Environmental Concerns

Vessels require a great deal of attention. They must be scraped, painted, and cleaned. Their engines need to be lubricated and otherwise tended. The vessel and engine need to be prepared to withstand the cold of winter. Each of these activities can introduce pollutants into the environment.

Sanding, blasting, and pressure washing are frequently employed to remove paint and marine growth. In the process, toxic metals such as copper and tin may be released. If heavy metals find their way into the water, they may be consumed by shellfish, worms, and other bottom-dwelling creatures and passed up the food chain to fish, birds, and humans. Heavy metals that are not incorporated into living tissue will remain in the sediments where their presence will substantially increase dredge material disposal costs.

Paints, solvents, thinners, and brush cleaners are often toxic and may cause cancer. If spilled, they may harm aquatic life and water quality. Additionally, the vapors released by some paints and solvents contribute to air pollution. Oil and grease from maintenance areas also threaten aquatic life.

Many of the cleaning products used in boat shops are also toxic. Many contain caustic or corrosive agents. They may also contain chlorine, phosphates, inorganic salts, and metals. Even some non-toxic products can harm wildlife. For instance, detergents commonly found in boat cleaning products destroy the natural oils on fish gills, reducing their ability to breathe.

Best Management Practices to Control Pollution from Vessel Maintenance and Repair Activities

Designate Work Areas.

One of the easiest ways to contain waste is to restrict the area where maintenance activities may be performed.

___✓ (5) Perform all major repairs such as stripping, fiberglassing, and spray painting in designated areas.

___✓ (5) Collect all maintenance debris. Clean work areas after completing each operation or at the end of the day, whichever comes first. Remove sanding residue, paint chips, fiberglass, trash, etc.

___✓ (5)* Locate vessel maintenance areas on an impervious surface (e.g., asphalt or cement) and, where practical, under a roof. Sheltering the area from rain will prevent stormwater from carrying debris into surface waters.

___✓ (5)* If asphalt or cement is impractical, perform work over filter fabric, canvas, or plastic tarps. Filter fabric will retain paint chips and other debris while allowing for water penetration. Plastic, on the other hand, should be used carefully because it is impervious and paint chips and debris may be washed into stormwater during a rain. Tarps may be used multiple times.

___✓ (5) Surround the maintenance area with a berm or retaining wall.

___✓ (5) Use vegetative or structural controls described in Stormwater Management Section to treat stormwater runoff.

___✓ (5) Inspect and clean stormwater systems in accordance with an established schedule. Remove trash, sediment, and other debris.

___✓ (1) Prohibit extensive maintenance or repair work outside of the designated maintenance areas.

___✓ (1) Clearly mark the work area with signs, e.g., “Maintenance Area for Stripping, Fiberglassing, and Spray Painting.”

___✓ (5) Post signs throughout the boatyard describing best management practices that boat owners and contractors must follow, e.g., “Use Tarps to Collect Debris.”

___✓ (1) Develop procedures for managing requests to use the workspace, to move boats to and from the site, and to ensure the use of best management practices.

___✓ (5) Collect debris. Have your waste hauler characterize the waste and take it to a facility authorized to manage municipal or industrial solid waste, provided that, if the waste is hazardous, the amount generated is less than 220 pounds per month or less than this quantity is accumulated at any time.

☐ **(48) Total Points for BMP** ☐ **Total N/A Points**

Contain Sanding Dust.

___✓ (5) Prevent dust from falling on the ground, into any nearby water, or becoming airborne. Invest in vacuum sanders and grinders. These tools collect dust as soon as it is removed from the hull. Vacuum sanders allow workers to sand a hull more quickly than conventional sanders. Additionally, health risks to workers are reduced because paint is collected as it is removed.

___✓ (5) Require contractors to use vacuum sanders. Rent or loan the equipment to contractors.

___✓ (1) Conduct sanding in the hull maintenance area or over a drop cloth.

☐ **(11) Total Points for BMP** ☐ **Total N/A Points**

Contain Abrasive Blasting Debris.

___✓ (1) Do not sand in a heavy breeze.

___✓ (1) Prohibit uncontained abrasive blasting.

___✓ (5) Perform abrasive blasting in the vessel maintenance area within a structure or under a plastic tarp enclosure. Do not allow debris to escape from the enclosure.

___✓ (5) Investigate alternatives to traditional media blasting. Hydroblasting and mechanical peeling essentially eliminate air quality problems. Debris must still be collected on a medium such as a filter cloth ground cover.

___✓ (5) Avoid dust entirely by using a stripper that allows the paint to be peeled off. These products are applied like large bandages, allowed to set, and are then stripped off. When the strips are removed, the paint is lifted from the hull. Dust and toxic fumes are minimized.

___✓ (5) Invest in a closed, plastic medium blast (PMB) system. These systems blast with small plastic bits. Once the blasting is completed, 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. A 50-foot vessel will produce about a gallon of paint dust, substantially less than the many barrels full of sand and paint that must be discarded with traditional media blasting methods.

☐ **(22) Total Points for BMP** ☐ **Total N/A Points**

Minimize Pressure Washing Impacts.

___ ⚖ Discharges of power wash wastewater into surface or ground waters of the state are violations of the Water Pollution Control Act and the NJPDES rules. Marinas can eliminate these discharges by pressure washing over a bermed, impermeable surface that allows power wash wastewater to be contained and filtered through a reclaim/recycling system. Boatyards also have the option of collecting the wash wastewater and having it hauled for proper disposal, connecting to an existing sewer line, applying for and obtaining a separate NJPDES permit, or ceasing the activity. The revised Basic Industrial Stormwater Permit and Guidance documents are available on the New Jersey Clean Marina webpage njcleanmarina.org

As a facility that hauls and power washes boats, you have a choice of recirculating/ recycling systems which will enable you to comply with the revised stormwater permit. These systems utilize filtration and/ or chemical or physical techniques to treat the wash water:

- filtration uses devices such as screens, filter fabrics, sand filters, and hay bales to remove particles;
- chemical treatment relies upon the addition of some type of catalyst to cause the heavy metals and paint solids to settle out of the water; and
- a swirl concentrator can be used to concentrate pollutants. Water flowing in this small, compact soil separation device without moving parts, creates a vortex that centralizes the pollutants. Clean water is then discharged.

___ ⚖ If you have a permit to discharge to surface waters, ensure that any wash waste-water that is discharged to surface and/or ground water complies with your NJPDES permit.

___ ✓ (1) When pressure washing boat bottoms, use the least amount of pressure necessary to remove the growth and leave the paint intact. Where practical, use a regular garden-type hose and a soft cloth.

___ ✓ (1) Sweep and collect debris from all docks and decks prior to washing them.

☐ **(2) Total Points for BMP** ☐ **Total N/A Points**

Box 1. Bottom Paints

Antifouling bottom paints protect hulls from barnacles and other types of fouling organisms that can interfere with vessel performance. Most paints work by slowly releasing a biocide, generally cuprous oxide (Cu_2O). Pesticides in the paint harm fish and other non-target species.

Copper-based paints are not used on aluminum hulls because the interaction of copper and aluminum leads to corrosion. Instead, tin-based paints (tributyl tin or TBT) are often used on aluminum-hulled vessels. Because tin is extremely toxic, it must be applied cautiously. Concentrations of TBT as low as a few parts per trillion have caused abnormal development and decreased reproductive success in oysters, clams, and snails (EPA 1993). Tin is easily absorbed by fish through their gills and accumulates to high levels in sediments. For these reasons, Federal law restricts the use of tin-based paints to aluminum vessels of any length, boats larger than 82 feet (25 meters), and outboard motors and lower drive units. Any boatyard operator wishing to apply TBT paints must obtain a pesticide business license and have a licensed pesticide applicator on staff.

Antifouling paints can be separated into three general categories:

Leaching Paints. Water soluble constituents of leaching antifouling paints dissolve slowly in water, releasing the pesticide. The insoluble portion of the paint film remains on the hull. The depleted paint film must be removed before the boat is repainted. Most leaching paints contain solvents that produce noxious fumes.

Ablative Paints. Ablative antifouling paints also leach some toxicant into the water. The major difference is that as the active ingredient is leached out, the underlying film weakens and is polished off as the boat moves through the water. As the depleted film is removed, fresh antifouling paint is exposed. There are several available water-based ablative paints that are up to 97% solvent free. As a result, levels of volatile organic compounds are substantially less than those of solvent-based paints. Ease of cleanup is another advantage of water-based paints.

Non-toxic Coatings. Teflon, polyurethane, and silicone paints are nontoxic options. All deter fouling with hard, slick surfaces.

Minimize Paint Impacts.

Stay informed about antifouling products.

___✓ (5) Recommend antifouling paints that contain the minimum amount of toxin necessary for the expected conditions.

___✓ (1) Use water-based paints whenever practical.

___✓ (1) Recommend to your customers the use of antifouling products that have limited environmental consequences, such as Teflon, silicone, polyurethane, and wax.

☐ **(7) Total Points for BMP** ☐ **Total N/A Points**

Minimize Painting Operations Impacts.

___✓ (1) Use brushes and rollers whenever possible.

___✓ (1) Use paint spray equipment sparingly.

___✓ (1) Painting should be conducted in the vessel maintenance area, and/or over a ground cloth.

___✓ (1) When painting with a brush or roller on the water, when possible and appropriate, transfer the paint to the vessel in a small (less than one gallon), tightly covered container. Small containers mean small spills.

___✓ (1) Only mix sufficient paint for a given job.

___✓ (5) Mix paints, solvents, and reducers in a designated area indoors or under a shed.

___✓ (1) Keep records of paint use to determine excess usage for jobs. Refer to this information to avoid future overmixing.

☐ **(11) Total Points for BMP** ☐ **Total N/A Points**

Reduce Overspray.

In some cases, spray painting is the only practical choice in terms of time and money. Minimize the impact of paint overspray and solvent emissions by employing the following practices:

___✓ (1) Conduct all spray painting in a spray booth, or under a tarp.

___✓ (5) Use equipment with high transfer efficiency. Tools such as high-volume, low-pressure (HVLP) spray guns direct more paint onto the work surface than conventional spray guns. As a result, less paint is in the air, less volatile organic compounds are released, less paint is used, and cleanup costs are reduced. Air-atomizer spray guns and gravity-feed guns are other types of highly efficient spray equipment.

___✓ (5) Train staff to use spray painting equipment properly in order to reduce overspray and minimize the quantity of paint per job.

☐ **(11) Total Points for BMP** ☐ **Total N/A Points**

Handle Solvents Carefully.

Refer to Waste Containment and Disposal for further information about requirements for handling, storing, and transporting hazardous wastes.

___⚖ Store open containers of usable solvents as well as waste solvents, rags, and paints in covered, UL listed, or Factory Mutual approved containers.

___⚖ Hire a licensed waste hauler to recycle or dispose of used solvents.

___✓ (5) Direct solvent used to clean spray equipment into containers to prevent evaporation of volatile organic compounds. A closed gun cleaning system will save you money on cleaning materials.

___✓ (1) Use only one cleaning solvent to simplify disposal.

___✓ (1) Use only the minimal amount of solvent (stripper, thinner, etc.) needed for a given job.

___✓ (1) For small jobs, pour the needed solvent into a small container in order not to contaminate a large amount of solvent.

___✓ (5) Use soy-based solvents and other similar products with no or low volatility.

___✓ (1) Order your spray painting jobs to minimize coating changes. Fewer changes mean less frequent purging of the spray system. Order your work light to dark.

___✓ (1) Allow solids to settle out of used strippers and thinners so you can reuse solvents.

___✓ (1) Keep records/inventory of solvent and paint usage to keep track of the amount of hazardous waste generated on site.

___✓ (1) Keep containers of cleaning and maintenance products closed.

☐ **(17) Total Points for BMP** ☐ **Total N/A Points**

Minimize Environmental Impacts from Engine Repair and Maintenance.

___✓ (5) Store engines and engine parts under cover on an impervious surface like asphalt or concrete.

___✓ (5) Do not wash engine parts over the bare ground.

___✓ (1) Use dry precleaning methods, such as wire brushing.

___✓ (1) Avoid unnecessary parts cleaning.

___✓ (5) * For part washing adopt bioremediating systems that take advantage of microbes to digest petroleum as an alternative to solvent based parts washer. Bioremediating systems are self-contained; there is no effluent. The cleaning fluid is a mixture of detergent and water. Microbes are added periodically to "eat" the hydrocarbons;

or

___✓ (5) * If you use a solvent to clean engine parts, do so in a container or parts washer with a lid to prevent evaporation of volatile organic compounds. Reuse the solvent. Once the solvent is totally spent, either recycle it on site with a distillation unit or have it removed by an appropriate waste hauler.

___✓ (5) Use drip pans when handling any type of liquid. Use separate drip pans for each fluid to avoid mixing. Recycle the collected fluid. Use funnels to transfer fluids.

___✓ (1) Drain all parts of fluids prior to disposal.

___✓ (5) Clean engine repair areas regularly using dry cleanup methods, e.g., capture petroleum spills with oil absorbent pads.

___✓ (1) Prohibit the practice of hosing down the shop floor.

___✓ (1) Provide a test tank for small outboard engines.

☐ **(35) Total Points for BMP** ☐ **Total N/A Points**

Winterize Safely.

___✓ (5) Use propylene glycol antifreeze for all systems. It is much less toxic than ethylene glycol antifreeze.

___✓ (1) Use the minimum amount of antifreeze necessary for the job.

___✓ (5) For health reasons, do not use ethylene glycol in potable water systems; it is highly toxic and cannot be reliably purged from the system.

___✓ (1) Add stabilizers to fuel to prevent degradation. Stabilizers are available for gasoline and diesel fuels and for crankcase oil. These products protect engines by preventing corrosion and the formation of sludge, gum, and varnish. Use of these products also eliminates the need to dispose of stale fuel at the beginning of the boating season.

___✓ (5) Be sure fuel tanks are 85-90% full to prevent accumulation of flammable fumes and to minimize the possibility of condensation leading to corrosion. Do not fill the tank more than 90% full. The fuel will expand as it warms in the springtime and may spill out the vent line of a full tank.

___✓ (1) Use the highest rated octane recommended by the engine manufacturer; premium fuels are more stable than regular fuels.

___✓ (1) Be sure the gas cap seals tightly.

___✓ (5) Promote reusable canvas or recyclable plastic covers. Some manufacturers will clean and store canvas covers during the boating season.

___✓ (1) Recycle used shrink wrap.

☐ **(25) Total Points for BMP** ☐ **Total N/A Points**

Conduct In-Water Maintenance Wisely.

___✓ (1) Plug scuppers to contain dust and debris.

___✓ (5) Limit spray painting on the water to small jobs only.

___✓ (5)* Prohibit underwater hull cleaning in your marina. Given the concentration of boats, underwater cleaning is dangerous to divers and the heavy metals that are released are harmful to aquatic life. In addition, insurance to cover divers is expensive.

___✓ (1)* If you allow underwater hull cleaning follow these BMPs

- Always use the least abrasive material possible to remove growth
- Do not clean hulls that have loose or flaking paint
- Do not clean hulls coated with ablative paints

___✓ (5) Offer incentives, like reduced mid-season haul out rates, so boaters can have their hulls cleaned on land where contaminants can be contained.

☐ **(17) Total Points for BMP** ☐ **Total N/A Points**

Chapter Total: ____ (207)

Chapter Total N/A Points: ____