CFR 265 Subpart I:

- **Condition:** The container must be in good condition.
- **Compatibility:** The container should be compatible with the waste. Plastic drums are not compatible with solvents found in paints, paint thinners, cleaners, and strippers. Steel drums should, therefore, be used for these fluids. Also, since these fluids are ignitable, be sure the drums are electrically grounded.
- **Container Management:** Containers holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste. Furthermore, containers must not be opened, handled or stored in a manner which may rupture the container or cause it to leak. Outdoor storage is generally not recommended. If outside storage is unavoidable, marina operators should protect the storage area from cars and trucks within the yard. A storage shed or a fenced and covered area should be considered.
- **Inspections:** Generators should implement a weekly inspection of the storage area looking for leaks or deterioration of hazardous waste containers. The inspection must be documented (refer to Hazardous Waste Storage Area Inspection Checklist in Appendix 4). Record inspections in a log and keep the records for at least three (3) years from the date of inspection. Consider hanging a clipboard on the wall with the checklist and inspection log.
- **Ignitable or Reactive Waste:** Containers holding ignitable or reactive waste must be located at least 50 feet from the facility's property line and must also be electrically grounded. Generators should also separate the storage area from open flames, sparks, and other sources of ignition and post "No Smoking" signs in the storage area.
- **Incompatible Wastes:** Potentially incompatible materials should be stored separately to prevent fires, explosions, gaseous emissions, leaching, or other discharges of hazardous waste or hazardous waste constituents. Hazardous waste should, therefore, not be mixed with or stored next to incompatible materials or be placed in unwashed containers that previously held an incompatible material. Contact DEM's Office of Technical and Customer Assistance for a listing of potentially incompatible materials: 401-222-6822.
- **Air Emissions:** To minimize air pollution, hazardous waste must be stored in containers approved by the Department of Transportation (DOT) and the containers must remain closed when not being filled.
- **Containment:** If the hazardous waste is a liquid, the 90-day storage area must have a secondary containment system capable of containing a spill or leak. Note that floor drains that discharge underground (through a drywell, galley or other means) are prohibited in hazardous waste storage areas.

Box 1: Summary of Hazardous Waste Storage Requirements

Satellite or Workstation Accumulation

State and Federal Hazardous Waste Regulations (specifically 40 CFR 262.34(c)(1)) allow a generator to accumulate up to 55 gallons of hazardous waste with no storage time limit provided that the container is:

- At or near the point of generation;
- Under control of the operator;
- In good condition;
- Kept closed except when adding or removing waste;
- Handled or stored so as not to cause a rupture or leak;
- Arranged to accommodate the storage of chemically incompatible wastes; and
- Labeled with the words "Hazardous Waste," and ID container contents.
- When drum is full, date the drum and within three days, either move to storage area or ship off-site. At that point, the label must include the company's name, address, DOT descriptive shipping name, and the EPA waste code.

Hazardous Waste Storage Area

- Store on impervious floor with secondary containment.
- Keep drums closed, clean, and in good condition and maintain aisle space.
- Consider keeping a spill kit in the area, and clean spills immediately.
- Electrically ground drums which contain ignitables.
- Implement a weekly inspection of the storage area.
- Label and date all drums according to guidelines listed in the Hazardous Waste Compliance Workbook.
- Ship off-site within 90 days.

If the area contains ignitables:

- Post "No-Smoking" signs in the area.
- Locate 50 feet from property line.

Recordkeeping

Keep copies of manifests, land disposal restriction forms, storage area inspections, employee training records, waste analyses, and biennial reports.

Emergency Equipment

Your facility must be maintained to minimize the possibility of a fire, explosion, or unplanned release of hazardous waste. Fire extinguishers, alarm systems, telephones, spill kits and other emergency equipment is required.

Source: "Hazardous Waste Compliance Workbook for Rhode Island Generators," State of Rhode Island, Department of Environmental Management, Office of Technical and Customer Assistance, March 2002.

Management of Rags, Towels and Oil Absorbent Pads

Shop towels saturated (dripping) with liquids that are considered hazardous wastes (such as solvents), must be handled as hazardous wastes. Towels with only minor contamination must also be handled as hazardous waste unless they are sent off-site for laundering at a properly licensed commercial laundry. Store ignitable rags in containers that are NFPA-approved, tightly closed, and labeled.

Oil absorbent pads used at the fuel dock to capture spills must also be treated as hazardous waste. Pads contaminated with diesel should be consolidated with other waste oil debris (e.g., oil filters) and collected by a licensed hauler. Pads contaminated with gasoline must be treated as flammable hazardous debris. That is, once a pad has gasoline on it, it must be contained in a labeled, fire-safe cabinet. Pads may be collected in a satellite unit at the fuel dock—such as an "oily waste can" designed to protect against spontaneous combustion (available from industrial supply companies)—and transferred every evening to the flammable waste storage area.

Labeling

Each container in the hazardous waste storage area must be labeled with the following information:

- The words, "HAZARDOUS WASTE - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency."
- The generator's name and address of generating facility.
- The USDOT shipping name and the generic names of the principal hazardous waste components (if the proper USDOT shipping name is not conclusive in identifying the hazardous waste).
- The EPA or Rhode Island waste code.
- Date of containerization (the date that the 90 day "clock" begins ticking).
- The hazardous waste manifest document number (prior to being shipped off-site).
- DOT hazard label. These labels are readily available from lab safety catalogs or from your waste transporter.

Whenever a "satellite accumulation" container is moved to the storage area—and, thus, becomes a shipping container—it must be labeled with all of the information listed above.

The hazardous waste generator (*i.e.,* marina operator) is also responsible for ensuring that the vehicle transporting the hazardous waste is licensed in Rhode Island and has the correct placards. Placards are similar in shape and color to the hazard labels, but are larger and must be on all four sides of the vehicle.

Hazardous Waste Manifests

Hazardous waste must be removed by a licensed hazardous waste hauler (call DEM's Office of Waste Management 401-222-2797 or visit http://www.dem.ri.gov/programs/benviron/waste/pdf/hwgenbk.pdf for a list). The hauler must provide you with a "hazardous waste manifest." A manifest is an eight-copy document designed to track hazardous waste shipments.

Rule 5.03 of the Rhode Island Regulations deals with shipping hazardous wastes. At shipment, you must sign the manifest and keep copy 8. Copies 6 and 7 must then be mailed to RI DEM and the state receiving the waste, respectively, within 5 days (if a Rhode Island facility is receiving the waste then both copies go to DEM). Some transporters will mail copies 6 and 7 for you. The facility receiving your waste will send you a signed Copy 3 of the manifest within 35 days. Staple copies 3 and 8 together and keep in your records for three years from the date the waste was accepted by the initial transporter. If Copy 3 is not received within 35 days, you must file an exception report with DEM. Contact DEM's Office of Waste Management at 401-222-2797 for guidance. Copies of Exception Reports must also be kept for three years.

Biennial Report

Each even-numbered year, RI DEM sends a Biennial Report to be filled out by generators. The report requests information that can be gathered from shipping manifests, as well as:

- A description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated.
- A description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years.

A generator must keep a copy of each Biennial Report for a period of at least three years from the due date of the report.

Training

The operator of any facility that accumulates hazardous waste is required to provide and document hazardous waste training. Personnel dealing with hazardous waste must successfully complete a program of classroom instruction or on-the-job training that teaches them hazardous waste management procedures relevant to their positions. The training program must also be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems.

Facility personnel must successfully complete the program within six months of employment or reassignment within the facility. They may not work in unsupervised positions until they have completed the training requirements. In addition, facility personnel must take part in an annual review of the initial training. With regard to this training, the generator must maintain the following documents and records at the facility:

- The job title for each position at the facility related to hazardous waste management, and the name of the employee filling each job;
- A written job description for each position;
- A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position.
- Records that document that the training or job experience required has been given to, and completed by, facility personnel.

Training records on current personnel must be kept until closure of the facility. Training records on former employees must be kept for at least three years from the date the employee last worked at the facility.

Requirements for Floor Drains

Floor drains that discharge to a waterway or below the ground via a dry well, septic system, galley or other means, are strictly regulated and sometimes prohibited. Contact DEM's Office of Technical and Customer Assistance for more information: 401-222-6822.

- Floor drains connected to local sewer systems are subject to local permitting.
- Floor drains connected to an underground tank are subject to permitting through the DEM Underground Storage Tank Program.
- If the floor drains discharge below ground, this discharge to the subsurface (underground through a drywell, galley, or other means) requires permitting through DEM's Underground Injection Control Program.

Emergency Planning

During an emergency situation, time is of the essence. Are you and your staff ready to respond quickly and effectively? How will you respond to a fuel spill? Or a medical emergency? Is the local fire department familiar with the layout of your marina? What are the most efficient evacuation routes? By thinking about these and other questions ahead of time, you are taking steps to ensure that a bad situation is not made worse by an inappropriate or insufficient response.

Being prepared for an emergency is a responsibility every business owner should take seriously. This section summarizes regulations regarding releases of petroleum and hazardous materials, as well as general preparedness guidelines for fires and other emergencies.

Oil Spill Response

All marinas—whether or not they sell fuel—should be prepared for a fuel spill. At a minimum, marina operators should maintain:

- Oil containment booms or sweeps (length = 3 x length of largest vessel),
- Oil absorbent pads, and a
- List of important phone numbers: DEM (401-222-3070), USCG (800-424-8802), owner, etc.

This basic equipment can be used to contain small spills and releases of contaminated bilge water. Marinas that sell fuel must meet more stringent criteria for planning for and reacting to fuel spills. The requirements are specified in Rhode Island's Oil Pollution Control and Underground Storage Tank regulations and in the Code of Federal Regulations.

Oil Pollution Control Regulations

Oil and Waste Release Responses

In the event of a release of oil to the environment, the regulations specify that the following steps shall be taken.

- Immediately cease all further oil transfer operations.
- Immediately stop discharge, begin containment and removal of the oil and waste materials.
- Immediately report the incident to DEM's Emergency Response Hotline: 401-222-3070.
- Notify other appropriate local, state and federal officials, which may include, but are not limited to, the National Response Center (800-424-8802), local Fire Chief, local Coast Guard unit, Environmental Protection Agency, and the Coastal Resources Management Council.
- Within ten calendar days of the time the release is first discovered, submit a written report to DEM, Chief of the Division of Groundwater.

Mechanical methods should be used initially to clean up oil and chemical releases. No chemical agents, dispersants, surface collecting agents, biological additives, burning agents, or sinking agents, shall be used without the prior consent of the Chief of the DEM Groundwater Division.

Storage and Removal of Oil Spill Cleanup Debris

Oil spill cleanup debris may be stored temporarily at the site of the spill or leak, or at another site approved by DEM provided that:

- the material is stored on an impermeable base or liner;
- the material is fully covered and secured so as to prevent the material from leaching into the groundwater, or particulates being dispersed by the wind;
- representative composite samples are immediately taken and analyzed for oil and grease, lead, PCB and flammability unless otherwise specified by an authorized DEM representative;
- samples are analyzed and the results are submitted to the DEM Division of Groundwater within (30) days of sample collection;
- if the sample results show the material to be a hazardous waste, the owner or operator of the site shall take immediate measures to properly store and dispose of the material in accordance with state and federal hazardous waste regulations;
- the temporary storage of the oil spill cleanup debris does not exceed thirty (30) days unless the owner or operator of the site demonstrates to DEM in writing that there is good cause for extending temporary storage and DEM issues written authorization for extended temporary storage.

Oil spill cleanup debris may be taken from the site only in secured drums or canisters or in a covered vehicle and taken only to an approved location.

Within ten (10) days of removal of the oil spill cleanup debris, the owner or operator must submit documentation to DEM showing when the material was removed and where it was taken.

Spill Prevention and Emergency Plans

The owner or operator of any outdoor oil storage tank—except a tank with a capacity of 500 gallons or less storing heating oil—must prepare an oil spill response plan. The plan must contain, at a minimum, the following information:

- Up-to-date schematic diagrams showing the location of all outdoor tanks and piping used for the storage and conveyance of oil, including the location of all emergency shutoff valves;
- A description of on-site emergency containment and cleanup equipment;
- Description of off-site auxillary emergency equipment that can be readily obtained, including a listing of cleanup contractors to contact for such equipment;
- Emergency telephone numbers of local, state and federal officials who should be contacted in case of an oil spill.

Emergency plans must be made available to DEM upon request for inspection and copying. Spill prevention control plans required under other federal or state requirements may be substituted for the plan required by this section provided the plan contains the information listed above. Refer to the requirements for Federally-mandated Spill Prevention, Control, and Countermeasure (SPCC) plans below.

Underground Storage Tank (UST) Regulations

All owners/operators of UST systems must report, investigate, and clean up any spills, leaks, or releases in accordance with applicable local, state, and federal statutes, rules, and regulations. All confirmed and suspected leaks must be reported to DEM, the appropriate local fire official, and the local water supplier if the leak is within a public supply watershed or a wellhead protection area.

Unless instructed by the Director of DEM to do otherwise, the owner/operator shall take the following actions to abate a confirmed release:

- As soon as possible and within 24 hours, completely remove the contents of the UST.
- Contain all discharged oil, oil-contaminated debris and hazardous waste. Such materials shall be handled, stored and disposed of in accordance with the state Oil Pollution Control Regulations (above) and other applicable state and federal statutes, rules and regulations;
- Assess fire, health and safety hazards and take reasonable steps to mitigate any such hazards; local fire officials should be consulted as conditions require;
- Inspect any exposed releases and take steps to prevent the migration of any released regulated substance into the environment, including soils, groundwater or surface waters;
- Investigate for the presence of free product and, if present, initiate free product removal in a manner that minimizes the spread of contamination; and
- Carry out other actions as directed by DEM pursuant to Oil Pollution Control regulations, or other local, state and federal statutes, rules and regulations.

Within seven days after a confirmed release from a UST or UST system, the owner/operator must submit a Release Characterization Report to the Director of DEM summarizing the events related to the release and describing the results of initial abatement steps. The Director may require additional information or a full site investigation if the Release Characterization Report does not establish, to the Director's satisfaction, that there are no present or potential adverse impacts to groundwater or surface water resulting from the release.

A full site investigation may be required if:

- The facility has closed USTs storing hazardous materials;
- Groundwater or surface waters adjacent to the facility have been affected by a release of petroleum product or hazardous material;
- An inspection of a tank closure and/or a Closure Assessment Report reveals soil or groundwater contamination;
- A site assessment report or information reveals soil or groundwater contamination; or
- Other evidence of a leak or release exists, including, but not limited to, failed tank or line tightness tests or perforated or highly corroded tanks or piping.

Site investigations must be conducted by environmental consultants. They must also prepare a Site Investigation Report that defines the nature, degree and extent of contamination and identifies threats to public health and the environment. Based upon the Site Investigation Report or other data, the Director may require owners/operators to develop and submit a Corrective Action Plan to address contaminated soils or groundwater or other related environmental or public health impacts. In order to be approved, the Corrective Action Plan must protect human health and the environment in a manner acceptable to the Director.

Federal Requirements for Spill Prevention, Control, and Countermeasure (SPCC) Plans

Federal regulations (40 CFR 112) require that marinas prepare and implement a plan to prevent any discharge of oil into navigable waters or adjoining shorelines if the facility has:

- an aggregate above ground storage capacity greater than 1,320 gallons or
- more than 42,000 gallons of completely buried oil storage capacity.

When calculating storage capacity, include all containers of oil with a capacity of 55 gallons or greater. Do not include the capacity of containers that are permanently closed.

Oil is defined in the SPCC regulations (40 CFR 112.2) as "oil of any kind or in any form, including, but not limited to: fats, oils, or greases of animal, fish, or marine mammal origin; vegetable oils, including oils from seeds, nuts, fruits, or kernels; and, other oils and greases, including petroleum, fuel oil, sludge, synthetic oils, mineral oils, oil refuse, or oil mixed with wastes other than dredged spoil."

SPCC plans must address:

- operating procedures implemented by the facility to prevent oil spills,
- control measures installed to prevent a spill from entering navigable waters or adjoining shorelines, and
- countermeasures to contain, cleanup, and mitigate the effects of an oil spill that impacts navigable waters or adjoining shorelines.

They must also include log forms on which to record information about maintenance inspections, employee training, and incidental spills.

Report Spills from USTs

During normal working hours, reports of releases from an UST should be made to the DEM UST Section at 401-222-2797; fax 401-222-3813. At all other times, reports can be made to the DEM 24-hour Emergency Response Hotline at 401-222-3070.

The original rule requiring the preparation of SPCC plans went into effect on January 10, 1974. Final revisions to the rule were published in the Federal Register in July 2002. However, EPA extended the compliance dates for amending existing SPCC Plans and for implementing amended or new Plans developed according to the revised rules. The current compliance dates in §112.3(a) and (b) for facilities are as follows:

A facility starting operation...	Must...
On or before August 16, 2002	Maintain the facility's existing SPCC Plan. Amend and implement the SPCC Plan no later than October 31, 2007.
After August 16, 2002, through October 31, 2007	Prepare and implement an SPCC Plan no later than October 31, 2007.
After October 31, 2007	Prepare and implement an SPCC Plan before beginning operations.

SPCC plans must be certified by a professional engineer. Plans must be reviewed and, if necessary, revised every five years. The reviews must be documented. Additionally, SPCC plans must be amended whenever there is a change in facility design, construction, operation or maintenance that materially affects the facility's potential to discharge oil. Such amendments must be fully implemented not later than six months after the change occurs. All amendments must be certified by a registered professional engineer.

SPCC plans must be kept on-site for EPA review. A copy of the SPCC plan must be submitted to EPA Region I if a single spill of greater than 1,000 gallons occurs or two discharges of more than 42 gallons each occur within any twelve month period,.

Refer to the SPCC Plan template in Appendix 5. For additional information, see *SPCC Guidance for Regional Inspectors* available online at http://www.epa.gov/oilspill/guidance.htm.

Hazardous Waste Spill Response

Hazardous Waste Spill Response Plan

The Rhode Island Rules and Regulations for Hazardous Waste Management require that all hazardous waste generators prepare formal written plans outlining specific steps that company personnel will take in response to spills, fires, and explosions or any unplanned release involving hazardous wastes.

To help generators develop their contingency plans, a guidance document with fill-in sections is included in Appendix 6.

Once developed, this plan is required to be submitted to local police, fire departments, and emergency response teams, as well as local hospitals. Hospitals should be informed about the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility. Be sure to keep records of conversations, emails and other interactions with emergency responders and hospitals. Should a response provider be unwilling to make arrangements with you, document this in the facility's operating record.

Response Equipment

Marina operators must have equipment and procedures in place to enable them and their staff to respond appropriately to spills, fires, explosions, or other unplanned releases of hazardous substances. Examples of emergency response equipment are listed below.

- An internal communication or alarm system capable of providing immediate emergency instructions (voice or signal) to facility personnel.
- A readily accessible phone or two-way radio capable of summoning local police and fire departments.
- Spill control equipment.
- Decontamination equipment.

All emergency response equipment must be tested and maintained as necessary to assure its proper operation in time of emergency.

Hazardous Waste Spill Reporting

In the event of an actual or threatened spill or release of hazardous waste or material which presents any risk of injury to health or the environment, or during an emergency event where the facility must implement its contingency plan, the generator must notify the Department of the Environment (401-222-3070) and the National Response Center (800-424-8802) immediately. The generator must also immediately take steps to prevent, contain and/or clean up the spill or release.

After such notification, the generator must note in the facility's operating record the date, time, and details of the incident, and also must submit a written report on the incident to the Regional EPA Administrator within 15 days.

Fire

Implement the following best management practices to minimize the chances of a fire starting and to maximize your ability to extinguish a fire should one occur.

- ● Meet the National Fire Protection Association's standards for marinas: NFPA 303, Fire Protection Standards for Marinas and Boatyards; NFPA 302, Fire Protection Standards for Pleasure and Commercial Motor Craft; NFPA 30A, Automotive and Marine Service Station Code; NFPA 307, Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves; and NFPA 33, Standard for Spray Application Using Flammable and Combustible Materials.
- ◉ Install smoke detectors and sprinklers.
- ◉ Maintain adequate, readily accessible, and clearly marked portable fire extinguishers throughout the marina, especially near fueling stations.
- ◉ Test fire extinguishers annually.
- ◉ Install hydrants to allow for fighting fires throughout your facility.
- ◉ Provide ready access to all piers, floats, and wharves for municipal fire fighting equipment.
- ◉ Invite the local fire marshal to visit your marina annually to train employees. These annual visits will also help the fire department to become familiar with your facility.

Additional Emergency Response Plans

This section describes a process for developing a binder of emergency response guidelines for a variety of situations that marina operators and staff may encounter. In addition to calling 911, further staff response is required in nearly every situation. To ensure that important steps are not overlooked, marina operators should plan ahead and document emergency response procedures in a quick reference guide that is clear, concise, and easy to use during an emergency. The procedures should describe specific actions to be taken under given circumstances. Consider these situations:

Medical emergency	Structural fire
Boat fire	Dock fire
Boating accident	SCUBA injury
Drowning	Poisoning
Auto accident	Missing person
Overdue boater	Downed power lines
Power outage	Holdup/robbery
Hurricane/storm	Injured pet
Injured wildlife	Sewage spill/overflow

Prepare a single-page response plan for each situation. Compile the response plans in a three-ring binder with a vibrant cover, spine and back that is easy to identify among other binders. In addition to the individual response plans, be sure to include a map and a list of important phone numbers.

Marina Map/Site Plan

- In the very front of the notebook, insert a laminated 11 by 17 inch site plan of the facility showing valves, pipes, tanks, structures, roads, hydrants, docks, power and fuel shutoffs, hazardous material storage locations, and telephones.
- Describe the type, amount, and location of materials stored on site, *e.g.*, petroleum and hazardous materials.
- Indicate where response materials are located.
- Characterize the facility's waterfront and vessels.

Emergency Phone Numbers

- U.S. Coast Guard's National Response Center: 800-424-8802
- DEM's Emergency Response Hotline: 401-222-3070
- Local fire department
- Local police department
- Local hospital emergency room
- Poison Control Center
- Owner
- Spill response contractors
- Veterinarian
- Neighboring marinas that have emergency response equipment
- Etc.

For assistance developing emergency response plans, refer to the *Panic Prevention File for Marinas* developed by Florida Sea Grant. It is a generic emergency reference guide that can be customized for any facility by following a four-step process:

1. Generate basic information: Make a list of potential situations (such as the list above) and then confer with emergency responders to gather information about what will enable them to provide quicker and more appropriate responses.
2. Compile a set of procedures: For each situation, prepare a set of response procedures following the format of the model plan. File the procedures in a three-ring view binder under easily understood tabs. Be sure the cover, side and back of the Panic File are bright and distinctive so that the binder stands out on a shelf or desk.
3. Acquaint all employees with contents of the *Panic File*: The procedures in the Panic File will be useful only if people know about them. Introduce new employees to the file as they come onboard and conduct an annual review for all regular employees. Also, be sure that multiple copies of the file are kept at strategic locations throughout the facility (*e.g.*, shop, office) and at key residences for after hours emergencies.
4. Review and evaluate the entire plan at least annually: Review the plan for accuracy and effectiveness. Rewrite sections as necessary and be sure to confirm phone numbers.

Box 2: Panic Prevention File for Marinas

"What if...?" is a basic question every marina owner/operator should ask. Common problems and some not so common problems are addressed in this set of recipes for countering disaster. The guide comes with a 3 1/2-inch disk with Word and WordPerfect versions of all instructions and forms. To order ($15.00), call 800-226-1764 or visit www.ifasbooks.ufl.edu (code number SGEB 45). You may view a copy online at http://nsgl.gso.uri.edu/flsgp/flsgph9_____f.

Whether you use the Panic Preventer File or create your own emergency response notebook, be sure to:

- Keep copies in strategic locations throughout the facility (*e.g.*, shop, office) and at key residences for after hours emergencies.
- Familiarize all staff with the contents of the plan(s).
- Update the plans annually to include any new technology or equipment and to confirm phone numbers.

Staff Training

To ensure a quick and effective response, staff must be made aware of emergency response procedures prior to an incident.

- ● Train employees on the following topics
  - Oil spill response (or SPCC Plan, if applicable), including containment and disposal methods.
  - Hazardous waste spill response.
  - Fire safety and response: who to call, location of hydrants, use of portable extinguisher, etc.
  - Additional emergency response plans.
- ⊙ Review emergency response plans and procedures with staff at the beginning of each boating season.
- ⊙ Run emergency response drills at least twice annually.
- ⊙ Invite the U.S. Coast Guard and local fire department to demonstrate emergency response procedures at your marina.

Additional Documentation Requirements

In addition to the record-keeping requirements noted elsewhere within this chapter and summarized in Box 3, marina operators must keep the following documents related to worker safety and hazardous materials, as applicable.

Material Safety Data Sheets

All marina operators should keep a file of Material Safety Data Sheets (MSDS). MSDSs are written descriptions of a product's chemical constituents, health hazards, and first aid procedures. MSDSs are available from product distributors/manufacturers and are also available at www.hazard.com.

- ● Keep a file of Material Safety Data Sheets (MSDS) for all products used at your facility, including solvents, paints, cleaning products, pool chemicals, and fuel products.
- ● Inform the Local Emergency Planning Committee what materials you store and what is released when they burn.
- ⊙ Store the file in an office away from material storage areas. Keep in mind during an emergency that this file will not tell you what quantity is on site or even whether all the materials listed are present.

Tier II Forms

The Emergency Planning and Community Right-to-Know Act (EPCRA) requires that facilities with 10,000 pounds or more of petroleum (approximately 1,250 gallons) file "Tier II" forms with emergency response agencies by March 1 of each year.

Tier II Emergency and Hazardous Chemical Inventory forms must be submitted in an electronic format developed by the U.S. Environmental Protection Agency. To download the Tier2 Submit software, please go to www.epa.gov/ceppo/tier2.htm and select Tier2 Submit Software.

The completed Tier II form must be sent to:

Department of Labor and Training
DIVISION OF OCCUPATIONAL SAFETY
1511 Pontiac Avenue – Building 70
PO Box 20157
Cranston RI 02920-0942

Copies of the Tier II form must also be sent to:

- ● Local municipal fire department.
- ● Local Emergency Planning Committee (LEPC) District Chairperson. See http://www.dlt.ri.gov/occusafe/lepcchairs.htm for a list.

Box 3: Record-keeping Requirements

Regulations generally require that you keep records for at least three years, but it is good management practice to keep these records indefinitely.

Multi-Sector General Permit (incorporate records into SWPPP)

- Benchmark storm water monitoring
- Routine facility inspections
- Employee training
- Annual Comprehensive Site Compliance Evaluation Report

Above Ground Storage Tanks

- Monthly inspections
- Annual report
- Ten-year report

Underground Storage Tanks

- Permanent records
- Routine records
- Inventory control records

Air Pollution Control Regulation No. 11

- Daily throughput records
- Maintenance records

Hazardous material/waste

- Material purchase or usage records
- Hazardous waste manifests (and any Exception Reports)
- Material safety data sheets (MSDS)
- Staff training
- Test results
- Biennial reports
- Spills
- Inspection/maintenance records
- Employee training
- Incidental spills

SPCC

- Maintenance inspections
- Employee training
- Incidental spills

Vessel Maintenance

What are the environmental concerns?

Boats require a great deal of maintenance over the course of a year. Engines must be tuned and lubricated; hulls must be washed, sanded and painted; and vessels must be prepped to withstand the cold of winter. Each of these tasks—along with a myriad of other vessel maintenance activities—has the potential to release pollutants into the land, water and air.

Contaminants include toxic substances such as solvents, petroleum products, and the biocides contained in antifouling paint (typically copper and tin). All of these substances can be harmful to human and animal health. They also have the potential to degrade land and water, which becomes a financial concern when the marina changes ownership or contaminated dredge spoils must be disposed of.

Some paints and solvents release dangerous fumes—known as volatile organic compounds (VOCs)—which contribute to air pollution and are health hazards. Care must also be taken when using non-toxic compounds. For instance, even mild detergents can reduce the ability of fish to breathe by destroying oils on gills.

BMPs for Mechanical Activities

Limit the Potential for Contamination due to Engine Maintenance

- ◉ Keep a supply of oil absorbent materials available in the shop area.
- ◉ Use drip pans when handling any type of liquid. Use separate drip pans for each fluid to avoid mixing. Recycle the collected fluid.
- ◉ Drain all parts of fluids prior to disposal.
- ◉ Store engines and engine parts under cover on an impervious surface.
- ◉ Clean engine repair areas regularly using dry cleanup methods, *e.g.,* oil absorbent material.

Minimize Spills and Drips Due to Oil Changes

- ◉ Use a no-spill pump system to draw crankcase oils out through the dipstick tube. Use the system in the boat shop and rent to boaters who perform their own oil changes.
- ◉ Slip a plastic bag over used oil filters prior to their removal to capture any drips.
- ◉ Hot drain used filters by punching a hole in the dome end and draining for 24 hour. Recycle the collected oil. Save the metal canister with other waste oil debris for collection by a licensed hauler.

The Best Management Practices described in this section are intended to:

Prevent releases of petroleum products, solvents and other hazardous materials to land, water and air.

Minimize Impacts of Parts Washing

- ◉ Avoid unnecessary parts cleaning.
- ◉ Use dry pre-cleaning methods, such as wire brushing.
- ◉ Use a water-based, non-VOC, bioremediating parts washer that takes advantage of microbes to digest petroleum.
- ◉ If using VOC-based solvents is unavoidable, do so in a parts washer or container with a lid to prevent evaporation of VOCs. Once solvent is totally spent, recycle it.

Minimize Impacts of Antifreeze

- ◉ Use propylene glycol (pink) antifreeze. It is less toxic to the environment than ethylene glycol (blue) antifreeze.
- ◉ Use the minimum amount of antifreeze necessary for the job.
- ◉ In the spring, recover antifreeze used to winterize systems by having somebody collect the antifreeze from the raw water throughput in a pail when starting the engine for the first time.

Contain Refrigerant Gases

- ● Adhere to federal requirements for containing refrigerant gases (see Chapter 2).
- ◉ Encourage vessel owners to have leaking air conditioning systems repaired (rather than just adding new refrigerant).

Handle and Store Batteries Appropriately

- ◉ Never drain batteries or intentionally crack the casings.
- ◉ Avoid long-term storage of lead acid batteries by sending accumulated batteries to a reclaimer within 6 months of receipt. Ship more frequently if necessary to limit accumulation.
- ◉ Store spent lead acid batteries upright in a secure location, protected from the elements.
- ◉ Never stack batteries directly on top of each other. Layer with wood.
- ◉ Place cracked or leaking batteries in a sturdy, acid-resistant, leak proof, sealed container (*e.g.,* a sealable 5-gallon plastic pail). The container should be kept closed within the battery storage area.
- ◉ Keep written records of weekly inspections of spent lead acid batteries.
- ◉ Strap batteries to pallets or wrap batteries and pallet in plastic during transport.

Prevent Contaminants from Reaching Floor Drains

- ● Ensure that your floor drain is properly permitted (see Chapter 2).
- ◉ Routinely place oil absorbent drain covers over floor drains.
- ◉ Block floor drains with an impermeable cover if there is a fuel or chemical spill. Clean up spills immediately.
- ◉ Prohibit the practice of hosing down the shop floor.

BMPs for Hazardous Materials

IMPORTANT: Refer to Chapter 2 for information about hazardous waste regulations.

Store Waste Solvents and Other Hazardous Materials According to Regulatory Requirements

- ● Hazardous wastes should never be handled like regular trash, nor should they be disposed in the regular trash.

Use Fewer Hazardous Chemicals

- ◉ Avoid using products that are corrosive, reactive, toxic or ignitable to the greatest extent possible. The use of these materials is likely to generate hazardous waste.
- ◉ Make one person (or a person in each department) solely responsible for chemical purchases and inventory control.
- ◉ Consider environmental and safety requirements in purchasing decisions.
- ◉ Conduct an annual inventory to reduce the number of chemical products used in the shop. Track chemical use and wastes to identify opportunities to reduce waste and use less toxic alternatives.
- ◉ Remove spoiled and obsolete materials.
- ◉ Use first-in, first-out management practices.
- ◉ Examine your use of materials by process. Are there new technologies that can replace your existing process and reduce toxics or waste? You may also be able to save money or provide a new customer service.
- ◉ Avoid the use of solvents for stripping paints. Use abrasive processes or heat guns to strip off old paint wherever possible.
- ◉ Consider purchasing recycling equipment to allow your shop to reuse materials such as solvents and washwaters.
- ○ Use soy-based solvents and other similar products with no or low volatility.

Box 4: Defining Hazardous Materials

Hazardous materials are defined as being corrosive, reactive, toxic or ignitable.

Read product labels. Labels convey information about the degree of hazard associated with a particular product. For example, DANGER equates to extremely corrosive, reactive, toxic or flammable. WARNING indicates that the material is moderately hazardous and CAUTION signals a less hazardous product. Select products that contain no warnings or which merely CAUTION consumers.

The Best Management Practices described in this section are intended to:

Minimize health risks due to exposure to harmful chemicals.

Establish an efficient process for managing hazardous materials.

Minimize chances of chemical fires.

Handle Solvents and Hazardous Materials with Care

- ● Never discard any solvent into sinks, floor drains or onto the ground.
- ⊙ Give employees simple incentives to keep their work areas clean, minimize chemical use, and use personal protective equipment. Promote good housekeeping.
- ⊙ Store strippers and other solvents where they are used most often.
- ⊙ Use only the minimal amount of solvent (stripper, thinner, etc.) needed for a given job.
- ⊙ For small jobs, pour the needed solvent into a small container in order not to contaminate a large amount of solvent.
- ⊙ Do not mix or add other types of solvents to any degreaser.
- ⊙ Allow solids to settle out of used strippers and thinners so solvents can be reused.
- ⊙ To minimize air pollution, cap solvents and paint thinners whenever not in use.
- ⊙ Clean containers as much as practical. Recycle the used containers or return them to the supplier or a drum reconditioner.

Manage Rags Contaminated with Hazardous Materials

- ● Refer to Chapter 2 for regulatory requirements.
- ⊙ Remove excess solvents from rags by wringing or pressing excess into coverable container for reuse or recycling.
- ⊙ Keep oily rags separate from rags that have been contaminated with hazardous materials such as solvents.
- ⊙ Use cloth rags that can be recycled by an industrial laundry service.
- ⊙ Contract with a permitted industrial laundry service that will pick up soiled rags and deliver clean rags on a regular basis.

BMPs for Liquid Waste

The Best Management Practices described in this section are intended to:

Reduce demand for raw materials by recycling oil, antifreeze, and solvents.

Reduce heating costs.

Recycle Liquid Waste

- ● Hire a licensed waste hauler to recycle or dispose of used solvents.
- ⊙ Ask your hauler to provide an insurance certificate to keep on file.
- ● Maintain shipping manifests for solvents and other hazardous wastes, including used oil, for a minimum of three years. Under the terms of the proposed new Hazardous Waste Management Rule 15.00, manifests will no longer be required for used oil that is being recycled.
- ⊙ Provide separate containers for oil, antifreeze, and solvents.
- ⊙ Check with your recycler to learn what materials may be mixed. Generally, engine oil, transmission fluid, hydraulic fluid, and gear oil may all be placed in a waste oil container. Some haulers will also take diesel and kerosene. Ethylene glycol and propylene glycol antifreeze are often collected in the same used antifreeze tank. As a precaution though, CHECK WITH YOUR RECYCLER BEFORE MIXING ANY MATERIALS.
- ⊙ DO NOT add gasoline, solvents, paints, varnishes or pesticides to oil or antifreeze recycling tanks. The introduction of these materials creates hazardous waste that is very expensive to dispose of.
- ⊙ Consider locking the intake to oil and antifreeze recycling containers to prevent contamination. If the tanks are locked, offer a service to collect all liquid wastes from boats or instruct patrons to get the key from the appropriate staff person or to leave their oil or antifreeze next to the collection tank. If you select the latter option, assign a staff member to inspect the collection site daily for any material that may have been dropped off.
- ⊙ Post signs indicating what may and may not be placed in each tank.
- ⊙ Surround tanks with impervious secondary containment that is capable of holding 110 percent of the volume of each tank.
- ⊙ Try to shelter the tanks from the elements.
- ⊙ Attach funnels to tanks to reduce chances of spills. Funnels should be large enough to drain portable containers and oil filters.

Encourage Boaters to Swap Leftover Materials

- ○ Encourage boaters to exchange excess thinners, varnishes, paints, etc. To facilitate this type of activity, provide a bulletin board where boaters can post notices that they are seeking particular materials or have an excess of a substance.
- ○ Post the names of local schools or theater groups that are willing to accept excess, nontoxic paints.

Heat with Used Oil

- ○ Burn used oil in a space heater or furnace. This method of heating is especially well-suited for shop areas.
- ● Be sure to comply with Air Pollution Control Regulation No. 9 (refer to Chapter 2).

BMPs for Bottom Preparation, Painting and Fiberglass Repair

The Best Management Practices described in this section are intended to:

Prevent the release of maintenance debris to land or water.

Ease clean-up by limiting work to designated areas.

Reduce risk of chemical fires.

Prevent overspray from marring adjacent vessels.

Provide environmentally-responsible options for customers.

Designate Work Areas

- ⊙ Perform maintenance work inside buildings whenever possible
- ⊙ Provide and clearly mark designated work areas for outside boat repairs and maintenance.
- ⊙ Do not permit work outside of designated areas.
- ⊙ Locate the maintenance area as far from shore as possible.
- ⊙ Vessel maintenance areas should have an impervious surface (*e.g.,* asphalt or cement).
- ⊙ Surround the maintenance area with a berm or retaining wall.
- ⊙ Clearly mark the work area with signs.

Collect All Maintenance Debris

- ⊙ Use filter fabric or canvas tarps to collect maintenance debris.
- ⊙ Clean work areas after completing each operation or at the end of the day—whichever comes first. Remove sandings, paint chips, fiberglass, trash, etc.
- ⊙ When sanding or grinding hulls over a paved surface, vacuuming or sweeping loose paint particles is the preferred cleanup method. Do not hose the debris away.

Contain Debris from Blasting

- Prohibit uncontained blasting.
- Perform abrasive blasting in the vessel maintenance area within a structure or under a plastic tarp enclosure.
- If tarp enclosures are used, avoid blasting on windy days when blasting material and residue may be carried away by the wind.
- Investigate alternatives to traditional media blasting, *e.g.*, hydroblasting, mechanical peeling, and closed plastic medium blast (PMB) systems. PMB systems blast with small plastic bits. Once the blasting is complete, the spent material and the paint chips are vacuumed into a machine that separates the plastic from the paint dust. The plastic is cleaned and may be reused. The paint dust is collected for disposal.

Contain Dust from Sanding, Scraping and Grinding

- Do not let dust fall onto the ground or water or become airborne.
- Conduct shoreside sanding in the hull maintenance area or over a drop cloth.
- Require staff, customers and contractors to use vacuum sanders. Rent or loan the equipment.
- Bring vacuum sanders to customers and contractors seen working with conventional sanding equipment. Charge them your usual rental fee, if appropriate.
- Provide a collection drum for the dust from vacuum sanders and other scraping debris.
- Avoid scraping or sanding on windy days unless activity is conducted in an enclosed maintenance structure or with a vacuum sander.
- Restrict or prohibit sanding on the water to the greatest extent practical. When sanding on the water is unavoidable, use a vacuum sander and keep dust out of the water.
- Use a damp cloth to wipe up small amounts of sanding dust.

Minimize Impacts of Fiberglassing Operations

- Styrene, the primary compound of gelcoat and other polyester resins, is an ignitable chemical that is regulated as an ignitable hazardous waste.
- Chlorinated solvents and the rags used to apply them must be managed as hazardous waste.
- Minimize waste by working with small batches of resin.
- Avoid putting liquid hardener in the trash since it can spontaneously combust when mixed with sawdust and other materials.

Minimize the Impacts of Painting Operations: General

- Test any paint waste to determine whether it should be disposed of as hazardous waste (see Chapter 2).
- Select paints with low or no VOC content.
- Clean the surface to be painted with plain water.
- Mix only as much paint as is needed for a given job.
- Mix paints, solvents, and reducers in a designated area. It should be indoors or under a shed and should be far from shore.
- Limit in-water painting to small jobs. Transfer the paint to the vessel in a small (less than one gallon), tightly-covered container.
- Any substantial painting should be done in the vessel maintenance area and in accordance with maintenance BMPs.

Minimize the Impacts of Spray Painting Operations

- Conduct all spray painting on land: in a spray booth or under a tarp.
- Use equipment with a transfer efficiency of at least 65 percent, such as high-volume low-pressure (HVLP) spray guns.
- Order your spray painting jobs to minimize coating changes. Order your work light to dark.
- Spray large areas at once.
- Use an appropriately-sized paint spray gun cup.
- Reuse used solvents for the first rinse of the spray gun.
- Use a spray gun cleaner or a similar device that recirculates the cleaning solvent and collects solids for proper disposal.
- Select a cleaning device that is totally enclosed during cleaning, rinsing and draining operations.
- Change filters in the shop ventilation system regularly.

Select Bottom Paints with the Least Negative Impacts

- Adhere to the restrictions on the use of TBT-based paint (refer to Chapter 2).
- Stay informed about non-toxic coatings, like EPaint, Teflon and silicone.
- Recommend non-toxic coatings or antifouling paints that contain the minimum amount of toxin necessary for local conditions to your customers. Stock these in your ship store.
- Avoid soft ablative paints.
- Use water-based paints and high-solids paints whenever practical.
- Discourage the use of antifouling paint on boats kept in fresh water, except where invasive species like zebra mussels are a problem.
- Recommend that boats that are rack stored or trailered use alternatives to antifouling paint such as polyurethane, bottom wax, or non-metallic epoxies.

BMPs for Hauling and Storing Boats

IMPORTANT: Refer to discussion of RIPDES Permits in Chapter 2.

Minimize Impacts of Pressure Washing

- Pressure wash over a bermed, impermeable surface that allows the waste water to be collected and treated to remove sediments.
- Remove solids from wash water before it is discharged.
  - Filter waste water with devices such as screens, filter fabric, sand filters or hay bales.
  - Direct waste water to a basin where solids can settle out. Relatively clean water is discharged.
  - A wash water recycling system filters and reuses wash water.
- Do not use detergents when pressure washing. Detergents and other chemical cleaning agents should not be discharged to waterways.
- When pressure washing ablative paint, use the least amount of pressure necessary to remove growth but leave the paint intact.

The Best Management Practices described in this section are intended to:

Remove solids from pressure wash water.

Limit the release of nutrients and other harmful compounds found in detergents.

Limit the release of petroleum.

Minimize solid waste.

Reduce demand for raw materials by recycling used shrink wrap.

Minimize Impacts of Cleaning Topsides and Decks

- Wash the boat hull above the waterline by hand.
- Clean with plain water.
- When cleaners are necessary, use phosphate-free and biodegradable detergents and cleaning compounds.
- Discourage the use of detergents containing ammonia, sodium hypochlorite, chlorinated solvents, petroleum distillates, or lye.
- Use only as much stain remover as necessary to remove stains or use a more abrasive rubbing or polishing compound.

Winterize with Care

- Use propylene glycol antifreeze.
- Ensure stern drive units and outboard engines are not leaking.
- Place drip trays under grease-filled stern tubes, stern drives and outboards.
- Encourage boaters to fill fuel tanks to no more than 85 percent of capacity and to use the highest rated octane recommended by the engine manufacturer.
- Add stabilizers to fuel to prevent degradation.
- Ensure that fuel tank suction line valves are closed where appropriate.
- Be sure the gas cap seals tightly.
- Inspect and clean bilges (with oil absorbent pads if appropriate) prior to extended vessel storage.
- Promote reusable canvas covers.
- Plan on using plastic shrink wrap only if there is a viable recycling program for the used shrink wrap.
- When installing shrink wrap, tape over all fuel vents before igniting the heat gun.

BMPs for In-water Maintenance

The Best Management Practices described in this section are intended to:

Minimize the release of cleaning compounds, maintenance debris, and paint residue to waterways.

Conduct In-water Maintenance Wisely

- If the impacts of cleaning or maintenance activities cannot be contained or mitigated against, remove the boat from the water.
- Keep containers of cleaning and maintenance products closed when not in use.
- Plug scuppers.
- Isolate the bilge pump from the automatic switch.
- Insure that absorbent materials are in place around the work area when working on hydraulic equipment or engines.

Discourage Underwater Hull Cleaning

- Establish a policy prohibiting in-water hull cleaning.
- Offer incentives, like reduced mid-season haul out rates, to encourage boaters to have their hulls cleaned on land where residue can be collected for proper disposal.

Minimize Impact of Underwater Hull Cleaning

- If you do allow divers, allow only divers that follow the Best Management Practices outlined below to clean hulls within the confines of your marina. Ask all subcontractors to sign in. Also, ask to see a current business license and proof of liability insurance.
- Keep a referral list of reputable divers to pass along to boaters seeking underwater hull services.
- Remind boaters that underwater hull cleaning is not a replacement for normal, out-of-water maintenance.
- Encourage boaters that typically hire divers to use hard bottom paints.
- After painting a boat's hull, provide the boat owner with a simple description of the paint used and the maintenance requirements. For example, "Your boat was painted on April 27, 2006 with Barnacle B-gone. Barnacle B-gone is an ablative paint. It should not be scrubbed while in the water. The active ingredient is cuprous oxide which is a potent biocide. A copy of the Material Safety Date Sheet is attached for your information. Barnacle B-gone retains its antifouling effectiveness when hauled and can be relaunched without repainting. Depending on frequency of use and other factors, the hull will need to be repainted in approximately 2 years."
- Ask customers who have had their hulls coated with ablative paints to read and sign a notice that states, "I understand that my boat has been painted with an ablative paint. If the hull is scrubbed while in the water, unacceptable concentrations of paint and the pesticide cuprous oxide will be released."

Insist that Divers Minimize Impact of Underwater Hull Cleaning

- On boats painted with ablative paints, clean only running gear and zinc anodes.
- Refrain from hull cleaning for a minimum of 60 days after hard antifouling paint has been applied.
- Always use the least abrasive material that will effectively clean the painted surfaces:
  - Use soft sponges or pieces of carpet to clean marine growth.
  - Use soft nylon or similar material on rotary brush machines.
  - Use more rigorous cleaning pads only as needed to remove hard growth.
  - Use stainless steel pads or brushes only on unpainted metal areas.
- Do not clean the entire hull if it is not dirty. Just do the waterline, running gear, and propeller.
- Never sand, strip or chip hull paint underwater.

Petroleum Control

What are the environmental concerns?

Petroleum in the water is a concern because of its physical properties and because it is toxic. Most people would agree that a major oil spill that smothers sea life in a thick layer of oil is a serious problem. Smaller, chronic spills are equally serious but far less visible. Consider that any fuel floating on water reduces the extent to which sunlight penetrates into the water column and also limits the exchange of oxygen at the water's surface. Aquatic plants and animals are, therefore, deprived of these life-giving elements.

Furthermore, petroleum in the water tends to accumulate in the microlayer—the uppermost portion of the water column. An abundance of fish, crustacean and mollusk eggs and larvae can also be found in the microlayer, along with algae and bacteria. Exposure to the heavy metals and other toxins found in petroleum can diminish the ability of these organisms to successfully reproduce.

Petroleum in the water can also release harmful fumes to the atmosphere, become suspended in the water column or settle to the sea floor. Prolonged exposure to petroleum is potentially harmful to the animals and plants that live in any of these environments.

BMPs for Petroleum Storage

IMPORTANT: Refer to summary of petroleum storage regulations in Chapter 2.

Prevent Spills and Leaks from Above Ground Tanks

- ● Above ground tanks containing over 500 gallons of petroleum must have overfill protection and a secondary containment system.
- ● Conduct and maintain records of monthly and ten-year inspections. Submit annual reports to DEM's Division of Groundwater and Freshwater Wetlands.
- ◉ If possible, cover the tank with a roof to prevent rainwater from filling the containment area.

Prevent Spills and Leaks from Underground Storage Tanks (USTs)

- ● All USTs must have corrosion protection, overfill prevention and leak detection equipment.
- ● Maintain permanent, routine, and product inventory records. For daily product inventory, use a stick or electronic method to measure the liquid level in the tank and reconcile the results with pump meter readings and receipt of product.

The Best Management Practices described in this section are intended to:

Prevent spills and leaks from fuel storage areas.

Minimize liability associated with fuel spills.

The Best Management Practices described in this section are intended to:

Prevent spills at the fuel dock

Minimize safety risks at the fuel dock.

- ● Install a readily accessible shut-off valve on shore to halt, when necessary, the flow of fuel through a pipeline from the UST to a wharf, pier or dock.
- ● Meet federal financial responsibility requirements (*i.e.,* insurance) for environmental pollution liability.

BMPs for Fueling

Maintain Fuel Transfer Equipment

- ● Inspect transfer equipment regularly and fix all leaks immediately.
- ⊙ Maintain transfer equipment in good working order: replace hoses, pipes and tanks before they leak.

Install/Maintain Environmental Controls at the Pumps

- ● Remove holding clips that hold fuel nozzles open.
- ⊙ Install automatic back pressure shut-off nozzles on fuel pump discharge hoses.
- ⊙ Maintain a supply of oil absorbent pads and pillows at the fuel dock.
- ⊙ Hang nozzles vertically when not in use so that fuel remaining in hoses does not drain out.
- ⊙ Place plastic or nonferrous drip trays lined with oil absorbent material beneath fuel connections at the dock. These trays are also useful places to lay fuel nozzles if it is not practical to hang them vertically when not in use.
- ⊙ Place oil absorbent material at the waterline of fuel docks to quickly capture small spills. Look for oil absorbent booms that are sturdy enough to stand up to regular contact with the dock and boats.
- ⊙ Offer your services to install fuel/air separators along vent lines from onboard fuel tanks.
- ○ Ask your fuel company representative to set the delivery rate on your fuel pump at no more than 10 gallons per minute.
- ○ Consider installing vapor control nozzles to capture fumes or nozzles that redirect blow-back into vessels' fuel tanks.

Supervise Fueling to Minimize Risks to Safety and the Environment

- ⊙ Always have a trained employee at the fuel dock to oversee or assist with fueling.
- ⊙ Instruct boaters to: stop all engines and auxiliaries; shut off all electricity, open flames and heat sources; extinguish all cigarettes, cigars and pipes; close all doors, hatches and ports; maintain nozzle contact with fill pipe to prevent static spark; inspect bilge after fueling for leakage and fuel odors; and ventilate all compartments after fueling until fumes are gone.
- ⊙ Require all passengers to get off gasoline powered vessels before fueling.
- ⊙ Require boaters to stay with their craft during fueling.
- ⊙ Train employees to always request that boaters use:
  - an oil absorbent pad to capture backsplash and vent line overflow (see disposal instructions below),
  - an absorbent "donut" around the filler on deck, and/or
  - a container to collect overflow from vent fittings. Commercially-available jugs attach to the hull with suction cups. A rubber seal on the container fits over the fuel vent allowing the overflow to enter the container. Fuel captured in this manner can be added to the next boat or saved for marina equipment such as lifts and lawn mowers.
- ⊙ Instruct fuel dock personnel and boaters to listen to filler pipes to anticipate when tanks are nearly full.
- ⊙ Instruct boaters to slow down at the beginning and end of fueling to prevent overfill and backsplash.
- ⊙ Train dock staff to carefully observe fueling practices to make sure fuel is not accidentally put into the holding or water tank.
- ⊙ Politely advise customers against "topping off." Explain that fuel expands as it warms up and that the tank may overflow if filled to the brim.
- ⊙ Encourage boaters to fill their fuel tanks just before leaving on a trip to reduce spillage due to thermal expansion and rocking, *i.e.,* if some of the fuel is used before it warms up, it is less likely to spill overboard.
- ⊙ If boaters prefer to refuel upon their return to port, encourage them to fill their tanks to no more than 90 percent of capacity.

Fill Portable Fuel Tanks with Care

- ● Do not fill anything other than approved portable fuel tanks.
- ● Do not fill a portable tank while it is onboard a boat or in the back of a vehicle.
- ⊙ Place small gas cans in plastic or nonferrous drip trays lined with oil absorbent material before filling them.
- ⊙ Do not fill portable fuel tanks beyond their stated capacity. Remember that fuel expands in the heat of summer.
- ⊙ Ensure that the filler cap is properly secured before the tank is replaced on board.
- ⊙ Use a funnel to prevent spillage, if appropriate.

Provide a Stable Platform for Personal Watercrafts (PWCs)

- ○ Provide a stable platform for fueling PWCs: purchase a prefabricated drive-on dock or modify an existing dock by cutting a v-shaped berth.
- ○ Consider placing the PWC fueling area at the end of the fuel pier to reduce conflict with larger boats.

BMPs for Spill Response

IMPORTANT: Refer to Chapter 2 for information about emergency planning and training requirements.

Maintain Oil Spill Response Equipment

- ⊙ Store enough boom or sweep to encircle the largest vessel in your facility: vessel length x 3 = required length of boom/sweep.
- ⊙ Store response material where there is the greatest threat of a spill: fuel receiving and dispensing areas.
- ⊙ Store materials in a covered container that is accessible to all staff—especially those who handle fueling operations.
- ⊙ Mark the storage site with a sign reading, "Oil Spill Response Kit."

The Best Management Practices described in this section are intended to:

Maximize fuel spill response capabilities.

Ensure proper disposal of used oil absorbents and other spill response materials.

- Consider leaving the storage container unlocked so that it is available to patrons, as well as staff. If left unlocked, check the inventory regularly.

Instruct Staff and Patrons about Spill Response Procedures

- Conduct annual oil spill response drills with staff.
- Post oil spill response instructions at the fuel dock:
  - Immediately stop the flow of fuel.
  - Remove spilled fuel from the dock and water with oil absorbent material. Indicate the location of the Oil Spill Response Kit if it is not obvious.
  - Notify DEM's Emergency Response Hotline (401-222-3070) and the National Response Center (800-424-8802). Also, include phone numbers for the local fire department, Coast Guard, CRMC, and spill response contractors.
- Post sign instructing staff and boaters NOT to use soaps or detergents to dissipate petroleum spills on the water: it is illegal. Soaps, emulsifiers and dispersants cause the petroleum to sink through the water column and mix with sediments where they will remain for years. Also, the soaps themselves are pollutants.

Properly Dispose of Used Oil Spill Response Equipment

- For large quantities of used oil spill response equipment—such as what would be created as the result of a sizable spill—contract with a licensed spill response company. Refer to Oil Pollution Control Regulations in Chapter 2.
- Smaller quantities—such as what would typically be generated at the fuel dock or engine shop—must also be handled as hazardous waste:
  - Standard absorbents that are saturated with gasoline must be treated as flammable hazardous debris. That is, once a pad has gasoline on it, it must be contained in a labeled, fire-safe cabinet. Pads may be collected in a satellite unit at the fuel dock—such as an "oily waste can" designed to protect against spontaneous combustion (available from industrial supply companies)—and transferred <u>every</u> evening to the flammable waste storage area.
  - Standard absorbents saturated with oil or diesel may be wrung out over oil recycling bins (if they are saturated with oil or diesel only!) and reused. Once they are no longer usable, store them with other waste oil debris (*e.g.,* oil filters) until they are collected by a licensed hauler.

Oil Absorbent Material

Oil absorbent pads, booms, and pillows absorb hydrocarbons and repel water. Depending upon the type, they may hold up to 25 times their weight in oil. These products are useful for capturing spurts at the fuel dock, cleansing bilge water, and wiping up spills in engine maintenance areas.

Sewage

What are the environmental concerns?

Illness and excessive nutrient loads are the primary concerns associated with sewage discharges from recreational boats. When boaters discharge raw sewage overboard, they are potentially exposing people to the bacteria and viruses contained in the effluent. People who swim in contaminated water, or eat shellfish that have been exposed to sewage, may develop illnesses such as typhoid fever, hepatitis, cholera and gastroenteritis. The high nutrient content of sewage is also a problem because it supports excessive algal blooms. As the algae multiply, they deplete the water of oxygen and prevent life-giving sunlight from reaching subsurface vegetation. Later, as the algae are decomposed by bacteria, the bacteria may further reduce levels of dissolved oxygen, potentially leading to fish kills.

Because of the serious nature of these impacts, the federal Clean Water Act prohibits the discharge of raw sewage within three miles of the United States' shore (*i.e.,* the Territorial Sea), in the Great Lakes, and in navigable rivers. In Rhode Island, the discharge of sewage treated by onboard marine sanitation devices (MSD) is also prohibited. While Type I and Type II MSDs do kill microorganisms, they are not able to reduce the nutrient content of sewage. Furthermore, the chemicals used as disinfectants in these systems are toxic to aquatic life.

All of Rhode Island's coastal waters have been designated as a No Discharge Area. The discharge of sewage—treated or untreated—is prohibited.

BMPs for Pumpout Systems

Install a Pumpout System

- Contact DEM for information about grant funding to construct, replace, retrofit, and maintain marine pumpout boats and shoreside pumpout facilities: 401-222-3961 x7258, joseph.migliore@dem.ri.gov or visit *http://www.dem.ri.gov/programs/benviron/water/shellfsh/pump/index.htm*.
- Select a system that meets boaters' needs and can move the expected volume of sewage over the required distance.
- Select a location that accommodates the types of boats that typically frequent the marina. Fuel docks are often a good location.
- Connect the pumpout system to a public sewer line or to an upland holding tank. Upland holding tanks, if above ground, should be secured and have a secondary containment area, including a concrete pad. Inspect area regularly.

The Best Management Practices described in this section are intended to:

Ensure that pumpout service is readily available to boaters.

Increase use of pumpout services.

Maintain Pumpout System

- Check the pipes from the dock pumpout station regularly for damage and leaks.
- Maintain the pumpout system according to the manufacturer's maintenance and winterization recommendations.
- Contents of upland holding tanks will need to be pumped periodically and trucked to a wastewater treatment plant by a licensed sewage hauler. Schedule the hauler's service before the tank is full.

Determine Operating Procedures

- Decide whether the pumpout facility will be staffed. If staffed, consider installing a buzzer or paging system so that boaters can locate the attendant easily. If unstaffed, be sure that clear instructions are posted.
- Train staff to assist boaters in such a way that the experience is as pleasant and convenient as possible.
- Decide whether a fee will be charge. If a fee is charged, how much will it be? If the pumpout was purchased with Clean Vessel Act grant funding through DEM, the fee may be no more than $5 per pumpout. Will tenants and liveaboards be charged or just transients? How will the fee be collected if the pumpout is not regularly staffed?
- Post signs with information about the use and cost of the pumpout station, hours of operation, and where to call for service if the system is out of order.

Conduct Pumpouts

- Take precautions to avoid coming into direct contact with sewage. Operators are advised to wear waterproof gloves. Workers should wear rubber gloves and respirators when maintaining or repairing pumpout systems.
- Ensure that boat is securely moored to the dock.
- Ensure that the upland holding tank is not already full.
- Open the deck connection slowly to allow any pressure to release.
- Ensure that all portable suction hoses between the boat and the pumpout suction are joined securely.
- Ensure that a sponge and bucket of water is at hand to clean up small spills.
- Do not leave boat and/or pumpout control unattended
- Use care when disconnecting the suction hose from the boat.
- Do not allow the suction hose to dangle in the water body.
- Do not clean the suction hose in the water body.
- Clean the suction hose by placing it into a bucket of clean water and sucking the contents into the upland storage tank (or sewer system).
- Hold the hose with its opening up to avoid spillage.
- Return the suction hose to its proper storage position.
- Replace the cap on the deck suction fitting and tighten securely. Place adapters into a bucket of water containing a mild disinfectant.
- Wash hands.

Publicize Availability of Pumpout System

- Formally advise your municipality that you have a pumpout facility available and provide pertinent information such as hours of operation and fee.
- Mention pumpout facilities in print and other advertising.

BMPs for Shoreside Facilities

Provide Shoreside Restrooms

- Provide clean, functional restrooms 24 hours a day.
- Install a security system on restroom doors so people will feel safe using them, particularly late at night.
- Keep washrooms clean and tidy to encourage their use by customers.
- Use only environmentally-acceptable cleaners (be especially careful to avoid using harsh cleaners if the marina is on a septic system).
- Provide air conditioning and heating.

Maintain Septic Systems to Protect Water Quality and Public Health

- Post signs in restrooms informing patrons not to place paper towels, tissues, cigarette butts, disposable diapers, sanitary napkins or tampons in toilets.
- Post signs in laundry room encouraging patrons to use minimal amounts of detergents and bleaches.
- Do not pour solvents, such as paint thinners or pesticides, down drains and post signs prohibiting customers from doing the same.
- Do not pour fats and oils down drains.
- Do not use a garbage disposal. Disposals increase the amount of solids entering the system, thus more frequent pumping is necessary.
- Use small amounts of drain cleaners, household cleaners, and other similar products.
- Do not use "starter enzyme" or yeast. These products can damage the system by causing the infiltration bed to become clogged with solids that have been flushed from the septic tank.
- Direct downspouts and runoff away from the septic field in order to avoid saturating the area.
- Do not compact the soil by driving or parking over the infiltration area.
- Hire a licensed professional to pump the tank every 2-5 years.

Provide Facilities for Liveaboards

- Provide a portable pumpout system or require that liveaboards contract with a mobile pumpout service.
- Reserve slips closest to shoreside restrooms for liveaboards. Be sure that the dock and route to the bath house are well lit at night.
- As a condition of the lease agreement, require that liveaboards place dye tablets in holding tanks to make any discharge clearly visible.
- ○ Install direct sewer hookups for liveaboards.

The Best Management Practices described in this section are intended to:

Reduce the amount of vessel sewage that must be disposed of.

Ensure that septic systems function properly.

Storm Water Management

What are the environmental concerns?

Storm water runoff is rain and melted snow that has not been absorbed by the ground. As storm water washes over the surface of the ground, it collects soil particles, petroleum products, industrial residues, fertilizers, pesticides, litter, animal wastes, and other harmful substances. All of these pollutants are carried with it into surface waters where they adversely impact water quality. As an area is developed—that is, as natural vegetation is replaced with hard surfaces like buildings, parking lots and roads—the volume and velocity of storm water tends to increase. This greater, faster flow of storm water can accelerate erosion which leads to flooding, destruction of plant and animal life, and loss of habitat. The overall impact of unmitigated storm water runoff is that coastal waters become less desirable for human recreation and are less able to support wildlife.

BMPs for Site Design and Maintenance

Practice Low Impact Development

- ◉ Develop a site without altering the existing hydrologic cycle. This approach takes advantage of a site's natural features—including vegetation—to minimize the need to build expensive storm water control devices. For example, direct runoff from a parking lot to a bioretention area or "rain garden." For additional information, visit http://www.npsnj.org/rain_garden_home.htm and http://www.npsnj.org/references/landscaping_for_marinas.pdf.

Minimize the Amount of Impervious Area

- ◉ Pave only those areas that are absolutely necessary, *e.g.,* just designated work areas and roadways for heavy equipment.
- ◉ Minimize the length of new roadway required to serve new or expanding marinas.
- ◉ Consider alternatives to asphalt for parking lots and vessel storage areas, *e.g.,* gravel, seashells or engineered porous pavement.

Cultivate Vegetated Areas

- ◉ Install and maintain adequate buffer areas between the shoreline and upland facilities.
- ◉ Plant environmentally-sensitive landscapes at the edge of parking lots and within islands in parking lots (refer to "Landscaping" in Chapter 7).
- ○ Construct wetlands to remove pollutants, shelter the coast from storms, and provide habitat for aquatic species and birds.

The Best Management Practices described in this section are intended to:

Increase infiltration of storm water.

Increase uptake of storm water by vegetation.

Direct Runoff to Vegetated Areas

- Position downspouts so that they drain to vegetated areas—avoid draining to concrete or asphalt.

Use Structural Controls as Necessary

- Depending upon site characteristics, use an engineered system to control storm water runoff, *e.g.,* pond system, wetland system, infiltration system, or filter system.

Maintain Storm Water Management Structures

- Remove paint chips, dust, sediment, and other debris from storm water management structures.
- Clean oil/water separators.

Control Sediment from Construction Sites

- Use devices such as hay bales, silt fences, storm drain filters, sediment traps, and earth dikes to prevent sediment from leaving construction areas.

Stencil Storm Drains

- Using non-toxic paint, stencil storm drains with the words "Don't Dump: Drains to Bay" (or sound or river, as appropriate). Save the Bay will loan stencils for free: 401-272-3540.

Facilities Management

What are the environmental concerns?

This chapter addresses a broad array of topics that can generally be classified as "facilities management." Sub-sections include solid waste, organic waste, facility cleaning and maintenance, landscaping, conservation, business practices, public relations, retail operations, and visitor facilities. Many of the environmental concerns associated with facilities management are similar to those expressed in other parts of this guidebook, *e.g.,* debris, nutrients, and toxics. Other, new concerns are introduced in this chapter, most especially related to the link between greenhouse gas emissions and global climate change.

The combustion of fossil fuels—in electrical power plants, automobiles, marine engines, lawn mowers, etc.—produces carbon dioxide (CO_2) gas. CO_2 is one of the "greenhouse gases" responsible for trapping heat from the sun within the Earth's atmosphere and making life, as we know it, possible. Too much CO_2, however, is causing significant global warming according to the Intergovernmental Panel on Climate Change (IPCC). CO_2 levels in 2005 are higher than any previous levels that can be reliably measured *(i.e.,* in the last 420,000 years). Increasing temperatures are likely to increase the frequency and severity of heat waves, heavy rainfall and other dramatic weather events. Furthermore, increasing temperatures could lead to large-scale effects such as melting polar ice sheets which, in turn, would have major impacts on low-lying regions throughout the world. In response to the very real threats posed by global climate change, the Science Academies of eleven nations, including the United States, issued a joint statement in July 2005 declaring that "there is now strong evidence that significant global warming is occurring." The statement continues, "It is likely that most of the warming in recent decades can be attributed to human activities. This warming has already led to changes in the Earth's climate" (refer to Appendix 7 for full text).

BMPs for Solid Waste

Reduce Solid Waste

- Avoid having leftover materials by sizing up a job, evaluating what your actual needs are, and using just enough product for the job.
- Minimize office waste: make double-sided copies, use scrap paper for notes and messages, and reuse polystyrene peanuts or give them to companies that will reuse them.
- Discourage the use of plastic and Styrofoam cups, food containers, utensils, and other non-biodegradable products.

The Best Management Practices described in this section are intended to:

Reduce the volume of material being sent to landfills.

Reduce disposal costs.

Decrease demand for raw materials.

Improve the appearance of a facility.

Provide Trash Receptacles

- ⊙ Provide adequate and reasonably attractive trash receptacles.
- ⊙ Select containers that are large enough to hold the expected volume of trash. On average, 4 to 6 gallons of reception capacity is needed per person per vessel per day.
- ⊙ Provide lids or some other means to trap the waste inside and to prevent animals and rainwater from getting in.
- ⊙ Locate trash receptacles in convenient locations, such as high traffic areas at the landside foot of the dock, near bathrooms and showers, alongside vending machines, adjacent to the marina office, or on the path to the parking lot.
- ⊙ Do not place trash containers on docks as waste may inadvertently be tossed or blown into the water.
- ⊙ Post signs directing people to trash receptacles if they are not in plain view.
- ⊙ Provide lights around trash receptacles so they are easy to find and safe.
- ⊙ Don't allow containers to overflow. Keep collection areas neat and tidy.
- ⊙ Ensure that containers are emptied into dumpster regularly.

Manage Dumpsters

- ⊙ Post signs indicating what may NOT be placed in the dumpster: gasoline, engine oil, antifreeze, paints, solvents, varnishes, pesticides, lead batteries, transmission fluid, distress flares, shrink wrap and polystyrene peanuts (loose peanuts tend to fly away).
- ⊙ Ensure that dumpster drains are kept closed.
- ⊙ Plant or construct a windscreen around dumpsters to make the area more attractive and to prevent trash from blowing away.
- ⊙ Arrange for a waste hauler to empty dumpsters before they are completely full.

Recycle Solid Waste

- ⊙ Provide containers to collect, at a minimum, plastic, glass, aluminum, newspaper, cardboard and paperboard.
- ⊙ Contact a waste hauler to learn what other materials are recycled in your area, such as metal fuel filter canisters, shrink wrap, steel, tin, lead batteries, corrugated cardboard, mixed paper, scrap metal, tires and appliances.
- ⊙ Recycle zinc anodes with other scrap metals through a scrap metal dealer.
- ⊙ Make the recycling bins look different from the standard trash cans, *e.g.,* use a different color or material.
- ⊙ Place the collection bins for solid recyclables in convenient locations. High traffic areas near trash receptacles are best.
- ⊙ Clearly mark each receptacle so people know what may and may not be put in.
- ○ Post information about local recycling services if you are not able to provide all of the desired services at your facility.

Involve all Employees in Litter Control

- ⊙ Require all employees to be involved in policing the facility for trash and vessel maintenance wastes.
- ⊙ Use a pool skimmer or crab net to collect floating debris that collects along bulkheads or elsewhere within your marina.

Dispose of Abandoned Vessels Before They Become a Problem

- ● Work with DEM's office of Licensing and Registration to gain title to abandoned vessels: 401-222-6647.
- ⊙ Before disposing of abandoned vessels at a permitted solid waste landfill:
  - Remove and recycle the following fluids and parts: fuel, oil, antifreeze, boat engine, any other metal with reuse value (*e.g.,* lead, zinc, aluminum), and refrigerants.
  - Remove all mercury containing devices, *e.g.,* some electronic equipment and bilge pump switches, and handle as hazardous waste.
  - Cut hull into pieces as directed by the solid waste facility.

BMPs for Organic Waste

Provide Options for Disposing of Fish Scraps

- ⊙ Establish fish-cleaning areas where scraps can be collected and properly disposed of. The fish cleaning area could be as simple as a cutting table and a covered trash can or as elaborate as a stainless steel table and sink equipped with a garbage disposal that is connected to a sanitary sewer.
- ⊙ Don't allow "fishy" water to drain back into the water body. Direct rinse-water to a sand filter or sanitary sewer. It should be free of solids.
- ⊙ Prohibit fish cleaning outside of designated areas.
- ⊙ Properly dispose of fish scraps:
  - Compost them.
  - Instruct boaters to place fish scraps in plastic bags and to discard in a dumpster or at home.
  - Bring scraps off shore for disposal over deep water or instruct boaters to do the same (remind boaters to be mindful of regulations concerning possession of fillets). There is less of a chance that the nutrients in fish scraps will lead to stagnation offshore where there is more mixing of waters then in confined, inshore areas.

Box 5: Composting Guides

For information about composting fish waste, refer to:

- *Composting Fish Waste: An Alternative for Minnesota Resorts,* Minnesota Extension Service, Univ. of Minn., 1991 (612-625-1253 or www.seagrant.umn.edu/pubs/mailorder.html).
- *The Compost Solution to Dockside Fish Wastes,* University of Wisconsin Sea Grant Institute, 1989. (608-263-3259 or www.seagrant.wisc.edu).
- *Composting and Using By-Products from Blue Crab and Calico Scallop Processing Plants in Florida,* Florida Sea Grant College Program, University of Florida, March 1992, publication no. SGR-107 (800-226-1764 or www.flseagrant.org).

The Best Management Practices described in this section are intended to:

Minimize the release of nutrients to local waterways.

Minimize the release of pathogens to local waterways.

Limit the potential for foul odors within the marina.

Limit conflicts related to pets.

The Best Management Practices described in this section are intended to:

Minimize the release of toxics.

Minimize the release of nutrients.

Minimize the release of volatile organic compounds.

Minimize the release of petroleum.

Manage Pet Waste

- ● Require customers to clean up after their dogs. Provide poop-a-scoop type bags for pet wastes.
- ● Establish a "pet walk" away from the shore and recreational and work areas.
- ● Identify the pet walk area with signs.
- ● Specify pet waste rules in marina slip contract.
- ● Encourage cat owners to maintain litter boxes on their boats.
- ○ To further minimize disease threats and potential customer conflicts, require that all pets be leashed and/or under control, wear identification, have a current license, and be vaccinated for rabies.

BMPs for Facility Cleaning and Maintenance

Select Environmentally-Responsible Cleaning Products and Techniques

- ● Consider non-toxic alternatives to conventional cleaning products (refer to Box 6).
- ● Try cleaning with water and a course cloth first. If a cleaner is necessary, use sparingly.
- ● Avoid/minimize use of cleaning products containing alcohol; ammonia; bleach; volatile organic compounds; ozone depleting chemicals; carcinogens; and ammoniated, petroleum or chlorinated solvent-based cleaning agents, such as butyl cellosolve, cresol, dye, ethanol, formaldehyde, glycols, hydrochloric acid, hydrofluoric acid, lye, napthalene, PDCBs (paradichlorobenzenes), perchloroethylene, petroleum distillates, phenol, phosphoric acid, propellants, sulfuric acid, and TCE (trichloroethylene).

Minimize Spills and Leaks from Machinery

- ● Avoid leaving the travel hoist parked over the haul-out dock when not in use to minimize the chance of hydraulic oil and grease dripping into the water.
- ● Ensure that all company vehicles are serviced regularly and all leaks repaired immediately: trucks, tractors, travel hoists and trailers.
- ● Place fixed pieces of machinery that use oil and gas on an impervious surface (*e.g.,* concrete) and surround with containment berms. The containment volume should be equal to 1.1 times the capacity of the fuel tank.
- ● Design containment areas with spigots to drain collected material.
- ● Dispose of all collected material appropriately.
- ● Place leak-proof drip pans beneath machinery. Empty the pans regularly, being conscientious to dispose of material properly (uncontaminated oil and antifreeze may be recycled).
- ● Place oil absorbent pads under machinery.
- ● Use non-water-soluble grease on lifts, cranes, winches and other equipment used over the water.
- ● Use vegetable-based greases where possible.

Box 6: Alternatives to Toxic Products

While baking soda, vinegar, lemon juice and vegetable oils are far less harmful than bleaches, scouring powders or detergents, they are still toxic to marine life. Use cleaning products sparingly and minimize the amount discharged into the water. Never dispose of any cleaning products down the thru-hull drain; dispose of them on shore.

Product	Alternative
Detergent & Soap	"Elbow grease"
Bleach	Borax
Scouring Powders	Baking soda. Or rub area with one-half lemon dipped in borax, then rinse
General Cleaner	Baking soda and vinegar. Or lemon juice combined with borax paste
Floor Cleaner	One cup vinegar in 2 gallons of water
Window Cleaner	One cup vinegar + 1 qt. warm water. Rinse and squeegee
Aluminum Cleaner	2 Tbsp. cream of tartar + 1 qt. of hot water
Brass Cleaner	Worcestershire sauce. Or paste made of equal amounts of salt, vinegar and water
Copper Cleaner	Lemon juice and water. Or paste of lemon juice, salt, and flour
Chrome Cleaner/Polish	Apple cider vinegar to clean; baby oil to polish
Stainless Steel Cleaner	Baking soda or mineral oil for polishing, vinegar to remove spots
Fiberglass Stain Remover	Baking soda paste
Mildew Remover	Paste with equal amounts of lemon juice and salt, or white vinegar and salt
Drain Opener	Dissemble or use plumber's snake. Or flush with boiling water + one-quarter cup baking soda + one-quarter cup vinegar
Wood Polish	Olive or almond oil (interior walls only)
Hand Cleaner	Baby oil or margarine
Head & Shower	Baking soda; brush thoroughly
Rug/Upholstery Cleaner	Dry corn starch sprinkled on; vacuum

Adapted from Buller, Pat. 1995. *Clean Marina+Clean Boating+Clean Water Partnership*. Seattle, WA: Puget Soundkeeper Alliance.

The Best Management Practices described in this section are intended to:

Minimize releases of nutrients.

Minimize releases of toxics.

Minimize time and effort needed for lawn and garden care.

Conserve water.

Enhance wildlife habitat.

Provide vegetation to capture and filter storm water runoff.

Create an attractive facility.

BMPs for Landscaping

Select Plants with Minimal Care Requirements

- ● Select plants that are suited to the existing conditions (*e.g.*., soil, moisture, sunlight) so that they will require little care in terms of water, fertilizer and pesticides. Refer to Appendix 7 for an extensive list of native plants. Also, visit http://www.riwps.org/PlantLibrary/native/nurseries.htm for a list of nurseries that carry native plants.
- ● Select perennial plants instead of annuals.
- ○ Choose plants that bear flowers, fruit, nuts and seeds to attract wildlife. Plant them in areas where they will not create conflicts (*e.g.,* pet /wildlife interactions, bird droppings on boats).

Practice Water-wise Landscaping

- ● Water in the early evening as temperatures are generally cooler and less water is lost to evaporation.
- ● Water deeply and infrequently rather than lightly and often.
- ● Select equipment that delivers water prudently. For instance, soaker hoses or drip irrigation systems deliver water directly to the roots of plants with minimal loss to evaporation.
- ● Place mulch to a depth of 3-4" around plants. Do not over mulch.
- ● Group plants with similar water needs together.
- ● Collect rainwater by directing downspouts into covered containers. Use the collected water on landscaped areas.

Adopt Integrated Pest Management Practices

- ● Avoid toxic lawn and garden chemicals. Instead,
  - Select native plants that are disease and insect resistant.
  - Pull weeds by hand to reduce reliance on herbicides.
  - Φoster natural predators such as spiders, praying mantis, dragonflies, and frogs.
  - Use natural agents such as milky spore disease for grubs and Japanese beetles and *Bacillus thuringiensis* (BT) for mosquitoes.
  - Consult a professional regarding disease issues before treatment to make sure you are targeting the correct problem (URI Cooperative Extension: 800-448-1011, 401-874-2929 or www.uri.edu/ce).

BMPs for Conservation

Conserve Energy

- ● Provide a metered electrical supply to individual docks to encourage energy savings.
- ● Turn off unnecessary lights and operate area lighting on automatic timers.
- ● Install energy saving (*i.e.,* Energy Star) lamps and fittings when replacing broken light bulbs and old fluorescent tubes.
- ● Upgrade lighting systems to include timers and motion sensors.
- ● Set building temperatures at reasonable levels to minimize operation of heating and air conditioning units. Maximize efficiency by closing doors and windows.
- ● Turn off heating/air conditioning when not required and use natural ventilation.
- ● Operate computers efficiently:
  - Turn off computers at night and at other times when they will not be used for several hours.
  - Enable the Power Management feature for your monitor.
  - Turn off your monitors when not using your computer for 15 minutes or longer
  - If you buy a new computer, consider a laptop: laptops use a quarter of the energy of desk top models.
  - If you buy a new monitor, consider a flat screen: flat screens use one-third the energy of monitors with cathode ray tubes.
- ● Check energy consumption ratings when purchasing new equipment such as refrigerators and dryers.
- ● Provide an alternative to electric hand dryers.

Conserve Fuel and Limit Emissions

- ● Request that customers turn off their vehicle engines and not leave them idling for more than a couple minutes without good reason.
- ● Avoid unnecessary use of company vehicles. Optimize vehicle use by combining several errands for each trip.

Box 7: Reduce Emissions and Save Money

The United States has only 5% of the world's population yet contributes 25 percent of all greenhouse gases. The greatest source of greenhouse gas emission in the U.S. is electricity production (33 percent in 2000). The second greatest source, at 27 percent, is transportation.

The simple, energy-saving actions listed below will save you money and help to minimize the effects of climate change.

- Replacing five frequently used lights with energy efficient bulbs can save you up to $60 a year
- Weather-stripping drafty doors and windows you can reduce your heating bill by 10 percent.
- For every degree you lower your thermostat you save about 2 percent off your heating bill.
- Compact fluorescent light bulbs can save you $40 to $50 over their lifetime.
- Turning off a second refrigerator can save you up to $15 a month.
- An easy way to manage energy costs and save money is to turn your water heater down to 120 degrees.

Did you know?

One computer left on 24 hours a day will cost you $64 - $115 in electricity costs a year and pump 850-1,500 pounds of CO_2 into the atmosphere. A tree absorbs 3-15 lbs of CO_2 each year. That means that 60-300 trees would be needed to offset the yearly emissions of one computer left on all the time!

Sources: http://www.nstaronline.com/customer_service/energy_efficiency/factoids.asp and http://www.tufts.edu/tie/tci/Computers.html, both viewed 10/27/05.

The Best Management Practices described in this section are intended to:

Save on energy costs.

Reduce emissions of greenhouse gases.

Reduce water bill.

Save on office supplies.

Provide wildlife habitat.

Minimize use of herbicides.

Conserve Water

- Equip all freshwater hoses with automatic-shutoff nozzles.
- Turn off dripping taps.
- Fix leaks and drips.
- Install low-flow shower heads and toilets (or place a brick in conventional toilet tanks).
- Install shower timers.
- Install customer operated flushing valves on urinals
- Install basin faucets with automatic shut-off devices.

Conserve Paper

- Install paper towel dispensers in washrooms that discourage multiple pulls and use 100% recycled paper.
- Reuse manila file folders, bankers boxes, etc.
- Use spell checker and proof read documents before printing them.
- Treat email like phone conversations and only print those messages that you definitely need to keep on file.
- Avoid making unnecessary hard copies.
- Purchase office paper with recycled content.
- Provide a bin for recyclable fine papers, newspapers and cardboard at each desk (or at least in each office).

Conserve Wildlife

- ○ Place "wild" land adjacent to the marina in a conservation trust. Contact a local land trust or DEM's Land Acquisition Program at 401-222- 6825 or visit http://www.dem.ri.gov/programs/bpoladm/plandev/landacq/index.htm for further information.
- ○ Participate in wildlife restoration programs. For instance, raise seed oysters on floats within the marina. The mature oysters can then be transferred to sanctuary areas to bolster natural populations.

BMPs for Business Operations

Announce Adoption of a Clean Marina Policy

- Let customers know that the marina has adopted a Clean Marine Policy and explain any changes that this will mean in the day-to-day operations of the marina. Get the word out through a newsletter, notice, or in the course of conversations with customers.
- Emphasize the need for customer involvement and encourage their participation, e.g., suggestion box.

Lead by Example

- Be absolutely diligent in containing pollution: your own and that created by your staff.

Insist that Subcontractors and Do-it-yourselfers Follow BMPs

- Give each subcontractor a copy of the facility's clean marina policy/rules the first time that they visit the marina (and insist that they show proof of liability insurance).
- Incorporate the facility's clean marina policy/rules into slip contracts (see Appendix 9).
- Do not allow any work to be done in a way that contravenes the policy.
- Advise customers that all contractors must be approved by management.

Determine Procedures for Approaching Polluters

- Determine who will address boaters and contractors who are polluting. Generally, this is a job for the manager. Let staff know whether they should confront polluters themselves or report pollution incidents to the manager.
- Politely inform boaters and contractors why what they are doing is harmful. Describe a more environmentally sensitive method and ask the individual to stop work until it can be done with less environmental impact. It will be easier to get cooperation if boaters and contractors are required to practice pollution prevention as a condition of their contracts.
- If the problem persists, take these additional steps: 1) discuss the matter with the boater or contractor again, 2) mail a written notice asking that the offending practice stop immediately and keep a copy for your records, 3) remove the problem from the dock and charge the individual for the cost of removal and clean-up, and 4) ask the tenant or contractor to leave the marina.

Track Pollution Incidents

- Create a log to record pollution incidents and remedial actions taken.
- Post the log on a clipboard in the maintenance area or another easily accessible location.

Offer Environmental Audits for Boaters

- Expand your service business by providing environmental audits.
- Inspect engines, bilges, fuel systems, and marine sanitation devices.

The Best Management Practices described in this section are intended to:

Establish an environmental ethic that customers and contractors can emulate.

Establish clear guidelines for dealing with polluters.

Document pollution incidents so similar accidents can be avoided in the future.

Create a new income-generating service: environmental audits.

The Best Management Practices described in this section are intended to:

Attract responsible customers.

Generate good will.

BMPs for Public Relations

Publicize Your Good Deeds through News Releases

- Seek free publicity with local press, magazines, and television and radio outlets.
- Prepare news releases to highlight innovative practices, new equipment or services, or a workshop you are sponsoring. Use phrases like "environmentally responsible" and "environmental stewardship."
- Plan news releases to coincide with seasonal activities, *e.g.,* helpful tips for winterization.
- Refer to a style manual, such as the *Associated Press Style Book,* for information about preparing a press release.
- Learn media deadlines and send releases in time to meet them.
- When submitting a news release, be sure you have the name of the correct editor and that it is spelled properly.
- Get press kits from manufacturers of environmentally-sensitive products. Use their photographs and product information.

Highlight Environmental Policies in Paid Advertisements

- Reference your facility's environmental policies and services in your paid advertisements.

The Best Management Practices described in this section are intended to:

Limit waste.

Make it easy for customers to identify and use environmentally-responsible products.

BMPs for Retail Operations

Consider the Environment When Making Purchasing Decisions

- Choose manufacturers and suppliers that have environmental policies in line with the marina's policy.
- Purchase products that are environmentally responsible.
- Purchase in quantities that are dictated by the marina's own sales predictions.
- Consider shelf life when deciding on quantities to stock.
- Negotiate return policies with suppliers for products that have limited shelf life.
- Investigate the possibility of buying products such as lube oil and antifreeze in bulk.
- Emphasize products that are durable, *i.e.,* avoid disposable products.

Consider the Environment When Developing Sales Strategies

- Know your products and their potential for environmental impact.
- Promote environmentally-responsible products over other lines. Be prepared to support the manufacturer's claims.
- Encourage customers to buy only enough product to suit their immediate requirements.
- If small quantities are not available, encourage customers to share with their friends.

Offer Environmentally-responsible Products for Sale

- Promote the sale of:
  - Fuel and oil additives that can increase engine efficiency and reduce fuel consumption, decrease air emissions, extend engine life and stabilize fuel during winter storage.
  - Four-stroke engines or two-stroke outboard motors that conform to new industry emission requirements.
  - Recycled oil and antifreeze.
  - Propylene glycol antifreeze.
  - Oil absorbent products such as pads, pillows, bilge socks and fuel nozzle "donuts."
  - Bilge pump discharge filters.
  - Oil-sensing switches for bilge pumps.
  - Energy-saving products.
  - Biodegradable and non-toxic holding tank deodorants.
  - Fuel/air separators for fuel tank vents.
  - Dustless sanders (also a good rental product).
  - Filter fabric for do-it-yourself hull work.
  - Non-toxic and low-toxic bottom paints.

Minimize Impacts of Packaging: Incoming Goods

- Request suppliers to reduce packaging to the minimum that is required to ensure the safety of the shipment.
- Request biodegradable packing material from vendors, *e.g.,* paper, potato starch peanuts, popcorn, etc.
- Request that suppliers avoid the use of plastic shrinkwrap on their consignments.
- Buy in bulk where possible and discourage the use of individual or small quantity packaging.
- Arrange for suppliers to take back large containers for reuse.
- Request that regular suppliers ship their products in reusable containers.
- Keep all packaging from incoming goods and reuse for outgoing goods where possible. Undo packages carefully so that the packaging can be reused.
- Segregate and recycle excess packaging material.

Minimize Impacts of Packaging: Outgoing Goods

- Use only as much packaging as is necessary for protection of the shipment.
- Reuse packaging from incoming goods when shipping products.
- Display small goods in bulk where possible and hand goods to customer loose.
- Ask customer if they specifically need a bag, otherwise don't provide one.
- Offer reusable cotton or canvas bags printed with the marina name and logo for sale to customers at cost.
- Ask customers to provide their own containers for products that are for immediate use and which you are able to purchase in bulk, *e.g.,* lube oil and antifreeze.

The Best Management Practices described in this section are intended to:

Minimize solid waste.

Minimize release of nutrients.

Minimize release of cooking oil and grease.

Divert organic waste from landfills.

Conserve energy.

Conserve water.

BMPs for Visitor Facilities

Minimize Impacts of Restaurants

- Cook to order.
- Purchase fresh food in small quantities as regularly as possible.
- Minimize packaging material on purchased food and supplies.
- Consolidate food in freezers and turn off units that are empty.
- Track food waste so as to minimize.
- Collect food scraps separately for composting on or off site, or for collection by an organic diverter. Some livestock breeders will take food scraps for use as animal feed.
- Collect used cooking oil and fat separately for recycling.
- Do not pour used cooking oil and fat into drains.
- Consider installing a grease trap in the waste water drain from the kitchen and clean it out regularly.
- Fill dishwashers completely before starting the wash cycle.
- Do not use soaps and detergents that contain phosphates.
- Don't serve food on disposable plates, drinks in disposable cups or supply disposable cutlery.
- Donate excess food to a local shelter facility or other charitable institution.
- Encourage customers to provide their own containers for carry-out foods and leftovers.

Minimize Impacts of Laundromat

- Don't allow the use of soaps and detergents containing phosphates.
- Encourage customers to minimize their use of mechanical dryers and allow laundry to dry naturally where appropriate (and allowed by marina's policy regarding clothes lines).
- Discourage customers from using washing machines unless they have a full load.
- Install EnergyStar labeled equipment.

Minimize Impacts of Guest Rooms

- Offer guests the option of having linen changed every second or third night, rather than daily.
- Ask guests to place towels to be washed in the tub or on the floor, telling them that other towels left on the rack will not be washed, even if used.
- Place a container for recyclables in each room with a polite notice to guests explaining the marina's environmental policy.
- Place a notice in each room requesting guests to turn off lights, radios and televisions that are not in use and to avoid leaving taps dripping.

Boater and Contractor Education

What are the environmental concerns?

There are varying degrees of environmental knowledge and concern among marina staff, customers, and contractors. To ensure efficient and "clean" operations, therefore, marina managers will need to define expected behaviors through contracts, signs, and other mechanisms. To assist with this process, Clean Boating Tip Sheets are included at the end of this chapter. They are intended to be copied and distributed to boaters.

Outreach Techniques: Contracts

Incorporate Best Management Practices (BMPs) into all Contracts

- Include language requiring the use of BMPs in all contracts: slip holders, liveaboards, transients, charters, workers, contractors and tenants. Be sure to address requirements for vessel maintenance, petroleum, sewage and marine sanitation devices, hazardous materials, and fish cleaning. Refer to sample contract language in Appendix 9.
- Include language specifying the consequences for not using BMPS, *e.g.,* failure to use BMPs will result in expulsion from the marina and forfeiture of rental fees.

Outreach Techniques: Signs

Post Signs Detailing Best Management Practices

- Post signs at fuel docks and pumpout stations, along piers, in vessel maintenance areas, and at dumpsters and recycling stations to inform patrons and workers about the facility's environmental policies.
- Be sure the signs are visible.
- Signs must be durable, eye catching, and appropriately sized.
- Post your facility's environmental policy in a conspicuous location.

Post Signs at Fuel Docks

- List proper refueling practices.
- Provide instructions for responding to and reporting spills.
- Indicate location of absorbent materials and instructions for their use.

Post Signs at Pumpout

- If you operate a pumpout facility, install adequate signs to identify the pumpout station, hours of operation, and fees.

The Best Management Practices described in this section are intended to:

Ensure that all customers and contractors are aware of the marina's environmental policy.

Provide a legal mechanism for enforcing the environmental policy.

The Best Management Practices described in this section are intended to:

Ensure that all customers and contractors are aware of the marina's environmental policy.

Ensure that evacuation routes are clearly marked.

- ◉ Mark the suction and washout hoses and their storage positions to clearly identify their purposes.
- ◉ Coil and hang the wash-water hose beside a sign that states that the water from the hose is not a drinking water supply.
- ◉ Indicate the location of the nearest washrooms to encourage boaters to make use of shoreside toilet facilities.
- ◉ Encourage the use of pumpout facilities by transient and resident boaters.
- ◉ Request that customers inform management immediately if the pumpout breaks.
- ◉ Indicate the location of the nearest pumpout if there is not one on site.
- ◉ Remind boaters that all of Narragansett Bay is a No Discharge Area.

Develop Instructional Signs Regarding Waste Management

- ◉ Provide plenty of signs indicating the nearest waste collection station.
- ◉ Post signs indicating what may NOT be placed in the dumpster: gasoline, engine oil, antifreeze, paints, solvents, varnishes, pesticides, lead batteries, transmission fluid, distress flares, and polystyrene peanuts (loose peanuts tend to fly away).
- ◉ Mark recyclable containers clearly with their intended contents.
- ● Mark hazardous waste containers clearly with their intended contents.
- ◉ Indicate that hazardous waste containers are for the use of marina staff only.

Mark Exits and Evacuation Routes

- ● Post evacuation routes and exit signs in areas where hazardous wastes are handled or stored.

Sample Language for Signs

Environmental Policy

It is the policy of this marina to protect the health of our patrons, staff and the environment by minimizing the discharge of pollutants to the land, water and air.

Keep Fuel Out of the Water

Do not top off tank.

Listen to anticipate when tank is full.

Use oil absorbents and/or catchment devices to prevent spills.

Wipe up any spills immediately.

Marine Sanctuary

This marina provides food and shelter for young fish.

- Prevent oil spills!
- Keep bilge clean!
- Use oil absorbent pads!

Help by recycling or properly disposing of used oil, antifreeze, solvents, cleaners, plastic, and other wastes.

Thank you for keeping the Bay clean and safe!

Notice

The Federal Water Pollution Control Act prohibits the discharge of oil or oily waste into or upon the navigable waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface water. Violators are subject to a penalty of $5,000.

The use of soaps to disperse oil is illegal. Violators may be fined up to $25,000 per incident.

Report spills to the USCG at 800-424-8802 and DEM at 401-222-3070.

Oil Spill Response Kit

Include name and number of person to contact at the marina in case of a spill.

Be sure that a copy of the Oil Spill Response Plan is clearly visible inside the Spill Response Kit.

Restrooms

Please use our clean, comfortable restrooms while you are in port.

Vessel Maintenance Area

- All major repairs (*e.g.*, stripping, fiberglassing) must be performed in the Vessel Maintenance Area.
- All blasting and spray painting must be performed within the enclosed booth or under tarps.
- Use tarps and filter fabric to collect paint chips and other debris.
- Use a vacuum sander *(include rental information if appropriate)*.
- Use high-volume low-pressure spray gun.
- Use drip pans with all liquids.
- Reuse solvents.
- Store waste solvents, rags and paints in covered containers.

Safety Notice

- Stop all engines and auxiliaries.
- Shut off all electricity, open flames and heat sources.
- Extinguish all cigarettes, cigars and pipes.
- Close all doors, hatches and ports.
- Maintain nozzle contact with fill pipe to prevent static spark.
- Inspect bilge after fueling for leakage and fuel odors; and ventilate all compartments after fueling until fumes are gone.
- All passengers must get off gasoline powered vessels before fueling.
- Vessels may not be unattended during fueling.

Pumpout Station

- *Instructions for use.*
- *Mark suction and washout hoses and their storage positions.*
- *Mark the wash-water hose and indicate that it is not a drinking water supply.*
- *Hours of operation.*
- *Fee.*
- *Name and number of person to call in case of malfunction.*
- *Indicate location of nearest washrooms.*
- *Remind boaters that all Rhode Island coastal waters are a No Discharge Area.*

Think Before You Throw

The following items may not be placed in this dumpster:

- Gasoline
- Oil
- Antifreeze
- Paint or varnish
- Solvents
- Pesticides
- Lead acid batteries
- Transmission fluid
- Distress flares
- Loose polystyrene peanuts
- Hazardous waste
- Shrink wrap

Recycle

- Oil
- Antifreeze
- Lead batteries
- Glass
- Plastic
- Aluminum
- Corrugated cardboard
- Metal fuel filter canisters
- Mixed paper
- Newspaper
- Shrink wrap
- Solvents
- Scrap metal: steel, zinc, tin, etc.
- Tires

Indicate which items you recycle and where the collection sites are. Include information about local recycling services for materials you do not collect.

No Fish Scraps

Please do not discard fish scraps within the marina basin.

- Use our fish cleaning station.
- Save/freeze scraps for chum.

Recycle Oil

This container is for:

- Engine oil
- Transmission fluid
- Hydraulic fluid
- Gear oil
- #2 diesel
- Kerosene

(Tailor to your hauler's requirements)

GASOLINE is strictly PROHIBITED

(If container is locked, include information about where to get the key or leave the oil.)

Recycle Antifreeze

This container is for:

- Ethylene glycol antifreeze
- Propylene glycol antifreeze

(Tailor to fit your hauler's requirements.)

Gasoline, diesel, kerosene and all other materials are prohibited.

(If container is locked, include information about where to get the key or leave the oil.)

Outreach Techniques: Other than Signs and Contracts

Distribute Literature to Patrons

- Copy and distribute the *Clean Boating Tip Sheets* included in this chapter.
- Get and distribute copies of "clean boating" materials from established clean marina programs and environmental organizations. Look for material on the internet by searching on the terms "clean boating" and "clean marina."
- Send clean boating tip sheets, pamphlets, etc. with monthly mailings or place in public gathering areas at the marina.
- Include articles about BMPs in your newsletter.

Provide Oil Absorbent Materials

- Distribute oil absorbent pads, pillows or booms to your tenants along with instructions for use and disposal.

Make Use of Informal Communication Mechanisms

- Pass along pollution prevention information in conversations with patrons and contractors.
- Have staff think "environment" every time they answer customers' questions.
- Post information about BMPs on the marina bulletin board.

Recognize Environmentally-responsible Boaters

- Publicly recognize boaters who are making an effort to control pollution: include a feature in the marina newsletter, post a flyer with the boater's picture, give an award, etc.

Host a Workshop or Environmental Seminar

- Include a walking tour of the facility to demonstrate BMPs.
- Schedule the workshop to coincide with an existing marina function that is traditionally well attended.
- Offer incentives to attendees: door prizes, discounts, product samples, food.

Solicit Suggestions

- Have an "Environmental Suggestion Box" or otherwise invite customers to comment on new arrangements and/or procedures.
- Encourage boaters to act proactively.

The Best Management Practices described in this section are intended to:

Ensure that all customers and contractors are aware of the marina's environmental policy.

Provide incentives for boaters to adopt best management practices.

Encourage boaters to suggest additional environmentally-responsible measures.

Clean Boating Tip Sheets

Six Clean Boating Tip Sheets are included in this section. They address:

- Vessel Cleaning and Maintenance
- Petroleum Control
- Vessel Sewage
- Trash
- Selecting a Bottom Paint, and
- Underwater Hull Cleaning.

The tip sheets are meant to be photocopied and shared with boaters. Consider placing them in the marina office or shop, posting on bulletin boards, and including in mailings.

Clean Boating Tip Sheet

Vessel Cleaning and Maintenance

The Issue

As a boater, you are well aware that boats require a great deal of maintenance over the course of a year. Engines must be tuned and lubricated; hulls must be washed, sanded and painted; and vessels must be prepped to withstand the cold of winter. Each of these tasks—along with a myriad of other vessel maintenance activities—has the potential to release pollutants into the land, water and air.

Contaminants include toxic substances such as solvents, petroleum products, and the biocides contained in antifouling paint (typically copper and tin). All of these substances can be harmful to human and animal health. They also have the potential to degrade land and water. Some paints and solvents release dangerous fumes—known as volatile organic compounds—which contribute to air pollution and are health hazards. Even non-toxic substances, such as mild detergents, can be harmful: they reduce the ability of fish to breathe by destroying oils on gills.

Follow the tips on this sheet to keep your vessel in tip top shape and protect natural resources.

Clean Carefully

- Wash frequently with a sponge or nonabrasive pad and plain water. This approach is very effective at removing salt. Additional "elbow-grease" is required to remove stains.
- When detergents are necessary, use soaps that are phosphate-free, biodegradable, and non-toxic. Any soap should be used sparingly.
- Wax your boat, if appropriate. A good coat of wax prevents surface dirt from becoming ingrained.
- Avoid detergents that contain ammonia, sodium hypochlorite, chlorinated solvents (bleach), petroleum distillates and lye.
- Try some of the alternative cleaning products listed on the reverse side of this page.
- Adopt onboard washing procedures that minimize water use and, hence, the volume of "gray water" produced.
- Use shoreside washing and shower facilities as much as possible, rather than onboard facilities.

Treat Teak Tenderly

- Clean teak with a mild, phosphate-free detergent and a bronze wool pad.
- Avoid teak cleaners containing acids (such as phosphoric acid or oxalic acid) or those labeled, "caustic, corrosive, or acidic."
- If possible, refinish teak in an upland maintenance area. If not possible, use mild cleaners and avoid flushing excess cleaner and teak oil into the marina basin.

Maintain Mindfully

- Collect all paint chips, dust, and residue. Dispose in regular trash.
- Share leftover paint and varnish.
- Use propylene glycol (pink) antifreeze: it is less toxic than ethylene glycol (blue) antifreeze.

Winterize Wisely

- Use propylene glycol antifreeze.
- Ensure stern drive units and outboard engines are not leaking.
- Place drip trays under grease-filled stern tubes, stern drives and outboards.
- Fill your fuel tans to no more than 85 percent of capacity and use the highest rated octane recommended by the engine manufacturer.
- Add stabilizers to fuel to prevent degradation.
- Ensure that fuel tank suction line valves are closed where appropriate.
- Be sure the gas cap seals tightly.
- Inspect and clean bilges (with oil absorbent pads if appropriate) prior to extended vessel storage.
- Use reusable canvas covers.
- Plan on using plastic shrink wrap only if there is a viable recycling program for the used shrink wrap.
- When installing shrink wrap, tape over all fuel vents before igniting the heat gun.

Tips for Trailers

- Maintain your trailer regularly to keep it free of oil and grease.
- Rinse hulls and pump bilges before moving to or from another location.
- Remove motor vehicles from boat ramps as quickly as possible.

Alternatives to Toxic Products

While baking soda, vinegar, lemon juice and vegetable oils are far less harmful than bleaches, scouring powders or detergents, they are still toxic to marine life. Use cleaning products sparingly and minimize the amount discharged into the water. Never dispose of any cleaning products down the thru-hull drain; dispose of them on shore.

Product	Alternative
Detergent & Soap	"Elbow grease"
Bleach	Borax
Scouring Powders	Baking soda. Or rub area with one-half lemon dipped in borax, then rinse
General Cleaner	Baking soda and vinegar. Or lemon juice combined with borax paste
Floor Cleaner	One cup vinegar in 2 gallons of water
Window Cleaner	One cup vinegar + 1 qt. warm water. Rinse and squeegee
Aluminum Cleaner	2 Tbsp. cream of tartar + 1 qt. of hot water
Brass Cleaner	Worcestershire sauce. Or paste made of equal amounts of salt, vinegar and water
Copper Cleaner	Lemon juice and water. Or paste of lemon juice, salt, and flour
Chrome Cleaner/Polish	Apple cider vinegar to clean; baby oil to polish
Stainless Steel Cleaner	Baking soda or mineral oil for polishing, vinegar to remove spots
Fiberglass Stain Remover	Baking soda paste
Mildew Remover	Paste with equal amounts of lemon juice and salt, or white vinegar and salt
Drain Opener	Dissemble or use plumber's snake. Or flush with boiling water + one-quarter cup baking soda + one-quarter cup vinegar
Wood Polish	Olive or almond oil (interior walls only)
Hand Cleaner	Baby oil or margarine
Head & Shower	Baking soda; brush thoroughly
Rug/Upholstery Cleaner	Dry corn starch sprinkled on; vacuum

Adapted from Buller, Pat. 1995. *Clean Marina+Clean Boating+Clean Partnership*. Seattle, WA: Puget Soundkeeper /

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For information about the Rhode Island Clean Marina Program, call the Coastal Resources Management Council at 401-783-3370.

Clean Boating Tip Sheet

Petroleum Control

The Issue

Petroleum in the water is a concern because of its physical properties and because it is toxic. Most people would agree that a major oil spill that smothers sea life in a thick layer of oil is a serious problem. Smaller, chronic spills are equally serious but far less visible. Consider that any fuel floating on water reduces the extent to which sunlight penetrates into the water column and also limits the exchange of oxygen at the water's surface. Aquatic plants and animals are, therefore, deprived of these life-giving elements.

Furthermore, petroleum in the water tends to accumulate in the microlayer—the uppermost portion of the water column. An abundance of fish, crustacean and mollusk eggs and larvae can also be found in the microlayer, along with algae and bacteria. Exposure to the heavy metals and other toxins found in petroleum can diminish the ability of these organisms to successfully reproduce.

Petroleum in the water can also release harmful fumes to the atmosphere, become suspended in the water column or settle to the sea floor. Prolonged exposure to petroleum is potentially harmful to the animals and plants that live in any of these environments.

The Law

The Federal Water Pollution Control Act (also called the Clean Water Act) prohibits the discharge of oil or oily waste into or upon the navigable waters of the United States or the waters of the contiguous zone if such discharge causes a film or sheen upon, or discoloration of, the surface of the water, or causes a sludge or emulsion beneath the surface of the water. Violators are subject to a penalty of $5,000 from the U.S. Coast Guard. State law also prohibits the discharge of oil. The Rhode Island Department of Environmental Management may impose additional fines.

Fueling Practices

Gas or diesel may be spilled during the act of fueling: as backsplash out the fuel intake or as overflow out the vent fitting. Spills of this sort harm aquatic life, waste money, and can result in stains on the hull and damage to the gel coat and striping. Follow these tips to avoid problems:

- Fill tanks to no more than 85 percent capacity--gas that is drawn from cool storage tanks will expand as it warms up onboard your vessel.
- To determine when the tank is 85 percent full, listen to the filler pipe, use a sounding stick, and be aware of your tank's volume.
- Rather than filling your tank upon your return to port, wait and fill it just before leaving on your next trip. This practice will reduce spills due to thermal expansion because some fuel will be used before it has a chance to warm up.
- Fill portable tanks ashore where spills are less likely to occur and easier to clean up.
- Use oil absorbent materials and/or catchment jugs placed over vent fittings to capture all drips.
- Slow down at the beginning and end of fueling.

Bilge Maintenance

Engine oil tends to accumulate in bilges. If no precautions are taken, the oil is pumped overboard along with the bilge water. Discharging oily water is illegal. To avoid fines and to protect water quality, follow these tips:

- Keep your engine well tuned to minimize the amount of oil that is released. Be sure there are no leaking seals, gaskets or hoses.
- Place oil absorbent materials or a bioremediating bilge boom in the bilge.
- Place an oil absorbent pad under the engine.
- Replace oil absorbent materials regularly.
- Dry bilges before performing oil changes.
- Look for contractors or marinas that offer a bilge pumpout service.
- Do not treat oily water with detergents. Soaps pollute and make clean up impossible. You may be fined up to $25,000 for using soaps to hide a fuel spill.

Emissions Control

Marine engines—especially 2-stroke outboard motors—produce the highest average level of hydrocarbon exhaust emissions after lawn and garden equipment. Hydrocarbon emissions contribute to ground level ozone, a known health risk. Follow these tips to help your engine operate as efficiently as possible:

- Use the gas to oil ratio recommended by the engine manufacturer. Too much oil can foul spark plugs and too little can lead to increased engine wear or even failure.
- Use premium two-cycle engine oil (TC-W3 or TC-W4--*confirm*). Premium oils improve engine performance and reduce pollution because they burn cleaner, contain more detergents, and prevent formation of carbon deposits.
- Use gasoline with the octane level recommended by the engine manufacturer.

Preventive Equipment

Products are available commercially which can help you prevent spills and reduce emissions:

- Install a fuel/air separator along your vent line. These devices allow air, but not fuel to escape through a vent opening.
- Alternatively, catch vent-line overflow in specially-designed jugs that attach to the outside of the hull with suction cups. Add the collected fuel to the tank once there is room for it or use in car or lawn equipment.
- Attach a safety nozzle to portable gas cans used to fill outboard engines. These nozzles automatically stop the flow of fuel when the receiving tank is full.
- To prevent oily bilge water from being discharged, install a bilge pump switch that leaves an inch or two of water in the bilge. Alternatively, connect a bilge water filter to your vessel's bilge pump. Filters will remove oil, fuel and other petroleum hydrocarbons from the water.
- When it is time to buy a new engine, select a fuel efficient, low emission model.

In Case of a Spill

Stop the flow.

Contain the spill.

Call the Rhode Island Department of Environmental Management at 401-222-3070

Call the U.S. Coast Guard National Response Center at 800-424-8802.

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Clean Boating Tip Sheet

Vessel Sewage

Is Sewage a Problem?

Illness and excessive nutrient loads are the primary concerns associated with sewage discharges from recreational boats. When boaters discharge raw sewage overboard, they are potentially exposing people to the bacteria and viruses contained in the effluent. People who swim in contaminated water, or eat shellfish that have been exposed to sewage, may develop illnesses such as typhoid fever, hepatitis, cholera and gastroenteritis. The high nutrient content of sewage is also a problem because it supports excessive algal blooms. As the algae multiply, they deplete the water of oxygen and prevent life-giving sunlight from reaching subsurface vegetation. Later, as the algae are decomposed by bacteria, the bacteria may further reduce levels of dissolved oxygen, potentially leading to fish kills.

No Discharge Area

The federal Clean Water Act prohibits the discharge of raw sewage within three miles of the United States' shore (*i.e.,* the Territorial Sea), in the Great Lakes, and in navigable rivers. In Rhode Island, the discharge of sewage treated by onboard marine sanitation devices (MSDs) is also prohibited because the state's coastal waters, including all of Narragansett Bay, were designated a No Discharge Area (NDA) in August 1998. A No Discharge Area is a designated body of water in which the discharge of treated and untreated boat sewage is prohibited. The discharge of "gray" water from sinks and showers is not restricted within a NDA.

U.S. boats are not required to have installed toilets. If they do, however, they must have a marine sanitation device. There are three types of MSDs:

- Type I systems mechanically cut solids and disinfect waste.
- Type II systems are similar to Type I systems. The difference is that they treat sewage to a higher standard and generally require more space and energy.
- Type III systems do not discharge sewage. Holding tanks are the most common Type III system. Incinerating systems are another option.

Type III MSDs or portable toilets are the only sanitary equipment that can be used in Rhode Island waters. Onboard treatment systems (Type I and Type II MSDs) are not allowed because, while they do kill microorganisms, they are not able to reduce the nutrient content of sewage. Furthermore, the chemicals used as disinfectants in these systems are toxic to aquatic life.

Type I and Type II MSDs must be secured to prevent discharge while operating within a No Discharge Area. Closing the seacock and padlocking it, using a non-releasable wire tie, or removing the seacock handle (with the seacock closed) are sufficient. Locking the door of the head with a padlock or door handle key lock is another acceptable method of securing the MSD while in a No Discharge Area.

All boats, with a few exceptions, operating or mooring in Rhode Island waters are required to obtain and display a "no discharge certificate decal" as of June 2006. The decals will be issued by authorized certification agents, based upon an inspection of each vessel to certify compliance with the State's no-discharge law.

Use shoreside restrooms when in port!

Use Pumpouts

Owners of boats with holding tanks are expected to pump their tanks regularly and to maintain a record of such activity on cards provided by certification agents or DEM. To locate pumpou facilities, call DEM's Office of Water Resources at 401-222-3961 or visit http://www.dem.ri.gov/programs/benviron/water/shellfsh/pump/index.htm.

Control Holding Tank Odors

When installing a new holding tank:

Use good plumbing to control holding tank odor. Fiberglass and metal tanks are highly resistant to permeation. Specially labeled flexible "sanitation hoses" and PVC piping are also highly impermeable. Hose runs should be as short and as straight as possible. Wherever practical, use rigid pipe below the level of the holding tank and in other areas where sewage will accumulate. Keep the number of connections to a minimum and insure that seals are tight.

When maintaining an existing holding tank:

Use enzyme-based products in your holding tank to further control odor. Enzymatic products use biological processes, rather than harsh chemicals, to breakdown sewage. Be sure to pump and rinse your holding tank prior to initial use of an enzyme product if you have used chemical-based odor control additives in the past. Chemical residues may interfere with the effectiveness of enzyme-based products.

Avoid holding tank products that contain quaternary ammonium compounds (QAC) and formaldehyde. These products may disrupt sewage treatment plants.

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Clean Boating Tip Sheet

Tame the Trash

The Issue

Trash is ugly and may be dangerous—dangerous to humans and to wildlife. For example, plastic may snare propellers and choke sea turtles. Congress passed a law in 1987 to protect our waterways from garbage. The Marine Plastic Pollution Research and Control Act (Title II of Public Law 100-220) regulates the disposal of garbage at sea according to how far a vessel is from shore:

- Within U.S. lakes, rivers, bays, sounds and within 3 nautical miles from the ocean shore, it is illegal to dump anything other than fish waste.
- Between 3 and 12 nautical miles from shore, it is illegal to dump plastic and any other garbage that is greater than one inch in size.
- Between 12 and 25 nautical miles from shore, it is illegal to dump plastic and dunnage, i.e, lining and packing material, nets, lines, etc.
- Beyond 25 nautical miles, it is illegal to dump plastic.

Do your part by adhering to these restrictions and adopting the following recommendations.

Contain Trash

- Don't let trash get thrown or blown overboard.
- If trash blows overboard, retrieve it. Consider it "crew-overboard" practice.
- Pack food in reusable containers.
- Buy products without plastic or excessive packaging.
- Don't toss cigarette butts overboard. They are made of plastic (cellulose acetate).
- Purchase refreshments in recyclable containers and recycle them.
- Properly dispose of all trash on-shore, *e.g.,* bring home or leave in a dumpster at the marina.
- Recycle cans, glass, plastic, etc.
- Bring used monofilament fishing line to recycling bins at your tackle shop or marina.

Fish Waste

For safety reasons, marinas are often located in sheltered areas—areas that will protect boats from wind and waves during a storm. The same features that protect boats during a storm, however, also limit the exchange of water. Poor exchange, or flushing, means that any waste which is discharged into the water may stay in the same general area for an extended length of time.

Fish cleaning may pose a problem if the scraps are discarded into a poorly flushed marina basin. Fish waste is smelly and unsightly. Also, life-sustaining oxygen is removed from the water column as bacteria decompose the innards. Avoid problems by following these tips.

- Do not discard fish waste in poorly flushed areas.
- Clean fish while returning to the dock.
- Discard waste over deep water or at home.
- Save waste in a sealed container and use as chum or bait.

Maintenance Waste

Dispose of maintenance debris according to the recommendations listed on the back of this sheet. Visit the Rhode Island Resource Recovery Corporation's web page at www.rirrc.org or call 401-942-1430 for information about hazardous waste collection (see the link to "Eco-Depot") and recycling.

Waste Product	Disposal Method
Oil and Oil Filters	Recycle
Antifreeze	Recycle
Lead batteries	Recycle
Paint and Varnish	Allow to dry completely (i.e., solidify). Dispose in regular trash.
Waste Gasoline, Solvents and Pesticides	Bring to a household hazardous waste collection day
Expired Emergency Flares	Bring to local fire department or a household hazardous waste collection day

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Clean Boating Tip Sheet

Selecting a Bottom Paint

The Issue

Marine growth, such as barnacles and slime, impair vessel performance. To maintain top performance, therefore, boats are often painted with toxic paint to prevent fouling growth. Unfortunately, the biocides found in the paints are harmful to many marine critters—not just those that try to make their homes on the undersides of boats.

Selecting a bottom paint is not an easy job. The challenge is to select the least toxic paint that will effectively prevent fouling. The effectiveness of a particular paint will be impacted by water temperature and salinity and by how frequently and how quickly the vessel is operated.

The Paints

Bottom paints can be separated into three general categories: antifouling hard, antifouling ablative, and non-toxic coatings.

The two most commonly used varieties of coatings are hard and ablative paints:

- When hard or "contact leaching" paints dry they create a porous film on the hull. Biocides are held in the pores. The toxins dissolve when they contact water.
- Ablative or "sloughing" paints are partially soluble. The active ingredient is continually leached out. The underlying film then weakens and is polished off as the boat moves through the water. Fresh antifouling paint is, thus, exposed.

Hard paints contain varying levels of biocides which are released slowly. Ablative paints generally contain lower levels of toxins yet they are released at a more steady rate. The impact to the aquatic environment overtime is about the same.

Non-toxic coatings are the most environmentally-friendly option. Some produce hard, slick surfaces to which fouling growth cannot firmly attach. Other products use photoactive technology to deter fouling. Paint companies are moving toward the broad introduction of non-toxic paints. Ask the Rhode Island Clean Marina Progam or your marina manager for recommendations.

Which bottom paint is right for you?

There is no easy answer to this question (at least until biocide-free coatings are readily available and affordable). Weigh the pros and cons described in the table on the reverse side of this sheet and consider the type of boat you have and where and how you use it. Ask yourself the following questions:

- **How frequently do I use my boat?** Ablative paint is most effective when a boat is used regularly.
- **How quickly do I typically travel?** Speed boats are generally painted with hard paints.
- **Will I want the hull scrubbed while the boat is in the water?** If you anticipate underwater hull cleaning, DO NOT USE ablative paint.
- **Will I have the boat hauled annually?** Hard paint is applied annually. Some ablative paints are designed to last for more than one season.
- **What type of coating is presently on the hull?** Select a new coating that is compatible.

Comparision of Maintenance Requirements

Maintenance Need	Ablative Paint	Hard Paint	Environmental Issues
Frequency of repainting	Every 1 to 3 years depending on the thickness of the original application and use of the boat.	A single coat is applied annually.	**Air Quality:** Fumes (volatile organic compounds) that are harmful to human health and air quality are released whenever solvent-based paints are used. Use water-based paints whenever practical.
Hull preparation	Light sanding is generally all that is needed prior to application of new paint.	Annual heavy sanding is suggested to improve adhesion and prevent build up. If you choose light sanding instead, the resulting build up will need to be blasted or stripped off periodically.	**Debris:** Use the following terchniques to keep debris out of the water: • Collect dust created by sanding with a vacuum sander or tarps. • Blast or strip in an enclosed area where debris can be easily captured. • Send collected debris with your regular trash to a municipal landfill or incinerator. • Encourage your marina or boatyard to follow these pollution prevention practices.
Pressure washing	Pressure washing will remove some ablative paint.	Pressure washing will remove fouling growth and possibly paint chips. Very little pigment should be released.	**Release of Biocides:** Boatyards are required to treat discharge according to regulatory standards. • Solids from hulls painted with hard paints are easily collected in filter cloth, settling basins or even hay bales. • Inform your yard manager if you have ablstive paint. He or she should use minimal water pressure so that, to the greatest extent possible, just slime is removed.
Underwater hull cleaning	Hulls painted with ablative paint should never be cleaned in the water.	Hard paints may be cleaned by divers if done carefully.	**Release of Biocides:** Be aware that colored plumes should not be visible in the water when a hull is being cleaned. They indicate that paint is being removed. • Hard or slick paints may be cleaned whil a vessel is in the water as long as care is taken to use the least abrasive material practical (see the *Underwater Hull Cleaning* tip sheet). • Ablative paint should not be cleaned in the water as the scrubbing action will release paint and its associated biocides.

Clean Boating Tip Sheet

Underwater Hull Cleaning: Tips for Divers and Boaters

In order to maintain maximum performance and to stretch the time between haul-outs, some boaters hire professional divers (or dive themselves) to clean their hulls while their boats are in the water. If done properly, underwater hull cleaning removes marine growth and a minimal amount of antifouling paint. When done too vigorously or when ablative paint is scrubbed, however, unacceptable levels of toxic bottom paint are released into the surrounding water.

The following tips for divers and boaters are intended to guide decisions about hull treatment and maintenance. By working together, we can minimize the pollution problems associated with underwater hull cleaning.

Best Management Practices for Divers

- Clean gently to avoid creating a plume or cloud of paint in the water.
- On boats painted with ablative paints, clean only running gear and zinc anodes.
- Refrain from hull cleaning for a minimum of 60 days after hard antifouling paint has been applied.
- Always use the least abrasive material that will effectively clean the painted surfaces:
  - Use soft sponges or pieces of carpet to clean marine growth.
  - Use soft nylon or similar material on rotary brush machines.
  - Use more rigorous cleaning pads only as needed to remove hard growth.
  - Use stainless steel pads or brushes only on unpainted metal areas.
- Do not clean the entire hull if it is not dirty. Just do the waterline, running gear, and propeller.
- Never sand, strip or chip hull paint underwater.
- If you have been hired to replace zinc anodes, bring the old ones ashore for recycling. Look in the phone book under "scrap" for dealers.
- Provide customers with a copy of your standard pollution prevention procedures.

Best Management Practices for Boaters

- Take advantage of "quick haulout specials" if offered by your marina.
- Where practical, store your boat out of the water.
- Be aware that colored plumes should NOT be visible in the water near underwater cleaning activity. They indicate that paint, rather than just marine growth, is being rubbed off of your boat.
- Let divers know you expect them to minimize pollution while working on your boat. Ask them to follow the best management practices for divers listed above.
- Never hire a diver to clean a hull painted with ablative (*i.e.*, sloughing) paint.
- Be knowledgeable about your antifouling paint. Ask your yard manager to provide a written statement describing the name and type of paint used, health and safety warnings, maintenance

requirements, and date applied. Keep a record of this same information if you paint your own hull.

- If you know you will want a diver to clean your hull, select a hard or slick paint.
- Wait a minimum of 60 days after applying fresh, hard bottom paint to have the hull cleaned underwater.
- Consider non-toxic paints or low copper hard paints and regular underwater hull cleaning instead of high copper content paints.
- Before hiring a diver, get three local references from a marina operator or other boaters who know the diver's work.

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Appendix 1:

Important Contact Information

Coastal Resources Management Council
Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879
401-783-3370
www.crmc.ri.gov

Rhode Island Department of Environmental Management
235 Promenade Street
Providence, RI 02908-5756
www.dem.ri.gov

- General Information: 401-222-6800
- Emergency Response: 401-222-3070
- Air Resources: 401-222-2808
- Compliance and Inspection: 401-222-1360
- Land Acquisition Program 401-222- 6825
- Law Enforcement (non-emergency): 401-222-2284
- Pumpout Grant Funding: 401-222-3961 x7258
- RIPDES permits: 401-222-4700 x7202
- Technical and Compliance Assistance: 401-222-6822
- Underground Storage Tanks (UST): 401-222-2797
- Waste Management: 401-222-2797

Rhode Island Department of Labor and Training
Division of Occupational Safety
1511 Pontiac Avenue – Building 70
PO Box 20157
Cranston RI 02920-0942
http://www.dlt.ri.gov/occusafe/

Rhode Island Marine Trades Association
PO Box 7663
Warwick, RI 02886
401-615-5419
Email: info@rimta.org

Rhode Island Underground Storage Tank Financial Responsibility Fund

235 Promenade Street
Providence, RI 02908
401-273-6570
401-273-6575 (fax)

Save the Bay

100 Bayview Drive
Providence, RI 02905
401-272-3540
Fax: 401-273-7153
www.savebay.org
savebay@savebay.org

- Backyards on the Bay: A yard care guide for the coastal homeowner: www.savebay.org/backyardbay/index.htm.

URI Cooperative Extension

University of Rhode Island
College of the Environment and Life Sciences
3 East Alumni Avenue
Kingston, RI 02881
Tel: 401-874-2900
Fax: 401-874-2259

- CE Gardening and Food Safety Hotline 1-800-448-1011 or 401-874-2929 from outside Rhode Island; Monday-Thursday between 9am and 2 pm.

Appendix 2:

Storm Water Pollution Prevention Plan Requirements

Reference: Part IV, Section F and Part VI, Section Q of the draft Multi-Sector General Permit, Rhode Island Pollutant Discharge Elimination System, Storm Water Discharge Associated with Industrial Activity issued by Rhode Island Department of Environmental Management, Office of Water Resources, Permitting Section, RIPDES Program, October 2005.

Use the following detailed outline to prepare a Storm Water Pollution Prevention Plan.

I. Pollution Prevention Team

The SWPPP must identify the staff individual(s) (by name or title) that comprise the facility's storm water Pollution Prevention Team. The Pollution Prevention Team is responsible for assisting the facility manager in developing, implementing, maintaining and revising the facility's SWPPP. Responsibilities of each staff individual on the team must be listed.

II. Site Description

A. Activities at Facility: Description of the nature of the industrial activity(ies) at the facility.

B. General Location Map: A topographic map showing the general location of the facility with enough detail to identify the location of the facility and the receiving waters within one mile of the facility.

C. Site Map: A legible site map identifying the following:

1. Directions of storm water flow (*e.g.,* use arrows to show which ways storm water will flow);
2. Delineation of impervious surfaces;
3. Locations of all existing structural BMPs to reduce pollutants in storm water runoff;
4. Locations of all surface water bodies;
5. Locations of all municipal separate storm sewers;
6. Locations of Industrial Materials exposed to precipitation, *e.g.,* machinery, fuels, solid wastes;
7. Locations where major spills or leaks have occurred;
8. Locations of Industrial Activities where such activities are exposed to precipitation: fueling; engine maintenance/repair; vessel maintenance/repair; pressure washing; painting; sanding; blasting; welding; metal fabrication; loading/unloading areas; locations used for the treatment, storage or disposal of wastes; liquid storage tanks;

liquid storage areas (*e.g.,* paint, solvents, resins); and material storage areas (*e.g.,* blasting media, aluminum, steel, scrap iron).

9. Locations of storm water outfalls and an approximate outline of the area draining to each outfall;
10. Location and description of non-storm water discharges;
11. Locations of the following activities where such activities are exposed to precipitation: processing and storage areas; access roads, rail cars and tracks; the location of transfer of substance in bulk; and machinery;
12. Location and source of runoff from adjacent property containing significant quantities of pollutants of concern to the facility (an evaluation of how the quality of the storm water running onto the facility impacts the storm water discharges may be included).

III. Receiving Waters and Wetlands

The name of the nearest receiving water(s), including intermittent streams and the areal extent and description of wetland that may receive discharges from the facility.

IV. Summary of Potential Pollutant Sources

The permittee must identify each separate area at the facility where industrial materials or activities are exposed to storm water. Industrial materials or activities include, but are not limited to, outdoor manufacturing or processing activities (*i.e.,* welding, metal fabricating); significant dust or particulate generating processes (*e.g.,* abrasive blasting, sanding, painting); material handling equipment or activities; industrial machinery; storage, cleaning, fueling and maintenance of vehicles and equipment storage; and raw materials, intermediate products, by-products, final products, or waste products. Material handling activities include the storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, final product or waste product. For each separate area identified, the description must include:

A. A list of the **activities** (*e.g.,* pressure washing, blasting and painting, material storage, engine maintenance and repair, material handling, equipment fueling and cleaning);

B. A list of the associated **pollutant**(s) or pollutant parameter(s) (*e.g.,* crankcase oil, iron, biochemical oxygen demand, pH) for each activity. The pollutant list must include all significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of five (5) years before being covered under this permit and the present;

C. Method of on-site **storage or disposal**;

D. A prediction of the **direction of flow** and an estimate of the types of pollutants, which are likely to be present in the storm water discharge from each area.

V. Spills and Leaks

The permittee must clearly identify areas where potential spills and leaks, which can contribute pollutants to storm water discharges, can occur, and their accompanying drainage points. For areas that are exposed to precipitation or that otherwise drain to a storm water conveyance at the facility, the permittee must provide a list of significant spills and leaks of toxic or hazardous pollutants that occurred during the five (5) year period prior to the date of the submission of a Notice of Intent (NOI). The list must be updated if significant spills or leaks occur in exposed areas of the facility during the time the permittee are covered by the permit.

VI. Sampling Data

The permittee must provide a summary of existing storm water discharge sampling data taken at the facility. All storm water sampling data collected during the term of this permit must also be summarized and included in this part of the SWPPP.

VII. Storm Water Controls

Describe the type and location of existing non-structural and structural best management practices (BMPs) selected for each of the areas where industrial materials or activities are exposed to storm water. All the areas identified in Part IV above should have a BMP(s) identified for the area's discharges. For areas where BMPs are not currently in place, describe appropriate BMPs that the permittee will use to control pollutants in storm water discharges. The SWPPP must include a schedule for the implementation of all proposed BMPs.

A. Good Housekeeping Measures

1. Pressure Washing Area. If pressure washing is used to remove marine growth from vessels, the discharge water must be permitted by a separate RIPDES permit. In the SWPPP, describe the measures to collect or contain the discharges from the pressure washing area; the method for the removal of the visible solids; the methods of disposal of the collected solids; and where the discharge will be released.

2. Blasting, Scraping, Sanding and Painting Area(s). Implement and describe measures to prevent spent abrasives, paint chips, sanding dust and over spray from discharging into the receiving water or the storm sewer systems. Consider containing all blasting/scraping/sanding/painting activities or use other measures to prevent or minimize the discharge of contaminants (*e.g.,* hanging plastic barriers or tarpaulins during blasting or painting operations to contain debris, using vacuum sanders). Where necessary, regularly clean storm water conveyances of deposits of abrasive blasting debris and paint chips. Detail in the SWPPP any standard operating practices relating to blasting/scraping/sanding/painting (*e.g.,* prohibiting uncontained blasting/painting over open water, or prohibiting blasting/painting during windy conditions which can render containment ineffective).

3. Material Storage Areas. Store and plainly label all containerized materials (e.g., fuels, paints, solvents, waste oil, antifreeze, batteries) in a protected, secure location away from drains. Implement and describe measures to prevent or minimize the contamination of precipitation/surface runoff from the storage areas. Specify which materials are stored indoors and consider containment or enclosure for those stored outdoors. If abrasive blasting is performed, discuss the storage and disposal of spent abrasive materials generated at the facility. Consider implementing an inventory control plan to limit the presence of potentially hazardous materials onsite.

4. Engine Maintenance and Repair Areas. Implement and describe measures to prevent or minimize the contamination of precipitation/surface runoff from all areas used for engine maintenance and repair. Consider the following (or their equivalents): performing all maintenance activities indoors; maintaining an organized inventory of materials used in the shop; draining all parts of fluid prior to disposal; prohibiting the practice of hosing down the shop floor; using dry cleanup methods; and treating and /or recycling storm water runoff collected from the maintenance area.

5. Material Handling Area. Implement and describe measures to prevent or minimize the contamination of precipitation/surface runoff from material handling operations and areas (*e.g.,* fueling, paint and solvent mixing, disposal of process wastewater streams from vessels). Consider the following (or their equivalents): covering fueling areas; using spill/overflow protection; mixing paints and solvents in a designated area (preferably indoors or under a shed); and minimize runoff of storm water to material handling areas.

6. Drydock Activities. Describe the procedures for routinely maintaining/cleaning the drydock to prevent or minimize pollutants in storm water runoff. Address the cleaning of accessible areas of the drydock prior to flooding, and final cleanup following removal of the vessel and raising the dock. Include procedures for cleaning up oil, grease or fuel spills occurring on the drydock. Consider the following (or their equivalents): sweeping rather than hosing off debris/spent blasting material from accessible areas of the drydock prior to flooding, and having absorbent materials and oil containment booms readily available to contain/cleanup any spills.

7. General Yard Area. Implement and describe a schedule for routine yard maintenance and cleanup, including management of trash bins, recycling containers, and dumpsters. Regularly remove from the general yard area: scrap metal, wood, plastic, miscellaneous trash, paper, glass, industrial scrap, insulation, welding rods, packaging, etc.

B. Minimizing Exposure

Where practicable, industrial materials and activities should be protected by a storm resistant shelter to prevent exposure to rain, snow, snowmelt, or runoff. NOTE: Eliminating exposure at all industrial areas may make the facility eligible for the RIPDES Rule 31(h) "No Exposure" exclusion from needing to have a permit.

C. Preventive Maintenance

As part of the preventive maintenance program, perform timely inspection and maintenance of storm water management devices (*e.g.,* cleaning oil/water separators and sediment traps to ensure that spent abrasives, paint chips and solids will be intercepted and retained prior to entering the storm drainage system) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.

D. Spill Prevention and Response Procedures

The permittee must describe the procedures which will be followed for cleaning up spills or leaks. Those procedures, and necessary spill response equipment, must be made available to those employees that may cause or detect a spill or leak. Where appropriate, the permittee must explain existing or planned material handling procedures, storage requirements, secondary containment, and equipment (*e.g.,* diversion valves), which are intended to minimize spills or leaks at the facility. Measures for cleaning up hazardous material spills or leaks must be consistent with applicable RCRA regulations at 40 CFR Part 264 and 40 CFR Part 265. Emergency response plans developed for other purposes (*e.g.,* SPCC Plan) may be incorporated here by reference.

E. Routine Facility Inspections

Qualified facility personnel must inspect the following areas on a monthly basis: pressure washing area; blasting, sanding and painting areas; material storage areas; engine maintenance/repair areas; material handling areas; dry dock area; and general yard area. The inspections must include an evaluation of existing storm water BMPs. Any deficiencies in implementation of the SWPPP must be corrected as soon as practicable: preferably before the next anticipated storm event but no later than 14 days after the inspection. The permittee must document in the SWPPP the results of the inspections and the corrective actions taken in response to any deficiencies or opportunities for improvement identified during the inspections.

F. Employee Training

Describe the storm water employee training program for the facility. The permittee must provide employee training for all employees that work in areas where industrial materials or activities are exposed to storm water, and for employees that are responsible for implementing activities

identified in the SWPPP (e.g., inspectors, maintenance people). The training program should inform employees about the components and goals of the SWPPP and address, at a minimum, the following activities (as applicable): used oil management; spent solvent management; disposal of spent abrasives; disposal of vessel wastewaters; spill prevention and control; fueling procedures; general good housekeeping practices; painting and blasting procedures; and used battery management.

G. Sediment and Erosion Control

The permittee must identify the areas at the facility which, due to topography, land disturbance (e.g., construction), or other factors, have a potential for significant soil erosion. The permittee must describe the structural, vegetative, and/or stabilization BMPs that the permittee will be implementing to limit erosion.

H. Management of Runoff

The permittee must describe the traditional storm water management practices (permanent structural BMPs other than those which control the generation or source(s) of pollutants) that currently exist or that are planned for the facility. These types of BMPs typically are used to divert, infiltrate, reuse, or otherwise reduce pollutants in storm water discharges from the site. All BMPs that the permittee determines are reasonable and appropriate, or are required by a State or local authority; or are necessary to maintain eligibility for the permit must be implemented and maintained. Factors to consider when the permittee is selecting appropriate BMPs should include: 1) the industrial materials and activities that are exposed to storm water, and the associated pollutant potential of those materials and activities; and 2) the beneficial and potential detrimental effects on surface water quality, ground water quality, receiving water base flow (dry weather stream flow), and physical integrity of receiving waters. Structural measures should be placed on upland soils, avoiding wetlands and floodplains, if possible. Structural BMPs may require a separate permit under section 404 of the CWA before installation begins. BMPs the permittee could use include but are not limited to: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices).

I. Other Controls

No solid materials, including floatable debris, may be discharged to waters of the State, except as authorized by a permit issued under section 404 of the CWA. Off-site vehicle tracking of raw, final, or waste materials or sediments, and the generation of dust must be minimized. Tracking or blowing of raw, final, or waste materials from areas of no exposure to exposed areas must be minimized. Velocity dissipation devices must be placed at discharge locations and along the length of any outfall channel if they are necessary to provide a non-erosive flow velocity from the structure to a water course.

VIII. Maintenance

All BMPs identified in the SWPPP must be maintained in effective operating condition.

IX. Non-Storm Water Discharges

A. Certification of Non-Storm Water Discharges

1. The SWPPP must include a certification that all discharges (*i.e.*, outfalls) have been tested or evaluated for the presence of non-storm water. The certification must be signed in accordance with Part VII.G of the MSGP permit, and include:
   a. the date of any testing and/or evaluation;
   b. identification of potential significant sources of non-storm water at the site;
   c. a description of the results of any test and/or evaluation for the presence of non-storm water discharges;
   d. a description of the evaluation criteria or testing method used; and
   e. a list of the outfalls or onsite drainage points that were directly observed during the test.

2. If the permittee is unable to provide the certification required (testing for non-storm water discharges), the permittee must notify the Director 180 days after submitting an NOI to be covered by this permit. If the failure to certify is caused by the inability to perform adequate tests or evaluations, such notification must describe:
   a. reason(s) why certification was not possible;
   b. the procedure of any test attempted;
   c. the results of such test or other relevant observations; and
   d. potential sources of non-storm water discharges to the storm sewer.

3. A copy of the notification must be included in the SWPPP at the facility. Non-storm water discharges to waters of the State which are not authorized by a RIPDES permit are unlawful, and must be terminated.

B. Allowable Non-Storm Water Discharges

1. Certain sources of non-storm water are allowable under this permit. Allowable non-storm water discharges under this permit are limited to the following: discharges from fire fighting activities; fire hydrant flushings; external building washdown that does not use detergents; lawn watering; uncontaminated ground water; springs; air conditioning condensate; potable waterline flushings; irrigation drainage; foundation or footing drains where flows are not contaminated with process materials, such as solvents, or

contaminated by contact with soils, where spills or leaks of toxic or hazardous materials has occurred; and incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of your facility, but NOT intentional discharges from the cooling tower (e.g., "piped" cooling tower blowdown or drains); uncontaminated utility vault dewatering; dechlorinated water line testing water; hydrostatic test water that does not contain any treatment chemicals and is not contaminated with process chemicals. In order for these discharges to be allowed, the SWPPP must include:

a. identification of each allowable non-storm water source;
b. the location where it is likely to be discharged; and
c. descriptions of appropriate BMPs for each source.

2. Except for flows from fire fighting activities, the permittee must identify in the SWPPP all sources of allowable non-storm water that are discharged under the authority of this permit.

3. If the permittee includes mist blown from cooling towers amongst the allowable non-storm water discharges, the permittee must specifically evaluate the potential for the discharges to be contaminated by chemicals used in the cooling tower and determine that the levels of such chemicals in the discharges would not cause or contribute to a violation of an applicable water quality standard after implementation of the BMPs the permittee has selected to control such discharges.

X. Documentation of Permit Eligibility Related to Endangered Species

The permittee must identify in the SWPPP if the facility is located within or discharges to a critical habitat of a listed or proposed to be listed endangered or threatened species (this information can be found on RIDEM's web site under Maps, Community Planning Maps, Natural Heritage Areas). If the Department makes a determination that the discharge may adversely affect a critical habitat of a listed or proposed to be listed endangered or threatened species, the discharge cannot be authorized under this permit and the permittee must submit an application for an individual RIPDES permit that would require appropriate storm water controls or the permittee must eliminate the discharge.

XI. Copy of Permit Requirements

The permittee must include a copy of the Multi-Sector General Permit in the SWPPP.

XII. Applicable State or Local Plans

The SWPPP must be consistent (and updated as necessary to remain consistent) with applicable State and/or local storm water, waste disposal, sanitary sewer or septic system regulations to the extent these apply to the facility and are more stringent than the requirements of this permit.

XIII. Comprehensive Site Compliance Evaluation.

Conduct regularly scheduled evaluations at least once a year and address those areas contributing to a storm water discharge associated with industrial activity (e.g., pressure washing area, blasting/sanding areas, painting areas, material storage areas, engine maintenance/repair areas, material handling areas, and drydock area) and areas where spills and leaks have occurred within the past 5 years. Inspect these sources for evidence of, or the potential for, pollutants entering the drainage system. Based on the results of the inspection, the permittee must modify the SWPPP as necessary to include additional or modified BMPs designed to correct problems identified. The permittee must insure a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, and major observations relating to the implementation of the SWPPP is completed no more than twelve (12) weeks after the date of the inspection and retained as part of the SWPPP for at least five (5) years from the date of the report.

XIV. Maintaining Updated SWPPP

The permittee must amend the Storm Water Pollution Prevention Plan whenever:

A. there is a change in design, construction, operation, or maintenance at the facility which has a significant effect on the discharge, or potential for discharge, of pollutants from the facility;
B. during inspections, monitoring, or investigations by the permittee or by local, State, or Federal officials it is determined the SWPPP is ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV or is otherwise not achieving the general objectives of controlling pollutants in discharges from the facility.

XV. Signature, Plan Review and Making Plans Available

The permittee must sign the SWPPP in accordance with guidance specified within the permit. and retain the plan on-site at the facility covered by this permit. The permittee must make the SWPPP available upon request to the Director, a Federal, State, or local agency approving storm water management plans, or the operator of a municipal separate storm sewer receiving discharge from the site. Also, in the interest of the public's right to know, the permittee must provide a copy of the SWPPP to the public if requested in writing to do so.

XVI. Additional Requirements for SARA Title III Facilities

Potential pollutant sources for which the permittee has reporting requirements under EPCRA 313 must be identified in the summary of potential pollutant sources as per Part IV.F.4. Note this additional requirement only applies to the permittee if the permittee is subject to reporting requirements under EPCRA 313.

XVII. Additional Requirements for Salt Storage Piles

If storage piles of salt used for deicing or other commercial or industrial purposes are located at the facility, they must be enclosed or covered to

prevent exposure to precipitation (except for exposure resulting from adding or removing materials from the pile). Piles do not need to be enclosed or covered where storm water from the pile is not discharged to waters of the State or the discharges from the piles are authorized under another permit.

Appendix 3:

Air Pollution Control Regulation No. 22, Table III

Minimum Quantities of Regulated Pollutants

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Acetaldehyde	75070	50
Acetamide	60355	5
Acetone	67641	20,000
Acetonitrile	75058	200
Acetophenone	98862	900
2-Acetylaminofluorene	53963	0.09
Acrolein	107028	0.04
Acrylamide	79061	0.09
Acrylic acid	79107	3
Acrylonitrile	107131	1
Aldrin	309002	0.002
Allyl chloride	107051	3
2-Aminoanthraquinone	117793	10
4-Aminobiphenyl	92671	0.02
Ammonia	7664417	400
Aniline	62533	3
o-Anisidine	90040	2
Antimony & compounds[a], including antimony trioxide		0.6
Aramite	140578	10
Arsenic & compounds[a] (inorganic)		0.02
Arsine	7784421	0.2
Asbestos	1332214	400[b]
Azobenzene	103333	3
Barium	7440393	600
Benzene	71432	10
Benzidine	92875	0.002
Benzoic acid	65850	30,000
Benzotrichloride	98077	0.03
Benzyl chloride	100447	2
Beryllium & compounds[a]		0.04
Biphenyl	92524	600
Bis (chloromethyl) ether	542881	0.002
Bis (2-ethylhexyl) phthalate (DEHP)	117817	40
Boron and borates		90
Bromates (including Potassium bromate)		0.8
Bromine and compounds (except Hydrogen bromide & Bromates)		200
Bromodichloromethane	75274	3
Bromoform	75252	100
1,3-Butadiene	106990	3
Butyl benzyl phthalate	85687	2,000

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Cadmium & compounds[a]		0.07
Calcium cyanamide	156627	100
Captan	133062	100
Carbaryl	63252	900
Carbon disulfide	75150	2,000
Carbon tetrachloride	56235	8
Carbonyl sulfide	463581	70
Catechol	120809	500
Chloramben	133904	200
Chlordane	57749	0.1
Chlorinated paraffins (avg length C12- C13, 60% chlorine)	108171262	4
Chlorine	7782505	20
Chlorine dioxide	10049044	20
Chloroacetic acid	79118	0.002
2-Chloroacetophenone	532274	0.09
4-Chloroaniline	106478	30
Chlorobenzene	108907	20,000
Chlorobenzilate	510156	80
1-Chloro-1,1-difluoroethane (CFC 142B)	75683	36,500
Chlorodifluoromethane (HCFC-22)	75456	36,500
Chloroform	67663	20
Chloromethyl methyl ether	107302	0.1
2-Chlorophenol	95578	60
4-Chloro-o-phenylenediamine	95830	20
Chloropicrin	76062	10
Chloroprene	126998	100
p-chloro-o-toluidine	95692	1
Chromium III & compounds[a], insoluble salts		20,000
Chromium VI & compounds[a]		0.009
Cobalt & compounds[a]		1
Coke oven emissions	8007452	0.2
Copper & compounds[a], except Copper cyanide		40
p-Cresidine	120718	2
Cresols/Cresylic acid isomers and mixtures (Methylphenols)	1319773	20,000
Cumene	98828	1,000
Cupferron	135206	2
Cyanide & compounds (inorganic)[i], except Hydrogen cyanide		100
Cyclohexane	110827	20,000
2,4-Diaminoanisole	615054	20
2,4-Diaminotoluene	95807	0.1
Diazomethane	334883	90

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Dibromochloromethane	124481	40
1,2-Dibromo-3-chloropropane	96128	0.05
Dibutylphthalate	84742	700
1,2-Dichlorobenzene	95501	900
1,4-Dichlorobenzene (p-Dichlorobenzene)	106467	10
3,3'-Dichlorobenzidene	91941	0.3
Dichloro diphenyl dichloroethylene (DDE)	3547044	1
cis- 1,2-Dichloroethene	156592	1,000
trans- 1,2-Dichloroethene	156605	200
Dichloroethyl ether (Bis (chloroethyl) ether)	111444	0.3
2,4-Dichlorophenoxyacetic acid, salts & esters (2,4-D)	94757	90
1,3-Dichloropropene	542756	20
Dichlorvos	62737	1
Dieldrin	60571	0.02
Diethanolamine	111422	300
Diethyl sulfate	64675	0.3
1,1-Difluoroethane (HCFC 152a)	75376	36,500
3,3'-Dimethoxybenzidine	119904	0.05
p-Dimethyl aminoazobenzene	60177	0.09
n,n-Dimethyl aniline	121697	20
3,3'-Dimethyl benzidine	119937	0.002
Dimethyl carbamoyl chloride	79447	0.03
Dimethyl formamide	68122	3,000
1,1-Dimethyl hyrazine	57147	0.1
1,2-Dimethyl hyrazine	540738	0.0007
2,4-Dimethylphenol	105679	200
Dimethyl phthalate	131113	1,000
Dimethyl sulfate	77781	0.02
4,6-Dinitro-o-cresol	534521	4
2,4-Dinitrophenol	51285	10
2,4-Dinitrotoluene	121142	1
1,4-Dioxane (1,4-Diethyleneoxide)	123911	10
1,2-Diphenylhydrazine (Hydrazobenzene)	122667	0.5
Epichlorohydrin	106898	90
1,2-Epoxybutane	106887	200
Ethyl acrylate	140885	50
Ethyl benzene	100414	3,000
Ethyl carbamate (Urethane)	51796	0.3
Ethyl chloride (Chloroethane)	75003	10,000
Ethylene dibromide (Dibromoethane)	106934	0.5
Ethylene dichloride (1,2-Dichloroethane)	107062	4

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Ethylene glycol	107211	400
Ethylene glycol monobutyl ether	111762	4,000
Ethylene glycol monoethyl ether	110805	100
Ethylene glycol monoethyl ether acetate	111159	40
Ethylene glycol monomethyl ether	109864	30
Ethylene glycol monomethyl ether acetate	110496	10,000
Ethylene imine (Aziridine)	151564	0.005
Ethylene oxide	75218	1
Ethylene thiourea	96457	9
Ethylidene dichloride (1,1-Dichloroethane)	75343	70
Fluorides & compounds, including Hydrogen fluoride		7
Formaldehyde	50000	9
Glutaraldehyde	111308	9
Heptachlor	76448	0.009
Hexachlorobenzene	118741	0.02
Hexachlorobutadiene	87683	2
Hexachlorocyclohexanes, technical grade & mixed isomers	608731	0.2
alpha-Hexachlorocyclohexane	319846	0.07
beta-Hexachlorocyclohexane	319857	0.2
gamma-Hexachlorocyclohexane (Lindane)	58899	0.1
Hexachlorocyclopentadiene	77474	20
Hexachloroethane	67721	30
Hexamethylene-1,6-diisocyanate	822060	0.6
Hexamethylphosphoramide	680319	0.005
Hexane	110543	20,000
Hydrazine	302012	0.02
Hydrochloric acid (Hydrogen chloride)	7647010	700
Hydrogen bromide	10035106	2,000
Hydrogen cyanide	74908	100
Hydrogen sulfide	7783064	10
Hydroquinone	123319	500
Isophorone	78591	2,000
Isopropanol	67630	1,000
Lead & compounds[a], inorganic		0.9
Lead - tetraethyl lead	78002	0.0009
Maleic anhydride	108316	4
Manganese & compounds[a]		0.2
Mercury & compounds[a] – elemental & inorganic		0.7
Mercury – Methyl mercury	22967926	0. 3
Methanol	67561	10,000
Methoxychlor	72435	60

31

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Methyl bromide (Bromomethane)	74839	70
Methyl chloride (Chloromethane)	74873	400
Methyl chloroform (1,1,1-Trichloroethane)	71556	4,000
4,4-Methylene bis (2-chloroaniline)	101144	0.2
Methylene chloride (Dichloromethane)	75092	200
4,4-Methylenedianiline	101779	0.2
Methylene diphenyl diisocyanate	101688	70
Methyl ethyl ketone (2-Butanone)	78933	4,000
Methyl hydrazine	60344	0.04
Methyl iodide (Iodomethane)	74884	1,000
Methyl isobutyl ketone (Hexanone)	108101	9,000
Methyl isocyanate	624839	100
Methyl methacrylate	80626	2,000
Methyl tert butyl ether (MTBE)	1634044	3,000
Michler's ketone (4,4'-Bis (dimethylamino) benzophenone)	90948	0.4
Fine mineral fibers[c]		2,000
Molybdenum and compounds[a]		60
Naphthalene	91203	30
Nickel and compounds[a], except Nickel subsulfide		0.4
Nickel subsulfide	12035722	0.2
Nitric acid	7697372	30
Nitrobenzene	98953	200
4-Nitrobiphenyl	92933	0.002
4-Nitrophenol	100027	10
2-Nitropropane	79469	10
N-Nitrosodi-n-butylamine	924163	0.07
N-Nitrosodiethylamine	55185	0.002
N-Nitrosodimethylamine	62759	0.008
N-Nitrosodiphenylamine	86306	40
N-Nitrosdi-n-propylamine	621647	0.05
N-Nitroso-n-methylethylamine	10595956	0.02
N-Nitroso-n-methylurea	684935	0.003
N-Nitrosomorpholine	59892	0.05
N-Nitrosopiperidine	100754	0.04
N-Nitrosopyrrolidine	930552	0.2
Parathion	56382	20
Pentachloronitrobenzene (Quintozene)	82688	30
Pentachlorophenol	87865	7
Phenol	108952	2,000
p-Phenylenediamine	106503	20
Phosgene	75445	1

32

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
Phosphine	7803512	30
Phosphoric acid	7664382	800
Phosphorus, white	7723140	0. 2
Phthalic anhydride	85449	2,000
Polychlorinated biphenyls (PCBs), except Aroclor 1254	1336363	0.1
PCBs- Aroclor 1254	11097691	0.2
Polychlorinated dibenzo dioxins (PCDDs), polychlorinated dibenzo furans (PCDFs) and dioxin-like polychlorinated biphenyls (PCBs)		3×10^{-7}[d]
Polycyclic Organic Matter		0.01[e]
1,3-Propane sultone	1120714	0.1
beta-Propiolactone	57578	0.02
Propionaldehyde	123386	10,000
Propoxur (Baygon)	114261	10
Propylene	115071	36,500
Propylene dichloride (1,2-Dichloropropane)	78875	10
Propylene glycol monomethyl ether (PGME)	107982	36,500
Propylene oxide	75569	30
1,2-Propylenimine (2-Methyl aziridine)	75558	0.01
Quinoline	91225	0.1
Quinone	106514	100
Selenium & compounds[a] except Hydrogen selenide and Selenium sulfide	7782492	2,000
Selenium – Hydrogen selenide		2
Selenium sulfide	7446346	20
Sodium hydroxide	1310732	3
Styrene	100425	3,000
Styrene oxide	96093	2
Sulfates[f]		40
Sulfuric acid and Oleum[g]		40
1,1,1,2-Tetrachloroethane	630206	300
1,1,2,2-Tetrachloroethane	79345	9,000
Tetrachloroethylene (Perchloroethylene)	127184	20
Tetrachlorophenols	25167833	10,000
1,1,1,2-Tetrafluoroethane	811972	36,500
Thioacetamide	62555	0.07
Titanium tetrachloride	7550450	10
Toluene	108883	1,000
2,4-Toluene diamine (2,4-Diaminotoluene)	95807	0.1
2,4-and 2,6-Toluene diisocyanate[h]	26471625	8
o-Toluidine	95534	2
Toxaphene (Chlorinated camphene)	8001352	0.03

33

Table III Minimum Quantities (pounds/year)		
CHEMICAL NAME	**CAS #**	**Minimum Quantity**
1,2,4-Trichlorobenzene	120821	90
1,1,2-Trichloroethane	79005	30
Trichloroethylene	79016	50
Trichlorofluoromethane	75694	3,000
2,4,5-Trichlorophenol	95954	900
2,4,6-Trichlorophenol	88062	30
Triethylamine	121448	800
Trifluralin	1582098	90
2,2,4-Trimethylpentane	540841	20,000
Vanadium and compounds[a]		0.07
Vinyl acetate	108054	600
Vinyl bromide	593602	0.5
Vinyl chloride	75014	20
Vinylidene chloride (1,1-Dichloroethylene)	75354	600
Xylenes, isomers and mixtures	1330207	1,000
Zinc and compounds[a]		3,000

[a]For metal compounds, Minimum Quantities apply to the metal portion of the compound.
[b]Asbestos units are fibers/year.
[c]Fine mineral fibers are mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers or other mineral derived fibers of average diameter 1 micrometer (µm) or less.
[d]PCDD Minimum Quantity is in terms of 2,3,7,8-tetrachlorodibenzodioxin equivalents, calculated as specified in the Rhode Island Air Toxics Guideline.
[e]Polycyclic Organic Matter Minimum Quantity is in terms of benzo(a)pyrene equivalents, calculated as specified in the Rhode Island Air Toxics Guideline.
[f]Sulfates MQ applies to ammonium bisulfate [$(NH_4)HSO_4$, CAS 7803-63-6], ammonium sulfate [$(NH_4)_2SO_4$, CAS 7783-20-2], ferric sulfate [$Fe(SO_4)_3$, CAS 10028-22-5] and sodium sulfate [Na_2SO_4, CAS 7757-82-6]
[g]Sulfuric acid and oleum MQ applies to sulfuric acid (H_2SO_4, CAS 7664-03-9), sulfur trioxide (SO_3, CAS 7446-71-9) and oleum ($H_2SO_4 + SO_3$, CAS 8014-95-7)
[h]Includes 2,4-TDI (CAS 584849), 2,6-TDI (CAS 91087) and 2,4/2,6 mixtures (CAS 26471625)
[i]XCN where X equals any group other than H where a formal dissociation may occur, such as KCN or $Ca(Cn)_2$.

34

Appendix 4:

Hazardous Waste Storage Area Inspection Checklist

Hazardous Waste Storage Area Inspection Checklist

Weekly Inspection Checklist and Record for_____ (shop name)

Name/Title of Inspector:_____Date and Time of Inspection:_____

Area(s) Inspected:_____Number of Full Containers:_____

Are All Containers Closed:_____

Condition of Containers:_____
(Do containers show signs of leaking? Is there deterioration due to rust? Have containers been damaged?)

Condition/Integrity of Containment Area:_____
(Will the area effectively contain a spill or leakage? Have berms or other containment device deteriorated or been damaged?)

Is there sufficient aisle space between rows of drums?_____
(At least three feet.)

Are ground-wires in place for ignitable wastes?_____
(Note condition of wires as well.)

Is there evidence of spilled material?_____

If there was a spill, list remedial action taken:_____
_____
(Example: Spill was cleaned and leaking drum was replaced.)

Are drum labeling requirements satisfied?_____
(Each container in the hazardous waste storage area must be labeled with the following information.)

EPA Label

HAZARDOUS WASTE -Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

The Generator's Name and Address:_____
_____

Generic Waste Shipping Name:_____
Hazard:_____
EPA Waste Code:_____
Date of Containerization:_____
Manifest Document Number:_____

DOT Hazard Label

Additional remarks or actions to be taken:_____
_____
_____

Record this inspection in an inspection log and keep these records for at least three (3) years from the date of inspection.

20

Source: "Hazardous Waste Compliance Workbook for Rhode Island Generators," State of Rhode Island, Department of Environmental Management, Office of Technical and Customer Assistance, March 2002.

Appendix 5:

Spill Prevention, Control and Countermeasure (SPCC) Plan Template

Appendix 6:

Hazardous Waste Contingency Plan Guidance

Source: "Hazardous Waste Compliance Workbook for Rhode Island Generators," State of Rhode Island, Department of Environmental Management, Office of Technical and Customer Assistance, March 2002.

Rule 5.02 (Storage) of the Rhode Island Rules and Regulations for Hazardous Waste Management requires that all hazardous waste generators prepare a formal written plan outlining specific steps that company personnel will take in response to spills, fires, and explosions or any unplanned release involving hazardous wastes or hazardous waste constituents which could threaten human health or the environment. This rule references 40 CFR 265 Subparts C and D of the Code of Federal Regulations (enclosed). This guidance was developed by the Department [of Environmental Management] to assist companies in developing a good, thorough, and easy-to-read plan for use during an emergency involving hazardous waste. Although contingency plans are site-specific and can be of various levels of detail, this information may be useful as a general guide. Please note that the contingency plan guidance is not necessarily all-inclusive, and that the Department requires that the preparer address all of the items in 40 CFR Subparts C and D.

Please contact the Division of Waste Management at (401) 277-2797 if you have specific questions regarding this guide or any other questions related to hazardous waste management.

INDEX/CONTENTS OF PLAN

1. Introduction
2. Index
3. Emergency Coordinators
4. Emergency Procedures
5. Emergency Equipment
6. Evacuation Routes
7. Facility Site Diagram
8. Arrangements with Local Authorities

EMERGENCY COORDINATORS

The emergency coordinators listed in this section are authorized to act as on-scene coordinators and to commit the necessary resources during an emergency. At all times, there is at least one coordinator (primary or alternate) either on the company premises or on-call. The coordinators must be familiar with all aspects of the contingency plan, all operations and activities at the company, the locations and characteristics of wastes

handled, the location of all company records, and the physical layout of the company. The emergency coordinator will take all reasonable measures to ensure that fires, explosions, and/or releases do not occur, recur, or spread to other areas in the company. These measures shall include, where applicable, stopping processes and operations, collecting and containing released waste, and removing or isolating containers.

The coordinators are as follows:

Primary Coordinator:
Name:
Address:
Phone number (work/home/mobile):

Alternate Coordinator:
Name:
Address:
Phone number (work/home/mobile):

Note: Qualifications of the emergency coordinators should be included in a separate enclosure.

EMERGENCY PROCEDURES

During an emergency, the emergency coordinator shall perform the necessary actions to insure a timely and appropriate response. The coordinator shall choose the order and applicability of the following actions, based upon the situation and the hazardous waste or hazardous waste constituents involved:

1. Identify and assess the situation (source, health and environmental impact),
2. Activate alarm to notify all company personnel,
3. Evacuate the company, if necessary,
4. Determine action to be taken (*e.g.* containment, absorption),
5. Oversee the cleanup throughout its entirety.
6. Within 15 days after the incident, emergency coordinator must submit a written report on the incident to the DEM and Regional EPA Administrator.

Note: Emergency procedures should be a step-by-step, site-specific plan which would be implemented in the event of an emergency. A detailed description of actions to be taken by company personnel during an emergency should be included.

EMERGENCY EQUIPMENT

The following equipment should be found in good condition at the company. Include the physical description and capabilities of each item:

EQUIPMENT PHYSICAL DESCRIPTION AND CAPABILITIES

Alarm system
Communication Systems
Fire Extinguishers
Sprinkler Systems
Spill Control
Personnel Protection
Other

Note: Location of emergency equipment should be indicated on site diagrams.

EVACUATION ROUTES

In the event an emergency arises involving hazardous waste where an evacuation of company personnel becomes necessary, the following evacuation plan would be implemented. Include a description of the signal that would be given to begin evacuation and both primary and secondary evacuation routes personnel would utilize.

Note: Indicate evacuation routes on facility site plan.

FACILITY SITE DIAGRAM

Note: Indicate location of emergency equipment, hazardous waste storage area(s), and both primary and secondary evacuation routes.

ARRANGEMENTS

The following local authorities have been sent copies of the contingency plan:

Police
Fire
Hospital
Response Contractor
Other

Note: Identify the primary emergency authority where more than one police or fire department may respond. Describe arrangements agreed to and provide documentation of local authority notifications.

I have read and understood the Contingency Plan and Emergency Procedures.

Employee's Name (Print)	Signature	Date

Appendix 7:

Joint science academies' statement: Global response to climate change

Joint science academies' statement: Global response to climate change

Climate change is real

There will always be uncertainty in understanding a system as complex as the world's climate. However there is now strong evidence that significant global warming is occurring[1]. The evidence comes from direct measurements of rising surface air temperatures and subsurface ocean temperatures and from phenomena such as increases in average global sea levels, retreating glaciers, and changes to many physical and biological systems. It is likely that most of the warming in recent decades can be attributed to human activities (IPCC 2001)[2]. This warming has already led to changes in the Earth's climate.

The existence of greenhouse gases in the atmosphere is vital to life on Earth – in their absence average temperatures would be about 30 centigrade degrees lower than they are today. But human activities are now causing atmospheric concentrations of greenhouse gases – including carbon dioxide, methane, tropospheric ozone, and nitrous oxide – to rise well above pre-industrial levels. Carbon dioxide levels have increased from 280 ppm in 1750 to over 375 ppm today – higher than any previous levels that can be reliably measured (i.e. in the last 420,000 years). Increasing greenhouse gases are causing temperatures to rise; the Earth's surface warmed by approximately 0.6 centigrade degrees over the twentieth century. The Intergovernmental Panel on Climate Change (IPCC) projected that the average global surface temperatures will continue to increase to between 1.4 centigrade degrees and 5.8 centigrade degrees above 1990 levels, by 2100.

Reduce the causes of climate change

The scientific understanding of climate change is now sufficiently clear to justify nations taking prompt action. It is vital that all nations identify cost-effective steps that they can take now, to contribute to substantial and long-term reduction in net global greenhouse gas emissions.

Action taken now to reduce significantly the build-up of greenhouse gases in the atmosphere will lessen the magnitude and rate of climate change. As the United Nations Framework Convention on Climate Change (UNFCCC) recognises, a lack of full scientific certainty about some aspects of climate change is not a reason for delaying an immediate response that will, at a reasonable cost, prevent dangerous anthropogenic interference with the climate system.

As nations and economies develop over the next 25 years, world primary energy demand is estimated to increase by almost 60%. Fossil fuels, which are responsible for the majority of carbon dioxide emissions produced by human activities, provide valuable resources for many nations and are projected to provide 85% of this demand (IEA 2004)[3]. Minimising the amount of this carbon dioxide reaching the atmosphere presents a huge challenge. There are many potentially cost-effective technological options that could contribute to stabilising greenhouse gas concentrations. These are at various stages of research and development. However barriers to their broad deployment still need to be overcome.

Carbon dioxide can remain in the atmosphere for many decades. Even with possible lowered emission rates we will be experiencing the impacts of climate change throughout the 21st century and beyond. Failure to implement significant reductions in net greenhouse gas emissions now, will make the job much harder in the future.

Prepare for the consequences of climate change

Major parts of the climate system respond slowly to changes in greenhouse gas concentrations. Even if greenhouse gas emissions were stabilised instantly at today's levels, the climate would still continue to change as it adapts to the increased emission of recent decades. Further changes in climate are therefore unavoidable. Nations must prepare for them.

The projected changes in climate will have both beneficial and adverse effects at the regional level, for example on water resources, agriculture, natural ecosystems and human health. The larger and faster the changes in climate, the more likely it is that adverse effects will dominate. Increasing temperatures are likely to increase the frequency and severity of weather events such as heat waves and heavy rainfall. Increasing temperatures could lead to large-scale effects such as melting of large ice sheets (with major impacts on low-lying regions throughout the world). The IPCC estimates that the combined effects of ice melting and sea water expansion from ocean warming are projected to cause the global mean sea-level to rise by between 0.1 and 0.9 metres between 1990 and 2100. In Bangladesh alone, a 0.5 metre sea-level rise would place about 6 million people at risk from flooding.

Developing nations that lack the infrastructure or resources to respond to the impacts of climate change will be particularly affected. It is clear that many of the world's poorest people are likely to suffer the most from climate change. Long-term global efforts to create a more healthy, prosperous and sustainable world may be severely hindered by changes in the climate.

The task of devising and implementing strategies to adapt to the consequences of climate change will require worldwide collaborative inputs from a wide range of experts, including physical and natural scientists, engineers, social scientists, medical scientists, those in the humanities, business leaders and economists.

June 2005

Conclusion

We urge all nations, in the line with the UNFCCC principles[4], to take prompt action to reduce the causes of climate change, adapt to its impacts and ensure that the issue is included in all relevant national and international strategies. As national science academies, we commit to working with governments to help develop and implement the national and international response to the challenge of climate change.

G8 nations have been responsible for much of the past greenhouse gas emissions. As parties to the UNFCCC, G8 nations are committed to showing leadership in addressing climate change and assisting developing nations to meet the challenges of adaptation and mitigation.

We call on world leaders, including those meeting at the Gleneagles G8 Summit in July 2005, to:

- Acknowledge that the threat of climate change is clear and increasing.
- Launch an international study[5] to explore scientifically-informed targets for atmospheric greenhouse gas concentrations, and their associated emissions scenarios, that will enable nations to avoid impacts deemed unacceptable.
- Identify cost-effective steps that can be taken now to contribute to substantial and long-term reduction in net global greenhouse gas emissions. Recognise that delayed action will increase the risk of adverse environmental effects and will likely incur a greater cost.
- Work with developing nations to build a scientific and technological capacity best suited to their circumstances, enabling them to develop innovative solutions to mitigate and adapt to the adverse effects of climate change, while explicitly recognising their legitimate development rights.
- Show leadership in developing and deploying clean energy technologies and approaches to energy efficiency, and share this knowledge with all other nations.
- Mobilise the science and technology community to enhance research and development efforts, which can better inform climate change decisions.

Notes and references

1 This statement concentrates on climate change associated with global warming. We use the UNFCCC definition of climate change, which is 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods'.

2 IPCC (2001). Third Assessment Report. We recognise the international scientific consensus of the Intergovernmental Panel on Climate Change (IPCC).

3 IEA (2004). World Energy Outlook 4. Although long-term projections of future world energy demand and supply are highly uncertain, the World Energy Outlook produced by the International Energy Agency (IEA) is a useful source of information about possible future energy scenarios.

4 With special emphasis on the first principle of the UNFCCC, which states: 'The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof'.

5 Recognising and building on the IPCC's ongoing work on emission scenarios.

Academia Brasiliera de Ciências
Brazil

Royal Society of Canada,
Canada

Chinese Academy of Sciences,
China

Académie des Sciences,
France

Deutsche Akademie der Naturforscher
Leopoldina, Germany

Indian National Science Academy,
India

Accademia Nazionale dei Lincei,
Italy

Science Council of Japan,
Japan

Russian Academy of Sciences,
Russia

Royal Society,
United Kingdom

National Academy of Sciences,
United States of America

Appendix 8:

Native Plants Suitable for the Shoreline

Source: http://www.savebay.org/backyardbay/appendix_two.htm

The following is a list of coastal plants developed by the Coastal Resources Management Council that can tolerate the conditions of the coastal zone. Since coastal areas vary, not all plants are suitable for each coastal area. Determine the type of coastal area you live in (for example a protected cove versus an exposed beach front) and then select the plants from the following list that are suitable to those conditions.

When purchasing these plants, refer to the scientific name. Do not buy hybrids. You can identify hybrids if a third name has been added to the Latin name such as *Ilex glabra compacta.*

The plants listed below are listed as sustainable in URI's *Sustainable Trees and Shrubs for Southern New England*. Sustainable plants thrive in the landscape with a minimal amount of fertilizer, pesticides and maintenance. They also do not require supplemental water once established.

Common Name/+ Scientific name *wildlife value +sustainable plant	**Growth Conditions**	**Characteristics**
Perennial Plants		
Butterfly Weed* *Asclepias tuberosa*	Requires full sun. Grows well in sandy soil.	**Height:** 1-2 feet **Flower:** Flat flower clusters, brilliant orange; June-July
New England Aster* *Aster novae-angliae*	Requires full sun to partial shade. Needs moist, fertile, organic soil.	**Height:** 1-6 feet per year **Flower:** Blue/purple/pink; August-October Long lasting, large flowers; many leaves coming out of stem; very adaptable; heat tolerant.
Boneset* *Eupatorium perfoliatum*	Grows best in partial to full sun. Requires wet to moist soil.	**Height:** 3-5 feet **Flower:** White; July-August Flowers grow in clusters; wrinkled leaves that unite at base of stem.

Pearly Everlasting *Gnaphalium obtusifolium*	Grows well in dry soil. Requires full sun.	**Height:** 1-3 feet **Flower:** White; July-September Flower in a flat cluster of white papery blossoms; long leaves colored a grayish green.
Wild Lupine *Lupinas perennis*	Grows well in dry soil.	**Height:** 1-2 feet **Flower:** Blue/violet; April-July Pea-like flowers.
New England Blazing-Star* *Liatris borealis*	Requires full to partial sun. Can grow in wet to well drained soils.	**Height:** 1-3 feet **Flower:** Rose/purple Member of daisy family; large flower heads.
Evening Primrose *Oenothera biennis*	Requires full sun. Grows in dry to poor soil.	**Height:** 1-3 feet **Flower:** Yellow; June Reddish stem.
Seaside Goldenrod *Solidago sempervirens*	Grows best in full sun. Prefers well drained to dry soil. Salt tolerant.	**Height:** 2-3 feet **Flower:** Yellow; July-September Thick, bright flowers: combines well with grasses, asters, and bayberry.
Wet Meadow Plants		
Tussock Sedge* *Carex stricta*	Requires full sun. Tolerates acidic soils.	**Height:** up to 3.5 feet Grass-like sedge which forms large hummocks.
Joe-Pye Weed* *Eupatorium maculatum*	Prefers partial to full sun. Needs wet to moist soil.	**Height:** 2-4 feet **Flower:** flat toppled pink/purple, July-September
Blue flag* *Iris versicolor*	Requires full sun for flowers. Prefers acidic soil.	**Height:** up to 4 feet **Flower:** Blue/violet; May-July Sword shaped leaves.
New York Ironweed* *Vernonia noveboracensis*	Prefers full sun and wet to moist soil.	**Height:** 5-8 feet **Flower:** Deep-purple aster-like flowers, August-September
Native Grasses		
Switch grass *Panicum virgatum*	Prefers full sun yet tolerates some shade. Grows well in dry soil.	**Height:** up to 6.5 feet Forms clump and has attractive seed head in fall and winter.
Little Bluestem* *Schizachyrium scoparium*	Drought tolerant. In dry or moist soils.	**Height:** 1.5-4 feet Bunch grass; foliage turns from blue-green to coppery in the fall.
Big Bluestem* *Andropogon gerardii*	Very drought tolerant.	**Height:** 3-8 feet Bunch grass, flowers to August to October.
Poverty grass* *Danthonia spicata*	Sandy disturbed sites.	**Height:** .5-2 feet Bunch grass; flowers June to July.
Shrubs: the following shrubs are tolerant of a wide variety of conditions		

Arrowwood *+ *Viburnum dentatum*	Requires partial to full sun, moist to dry soils. Tolerates drought. pH preference=5.1-7.0	**Height:** 6-12 feet **Growth rate:**1-2 feet/year **Flower:** Wide clusters of white flowers in June Dense foliage, reddish in the fall; blue berries in August; great site adaptability and very durable.
Blueberry, high bush* *Vaccinium corymbosum*	Grows in full sun to partial shade; more shade equals fewer berries. Prefers moist, acidic soil.	**Height:** 6-12 feet **Growth rate:** 1 feet/year **Flower:** White/pinkish bell; May-June Attractive flowers in dense clusters; scarlet fall foliage; red winter stem color.
Inkberry holly*+ *Ilex glabra*	Tolerates partial shade. Prefers moist to wet, acidic soils.	**Height:** 6-8 feet **Growth rate:**1 feet/year Small-leaved evergreen shrub; narrow, spineless leaves about 2 in. long; black berries from September to spring (only females); grows upright and leggy.
Huckleberry *Gaylussacia baccata*		**Height:** up to 3 feet **Flower:** Reddish, dense flower Edible black berries; bright, red foliage in the fall.
Virginia Creeper* *Parthenocissus quinquefolia*	Grows in the sun or shade.	**Height:** up to 25 feet **Growth rate:** up to 10 feet/year A tall climbing vine; large 5-lobed leaves; shiny, dark green leaves; bright red fall foliage and dark purple berries.
Black Chokeberry*+ *Aronia melanocarpa*	Grows in shade and full sun; more shade equals fewer berries. Tolerates any soil, adapted to wetter areas.	**Height:** 4-5 feet **Growth rate:** slow **Flower:** White; late spring Glossy, oval dark green leaves; purple/black berries ripen in late summer; reddish fall foliage.
Shrubs: sunny, dry sites		
Sweet Fern+ *Comptonia peregrina*	Grows in full sun to light shade. Tolerant of dry soil.	**Height:** 2-3 feet **Growth rate:** Slow **Flower:** catkins A grayish green color; aromatic fern-like leaves.
Virginia Rose* *Rosa virginiana*	Requires full sun and well-drained soil. Salt tolerant. Can grow directly along edge of salt marsh.	**Height:** 3-6 feet **Flower:** Pink roses; July-August Fragrant, wild roses; bright fall foliage; spreads to create a thicket; red barked canes which stay colored throughout the winter season.

Bayberry*+ *Myrica pensylvanica*	Grows in full sun to partial shade. Male and female flowers on separate plants. Salt tolerant.	**Height:** 8-10 feet **Growth rate:**1-2 feet/year Semi-evergreen shrub; leaves colored green in summer and purple in the fall; fragrant, waxy silver/gray berries.
Shrubs: shady moist sites		
Sweet Pepperbush*+ *Clethra alnifolia*	Flowers best in partial shade and full sun. Grows well in damp soil.	**Height:** 6-9 feet **Growth rate:**1 foot/year **Flower:** Pink/white; July-August Fragrant flowers; glossy leaves that turn golden in the fall.
Witch Hazel *Hamamelis virginiana*	Grows in partial to full sun. Prefers fertile, organic, acid soil and moisture.	**Height:** 20-25 feet **Flower:** Yellow; October-December Yellow flowers appear while leaves are falling in the fall. Beautiful yellow foliage.
Spice bush* *Lindera benzoin*	Male and female flowers on separate plants. Tolerates drought.	**Height:** up to 15 feet **Growth rate:**1 foot/year Very dark bark; yellow flower clusters in early spring; scarlet fruits in August; yellow fall foliage.
Shrubs: sites with no salt spray		
Mountain Laurel*+ *Kalmia latifolia*	Grows in full sun to partial shade. Requires acidic, organic, moist soil and good drainage.	**Height:** 7-15 feet **Growth rate:** slow **Flower:** White/pink; May and June Adaptable evergreen shrub; has the ability to create dense thickets; susceptible to leaf spots; root rots if site is poorly drained or over watered.
Sheep Laurel+ *Kalmia angustifolia*	Grows best in moist soil. Grow in either full sun or partial shade.	**Height:** 1-3 feet **Flower:** Crimson/pink in clusters; June Semi-evergreen shrub; narrow drooping gray-green leaves.
Swamp Azalea* *Rhododendron viscosum*	Prefers acidic, moist soil. Requires partial shade.	**Height:** 3-8 feet **Growth rate** 6-12 feet/year **Flower:** White, very fragrant; July A deciduous shrub; susceptible to disease and insect damage yet cold tolerant.
Winterberry holly*+ *Ilex verticillata*	Prefers partial to full sun and wet to moist soil. Thrives in acidic soil. Intolerant to drought.	**Height:** 6-12 feet **Growth rate:** Slow/1 foot per year Small red berries in late fall and winter; male/female flowers on separate plants; requires both sexes for berry production; red berries attract wildlife.
Shrubs: beach sites		

Beach Plum+ *Prunus maritima*	Grows well in sandy, acidic soil. Salt tolerant.	**Height:** up to 8 feet **Growth rate:** slow **Flower:** Pinkish, white; May Low growing shrub; red and yellow plums ripen in summer; used for jelly; reddish fall foliage.
Trees: dry, shady or sunny sites		
Red Oak* *Quercus rubra*	Requires full sun and well drained, acidic soil.	**Height:** 50-90 feet **Growth rate:** Medium-fast Rounded top with spreading branches; large leaves with pointed lobes; great red foliage in the fall; heat tolerant.
Black Oak* *Quercus velutina*	Requires full sun and well drained, acidic soil.	**Height:** 50-60 feet **Growth rate:** Fast Brown foliage in the fall; blocky bark and fuzzy buds; many of its leaves stay on into the winter saving time on raking.
Black Cherry* *Prunus serotina*	Requires full sun and moist to well-drained soil.	**Height:** 40-60 feet **Growth rate:** Fast **Flower:** White Grows black berries; seed tends to be spread far and wide by birds; valuable timber; adaptable.
Sassafras* *Sassafras albidum*	Prefers partial to full sun and well-drained soil.	**Height:** 30-60 feet **Growth rate:** Medium Dark green leaves of three different shapes; bright yellow and orange fall color; birds are to the purple berries.
Pitch Pine* *Pinus rigida*	Requires full sun. Does well in poor soils. Tolerates drought.	**Height:** 50-75 feet **Growth rate:** 2-3 feet/year **Flower:** Red/purple cone; May A three needle species; medium sized evergreen tree.
Red Cedar* *Juniperus virginiana*	Salt tolerant. Requires full sun and well-drained soil.	**Height:** 30-50 feet **Growth rate:** Medium Conical shaped evergreen with prolific blue berries.
Trees: moist sites, both shady and sunny		
Red Maple* *Acer rubrum*	Grows best in moist, acidic conditions.	**Height:** 75-100 feet **Growth rate:** 18-25 feet in 10 years Red fall foliage; clusters of small red flowers in spring; inhospitable to plants within it's drip line; male and female flowers on separate plants.

Pagoda Dogwood *Cornus alternifolia*	Requires partial sun or full shade.	**Height:** up to 25 feet tall **Growth rate:** slow to moderate **Flower:** Cream; June Small native tree; blue fruits in summer; deep red foliage; heat tolerant; susceptible to borers and fungus disease.
Shadbush* *Amelanchier canadensis*	Tolerates full shade. Prefers moist conditions, yet tolerates drought. Salt tolerant. Can grow directly along edge of salt marsh.	**Height:** 35-50 feet **Growth rate:** 2.5 feet/year **Flower:** White; April Multi-stemmed large shrub with striped gray bark.
Pussy Willow *Salix discolor*	Prefers moist to wet soil, yet tolerates drier conditions. Salt tolerant. Can grow along edge of salt marsh.	**Height:** up to 20 feet **Growth rate:** fast **Flower:** gray catkins turning yellow at maturity; silvery leaves.
Trees: sites with no salt spray		
Eastern White Pine* *Pinus strobus*	Prefers partial to full sun. Moist to dry soil.	**Height:** 50-80 feet **Growth rate:** Fast

Appendix 9:

Sample Contract Language

The following text is based on the Marine Trades Association of New Jersey's *Best Management Pledge*. The language may be incorporated into lease agreements. Contact the Coastal Resources Management Council at 401-783-3370 for an electronic copy.

FOR TENANTS:

I,_____ (name), understand that

_____(marina/boatyard) subscribes to and enforces pollution prevention procedures. I further understand and agree that in return for the privilege of performing work on a boat at this facility such as hull cleaning, washing, sanding, polishing and/or painting; bottom cleaning, sanding, scraping, and/or painting; opening the hull for any reason, *e.g.*, installation of equipment or engine work; engine and/or stern drive maintenance, repair, painting; etc., it is my responsibility to comply with, at a minimum, the following pollution prevention practices. I understand that this list may not be complete and pledge that I will exercise common sense and judgment in my actions to insure that my activities will not deposit pollution residues in surface waters or elsewhere where they may be conveyed by stormwater runoff into the surface waters. I understand that failure to adopt pollution prevention procedures may result in expulsion from the marina/boatyard (*insert name of facility*) and forfeiture of rental fees. I understand that I may elect to employ the facility to perform potentially pollution producing activities on my behalf in which case the responsibility for compliance with the best management practices is entirely theirs.

Signed _____ Date_____

FOR SUB-CONTRACTORS ONLY:

I understand and agree to have my proposed work first authorized by this facility and that I will adhere, at a minimum, to the contents of this document. I further understand that because of the nature of my proposed work, the facility may require that I be supervised by an employee of said facility for which I will pay the normal existing labor rate.

Signed _____ Date_____

POLLUTION PREVENTION PRACTICES:

A. REPAIRS AND SERVICE (to hull and engine: painting, cleaning, washing, sanding, scraping, etc.)

1. Work on hulls and engines only in designated areas or use portable containment enclosures with approval of marina management.
2. Use tarps and vacuums to collect solid wastes produced by cleaning and repair operations–especially boat bottom cleaning, sanding, scraping, and painting.
3. Conduct all spray painting within an enclosed booth or under tarps.
4. Use non-toxic, biodegradable solvents.
5. Capture debris from boat washing and use only minimal amounts of phosphate-free, non-toxic, and biodegradable cleaners.
6. Use drip pans for any oil transfers, grease operations, and when servicing I/Os and outboard motors.
7. Obtain management approval before commencing any repair which will open the hull. Clean and pump bilges free of contaminated materials before and after repairs which open the hull.
8. Use spill proof oil change equipment.

B. VESSEL MAINTENANCE WASTE

1. Non-toxic residue of sanding, scraping, and grinding: bag and dispose of in regular trash.
2. Toxic and non-environmentally safe solvents and cleaning liquids: seek specific directions from marina management or dispose of with licensed agency.

C. FUEL OPERATIONS

1. Install fuel/air separator on fuel tank vent line(s) to prevent overflow of fuel through vent.
2. Keep petroleum absorbent pad(s) readily available to catch or contain minor spills and drips during fueling.

D. WASTE OIL AND FUEL

1. Recycle used oil and antifreeze.
2. Add a stabilizer to fuel tank in the fall or an octane booster to stale fuel in the spring. Use the fuel or bring it to a household hazardous waste collection site.
3. Absorbent materials soaked with oil or diesel: drain liquid and dispose of in used oil recycling container; ask marina staff how to dispose of oil abosrbent materials.
4. Oil filters: drain and recycle the oil and the filter.

E. ONBOARD PRACTICES

1. Maintain oil absorbent pads in bilge. Inspect no less than annually.
2. Do not discharge bilge water if there is a sheen to it.
3. Use only low-toxic antifreeze (propylene glycol). Recycle used antifreeze (even low-toxic antifreeze will contain heavy metals once it has been used).

F. SEWAGE HANDLING

1. Never discharge raw or treated sewage within Rhode Island waters.
2. Use marina restroom facilities when at slip.
3. Do not empty port-a-pots overboard; use marina dump facility. Do not empty port-a-pots in the restrooms.
4. Do not discharge holding tanks overboard; use pumpout facility.
5. If you must use a holding tank additive, use an enzyme-based product. Avoid products that contain quaternary ammonium compounds (QACs), formaldehyde, formalin, phenal derivatives, alcohol bases, or chlorine bleach.
6. Liveaboards, place a dye tablet in holding tank after each pumpout. The dye will make any illegal discharges clearly visible.

G. ORGANIC WASTE

1. Clean fish only in designated areas.
2. Grind, compost, or double bag fish scraps (*depending on the services offered by your marina*).
3. Walk pets in specified areas and dispose of their wastes, double-bagged, in the dumpster.

H. SOLID WASTE

1. Recycle plastic, glass, aluminum, newspaper, and used lead batteries (*tailor this section to fit your facility's practices*).

Rhode Island Clean Marina Guidebook