

INDUSTRIAL STORMWATER

FACT SHEET SERIES

Sector R: Ship and Boat Building or Repair Yards



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What is the NPDES stormwater permitting program for industrial activity?

Activities, such as material handling and storage, equipment maintenance and cleaning, industrial processing or other operations that occur at industrial facilities are often exposed to stormwater. The runoff from these areas may discharge pollutants directly into nearby waterbodies or indirectly via storm sewer systems, thereby degrading water quality.

In 1990, the U.S. Environmental Protection Agency (EPA) developed permitting regulations under the National Pollutant Discharge Elimination System (NPDES) to control stormwater discharges associated with eleven categories of industrial activity. As a result, NPDES permitting authorities, which may be either EPA or a state environmental agency, issue stormwater permits to control runoff from these industrial facilities.

What types of industrial facilities are required to obtain permit coverage?

This fact sheet specifically discusses stormwater discharges from ship and boat building or repair yards as defined by Standard Industrial Classification (SIC) Major Group 37. This group consists of facilities that primarily engage in ship and boat building and repairing services including:

- ◆ Ship building and repairing (SIC 3731)
- ◆ Boat building and repairing (SIC 3732)

What does an industrial stormwater permit require?

Common requirements for coverage under an industrial stormwater permit include development of a written stormwater pollution prevention plan (SWPPP), implementation of control measures, and submittal of a request for permit coverage, usually referred to as the Notice of Intent or NOI. The SWPPP is a written assessment of potential sources of pollutants in stormwater runoff and control measures that will be implemented at your facility to minimize the discharge of these pollutants in runoff from the site. These control measures include site-specific best management practices (BMPs), maintenance plans, inspections, employee training, and reporting. The procedures detailed in the SWPPP must be implemented by the facility and updated as necessary, with a copy of the SWPPP kept on-site. The industrial stormwater permit also requires collection of visual, analytical, and/or compliance monitoring data to determine the effectiveness of implemented BMPs. For more information on EPA's industrial stormwater permit and links to State stormwater permits, go to www.epa.gov/npdes/stormwater and click on "Industrial Activity."

What pollutants are associated with activities at my facility?

Pollutants conveyed in stormwater discharges from facilities involved with ship and boat building and repairing services will vary. There are a number of factors that influence to what extent industrial activities and significant materials can affect water quality.

- ◆ Geographic location
- ◆ Topography

- ◆ Hydrogeology
- ◆ Extent of impervious surfaces (e.g., concrete or asphalt)
- ◆ Type of ground cover (e.g., vegetation, crushed stone, or dirt)
- ◆ Outdoor activities (e.g., material storage, loading/unloading, vehicle maintenance)
- ◆ Size of the operation
- ◆ Type, duration, and intensity of precipitation events

Although each facility is unique in regards to sources, type, and volume of contaminated stormwater discharges, common activities at ship and boat yards include:

- ◆ Vessel and equipment cleaning fluid changes
- ◆ Mechanical repairs
- ◆ Parts cleaning
- ◆ Sanding
- ◆ Blasting
- ◆ Welding
- ◆ Refinishing
- ◆ Painting
- ◆ Fueling
- ◆ Storage of the related materials and waste materials, such as oil filters

Discharge of bilge and ballast water, pressure wash water, sanitary wastes, and cooling water originating from vessels are prohibited under an industrial stormwater permit. These discharges require coverage under a separate NPDES permit if discharging to receiving waters or through a municipal separate storm sewer system.

The activities, pollutant sources, and pollutants detailed in Table 1 are commonly found at ship and boat building or repair yards.

Table 1. Common Activities, Pollutant Sources, and Associated Pollutants at Ship and Boat Building or Repair Yards

Activity	Pollutant Source	Pollutant
Pressure washing	Wash water	Paint solids, heavy metals, suspended solids
Surface preparation, paint removal, sanding	Sanding, mechanical grinding, abrasive blasting, paint stripping	Spent abrasives, paint solids, heavy metals, solvents, dust
Painting	Paint and paint thinner spills, spray painting, paint stripping, sanding, paint cleanup	Paint solids, spent solvents, heavy metals, dust
Engine maintenance and repairs	Parts cleaning; waste disposal of greasy rags, used lubricants, coolants, and batteries; fluid spills; fluid replacement	Spent solvents, oil, heavy metals, ethylene glycol, acid/alkaline wastes, detergents
Material handling: Transfer Storage Disposal	Fueling: spills, leaks, and hosing area	Fuel, oil, heavy metals
	Liquid storage in above ground storage: spills and overfills, external corrosion, failure of piping systems	Fuel, oil, heavy metals, material being stored
	Waste material storage and disposal: paint solids, solvents, trash, and spent abrasives and petroleum products	Paint solids, heavy metals, spent solvents, oil
Shipboard processes improperly discharged to storm sewer or into receiving water	Process and cooling water, sanitary waste, bilge and ballast water	Biochemical oxygen demand (BOD), bacteria, suspended solids, oil, fuel

What BMPs can be used to minimize contact between stormwater and potential pollutants at my facility?

A variety of BMP options may be applicable to eliminate or minimize the presence of pollutants in stormwater discharges from ship and boat building or repair yards. You will likely need to implement a combination or suite of BMPs to address stormwater runoff at your facility. Your first consideration should be for pollution prevention BMPs, which are designed to prevent or minimize pollutants from entering stormwater runoff and/or reduce the volume of stormwater requiring management. Prevention BMPs can include regular cleanup, collection and containment of debris in storage areas, and other housekeeping practices, spill control, and employee training. It may also be necessary to implement treatment BMPs, which are engineered structures intended to treat stormwater runoff and/or mitigate the effects of increased stormwater runoff peak rate, volume, and velocity. Treatment BMPs are generally more expensive to install and maintain and include oil-water separators, wet ponds, and proprietary filter devices.

BMPs should be implemented in the following areas of the site:

- ◆ Pressure washing area
- ◆ Blasting and painting area
- ◆ Material storage areas
- ◆ Engine maintenance and repair areas
- ◆ Material handling area
- ◆ Drydocks
- ◆ General yard area

BMPs must be selected and implemented to address the following:

Good Housekeeping Practices

Good housekeeping is a practical, cost-effective way to maintain a clean and orderly facility to prevent potential pollution sources from coming into contact with stormwater. It includes establishing protocols to reduce the possibility of mishandling materials or equipment and training employees in good housekeeping techniques. Common areas where good housekeeping practices should be followed include trash containers and adjacent areas, material storage areas, vehicle and equipment maintenance areas, and loading docks. Good housekeeping practices must include a schedule for regular pickup and disposal of garbage and waste materials and routine inspections of drums, tanks, and containers for leaks and structural conditions. Practices also include containing and covering garbage, waste materials, and debris. Involving employees in routine monitoring of housekeeping practices has proven to be an effective means of ensuring the continued implementation of these measures.

Minimizing Exposure

Where feasible, minimizing exposure of potential pollutant sources to precipitation is an important control option. Minimizing exposure prevents pollutants, including debris, from coming into contact with precipitation and can reduce the need for BMPs to treat contaminated stormwater runoff. It can also prevent debris from being picked up by stormwater and carried into drains and surface waters. Examples of BMPs for exposure minimization include covering materials or activities with temporary structures (e.g., tarps) when wet weather is expected or moving materials or activities to existing or new permanent structures (e.g., buildings, silos, sheds). Even the simple practice of keeping a dumpster lid closed can be a very effective pollution prevention measure.

Erosion and Sediment Control

BMPs must be selected and implemented to limit erosion on areas of your site that, due to topography, activities, soils, cover, materials, or other factors are likely to experience erosion. Erosion

control BMPs such as seeding, mulching, and sodding prevent soil from becoming dislodged and should be considered first. Sediment control BMPs such as silt fences, sediment ponds, and stabilized entrances trap sediment after it has eroded. Sediment control BMPs should be used to back-up erosion control BMPs.

Management of Runoff

Your SWPPP must contain a narrative evaluation of the appropriateness of stormwater management practices that divert, infiltrate, reuse, or otherwise manage stormwater runoff so as to reduce the discharge of pollutants. Appropriate measures are highly site-specific, but may include, among others, vegetative swales, collection and reuse of stormwater, inlet controls, snow management, infiltration devices, and wet retention measures.

A combination of preventive and treatment BMPs will yield the most effective stormwater management for minimizing the offsite discharge of pollutants via stormwater runoff. Though not specifically outlined in this fact sheet, BMPs must also address preventive maintenance records or logbooks, regular facility inspections, spill prevention and response, and employee training.

All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements, others are quite involved. You must regularly inspect all BMPs to ensure they are operating properly, including during runoff events. As soon as a problem is found, action to resolve it should be initiated immediately.

Implement BMPs, such as those listed below in Table 2 for the control of pollutants at ship and boat building or repair yards, to minimize and prevent the discharge of pollutants in stormwater. Identifying weaknesses in current facility practices will aid the permittee in determining appropriate BMPs that will achieve a reduction in pollutant loadings. BMPs listed in Table 2 are broadly applicable to ship and boat building or repair yards; however, this is not a complete list and you are recommended to consult with regulatory agencies or a stormwater engineer/consultant to identify appropriate BMPs for your facility.

Table 2. BMPs for Potential Pollutants Sources at Ship and Boat Building or Repair Yards

Pollutant Source	BMPs
Pressure washing	<ul style="list-style-type: none"> <input type="checkbox"/> Collect discharge water and remove all visible solids before discharging to a sewer system, or where permitted, to a drainage system, or receiving water. <input type="checkbox"/> Perform pressure washing only in designated areas where wash water containment can be effectively achieved. <input type="checkbox"/> Use no detergents or additives in the pressure wash water. <input type="checkbox"/> Direct deck drainage to a collection system sump for settling and/or additional treatment. <input type="checkbox"/> Implement diagonal trenches or berms and sumps to contain and collect wash water at marine railways. <input type="checkbox"/> Use solid decking, gutters, and sumps at lift platforms to contain and collect wash water for possible reuse.
Surface preparation, sanding, and paint removal	<ul style="list-style-type: none"> <input type="checkbox"/> Confine activities to designated areas outside drainage pathways and away from surface waters. <input type="checkbox"/> Enclose, cover, or contain blasting and sanding activities to the extent practical to prevent abrasives, dust, and paint chips from reaching storm sewers or receiving water. <input type="checkbox"/> Hang plastic barriers or tarpaulins to contain debris. <input type="checkbox"/> Where feasible, cover drains, trenches, and drainage channels to prevent entry of blasting debris to the system. <input type="checkbox"/> Prohibit un-contained blasting or sanding activities performed over open water.

Table 2. BMPs for Potential Pollutants Sources at Ship and Boat Building or Repair Yards (continued)

Pollutant Source	BMPs
Surface preparation, sanding, and paint removal (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Where sanding is conducted in the water, cover the water near the boat with floating traps or surround the immediate area with floating booms and remove debris with a skimmer. <input type="checkbox"/> Prohibit blasting or sanding activities performed during windy conditions which render containment ineffective. <input type="checkbox"/> Prohibit discharge of bottom paint residues to surface waters or land. <input type="checkbox"/> Conduct bottom paint removal over an impermeable surface such as sealed asphalt or cement (not over open ground) and use a retaining berm so that the waste water can be contained. <input type="checkbox"/> Collect bottom paint residues for disposal by a licensed waste hauler. <input type="checkbox"/> Inspect and clean sediment traps to ensure the interception and retention of solids prior to entering the drainage system. <input type="checkbox"/> Use vacuum sanding systems to collect sanding dust as it is created. <input type="checkbox"/> Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding. <input type="checkbox"/> Collect spent abrasives routinely and store under a cover to await offsite disposal. <input type="checkbox"/> Store and reuse/recycle used strippers. Solvent strippers, particularly stripping baths, can generally be reused several times before their effectiveness is diminished. <input type="checkbox"/> Use environmentally-sensitive chemical paint strippers. <input type="checkbox"/> Inspect area regularly to ensure BMPs are implemented. <input type="checkbox"/> Train employees on waste control and disposal procedures.
Painting	<ul style="list-style-type: none"> <input type="checkbox"/> Confine activities to designated areas outside drainage pathways and away from surface waters. <input type="checkbox"/> Enclose, cover, or contain painting activities to the maximum extent practical to prevent overspray. <input type="checkbox"/> Hang plastic barriers or tarpaulins during blasting or painting operations to contain debris <input type="checkbox"/> Prohibit uncontained spray painting activities over open water. <input type="checkbox"/> Prohibit spray painting activities during windy conditions which render containment ineffective. <input type="checkbox"/> Use effective spray equipment that delivers more paint to the target and less overspray. <input type="checkbox"/> Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters, preferably indoors or under cover. <input type="checkbox"/> Have absorbent and other cleanup items readily available for immediate cleanup of spills. <input type="checkbox"/> Allow empty paint cans to dry before disposal. <input type="checkbox"/> Keep paint and paint thinner away from traffic areas to avoid spills. <input type="checkbox"/> Recycle paint, paint thinner, and solvents. <input type="checkbox"/> Establish and implement effective inventory control to reduce paint waste, including tracking date received and expiration dates. <input type="checkbox"/> Store waste paint, solvents, and rags in covered containers to prevent evaporation to the atmosphere. <input type="checkbox"/> Use solvents with low volatility and coatings with low VOC content; use high transfer efficiency coating techniques such as brushing and rolling to reduce overspray and solvent emissions. <input type="checkbox"/> Train employees on proper painting and spraying techniques.

Table 2. BMPs for Potential Pollutants Sources at Ship and Boat Building or Repair Yards (continued)

Pollutant Source	BMPs
Drydock maintenance	<ul style="list-style-type: none"> <input type="checkbox"/> Clean and maintain drydock on a regular basis to minimize the potential for pollutants in the stormwater runoff. <input type="checkbox"/> Sweep accessible areas of the drydock to remove debris and spent sandblasting material prior to flooding. <input type="checkbox"/> Collect wash water to remove solids and metals for disposal by a licensed waste disposal company. <input type="checkbox"/> Clean the remaining areas of the dock after a vessel has been removed and the dock raised. <input type="checkbox"/> Remove floatable and other low-density waste (wood, plastic, insulations, etc), and place in closed containers for disposal. <input type="checkbox"/> Have absorbent materials and oil containment booms readily available to contain/cleanup any spills.
Drydock activities	<ul style="list-style-type: none"> <input type="checkbox"/> Use plastic barriers beneath the hull, between the hull and drydock walls for containment. <input type="checkbox"/> Use plastic barriers hung from the flying bridge of the drydock, from the bow or stern of the vessel, or from temporary structures for containment. <input type="checkbox"/> Weight the bottom edge of the containment tarpaulins or plastic sheeting during a light breeze. <input type="checkbox"/> When sandblasting (scuppers, railings, freeing ports, ladders, and doorways), use plywood and/or plastic sheeting to cover open areas between decks. <input type="checkbox"/> Install tie rings or cleats, cable suspension systems, or scaffolding to make implementation containment easier. <input type="checkbox"/> Inspect the maintenance area regularly to ensure BMPs are implemented. <input type="checkbox"/> Train employees on waste control and disposal procedures.
Nondrydock activities	<ul style="list-style-type: none"> <input type="checkbox"/> Hang tarpaulin from the boat, fixed, or floating platforms to reduce pollutants transported by wind. <input type="checkbox"/> Pave or tarp surfaces under marine railways. <input type="checkbox"/> Clean railways before the incoming tide. <input type="checkbox"/> Haul vessels beyond the high tide zone before work commences or halt work during high tide. <input type="checkbox"/> Place plastic sheeting or tarpaulin underneath boats to contain and collect waste and spent materials and clean and sweep regularly to remove debris. <input type="checkbox"/> Use fixed or floating platforms with appropriate plastic or tarpaulin barriers as work surfaces and for containment when work is performed on a vessel in the water to prevent blast material or paint overspray from contacting stormwater or the receiving water. <input type="checkbox"/> Vacuum or sweep, rather than hose, to remove debris present on the dock.
Engine maintenance and repairs	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct maintenance and repair operations over land, avoid repairs conducted over water whenever possible. <input type="checkbox"/> Move work indoors, if possible, or create temporary work enclosures using heavy-gauge polypropylene plastic stretched over a tubular metal frame (or comparable materials). <input type="checkbox"/> Conduct the cleaning operations in an area with a concrete floor with no floor drainage; if necessary, install a sump that is pumped regularly. Collected wastes should be treated or disposed of by a licensed waste hauler. <input type="checkbox"/> If operations are uncovered, perform them on concrete pad that is impervious and contained. <input type="checkbox"/> Use berms, curbs, or similar means to ensure that stormwater runoff from other parts of the facility does not flow over the maintenance area.

Table 2. BMPs for Potential Pollutants Sources at Ship and Boat Building or Repair Yards (continued)

Pollutant Source	BMPs
Engine maintenance and repairs (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Use suction-style oil pumps to drain crankcase oil, and use absorbent pads to remove oil from bilges. <input type="checkbox"/> Engine test tanks should never be drained to storm sewer, surface waters or septic systems. <input type="checkbox"/> Collect the stormwater runoff from the cleaning area and providing treatment or recycling. <input type="checkbox"/> Plug floor drains that are connected to the storm or sanitary sewer; if necessary, install a sump that is pumped regularly. <input type="checkbox"/> Use drip plans, drain boards, and drying racks to direct drips back into a sink or fluid holding tank for reuse. <input type="checkbox"/> Drain all parts of fluids prior to disposal. Oil filters can be crushed and recycled. <input type="checkbox"/> Promptly transfer used fluids to the proper container; do not leave full drip pans or other open containers around the shop. Empty and clean drip pans and containers. <input type="checkbox"/> Dispose of greasy rags, oil filters, air filters, batteries, spent coolant, and degreasers in compliance with RCRA regulations. <input type="checkbox"/> Label and track the recycling of waste material (e.g., used oil, spent solvents, batteries). <input type="checkbox"/> Maintain an organized inventory of materials. <input type="checkbox"/> Eliminate or reduce the number or amount of hazardous materials and waste by substituting nonhazardous or less hazardous materials. <input type="checkbox"/> Clean up leaks, drips, and other spills without using large amounts of water. <input type="checkbox"/> Prohibit the practice of hosing down an area where the practice would result in the exposure of pollutants to stormwater. <input type="checkbox"/> Clean without using liquid cleaners whenever possible. <input type="checkbox"/> Do all cleaning at a centralized station so the solvents stay in one area. <input type="checkbox"/> If parts are dipped in liquid, remove them slowly to avoid spills. <input type="checkbox"/> Do not pour liquid waste down floor drains, sinks. <input type="checkbox"/> Inspect the maintenance area regularly to ensure BMPs are implemented. <input type="checkbox"/> Train employees on waste control and disposal procedures.
Material handling and storage	<ul style="list-style-type: none"> <input type="checkbox"/> Cover and/or enclose chemical storage areas (including temporary cover such as a tarp that prevents contact with precipitation). <input type="checkbox"/> Store permanent tanks in a paved area surrounded by a dike system which provides sufficient containment for the larger of either 10 percent of the volume of all containers or 110 percent of the volume of the largest tank. <input type="checkbox"/> Store containerized materials (fuels, paints, solvents, etc.) indoors where possible. Provide secondary containment, such as dikes or portable containers, with a height sufficient to contain a spill (the greater of 10 percent of the total enclosed tank volume or 110 percent of the volume contained in the largest tank). <input type="checkbox"/> If containment structures have drains, ensure that the drains have valves, and that valves are maintained in the closed position. Institute protocols for checking/testing stormwater in containment areas prior to discharge. <input type="checkbox"/> Locate storage areas away from high traffic areas and surface waters. <input type="checkbox"/> Identify potentially hazardous materials, their characteristics, and use. <input type="checkbox"/> Clearly label drum with its contents.

Table 2. BMPs for Potential Pollutants Sources at Ship and Boat Building or Repair Yards (continued)

Pollutant Source	BMPs
Material handling and storage (continued)	<ul style="list-style-type: none"> <input type="checkbox"/> Store reactive, ignitable, or flammable liquids in compliance with the local fire code, local zoning codes, and the National Electric Code. <input type="checkbox"/> Control excessive purchasing, storage, and handling of potentially hazardous materials. <input type="checkbox"/> Keep records to identify quantity, receipt date, service life, users, and disposal routes. <input type="checkbox"/> Secure and carefully monitor hazardous materials to prevent theft, vandalism, and misuse of materials. <input type="checkbox"/> Properly dispose of chemicals that are no longer in use. <input type="checkbox"/> Use temporary containment and portable drip pans where required. <input type="checkbox"/> Use spill troughs for drums with taps. <input type="checkbox"/> Provide drip pads/pans where chemicals are transferred from one container to another to allow for recycling of spills and leaks. <input type="checkbox"/> Develop and implement spill plans or spill prevention, containment, and countermeasure (SPCC) plans, if required for your facility. <input type="checkbox"/> Train employees in proper storage, use, cleanup, and disposal of materials.
Bulk liquid storage and containment	<ul style="list-style-type: none"> <input type="checkbox"/> Maintain good integrity of all storage tanks. <input type="checkbox"/> Inspect storage tanks to detect potential leaks and perform preventive maintenance. <input type="checkbox"/> Inspect piping systems (pipes, pumps, flanges, couplings, hoses, valves) for failures or leaks. <input type="checkbox"/> Train employees on filling and transfer procedures.
Designated material mixing areas	<ul style="list-style-type: none"> <input type="checkbox"/> Mix paints and solvents in designated areas away from drains, ditches, piers, and surface waters. Locate designated areas preferably indoors or under a shed. <input type="checkbox"/> If spills occur: <ul style="list-style-type: none"> - Stop the source of the spill immediately. - Contain the liquid until cleanup is complete. - Deploy oil containment booms if the spill may reach a surface water. - Cover the spill with absorbent material. - Keep the area well ventilated. - Dispose of cleanup materials in the same manner as required by the spilled material. - Do not use emulsifier or dispersant.
Shipboard process water handling	<ul style="list-style-type: none"> <input type="checkbox"/> Keep process and cooling water used aboard ships separate from sanitary wastes to minimize disposal costs for the sanitary wastes. <input type="checkbox"/> Keep process and cooling water from contact with spent abrasives and paint to avoid discharging these pollutants. <input type="checkbox"/> Inspect connecting hoses for leaks.
Shipboard sanitary waste disposal	<ul style="list-style-type: none"> <input type="checkbox"/> Discharge sanitary wastes from the ship being repaired to the yard's sanitary system or dispose of by a commercial waste disposal company. <input type="checkbox"/> Use appropriate material transfer procedures, including spill prevention and containment activities. <input type="checkbox"/> Train employees in appropriate material transfer procedures, including spill prevention and containment activities.
Bilge and ballast water	<ul style="list-style-type: none"> <input type="checkbox"/> Collect and dispose of bilge and ballast waters which contain oils, solvents, detergents, or other additives to a licensed waste disposal company.

What if activities and materials at my facility are not exposed to precipitation?

The industrial stormwater program requires permit coverage for a number of specified types of industrial activities. However, when a facility is able to prevent the exposure of ALL relevant activities and materials to precipitation, it may be eligible to claim no exposure and qualify for a waiver from permit coverage.

If you are regulated under the industrial permitting program, you must either obtain permit coverage or submit a no exposure certification form, if available. Check with your permitting authority for additional information as not every permitting authority program provides no exposure exemptions.

Where do I get more information?

For additional information on the industrial stormwater program see www.epa.gov/npdes/stormwater/msgp.

A list of names and telephone numbers for each EPA Region or state NPDES permitting authority can be found at www.epa.gov/npdes/stormwatercontacts.

References

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