Best Management Practices for Stormwater Pollutants of Concern

Mercury, Copper & PCBs

Owners and operators of commercial and industrial facilities are required to comply with all rules, regulations, and procedures of the National Pollutant Discharge Elimination System (NPDES) for municipal, construction and industrial activities as required by the California State Water Resources Control Board, or any of its Regional Water Quality Control Boards (In Contra Costa County: San Francisco Bay, Region 2 and Central Valley, Region 5.)

Contra Costa County's Municipal Regional Stormwater and East Contra Costa County Municipal NPDES Permits require municipalities prohibit non-stormwater discharges to the storm drain system. Activities shall be in accordance with the requirements of the Contra Costa County Public Works Department Watershed Program (for unincorporated areas of the County) and the Contra Costa Clean Water Program (representing the County's 19 cities/towns, unincorporated County and the Flood Control and Water Conservation District).

Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) Compliance

Regulatory Agencies

US Environmental Protection Agency (EPA), Region 9	
24-Hour Spill Hotline	1-800-300-2193
TSCA Hotline (e-mail: TSCA-Hotline@epa.gov)	(202) 554-1404
Regional PCB Coordinator	(415) 972-3352
National Response Center	
(For Spills of a Reportable Quantity)	1-800-424-8802
CA Dept. of Toxic Substances Control (DTSC)	1-800-69-TOXIC
Regional Water Quality Control Boards (RWQCB):	
San Francisco Bay, Region 2	(510) 622-2300
Central Valley, Region 5	(916) 464-3291
Contra Costa Health Services Department:	
Hazardous Materials Programs (CUPA)	(925) 335-3200
Environmental Health	(925) 692-2500
County Watershed Program	(925) 313-2000

Contra Costa County Public Works Department

Watershed Program
255 Glacier Drive, Martinez, CA 94553

Stormwater NPDES Compliance for Pollutants of Concern

Only a small percentage of the massive number of chemicals in use today are being monitored for their presence and toxic effects in the environment. These generally include heavy metals like Mercury and Copper and persistent and bioaccumulative chlorinated compounds such as PolyChlorinated Biphenyls (PCBs).

Because they degrade slowing, such pollutants persist in the environment. Urban stormwater run-off has been found to be a significant source of these Pollutants of Concern (POCs) in our receiving waters like the Delta and the Bay.

The County's Stormwater NPDES Permits require municipalities to implement control programs for Mercury, Copper and PCBs in order to reduce loads to receiving waters, and to make substantial progress towards achieving urban run-off load allocations to improve water quality.

What You Need To Do

If your business uses or has these Pollutants of Concern (POCs) on site, owners and operators must take an active role to prevent their discharge into the environment in the following ways:

- Identify sources of these POCs at your facility or business
- Educate yourself and your employees about why these POCs pose a threat to human health and the environment.
- Employ Best Management Practices (BMPs) to prevent the discharge of these POCs to stormwater and the environment.
- Protect the storm drain system around your property.
- Train your employees in proper handling, management and disposal of these POCs.

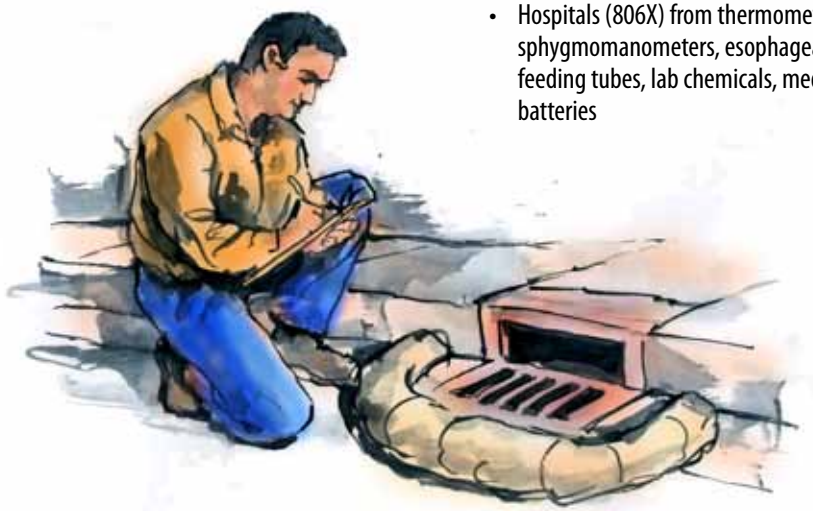
Mercury

San Francisco Bay and the Delta are considered to be "impaired" by Mercury for beneficial uses like recreation and habitat because Mercury is persistent in the environment from industrial processes, accidental breakage and improper disposal.

Mercury is highly toxic to wildlife and humans. Within sediments, bacteria convert Mercury into its more toxic form - Methylmercury which bioaccumulates in tissues as it moves up the food chain. Fish caught in the Bay-Delta Estuary may contain Mercury at concentrations that may threaten the health of wildlife and humans consuming them.

Sources of Mercury

- Industrial/commercial facilities
- Atmospheric deposition
- Historic mines
- Facilities that use Mercury in processes and equipment
- Facilities that have Mercury-containing devices
- e-Waste collection centers



Erosion Control

Bay Area stormwater studies have found concentrations of total Mercury bound with sediments. Reducing erosion from your property and preventing sediment from being washed down the storm drain system may be the best way to reduce total Mercury loads to our receiving waters.

Industrial and Commercial Facilities of Concern

From outdoor storage and outdoor processes:

- Metal finishing/electroplating facilities [Standard Industrial Classification (SIC)3471]
- Coating, engraving and allied services (SIC 3479)
- Establishments primarily engaged in manufacturing fabricated metal products, not elsewhere classified (SIC 3499)
- Motor vehicle parts, used (SIC 5015) including auto dismantlers

From Mercury-containing devices:

- Motor vehicle parts, used (SIC 5015) including auto dismantlers from switches, headlights, vehicles fluids, vehicle bodies/parts
- Hospitals (806X) from thermometers, sphygmomanometers, esophageal dilators, feeding tubes, lab chemicals, medical batteries

Mercury-Containing Devices

Fluorescent Bulbs

- Fluorescent light tubes
- Compact fluorescent lights (CFLs)
- Tanning lamps
- Germicidal lamps

High Intensity Discharge (HID) Lights

- Metal halide lamp
- High pressure sodium lamps
- Mercury vapor lamps

Other Types of Lighting

- Mercury (and xenon) short-arc lamps
- Mercury capillary lamps
- Neon lights

E-Waste

- Cathode ray tubes (CRT) monitors
- Liquid crystal display (LCD) screens

Relays and Tilt Switches

- Various switches - float, tilt, pressure, temperature
- Root switch from sump pumps
- Tilt switch from washing machines
- Mercury displacement relays
- Mercury wetted relays
- Flame sensor from gas ranges
- Mercury contact relays

Batteries

- Mercury batteries
- Older alkaline batteries
- Zinc air miniature batteries
- Silver oxide button cell batteries
- Alkaline manganese oxide button-cells

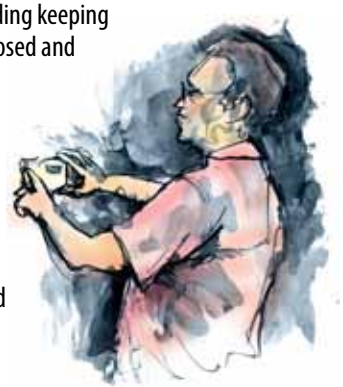
Other Mercury-Containing Devices

- Thermometers
- Thermostats
- Pressure-sensing devices ie. barometers, manometers

Best Management Practices for Mercury

Source Control

- Educate operators in BMPs to prevent the discharge of Mercury to the environment.
- Protect and maintain storm drains around your property.
- Follow good housekeeping practices: keep areas clean and prevent spills and leaks.
- Dispose of all wash water to the sanitary system.
- Store Mercury-containing devices inside or under cover.
- Use secondary containment when storing Mercury-containing chemicals.
- Properly store/manage hazardous materials/wastes including keeping containers closed and labeled.
- Use Mercury-alternative products.
- Practice waste reduction and recycling.



Spill Management

- Never touch Mercury with bare hands.
- Never use vacuum cleaners or brooms to clean up Mercury spills.
- Use cardboard pieces, a squeegee, or an eyedropper to gather and collect the Mercury.
- Place Mercury and clean up materials in a container, label it for proper hazardous communication and properly dispose of it.

Proper Disposal

- In CA, Mercury Is regulated by recycling and disposal requirements of the CA Universal Waste Regulations: Cal. Code Regs, Tit. 22, Div. 4.5, Ch. 11 Section 66261.9
- Small businesses may qualify as a Conditionally Exempt Small Quantity Universal Waste Generator (CESQUWG) if they generate less than 220 pounds of RCRA hazardous wastes (including fluorescent lights, batteries and Mercury containing devices) per month, and accumulate no more than 2,200 pounds at any time.
- CESQUWGs can recycle their Universal Waste at their local Household Hazardous Waste Facility (for a nominal fee), contract with a private, certified universal waste transporter, or go to Contra Costa County's Recycling and Reuse website for more disposal options: cccrecycle.org.
- See CA Dept. of Toxic Substances Control's (DTSC) informational fact sheet developed to help universal waste handlers properly manage their waste: www.dtsc.ca.gov/HazardousWaste/UniversalWaste/upload/UW_Factsheet1.pdf

Copper

Although ubiquitous in our daily lives, Copper is a pollutant due to its acute toxicity to plankton and other aquatic organisms that form the base of the food chain. Copper dust sloughs off vehicle brake pads and is washed down the storm drain system to pollute receiving waters when it rains.

Copper has many industrial algae control applications. Copper algaecides are widely used in direct treatment of irrigation ponds and in recirculated cooling water systems. Copper is also commonly used in anti-fouling paints on vessel hulls to prevent proliferation of encrusting marine life.

Municipalities and businesses have made significant investment in Copper reduction measures. In CA, legislation has passed that will eliminate Copper in brake pads by 2026.

Sources of Copper

- Vehicle brake pads
- Plumbing
- Potable water discharged to storm drains
- Air emissions
- Soil erosion
- Architectural features, eg. roofs and downspouts
- Roof runoff/deposition
- Industrial use
- Pool and spa water containing Copper-based water treatment chemicals
- Copper-containing pesticides and algaecides
- Anti-fouling boat hull paints

Industrial and Commercial Facilities of Concern for Copper

From outdoor storage and outdoor processes and ventilation equipment roof run-off:

- Primary smelting and refining of Copper (SIC 3331)
- Secondary smelting and refining of non-ferrous metals (SIC 3341)
- Rolling, drawing and extruding of Copper (SIC 3351)
- Electroplating (SIC 3471) plating, polishing, anodizing and coloring
- Semiconductor manufacturing (SIC 3674)
- Auto dismantlers (SIC 5015) motor vehicle parts, used, from outdoor storage
- Boat yards and marinas with on-shore maintenance yards (SIC 4493 & 4499) from copper-based anti-fouling coatings
- Scrap and waste materials (SIC 5093) from outdoor storage
- Car Washes (SIC 7542) from wash water
- Automotive services (SIC 7549) from radiator repair, flushing operations, dripping vehicles, outdoor storage and outdoor operations

Best Management Practices for Copper

Source Control

- Educate operators in BMPs to prevent the discharge of Copper to storm drains.
- Protect and maintain storm drains around your property.
- Follow good housekeeping practices: keep areas clean and prevent spills and leaks.
- Dispose of all wash water to the sanitary system.
- Store Copper-containing items inside or under cover.
- Use secondary containment when storing Copper-containing chemicals.
- Properly store/manage hazardous materials/wastes including keeping containers closed and labeled.
- Practice waste reduction and recycling

Industry Specific

- ***Conduct vehicle servicing indoors*** - If work must be done outside, use a ground cover eg. drip pan, tarp, cardboard, to prevent the discharge of leaks and drips.
- ***Properly manage Copper architectural features*** - Installers and contractors are required to be trained in and follow appropriate BMPs to properly manage wash water and potential discharges from cleaning and treating Copper architectural features such as Copper roofs.
- ***Manage Copper treatments for pools/spas*** The discharge of Copper-based chemicals from pools, spas and fountains to the storm drain is prohibited. Sanitary district permitted installation of sewer connections including for filter backwash, is required, or discharges can be diverted to landscaping.
- ***Use Copper-alternative anti-fouling paints on boat hulls*** - Employ BMPs during in-water hull cleaning including soft bristled brushes that slough off minimal paint; properly store and prevent spills from Copper anti-fouling coatings.

Roof Runoff

For metal finishing, electroplating and semiconductor manufacturing industries that use Copper chloride etchers, ammonia etchers, and acid plating baths in their processes, exhaust venting systems have been found to often have Copper deposition around vents, pipes, and other roof surfaces.

If your industry uses Copper and has a roof ventilation system, follow these BMPs to minimize Copper contamination from roof runoff:

- Install vent covers and drip pans.
- Perform routine maintenance to prevent leaks in pipe fittings and containment vessels.
- Promote condensation of ammonia etchant vapor.
- Treat or properly dispose of ventilation condensate.
- Install scrubber systems to collect vapors.
- Use appropriate scrubber solution to neutralize/ bind chemical fumes.
- Routinely inspect venting systems for Copper deposition.

Plumbing

It is estimated that 77% of Copper loads to the Bay are from urban run-off. The remaining 23% comes from wastewater treatment plant effluent. Of this, an estimated 60% comes from indoor plumbing where excess flux residue and burrs can cause pipe corrosion. Copper is then sloughed off piping to enter our waterways after passing through conventional wastewater treatment plants.

Follow these BMPs to minimize Copper contamination from plumbing:

- Follow industry installation techniques for soldering and brazing Copper tube and fittings.
- Design plumbing systems to minimize velocities, turbulence, high temperature, stagnant sections and direction/size changes.
- Eliminate small burrs from pipe cutting to reduce turbulence and corrosion.
- Minimize flux use to minimize corrosion; Use fluxes that meet ASTM B813 standards that are 'water flushable' with limited corrosivity.
- Thoroughly clean and flush newly-installed piping.

PCBs

PCBs are a class of chlorinated synthetic chemicals heavily utilized in industry due to their lubricating properties under intense heat and temperature extremes. They were commonly used in transformers. Prior to 1978, they were used in 95% of all US manufactured capacitors.

PCBs were also used in hydraulic systems at steel manufacturing and die-casting plants to reduce fire hazards in equipment exposed to hot metals. PCBs were the primary insulating material used in older fluorescent light ballasts.

Because of their extraordinary persistence in the environment, harmful health effects and bio-accumulative properties in the food chain, U.S. companies stopped manufacturing PCBs in 1977, and the US Environmental Protection Agency (EPA) banned most uses in 1979. PCBs are regulated under the Federal Toxic Substances Control Act (TSCA).

TSCA Regulations

- Enacted to control the distribution, use and disposal of harmful chemicals including PCBs.
- Designed to ban the manufacture of PCBs and ensure the proper disposal of PCBs and PCB-containing equipment, while minimizing the risks posed by their storage, use and handling.
- Categorize the management and disposal of PCB-contining fluids into three groups:
  1. PCB-containing: >500ppm
  2. PCB-Ccontaminated: 50 – 500ppm
  3. Not-TSCA Regulated: <50ppm (some requirements may apply)
- Require owners of PCB transformers to register transformers with USEPA.
- Include requirements for marking, storage, record-keeping and disposal of PCB-containing equipment.
- Include numerous exemptions, authorized concentration limits and current authorized uses such as servicing of PCBs in various PCB-containing equipment including:
  - Transformers
  - Railroad transformers
  - Heat transfer systems, hydraulic systems, mining equipment
  - Natural gas pipelines
  - Research & development, environmental analysis
  - Scientific instruments, microscopy immersion oils
  - Carbonless copy paper
  - Electromagnets, switches, voltage regulators, circuit breakers, reclosers, cable

For guidance in conducting inspections and ensuring compliance with PCB regulations under TSCA Section 6(e) and Code of Federal Regulations (CFR) Title 40, Part 761, go to USEPA's PCB Inspection Manual (August 2004) www.epa.gov/oecaerth/resources/publications/monitoring/tsca/manuals/pcbinspect

Sources of PCBs

- Industrial areas
- Electrical equipment
- Dielectric fluids
- Hydraulic fluids
- Lubricants
- Adhesives & tapes
- Plasticizers
- Thermal insulation including fiberglass, felt, foam and cork

PCB-Containing Equipment

- Transformers
- Capacitors
- Hydraulic systems
- Fluorescent light ballasts
- Heat transfer systems
- Electric motors
- Electromagnets
- Other electrical equipment

PCBs in Older Buildings

- Facilities with old fluorescent light ballasts
- Investment casting wax
- Carbonless copy paper
- Resins, sealants and coatings, including windshield sealant and silo sealant
- Lubricants, including bridge bearings and transmission fluid additives
- Oil-based paint including marine paint
- Electrical cable insulation
- Exterior building materials, ie. caulks & roofing materials

Industrial/Commercial Facilities of Concern with:

Transformers and capacitors

- Primary and secondary metals smelting and refining (SIC 333X and SIC 334X)
- Rail yards (SIC 4013)
- Electric utilities including generation, transmission and distribution (SIC 4911)
- Electrical equipment maintenance facilities and salvage yards (SIC unspecified)

Capacitors in Cranes and Metal Separation Equipment for Recycling Operations

- Scrap and waste materials (SIC 5093)
- Motor vehicle parts, used, including auto dismantlers (SIC 5015)

Industrial/Commercial Facilities of Concern with: (continued)

High Power Requirements

- Electrical substations
- Powerhouses that generate/distribute Electrical power throughout their facilities
- Underground vaults
- Sawmills
- Pulp and paper mills
- Chemical manufacturing
- Shipyards

Heat Transfer Systems for Producing

- Chemicals
- Asphalt
- Pulp and paper
- Metal products such as steel tubing and die-casting
- Adhesives
- Food processing
- Paint & coatings
- Textiles

Hydraulic Systems

- Steel manufacturing
- Die-casting plants

PCB-Containing Equipment Requirements

Manufacturer Labeling

Most commercial PCB mixtures are described on manufacturer labels by their industrial trade names including the most common: Aroclor. Other cogeners (PCB chemical mixtures) include:

- Askarel, Eucarel, Pyranol, Dykanol, Clorphen, Clorinol, Chlorextol, Diaclor, Hyvol, Asbestol, Inerteen, Elemex, Saf-T-Kuhl, No-Flanol, Nepolin, EEC-18

To aid in determining PCB content, USEPA required all low-voltage and small capacitors and fluorescent light ballasts manufactured between 1978 - 1998 to be labeled "No PCBs".

Facility Labeling

- Required on in-use or stored PCB-containing equipment (except for small capacitors).
- Signage required for storage areas of PCB wastes and at access areas to PCB transformers.

Recordkeeping & Reporting

- Identification of PCB-containing items, quantities and weights.
- Maintain dates of storage, transfer, and disposal.
- Identification of shippers and receivers.
- Owners of facilities w/PCB transformers must register them at USEPA's Transformer Registration Database: www.epa.gov/osw/hazard/tsd/pcbs/pubs/data.htm.
- Report all PCB spills (>1 pound) to the environment to National Response Center: 1-800-424-8802 and to USEPA, Region 9 24-Hour Spill Hotline: 1-800-300-2193.

Best Management Practices for PCBs

- Employee awareness of TSCA and USEPA regulations governing proper PCB equipment labeling, handling, storage, disposal, record-keeping and spill control.
- Implement spill containment provisions in the work area and provide employee training.
- Practice good housekeeping and proper storage including secondary containment.
- Properly dispose of contaminated soil, rags, filter media and debris from clean-up operations.

- Conduct routine equipment inspections for leaks due to normal wear-and-tear, malfunctioning or damaged equipment, or from maintenance activities.
- Prevent erosion and sediment discharges from your property to the storm drain system since PCBs often bind to very small particles.
- Realize best abatement of PCBs may be from:
  1. Capture during building demolition.
  2. Targeted clean-up of PCB-contaminated hotspots.
  3. Treatment of run-off from industrial areas.

Regulatory Agencies for PCB Referrals

The County's Municipal Regional NPDES Permit Section C.12.a.ii requires municipal inspectors document presence of PCBs at facilities in inspection reports and refer violations and unregistered transformers to appropriate regulatory agencies:

- USEPA, Region 9 Regional PCB Coordinator: 415-972-3352. In CA provides support for TSCA compliance: www.epa.gov/region9/toxic/pcb/index.html.
- TSCA Hotline: 202-554-1404 and e-mail: TSCA-Hotline@epa.gov.
- CA Dept. of Toxic Substances Control (DTSC) for disposal of PCB contaminated wastes and complaints: 1-800-69-TOXIC.