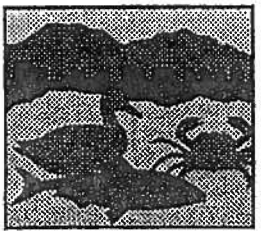
Machine Shops

Best Management Practices for Water Quality Protection



Regional Water Quality Control Plant

Operated by the City of Palo Alto for the communities of East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford

BEST MANAGEMENT PRACTICES FOR MACHINE SHOPS

The Regional Water Quality Control Plant has developed these "Best Management Practices" (BMPs) to minimize loadings of metals from machine shops to the sanitary sewer and storm drain systems. We hope you'll join us in our efforts to protect San Francisco Bay.

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HOUSEKEEPING

Good housekeeping practices are the first line of defense against pollutants entering the sanitary sewer and storm drain system.

1. Eliminate any storm drains in areas where metalworking is conducted.
2. Plug all floor drains connected to the sanitary sewer, or obtain an industrial waste discharge permit for the drain(s).
3. If necessary, use berms to isolate metalworking areas from any storm drains.
4. Never discharge any oil, coolants, or other metalworking fluids into sinks, outdoor storm drain inlets, or other connections to the sanitary sewer or storm drain system.
5. Install secondary containment around all machines that may leak or drip fluids. Keep secondary containment clean and dry at all times. Do not leave drip pans or other open containers unattended unless they are within secondary containment.

Contact the RWQCP for information about obtaining a discharge permit for your facility.

6. If secondary containment is not feasible, use drip pans or absorbent materials (such as rags, "pigs," sock-type absorbents or pads, or cat litter) to catch drips and leaks.

7. When purchasing new machines, select models that have built-in secondary containment.

8. Promptly transfer used fluids to the appropriate waste receptacles or recycling drums.

9. Keep waste fluids segregated to facilitate reuse, recycling, or treatment.

10. Keep clean-up materials such as a shop vacuum cleaner, absorbent "pigs" or other portable berms, and absorbent materials handy at all times.

FLOOR CLEANING

Sweep or vacuum instead of mopping whenever possible. If wet cleaning is necessary, clean floors using one of the following methods:

Method #1: The three-step "dry cleanup" process

Dry material collected by vacuuming machine shop floors prior to mopping is considered "scrap metal." It should be carefully contained and recycled.

Step 1: Use rags or absorbent materials to clean up spills or visible liquids. (Absorbent materials include "pigs," sock-type absorbents or pads, and cat litter.)

Step 2: Use a dry shop vacuum cleaner (shop vac) routinely, instead of or before mopping.

Step 3: Follow steps 1 and 2 above, and *then* mop. To minimize the volume of wastewater, clean floors using a damp mop rather than a wet mop, when possible. Dispose of mop water to the sanitary sewer. Never discharge mop water to the storm drain.

Method #2: Discharge after tests confirm compliance

Mop shop floors and collect the mop water in a holding tank. Analyze a representative sample from the holding tank for the appropriate parameters (i.e. metals). If test results indicate compliance with the

local discharge limits, discharge the contents of the holding tank to the sanitary sewer. If the test results indicate noncompliance, either treat to comply with limits and then dispose to the sanitary sewer, or arrange for proper disposal off-site.

Method #3: Pretreatment of cleanup water

Mop shop floors when necessary, and discharge the mopwater to a pretreatment system. Pretreatment may include separation, filtration, metals precipitation, or other processes capable of reducing contaminant concentrations below the discharge limit. Test for compliance with discharge limits; when compliance is reached, discharge to the sanitary sewer.

An industrial waste discharge permit must be obtained from the Regional Water Quality Control Plant for discharge of cleanup water from Methods #2 and #3. Your facility may also need to comply with California Department of Toxic Substances Control (DTSC) permit requirements. Do not increase water use to dilute the discharge in order to achieve compliance with concentration-based discharge limits. *The solution to pollution is NOT dilution!*

MACHINING

Machining operations utilize two basic types of metalworking fluids: water-based coolants and oil-based cutting lubricants. The following BMPs apply to both types of metalworking fluids.

1. Do not discharge spent metalworking fluids to the sanitary sewer or storm drain systems.
2. Collect all spent fluids, segregate by type, and store separately as hazardous wastes. If possible, separate out metal particles and reuse the fluids or send them to a recycler. If recycling is not possible, dispose of waste fluids as hazardous wastes.
3. Take preventive maintenance measures (such as replacing machine seals and wipers) to reduce the likelihood of contaminating metalworking fluids.
4. Put collection basins on wheels so that they may be easily moved between work stations and the recycling/waste storage area. Dedicate separate basins for the machining of different metals in

order to facilitate reclamation or recycling.

5. Recirculate metalworking fluids through a collection basin/sump unit. Remove settled fines from the unit periodically. These fines should be disposed of as a hazardous waste unless analytical testing proves that the material is not hazardous.

6. Keep to a regular schedule for machine cleaning and gasket, wiper, and seal maintenance.

SPILL CLEANUP

1. If a spill occurs, refer to the "Floor Cleaning" section of this brochure for spill cleanup methods.

2. Keep spill cleanup materials, such as absorbents, portable berms, and shop vacuums available and accessible at all times.

3. Keep your facility's updated Spill Response Plan on file at all times. Be sure that all employees are familiar with the plan and are trained for spill response.

Absorbent materials used for spill cleanup should be disposed of as hazardous wastes unless analytical testing proves that the waste is not hazardous.

PARTS CLEANING

Parts cleaning is typically accomplished with either solvents or aqueous cleaning solutions.

1. Do not discharge spent solvents to the sanitary sewer or storm drain. Spent solvents must either be recycled or disposed of as hazardous waste.

2. Use aqueous cleaners instead of organic solvents whenever possible. Aqueous cleaners are often used in conjunction with ultrasonic agitation and either thermal or mechanical methods.

Never discharge spent aqueous solutions to the storm drain.

3. Collect aqueous solutions and recycle, or discharge to the sanitary sewer. **Discharge to the sanitary sewer requires an industrial waste discharge permit.** Pretreatment may also be required, depending on concentrations of oils and metal particles in the solutions.

4. Use zero-discharge equipment such as self-contained solvent or aqueous cleaning solution sinks that recirculate liquid with a

storage drum. If possible, contract with a recycling service that will pick up spent solvents and/or aqueous cleaners when they provide fresh solutions.

5. Perform all liquid parts cleaning at a centralized area so the solvents and residues remain in one area of the shop.

6. Prevent solvents and cleaning solutions from spilling and dripping onto the shop floor. Install drip pans, drain boards, and/or drying racks at each cleaning station to direct drips back into the holding tank.

6. If zero-discharge equipment does not provide adequate cleaning, use it to pre-clean parts and reduce the use of solvents.

7. Install filters in enclosed parts washers to remove contaminants from the cleaning solution. Such units can reuse cleaning solutions over extended periods of time, and often use hot water and detergents rather than hazardous fluids.

Remove immersed parts from the solution slowly to avoid spillage.

An industrial waste discharge permit must be obtained from the RWQCP for any discharge from parts cleaning processes.

DEBURRING

1. Remove deburred parts from deburring water or solution prior to rinsing. Reuse the deburring fluid as many times as possible. When spent water or solution is no longer suitable for reuse, either pre-treat and then discharge to the sanitary sewer, or dispose of it as hazardous waste.
2. Prior to rinsing, wipe off deburred parts with a dry rag or towel to remove metal contaminants.
3. Collect water from at least the first two rinses of deburred parts. Reuse this rinse water as many times as possible. Treat, test, and discharge to the sanitary sewer, or dispose as a hazardous waste. In general, subsequent rinses may be discharged to the sanitary sewer (if initial testing shows compliance with discharge limits).
4. Use computer numerically controlled (CNC) machines to reduce the need for deburring.

Your facility must have an industrial waste discharge permit if deburring waters or any rinses from deburred parts are to be discharged to the sanitary sewer.

PAINTING

1. Do not discharge waste paints or primers to the sanitary sewer or storm drain.
2. Do not discharge paint booth spray water to the sanitary sewer or storm drain.
3. Do not discharge pretreatment baths to the sanitary sewer or storm drain.
4. Replace oil-based paints with water-based paints whenever possible. Polyurethane paints must be used in compliance with Bay Area Air Quality Management District regulations.
5. Replace liquid paint remover with sand- or bead-blasting, or a burn oven.
6. Replace chrome conversion coatings for aluminum with non-chrome alternatives. If chrome conversion coating processes are used, the rinse waters must be treated prior to discharge to the sanitary sewer.
7. Replace chromate "seals" (hexavalent chrome) for both iron and aluminum with non-chromate alternatives.

An industrial waste discharge permit must be obtained for pre-treated chrome conversion rinsewaters.

RECYCLING/HAZARDOUS WASTE STORAGE & DISPOSAL

1. Reuse or recycle (on- or off-site) cutting, cooling, and lubricating oils by filtration, clarification, skimming, dissolved air floatation, coalescing, hydrocloning, centrifugation, or pasteurization. If you conduct any of these activities on site, your facility may need to comply with DTSC permitting requirements for hazardous waste treatment.
2. Storage and disposal of hazardous wastes must be conducted in compliance with state and federal regulations.
3. Store and handle hazardous wastes in special hazardous waste containers, or in drums with secondary containment approved by your local Fire Department HazMat authority. Wastes held for recycling must be stored on-site in accordance with hazardous waste requirements.

4. Fines that settle out of metal-working fluids, cleaning solutions, solvents, etc. are considered to be hazardous wastes by the Department of Toxic Substances Control (DTSC). Such fines must be manifested and disposed of as hazardous waste. If you believe that the fines generated at your shop are non-hazardous, you may conduct a series of waste characterization tests to demonstrate that they do not exhibit any hazardous waste characteristics. For more information, call DTSC at 510/540-2122.

MATERIALS MANAGEMENT

1. Obtain a Material Safety Data Sheet (MSDS) for each chemical used or stored on your premises. Determine whether you can use less toxic substitutes.
2. Order minimum amounts of materials and chemicals. This practice reduces waste and left-over materials when procedures are changed, expiration dates pass, or spills occur.
3. Use a "first-in, first-out" materials management policy (i.e. use the materials in the order they are received) to make sure stockpiled materials do not "expire" before use.
4. Inspect containers of raw materials closely for leaks before acceptance.

5. Standardize the types of metalworking fluids, solvents, and cleaning solutions used in the shop. Using the same fluid for as many applications as possible facilitates reuse, recycling, or treatment, and also minimizes waste storage and disposal problems.
6. Whenever possible, select suppliers who provide fresh chemicals and pick up used solutions for recycling.

TRAINING

1. Train all employees in Best Management Practices for water quality protection, including proper chemical handling, storage, disposal, and water conservation techniques. Provide information for new employees, and refresh all personnel at least annually.
2. Keep your facility's Spill Response Plan updated and available to employees at all times.

ADDITIONAL INFORMATION

Hazardous Waste Disposal Requirements

A waste is considered to be hazardous if:

1) It is a specifically listed hazardous waste as defined in the California Code of Regulations (CCR), Title 22.

OR

2) It exceeds the "characteristic" standards of ignitability, corrosivity, reactivity, and toxicity as defined in Title 22.

If not reused or recycled, hazardous wastes must be properly disposed of in a Class I hazardous waste management facility.

If hazardous waste is shipped off site, an identification number from DTSC is needed. Depending on the nature and quanitity of waste generated, a hazardous waste generator permit from the Hazardous Materials Compliance Division, Santa Clara County Department of Health, may also be required.

DTSC is currently implementing a new consultative services program, intended to help small businesses (those with 50 employees or fewer) come into compliance with hazardous waste regulations. The program provides both advice and regulatory clarity. For information on setting up a consultation appointment, contact DTSC Region 2, Berkeley, at 510/540-3742.

Local Hazardous Waste Drop-off Program for Small Businesses

The Regional Water Quality Control Plant (RWQCP) and the City of Palo Alto sponsor a monthly hazardous waste drop-off program for small businesses. The intent of this program is to provide qualifying small businesses with an economical and convenient method for hazardous waste disposal.

In order to use this program, a business must:

1) Be located in one of the RWQCP service area communities — East Palo Alto, Los Altos, Los Altos Hills, Mountain View, Palo Alto, and Stanford,

AND

2) Generate less than 100 kilograms (220 pounds or approximately 27 gallons) of hazardous waste, or one kilogram (2.2 pounds) of extremely hazardous waste per month. ("Very Small Quantity Generator")

The drop-off program is held at the RWQCP, 2501 Embarcadero Way, Palo Alto, on the first Saturday afternoon of each month (except when major holidays are associated with that weekend). **Participation is by appointment only.** A fee will be charged to cover disposal and administrative costs. For more information or an appointment, call 415/496-6980.