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Scraping and Sanding

Potential Environmental Impacts:

Hull paints often contain heavy metals and other toxins. Sanding chips and dust that fall onto the ground can enter a marina basin through stormwater runoff. Paint chips and sanding debris can be particularly dangerous when shellfish ingest them and other animals, including humans, then ingest the shellfish.

Legal Requirements:

Make hazardous waste determination	❑ You must determine if your sanding dust is hazardous and manage accordingly [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11]. ❑ If the sanding dust is not hazardous, it must be handled as a Special Waste. This waste may be disposed of at a solid waste landfill if the site meets the design criteria for municipal solid waste landfills. [DHEC R. 61-107.258].

Best Management Practices:

Designate indoor or upland area	❑ Conduct sanding and scraping away from the water's edge. Designate an indoor or upland area for debris-producing maintenance such as scraping, sanding, and sandblasting. The boat maintenance area can be a temporary structure or plastic sheeting provided to minimize the spreading of dust and windblown material. The work area should be well marked with signs.
Use tarps	❑ Place drop cloths or tarps under vessels when sanding or scraping. ❑ Weight the bottom edges of tarps and drop clothes to keep them in place.
Impervious pad	❑ Consider installing an impervious pad for conducting debris-producing maintenance.
Clean up immediately	❑ Clean up all debris, trash, sanding dust, and paint chips immediately following any maintenance or repair activity. ❑ 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. ❑ Dispose of water-based (non-hazardous) waste paint chips and sanding waste in a covered dumpster or other covered solid waste receptacle.
Non-windy days	❑ Avoid scraping or sanding on windy days, unless conducting activity in an enclosed maintenance structure.
Use vacuum sanders	❑ Use dustless or vacuum sanders when sanding. These tools can collect over 98% of dust generated instead of releasing it into the air. Workers can use this equipment without full suits or respirators and have fewer cleanups when the job is done. ❑ Require customers and contractors to use dustless or vacuum sanders. Rent or loan the equipment to them. ❑ Post signs indicating the availability of the dustless or vacuum sanders.
Provide covered container	❑ Provide a covered collection drum for the dust from vacuum sanders and other scraping debris.

In water activities	❑ Restrict or prohibit sanding and scraping boats that are in the water, to the greatest extent practicable. ❑ If sanding, scraping, or grinding must take place while the boat is in the water, use tarps and sheeting installed between the vessel being worked on and the floats or walking surface to prevent dust, paint chips, debris, or other materials from falling or being blown into the water. The sheeting should have a tight seal to the vessel and adjacent surfaces to prevent leakage of any paint chips or dust outside the work area. Remove the sheeting carefully to prevent the loss of accumulated waste material into the water.
Minimize scraping need	❑ Where feasible, boat maintenance and storage practices that minimize the need for scraping and sanding should be encouraged.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Abrasive Blasting section.

Paint Stripping

Potential Environmental Impacts:

Many paint strippers are solvent-based, and contain chemicals that are dangerous to humans. Some are flammable and most can cause water and air pollution if not handled properly. Toxic chemicals in paint strippers may include methylene chloride (also called dichloromethane, or DCM), methyl ethyl ketone (or 2-Butanone), acetone, toluene, methanol, N-methylpyrrolidone (NMP), or xylene. There are some less environmentally damaging and less hazardous paint strippers available on the market.

Legal Requirements:

Make hazardous waste determination	❑ A hazardous waste determination must be conducted to establish whether or not disposal of used paint strippers is subject to hazardous waste regulations [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11]. A hazardous waste determination must also be conducted on any materials used to clean up a spill. Manage waste accordingly.

Best Management Practices:

Use alternatives	❑ Consider alternatives to chemical paint stripping depending on the characteristics of the surface being stripped, the type of paint being removed, and the volume and type of waste produced. Alternatives include scraping, sanding, and/or abrasive blasting. Use a heat gun to remove paint and varnish where appropriate. ❑ If paint strippers must be used, use soy-based or water-based products that are less hazardous.
Reduce leftovers	❑ Use only the minimum amount of paint stripper needed for a job.
Reduce evaporation	❑ Prevent evaporation by using tight fitting lids or stoppers. Reducing evaporation protects air quality, saves product and money.
Reduce spills	❑ Reduce the chance of spills during transport by storing unused paint stripper where it's used most in the shop. Place the product on an impervious base.
Educate and train employees	❑ Encourage careful use by informing all workers and operators of the hazardous nature of solvents and the purchasing and recycling costs. ❑ Train employees to use less paint stripper, to properly store new and used paint strippers, to use wise clean-up procedures, and to prevent leaks and spills.

Relevant Sections and Appendices:

- ⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
- ⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
- ⇒ Abrasive Blasting section and Scraping and Sanding section.

Prepping and Painting Boat Bottoms

Antifouling Paint

Potential Environmental Impacts:

Most antifouling paint contains elemental copper, cuprous oxide (a copper compound), or tin-based compounds (tributyl tin) that kill organisms attempting to attach to a painted surface. By design, antifouling paints are toxic to marine life and can be absorbed by edible fish and shellfish. Concentrations of tributyltin (TBT) as low as a few parts per trillion have caused abnormal development and decreased reproductive success in oysters, clams, and snails (EPA, 1993). The toxins in antifouling paints enter the environment through spillage, sanding, sand blasting, or scraping. Antifouling paint chips left on the ground or driveway can be transported into the water by stormwater runoff. The toxicants in antifouling paint can be passed up the food chain from mussels and worms to fish, birds, and humans.

Legal Requirements:

No TBT on vessels < 25m	❑ The use of anti-fouling tributyltin (TBT) containing paints is prohibited on vessels less than 25 meters (82 feet) in length. Vessels with aluminum hulls, which quickly corrode from cuprous oxide anti-foulant coatings, are also allowed to use TBT [Organotin Antifouling Paint Control Act 33 U.S.C. 2401].
Make hazardous waste determination	❑ A hazardous waste determination must be conducted to establish whether or not disposal of traditionally used antifouling paints, in solid or liquid form, is subject to hazardous waste regulations [RCRA; 40 CFR 262.11; DHEC r.61-79.262.11]. A hazardous waste determination must also be conducted on any materials used to clean a spill.
Abrasive blast media	❑ Abrasive Blast Media Containing Pesticides (such as TBT paint chippings) must be handled as special waste. This waste may be disposed of at a solid waste landfill if the site meets the design criteria for municipal solid waste landfills [DHEC R. 61-107.258].

Best Management Practices:

Use alternative products	❑ Switch to long-lasting, low-toxicity antifouling paint. ❑ Recommend antifouling paints containing the minimum amount of toxin necessary for the expected condition to your customers. Stock only those in the ship store. ❑ Stay informed about antifouling products, like Teflon, silicone, polyurethane, and wax that have limited negative impacts. Pass on the information to your customers.
Don't use in fresh water	❑ Discourage use of antifouling paint on boats kept in fresh water.
Non-moored boats	❑ Recommend that boats that are rack stored or trailered use alternatives to antifouling paint such as polyurethane, bottom wax, or non-metallic epoxies, since antifouling paint is not necessary for boats that are not continuously in the water.

Sanding	❑ Use dust-collecting sanders when sanding anti-fouling paint. ❑ Sandblasting is not recommended for removal of antifouling paint. ❑ Sweep and collect paint chips (don't hose) immediately after scraping or sanding.
Mix away from water	❑ Mix paints and solvents away from the water and prevent dripping into the water. Avoid mixing paint or cleaning brushes on open floats or other structures over the water.
Use drip pans, tarps, and sheeting Weight tarp bottoms	❑ Use drip pans, tarps, and sheeting to contain droppings and spilled materials. Drip pans should be used for all paint mixing, solvent transfer, or equipment clean up operations unless the operations are conducted in controlled areas away from storm drains, surface waters, shorelines, piers, docks, or floats. ❑ Weight the bottom edges of tarps and plastic sheeting to keep them in place.
Reduce leftovers	❑ Mix only enough paint necessary for a job. ❑ Save excess or unused antifouling paint for future uses.
Reuse solvents	❑ Reuse solvents and thinners by draining the clean product off the top once solids settle out.
Prohibit in-water bottom cleaning	❑ Prohibit in-water bottom cleaning, hull scraping, or any process that occurs underwater that could remove antifouling paint from the boat hull. It is impossible to treat what's cleaned from the boat bottom. ❑ If in-water bottom cleaning is allowed, require that customers or contractors use only soft sponges to clean marine growth and use stainless steel pads or brushes only on unpainted metal areas (never on bottom paint). Colored plumes of paint in the water near underwater cleaning activity should not occur.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Abrasive Blasting section for sandblasting information.
⇒ Scraping and Sanding section.

Hull and Topside Painting

Potential Environmental Impacts:

Hull and topside paints may be toxic and inhalation may cause cancer. If spilled, they may harm aquatic life and water quality. Additionally, the fumes released by some paints can contribute to air pollution.

Legal Requirements:

Make hazardous waste determination	❑ A hazardous waste determination must be conducted on painting wastes and any materials used to clean up spilled paint to establish whether or not their disposal is subject to hazardous waste regulations [RCRA; 40 CFR 262.11; DHEC R. 61-79.262.11].
Paint can residue	❑ Paint cans and other containers that have residues of hazardous (e.g., oil-based) paints must be handled as hazardous waste unless they have been "emptied," which means: ▪ Drained of all material that can be removed from them by normal methods (e.g., pouring or pumping), AND ▪ No more than one inch (or 3% by weight) of residue remains in the container [40 CFR 261.7; DHEC R.61-79.262.34]. ❑ "Emptied" containers of hazardous paints and those that have dried out residues of non-hazardous (e.g., latex) paints may be recycled as scrap metal, or disposed of in the regular trash.
Report spills	❑ If paint or varnish that is discharged into the navigable waters of the state causes a visible sheen, report the spill to the National Response Center at (800) 424-8802 [§311 of the Clean Water Act; 33 USC 1321].

Best Management Practices:

Storage	❑ Store all paint in a centralized, covered area. Return all unused paints to that area and immediately and properly manage empty containers.
Leftover paint	❑ Avoid the problem of having leftover paint by mixing only as much paint as is needed for a given job. ❑ Consider sharing leftover paints with customers or setting up an exchange area for customers to swap unused items. Contact the local SCDHEC regional office to ensure a leftover paint swap area does not change your hazardous waste generator status.
In-water painting	❑ Limit in-water painting to interior surfaces and bright work, where paint materials and spills can be contained and prevented from entering the water. Do not allow in-water hull scraping or any process that occurs underwater to remove paint from the boat hull.
Small containers	❑ Although it is not advised to conduct painting while the boat is in the water, if it must be done, transfer the paint to the vessel in a small (less than one gallon), tightly covered container. Small containers mean small spills.

Designate area	❑ Designate an upland area for debris-producing maintenance activities such as sanding and painting. ❑ Do as much work as possible away from the water, including mixing paints and/or cleaning brushes.
Use tarps	❑ Use tarps or drop cloths to collect drips. Weight the bottom edges of tarps and plastic sheeting to keep them in place.
Use drip pans	❑ Use drip pans for all paint mixing, paint transfer, and/or equipment clean up. ❑ Material captured in drip pans should be used or returned to their original container if possible.
Use alternative products	❑ Use low-VOC, high solids content, and water-based paints and surface preparation products instead of traditional paints and primers. ❑ Encourage the use of non-toxic, high bonding, and easily cleaned hull coatings.
Use brushes and rollers	❑ Use brushes and rollers instead of paint sprayers whenever possible, since paint spraying is potentially more wasteful and more harmful to the environment.
Reuse solvents	❑ Reuse solvents and thinners by draining the clean product off the top once solids settle out.
Spills	❑ Contain and clean up spilled paint or varnish immediately.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix E and Spills section for spill reporting requirements and actions.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Paint Spraying section.

Abrasive Blasting

Potential Environmental Impacts:

In abrasive blasting, sand, glass or plastic bead, walnut shells, metal shot or grit, sodium bicarbonate, or dry ice pellets are used with air pressure or water pressure to remove paint. Traditional abrasive blasting of large boat hulls is a messy job resulting in many hundreds of pounds of spent abrasive mixed with bottom paint. While the abrasive can be relatively cheap, the labor is costly and the potential environmental impacts are large.

Legal Requirements:

Make hazardous waste determination	❑ You must determine if your blasting wastes are hazardous [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11] and manage accordingly.
Abrasive blast media	❑ Abrasive Blast Media Containing Pesticides (such as TBT paint chippings) must be handled as special waste. This waste may be disposed of at a solid waste landfill if the site meets the design criteria of municipal solid wastes landfills. [DHEC R.61-107.258].
Fugitive emissions	❑ Fugitive particulate emissions shall be controlled in a manner, or to a degree, that it does not create an undesirable level of pollution [DHEC R. 61-62.6].

Best Management Practices:

Use alternatives	❑ Consider alternatives to abrasive blasting on-site, such as dustless sanders or contracting the work off-site.
Containment and location	❑ If abrasive blasting must be done, perform it within well-ventilated spray booths or plastic tarp enclosures away from the water to minimize the spreading of dust and windblown material, and to prevent residue from being carried into surface waters. ❑ Prohibit uncontained blasting in the marina.
Blast on non-windy days	❑ If tarp enclosures are used, avoid blasting on windy days. Because tarps are not rigid, they do not eliminate wind flow through the blasting area, and so they allow the wind to carry blasting material and residue into surface waters.
Waste storage	❑ Store spent sandblasting grit, scrapings, and debris under cover in a manner that minimizes contact with process water or stormwater.
Recycle blast media	❑ Recycle used blast media. Investigate companies that recycle used blast media into new media or other products.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.

Paint Spraying

Potential Environmental Impacts:

Paint spraying has potential air and water quality impacts. Most paints contain volatile organic compounds (VOCs) that evaporate quickly and are ignitable. Many paints are also toxic. When released to the atmosphere, VOCs combine with combustion emissions of nitrogen oxides (NO_x) to form ground level ozone, which damages lungs and degrades many materials. Marine paint may be toxic to aquatic and marine life.

Legal Requirements:

Make hazardous waste determination	❑ You must determine if your painting wastes (including leftover paints, spray gun solvents, and rags), or any materials used to clean a spill, are hazardous [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11] and manage accordingly.

Best Management Practices:

Use brushes and rollers	❑ Whenever possible, use brushes and rollers instead of paint sprayers since paint spraying is potentially more wasteful and more harmful to the environment than applying paint by hand.
<u>Location preferences</u>: Shipyard Inside Inland with sheeting Covered slips with sheeting	❑ Avoid unprotected paint spraying. Paint spraying may be conducted (in order of preference): 1. Inside of commercial shipyard facilities that are designed for this activity; 2. Inside designated structures with ventilation and filter systems; 3. At designated shore-side areas away from open water, with temporary structures or plastic sheeting provided to minimize the spreading of overspray; or 4. In covered slips, with tarps and sheeting installed with a tight seal between the vessel being worked on and the floats or walkway surface. Be sure to remove the protective sheeting with care to prevent loss of accumulated waste material into the water. ❑ Prohibit paint spraying on the water without protective sheeting.
Use high transfer efficiency equipment	❑ Use spray equipment with high transfer efficiency. Paint guns used in spray booths should be either High Volume Low Pressure (HVLP) or High Efficiency Low Pressure (HELP), which are rated at 65% efficient paint transfer. HVLP guns can reduce overspray by 25% to 50%. Electrostatic spraying also requires less pressure, produces little overspray, and uses relatively little paint.
Alternative products	❑ Encourage the use of non-toxic, high bonding, and easily cleaned hull coatings.
Non-windy days	❑ If spraying outdoors with protective sheeting, avoid working on windy days when controlling the protective covering and the paint spray is difficult.

Reduce leftovers	❑ Limit the amount of leftover paint and decrease solvent use by using a smaller paint spray gun cup.
Reuse solvents	❑ Reuse solvents and thinners by draining the clean product off the top once solids settle out.
Paint gun cleaning	❑ Clean paint guns in an enclosed gun cleaner and capture all solvents.
Solvent disposal	❑ Spent paint gun solvent must be treated as hazardous waste and should never be discharged into drains or onto the ground. ❑ Solvents should be recycled either in an onsite distillation unit or by a permitted recycling facility. ❑ Evaporation of waste solvent or waste solvent-based paint constitutes illegal disposal of hazardous waste.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Rags and Oil Absorbent Pads section.

Compound Waxing

Potential Environmental Impacts:

Whether a hull is slightly oxidized or heavily oxidized and stained or whether a one or two-step5 process is required to improve the luster of the hull, there are few environmental impacts from compounding and waxing a hull. Basic pollution prevention techniques and proper management of the substances used to restore fiberglass hulls will help keep waxes and cleaners out of the environment.

Legal Requirements:

Make hazardous waste determination	❑ Most stain removers, rubbing compounds and waxes are not hazardous materials, although some have hazardous constituents. If any of the products you use contain hazardous ingredients, you must determine if the waste materials that are generated are hazardous [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11] and manage accordingly.

Best Management Practices:

Use non-hazardous	❑ Check all product Material Safety Data Sheets and purchase those that are non-hazardous. ❑ If possible, use phosphate free, biodegradable and non-toxic soap when prepping a hull. When removing tough stains, use only as much stain remover as necessary, or use a more abrasive rubbing or polishing compound.
Location	❑ Conduct compounding and waxing away from the water.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Rags and Oil Absorbent Pads section.

Varnishing

Potential Environmental Impacts:

Spills of oil-based varnishes may be detrimental to the marine and aquatic environment. Since they are petroleum-based, spills may have similar impact as oil spills. Chemicals in varnishes can be highly flammable and potentially harmful to human health.

Legal Requirements:

Make hazardous waste determination	❑ Many varnishes are composed of hazardous materials. You must determine if your waste varnish is hazardous [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11]. A hazardous waste determination must also be conducted for any materials used to clean a spill. Manage hazardous waste accordingly.

Best Management Practices:

Reduce leftovers	❑ Avoid the disposal problem of leftover varnish by mixing only as much as is needed for a given job. ❑ Consider sharing leftover varnishes with customers or setting up an exchange area for customers to swap unused items.
Use alternatives	❑ Use less hazardous, water-based varnishes that pose less of a threat to human health or the environment.
Clean up spills appropriately	❑ In case of spills of varnish on land, use absorbent material to clean it up and collect any contaminated soils. ❑ Spills in waterways should be contained and mopped up with booms or pads that repel water but absorb petroleum. ❑ Do not use soaps or detergents to clean up spills. They spread out the problem rather than helping and the detergent is toxic to marine life.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Spills section.

Teak Refinishing

Potential Environmental Impacts:

Teak cleaners that contain acids and caustics can be toxic to marine life when spilled in the water.

Legal Requirements:

Make hazardous waste determination	❑ A hazardous waste determination must be conducted for spent teak cleaner and for any materials used to clean a spill [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11]. Manage hazardous waste accordingly.

Best Management Practices:

Use alternative products	❑ Avoid teak cleaners containing acids (such as phosphoric acid or oxalic acid) or those labeled "caustic, corrosive, or acidic." ❑ Clean teak with a mild, phosphate-free detergent with bronze wool, if possible.
Use dustless sander	❑ If sanding teak, use a dustless or vacuum sander.
Location	❑ If possible, conduct teak refinishing in upland maintenance area. If not possible, use safer cleaners and avoid flushing excess teak cleaner and teak oil into the marina basin.

Relevant Sections and Appendices:

⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.

Fiberglassing

Potential Environmental Impacts:

The processes involved in fiberglassing, whether using epoxy, polyester, or vinylester resins for small or big jobs, can have environmental impacts. Some of the materials used in the fiberglassing process can be dangerous to workers. Some resins, catalysts and the solvents used for cleanup can be flammable, irritate the skin and respiratory system, and may cause cancer.

Legal Requirements:

Make hazardous waste determination	❑ Styrene, the primary component of gelcoat and other polyester resins, is an ignitable chemical. Therefore, cans or containers of waste resins may be regulated as ignitable hazardous waste. Certain hardeners and accelerators may also be regulated as hazardous waste [RCRA; 40 CFR 262.11; DHEC R.61-79.262.11]. ❑ Chlorinated solvents and the rags used to apply them must be managed as hazardous waste [RCRA; 40 CFR 262.11; DHEC R.61-79.262.34].
Hazardous waste storage >10,000 lbs	❑ If you store over 10,000 pounds of any hazardous substance requiring a Material Safety Data Sheet (such as a solvent), you must comply with the reporting requirements under Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) [40 CFR 355].
Hull or deck manufacture	❑ If you manufacture hulls or decks for recreational boats made from fiberglass or aluminum *and* emit 10 tons or more per year of any one federally designated hazardous air pollutant (HAP) like styrene, toluene, or xylene, and/or 25 tons or more per year of all HAPs combined, several EPA air emission standards must be followed [40 CFR 63, Subpart VVVV].

Best Management Practices:

Minimize waste	❑ Minimize waste by working with small batches of resin.
No liquid hardener in trash	❑ Avoid putting liquid hardener in the trash, since it can spontaneously combust when mixed with sawdust and other materials.

Relevant Sections and Appendices:

⇒ Appendix A for hazardous substance management information.
⇒ Appendix B and Hazardous Waste section for hazardous waste management information.
⇒ Appendix F and Stormwater Runoff Management Practices section for stormwater discharge information.
⇒ Rags and Oil Absorbent Pads section.