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# Environmental Health & Safety

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## Environmental Protection Requirements

Environmental Programs is responsible to assure that UW organizations are complying with the environmental regulations, standards and UW best practices when designing, constructing, operating, and decommissioning facilities owned by the University.

### 1. Air Emissions

The Clean Air Act of 1970 gave the U.S (United States). Environmental Protection Agency (EPA) authority to regulate air pollutants, including the protection of stratospheric ozone. The Washington Department of Ecology and the Puget Sound Clean Air Agency are authorized by the EPA to administer permits, and an Air Operating permit was issued to the UW in 2001.

#### a. Air Operating Permit – Seattle Campus

Federal regulations require each major source of air pollutant emissions to obtain an "operating permit" that consolidates all air pollution control requirements into a single, comprehensive document covering all aspects of the source's air pollution activities. These are called Title V operating permits, and managed by our regional air authority, the Puget Sound Clean Air Agency (PSCAA).

The UW is considered a "major source" for two primary reasons. First, the Power Plant. The boilers, primarily, and the large stack, are "sources with annual emissions:

- i. Greater than or equal to 2.50 tons of any single hazardous air pollutant (HAP).
- ii. Greater than or equal to 6.25 tons of total hazardous air pollutants (HAP); or
- iii. Greater than or equal to 25.0 tons of carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM<sub>2.5</sub> or PM<sub>10</sub>), sulfur oxides (SO<sub>x</sub>), or volatile organic compounds (VOC).

View the [Air Operating Permit](#) issued to the UW on the Puget Sound Clean Air Agency website

#### b. Ozone Depleting Substances

Federal regulations direct the use of [ozone-depleting substances](#). Refrigerants, widely used on campus, are categorized as ozone-depleting substances, and must be managed accordingly. The UW Facilities' Refrigeration Shop ensures that all refrigerators, freezers, air conditioners and cooling units on campus are well-maintained. When they are removed from service, any ozone-depleting substances are either recycled or incinerated as waste, so they do not destroy stratospheric ozone.

If contracting the removal of air conditioning, chillers, or refrigeration equipment, or if you purchase and install new equipment, please notify the Facilities Services Refrigeration Shop Supervisor at 206.685.8835.

**c. Air Pollutant Sources**

UW also emits, or has the potential to emit, other Hazardous Air Pollutants.

<https://www.epa.gov/haps/what-are-hazardous-air-pollutants>

Also known as toxic air pollutants or air toxics, these are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Examples of toxic air pollutants include benzene, which is found in gasoline, asbestos, and metals such as mercury, and lead compounds. Dust, dirt, and fine particulate matter leaving construction sites would be classified as “fugitive emissions” and regulated.

The University has several other air pollutant sources related to research and general campus operations. There are paint spray booths, dust collectors, machine shops, a gas station and emergency generators. All of these have the potential to emit toxic air pollutants as well as CO, NOx, and volatile organic compounds.

We do not allow Ethylene Oxide (EtO) or Chlorine Dioxide sterilization systems on campus. Please contact Environmental Programs at 206.616.5835.

## **2. Stormwater Management**

The UW has established Stormwater Management Programs to manage separate storm drainage systems across jurisdictions. The programs are designed and implemented to reduce the discharge of pollutants from the stormwater system to the maximum extent practicable to protect water quality.

The UW Seattle Stormwater Management Plan and UW Seattle Stormwater Operations and Maintenance Plans can be found on the [EH&S website](#).

The Washington Department of Ecology (Ecology) has inserted requirements related to polychlorinated biphenyls (PCBs) in building materials in the Phase I, Western Washington Phase II Municipal Stormwater Permits for 2023. Best management practices (BMPs) have been developed to control PCBs in building materials to reduce exposure to people and prevent PCBs entering stormwater. Contamination can enter the MS4 through precipitation and routine external building cleaning and maintenance. Source controls measures can also prevent off site impacts during construction, demolition, and renovations.

Projects must minimize the pollution of storm water. Storm drains at UW Seattle and UW Bothell drain directly into Portage Bay and Lake Washington. Storm drains at UW Tacoma drain directly to the Puyallup River, another salmon corridor. The biggest pollution concerns for construction projects are settleable solids (mainly sediment) and pH.

a. **Construction Stormwater Protection**

Temporary construction permits should be expected. Depending on the size of the project, permanent storm water detention or treatment may be required.

Below are general outlines of requirements in Seattle, Tacoma, and Bothell for construction-phase stormwater protection.

If your project disturbs more than one acre of land, you must apply for coverage under the state Construction National Pollutant Discharge Elimination System (NPDES) permit. Washington State Department of Ecology requires regulated construction sites to get coverage under the Construction Stormwater General Permit (CSWGP). Following the requirements in this permit helps control and reduce water pollution. If the construction site is contaminated, proper management will be detailed in the on-site Storm Water Pollution Prevention Plan (SWPPP).

EH&S Environmental Programs (EP) will assist with permits on behalf of the project and provide guidance and advice in planning and during construction. Requirements and permit applications are at the following link: <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit>.

The Seattle campus has three storm drainage systems with three different owners: The City of Seattle, King County and University of Washington. The process for construction projects is the same for all three – submit appropriate plans to the **City of Seattle Department of Planning and Development**.

For projects that involve over 5,000 square feet of new or replaced impervious surfaces, the City of Seattle requires a Large Project Construction Storm Water Control Plan. Requirements for both types of projects are at [https://www.seattle.gov/sdci/codes/codes-we-enforce-\(a-z\)/stormwater-code](https://www.seattle.gov/sdci/codes/codes-we-enforce-(a-z)/stormwater-code)

For all other projects that disturb land or involve new or replaced impervious surfaces of over 750 square feet, the City of Seattle requires a **Small Project Construction Stormwater Control Plan**.

Requirements for the City of Tacoma can be found in the Tacoma Surface Water Management Manual at <https://www.cityoftacoma.org/cms/one.aspx?pageId=3092>

For the City of Bothell, Bothell's Surface Water Design Manual outlines drainage review. It is at: <http://www.ci.bothell.wa.us/1239/Design-Manual>

Some types of minor projects are exempt from this requirement, including maintenance, repair and installation of utilities and existing sanitary sewer or drainage systems; road maintenance and shoulder grading; drainage ditch maintenance and vegetation maintenance. However, best practices and a Temporary Erosion and Sediment Control (TESC) plan should be implemented to limit surface runoff and reduce water pollution.

**b. Additional Advice**

The environmental consultant assigned to the project should complete the permit application and create the Storm Water Pollution Prevention Plan (SWPPP).

A SWPPP is required if demolishing or renovating the exterior of a building with PCB contamination present.

EH&S and Facilities Campus Engineering should review any applications before they are signed and submitted. Expect at least 30 days for the Washington State Department of Ecology to review and approve. More so if there is any known or assumed contamination on the site.

EH&S and Facilities Campus Engineering should receive copies of the final signed permit application and final permit. Signatures must come from the director level or an authorized representative.

Monthly discharge monitoring reports (DMRs) are required.

Termination forms are required once the project is complete.

<https://apps.ecology.wa.gov/publications/SummaryPages/ecy02087.html>

**c. Local Discharge Permits for Dewatering/Contaminated Stormwater**

Discharge authorizations are required for discharge of stormwater to the sanitary sewer.

EH&S Environmental Programs (EP) is the UW liaison for King County Industrial Waste Division and will assist with authorization and permits on behalf of the project.

Requirements and permit applications are at the following link:

<https://kingcounty.gov/services/environment/wastewater/industrial-waste/business/construction.aspx>

**d. Post-construction storm water protection**

Depending on the size of the project, permanent stormwater detention and/or treatment may be required. Guidance and specifications are provided by the city issuing the building permit and EH&S is generally not involved. Contact EH&S (Environmental Programs) at 206.616.5837 for assistance.

**3. Contaminated Wastewater Management**

Construction, renovations, and maintenance projects sometimes generate wastewater, which must be disposed of properly and in consultation with EH&S. The UW has a wastewater discharge permit. King County sewer discharge limits are included, along with approved discharges and general conditions. <https://www.ehs.washington.edu/environmental/wastewater>

If you are using cleaning products or washing a contaminated surface, you must collect the contaminated wastewater for discharge to sanitary sewer.

Lead, asbestos, and other hazardous materials cause the wash water to violate sewer discharge limits. If hazardous materials could be in the wash water, you must collect samples and have them analyzed for the concentrations of those materials. If the water exceeds local sewer discharge limits, then it must be disposed of as hazardous waste.

Potable water, or water flushed from sprinkler systems or fire hydrants, may not be discharged directly to the storm drainage system due to chlorine levels. This water must be discharge to the sanitary sewer system. If that is not feasible, consider a drain connected to the combined system, through surface vegetation, or overnight tank storage to allow chlorine to dissipate into the air before the water can enter the storm drain.

- a. At the job site, you must set up berms to prevent wash water from reaching storm drains. Avoid the use of strong cleaners and solvents, which can cause the wastewater to be hazardous waste even after use and dilution with rinse water. Sweep the area to minimize the rinsing of dirt and other solids into the sanitary sewer.

[Seattle SDCI – 2021 Stormwater Code – Section 22.802.030 Permissible Discharges](#)

gives permission to discharge wash water to the storm system, provided you sweep first and use no detergents. [Section 3.1 Cleaning and Washing applies](#) (see BMP 17 pg. 51). You are not required to collect and discharge to sanitary sewer.

Do not allow wastewater or rinse water to soak into the landscaping unless you have made prior arrangements with grounds maintenance staff. Some landscaped areas are under a strict watering schedule to minimize plant diseases. Storage of the wastewater in a Baker tank may be required or other container to allow sediments to settle to meet the standard. For grit and dirt that can be easily filtered, use a drain insert. For more information about wastewater disposal, call EH&S at 206.616.5837.

## **4. Site Contamination Management**

Environmental Health & Safety (EH&S) maintains information on the location of known and suspected contaminated sites and oversees compliance with the Washington State Model Toxics Control Act (MTCA) rules. MTCA rules guide environmental release discovery, investigation and cleanup requirements and sets cleanup standards to protect human health and the environment. The discovery of environmental contamination during construction can lead to project delays, contractor change-orders, and emergency response costs. Therefore, EH&S recommends that Project Managers conduct due diligence early in the project and manage known or suspected environmental contamination prior to construction where possible, and ensure specifications and designs clarify environmental impacts.

- a. **Due Diligence**

Due diligence may start with reviewing a Phase I Environmental Site Assessment (ESA).

Determine if a Phase I ESA is available for the site. A Phase I ESA helps determine if the site has any recognized environmental conditions based on historic uses, an onsite visit, onsite interviews, and an extensive records review. EH&S or UW Real Estate may have a copy of it. If a Phase I ESA does not exist for the property, consider hiring an environmental consultant to conduct one. Sites with heating oil tanks, imported soil, and a history of past commercial or industrial activities may have environmental contamination. Contact EH&S (206-616-0585) to discuss the results of the Phase I ESA and suggestions for additional assessments.

EH&S will review environmental recommendations and help the Project Manager determine when additional assessments are necessary. Reporting newly discovered environmental contamination If contamination is found in due diligence or during construction, contact EH&S immediately.

EH&S will help determine if the release is reportable. Notifications of confirmed releases from an underground storage tank (UST) or associated piping are required within 24 hours of discovery, while other types of releases are reported within 90 days.

#### **b. Managing Environmental Contamination**

Project Managers can manage certain types of site contamination issues early in the pre-design stage of the project. For example, consider the closure of an underground storage tank prior to mass excavation activities. If the tank leaked, properly trained and equipped contractors can manage the cleanup efficiently and effectively following UST and MTCA requirements. This simplifies specifications and designs as the project moves forward. In other cases, site contamination may need to be managed during construction, and the Project Manager will rely on carefully crafted specifications and designs to inform bidders of environmental impacts including remediation and disposal plans. Project Managers will rely on environmental consultants to conduct environmental assessments and, in combination with EH&S, clarify their impacts to the project designs. EH&S recommends use of the UW State Hazardous Materials Contract to hire environmental contractors who are familiar with site contamination requirements and the impacts to the specifications. Contact EH&S for a copy of the contract and to review the environmental consultant's scope of work.

Environmental consultants may be called upon to provide the following types of services:

- Conducting due diligence (a Phase I and II Environmental Site Assessment)
- Decommissioning an underground storage tank per Ecology requirements
- Characterizing soil and groundwater conditions prior to and during construction
- Drafting a wastewater discharge permit that stipulates specific limits and conditions of allowable discharge
- Drafting a Construction National Pollution Discharge Elimination System Permit (NPDES)
- Drafting a Construction Storm Water General Permit (CSWGP) and a Storm Water Pollution Prevention Plan
- Developing a waste management plan including the proper storage, sampling and disposal of soil and water
- Drafting waste profiles for EH&S signature

- Conducting a methane assessment and determining the need for methane mitigation systems at sites located on or within 1000-feet of the Montlake Landfill
- Conducting a vapor intrusion assessment and determining the need for vapor mitigation systems
- Drafting assessment and cleanup reports for EH&S to review
- Preparing contract documents/specifications to ensure all contractors are aware of site conditions, safety considerations, cleanup, and waste management plans.

EH&S will review environmental bids, waste management plans and profiles, sampling results, draft assessment and cleanup reports, and designs and specifications to determine if they meet environmental standards.

EH&S is required to submit environmental assessment and cleanup reports to Ecology. EH&S (206.616.0585) will assist project managers with determining the extent of cleanup requirements.

Cleanup requirements vary from site to site and depend on the location, contaminant, concentration, and the likelihood of impacts to human health and the environment.

Ecology requires removal of the source(s) of environmental contamination to the extent practicable and in a manner that prevents the spread of hazardous substances. In most cases, contaminated soil excavation and offsite disposal is required. If soil contamination runs deep and is suspected of impacting the groundwater, Ecology will expect proof that the groundwater was not impacted.

The environmental consultant will advise EH&S and the Project Manager if groundwater monitoring wells are necessary to assess this impact. When environmental contamination cannot be fully remediated due to structural constraints or safety considerations, the University implements engineering or institutional controls to protect human health and the environment.

Engineering or Institutional Controls Engineering or institutional controls limit or prohibit activities that may interfere with the integrity of a cleanup action or that may result in exposure to hazardous substances at a site.

Institutional controls can be:

- Physical measures such as fences
- Use restrictions such as limitations on the use of property or resources; or requirements that cleanup action occur if existing structures or pavement are disturbed or removed
- Maintenance requirements for engineered controls such as the inspection and repair of monitoring wells, treatment systems, caps, or groundwater barrier systems
- Educational programs such as signs, postings, public notices, health advisories, mailings, and similar measures that educate the public and/or employees about site contamination and ways to limit exposure.



**c. Disposal of Contaminated Soil**

During assessment and cleanup activities contaminated soil must be contained, labeled, and protected from the weather. Contaminated soil must remain on site until it has been fully characterized for disposal. Waste soil may be stored in bins, labeled drums, or covered stockpiles on Visqueen before it is hauled under a waste profile to a UW authorized disposal site. In certain cases, soil may be pre-characterized, placed into dump trucks, and hauled directly to a UW authorized disposal site.

Representative samples of contaminated soil must be taken for waste designation purposes and the analytical must be sent to EH&S for review prior to disposal.

EH&S will determine if the soil is Hazardous Waste, Solid Waste, or “reusable.”

All Hazardous Waste and Solid Waste must go to a UW approved disposal site. If soil designates as a Hazardous Waste, EH&S must manage the containment, transport, and disposal of it through the state hazardous waste contract. If soil is a solid waste, the contractor will arrange for containment, transport and disposal to a UW approved treatment, recycling, or disposal site.

**5. Environmental Protection Site Design Guide**

Petroleum-contaminated soils depending on the specific contaminant and concentration are a Solid Waste and must be disposed of at a UW approved treatment, recycling or disposal site like a subtitle D landfill or a treatment facility.

Contact EH&S at 206.685-3759 for assistance in estimating disposal costs. A good rule of thumb when estimating the volume and weight of soil for disposal is that one cubic yard of dry soil weighs approximately 1.5 tons.

**a. Disposal of Contaminated Water**

Where contamination exists at a construction site, water quality will need to be evaluated during and post construction to identify appropriate discharge locations (storm water system, sanitary system, off-site disposal).

During construction, water should be pumped into Baker tanks, settled, and then sampled for turbidity, pH, and suspected chemical contaminants following permit requirements prior to discharge.

Projects need authorization permits to discharge to the sanitary sewer, to the storm sewer system, or directly to surface waters of the state.

Contact EH&S for assistance with the proper treatment, sampling, and discharge permit requirements. See the Wastewater and Storm Water Management sections for more information.

Worksite training requirements: All site workers at a MTCA listed contaminated site who will or are likely to have contact with contaminated soil, water or air-borne hazardous materials must have the appropriate level of Hazardous Waste Operations and Emergency Response (HAZWOPER) training (WAC 296-843) or the documented equivalent training.

## **6. Oil Management**

Failure to prevent, prepare for, or respond to a spill or discharge may result in serious injuries, environmental damage, and long-term liability to the University of Washington. Spills can also cause costly cleanups and project delays and be subject to fines. The University retains a spill response contractor to contain and clean up larger spills and spills to water.

EH&S is also responsible for all spill reporting on behalf of the University. Spill planning and prevention Develop spill prevention and containment plans when engaged in projects that represent a high potential for spills or releases of pollutants. Have materials available to control and contain a spill.

Examples of high-risk activities include:

- Fueling
- Vehicle, equipment or building cleaning
- Outside storage of non-containerized materials
- Outside storage of liquids in portable containers
- Any near-water or overwater work

Best-management practices (BMPs) for these activities are available through the UW Stormwater Operations and Maintenance Plan.

### **a. Emergency Notification**

If a spill presents an immediate physical or health risk, immediately call 911 to alert the local fire department.

If it will cause environmental contamination (release of petroleum or other hazardous substances to the ground, air, or water bodies,) during business hours immediately call 206.543.0467 to alert the EH&S Environmental Programs (EP). After hours, weekends or Holiday's call UWPD at 206.685.8973 and ask for the EHS Staff on Call.

EP can assist with obtaining cleanup response and notifies regulatory agencies as needed depending on the type and quantity of a released material. Some types of notification must occur immediately.

### **b. Spill Containment and Cleanup**

The source of an incidental spill or discharge should be controlled if safe and feasible by individuals knowledgeable of the hazards, using appropriate protective gear and cleanup supplies (e.g., closing an open valve, diking, absorbing, blocking a storm drain). Immediate containment and cleanup of discharges to storm drains, sanitary sewer, soil, air, and water is

required. If assistance is needed, call EP at 206.543.0467 to request help from the hazardous materials cleanup contractor. The cost of cleanup is billed to the project or party responsible for the spill.

## **7. Underground Storage Tanks**

Project Managers need detailed project specifications and designs to protect project budgets and schedules.

Underground Storage Tanks (USTs) in Washington State are subject to state laws and must be installed and decommissioned in compliance with the Department of Ecology UST regulation (WAC 173-360).

Residential heating oil tanks are exempt from UST regulations but fall under local laws. Local laws administered by the local fire marshal, the local public health department or the local planning department normally require permits to close heating oil tanks.

The University of Washington Environmental Health & Safety Department (EH&S) oversees compliance with these regulations and maintains historical or current information on all USTs such as tank location, name of the operator, size, content, and tank leak detection systems.

### **a. UST Installation**

Newly installed and regulated UST systems must meet the performance and operating standards found in the underground storage tank regulations. For instance, all tank systems (tank and pipes) must be properly designed and constructed.

Tanks must be constructed of fiberglass-reinforced plastic, cathodically-protected steel, or a steel-fiberglass-reinforced-plastic composite.

Piping must be constructed of fiberglass-reinforced plastic or cathodically-protected steel. Tanks and piping must be double-walled and contain releases through secondary containment systems or external liners. Precipitation and groundwater must not enter the external liner.

Secondary spill containment is required under fuel dispensers.

New tank systems must be designed with automatic tank gauging equipment including interstitial monitoring of tanks and pipes or a containment sump.

Tank systems must have an automatic shut off device at 95% full to avoid overfilling.

Tanks systems must have a spill bucket or catchment basin to prevent environmental releases during fill operations.

Emergency signage must be installed in a prominent area and easily visible to anyone dispensing or delivering fuel.

Emergency signage must provide instructions to phone 911 and the 24-hour facility operator in case of emergencies. The sign must identify the location of the nearest fire extinguisher and emergency shut-off device unless the sign happens to be posted next to these devices.

Project Managers should contact EH&S with plans to install a new UST system. EH&S will assist Project Managers and the tank operator with the registration process.

A Notice of Intent form must be sent to Ecology at least 30 days prior to installing the UST system.

After installation, a tank addendum form, including the “as-built” drawing and tank registration information, must be submitted to the Department of Revenue, Business Licensing Services. If all is in order Ecology will issue a paper license listing each regulated tank. The license must be prominently displayed by the tank operator.

Ecology will also send a tank tag (a metal plate or tank permit) that must be prominently displayed outdoors for inspectors and fuel vendors. Fuel vendors are not allowed to fill regulated tanks if tank tags are not visible.

**b. Decommissioning a Regulated UST**

Regulated USTs that are no longer in service must be emptied, triple rinsed and removed from the ground by a certified tank assessor.

Piping must also be emptied and removed. Any residual fuel must be managed by a UW approved petroleum recycler.

The UW has contract with a certified tank assessor. Contact EH&S for guidance 206.616.0585.

A certified tank assessor prepares tank closure paperwork, including:

- a 30-day Ecology notification form,
- a tank closure form for local jurisdictions as needed,
- permits as needed, and
- waste documentation (profile and weigh tickets)

An environmental site assessment is always required during closure of a regulated UST regardless of whether the tank shows signs of leakage.

The project is responsible for hiring an Environmental Consultant who will conduct the environmental site assessment and document any cleanup activities per Ecology requirements. All documents must be reviewed by EH&S prior to being sent to Ecology. Contact EH&S for a list of consultants to perform this service.

**c. Decommissioning an Exempt UST**

Heating oil tanks are exempt from Ecology UST regulations; except, if the tank contains more than 1100 gallons of heating oil then the UST rules for release investigation and reporting still apply.

Heating oil tank closures are regulated by local codes and permit requirements. The local Fire Chief or Fire Marshal establishes the requirements or procedures for tank closures.

The international fire code requires that a heating oil tank, which has been out of service for a period of one year, must be either removed from the ground, or permanently closed in place. If an underground heating oil tank is closed in place all the following requirements must be met:

- Flammable and combustible liquids must be removed from the tank and piping.
- The suction, inlet, gauge, vapor return and vapor lines must be disconnected.
- The tank must be filled completely with an approved inert solid material.
- All remaining underground piping must be capped or plugged.
- A record of the tank size, location and date of abandonment must be retained.
- All exterior above-grade fill piping must be permanently removed.

Soil assessment activities are not normally required when closing heating oil tanks, unless there is evidence of a release; however, in Pierce County soil assessment work is always required when closing heating oil tanks.

The UW has a contract with an environmental consultant and a certified tank assessor who can conduct the closure work following local codes and permit requirements. Contact EH&S at 206.616.0585 for information on the contract.

#### **d. Leaking and Abandoned USTs**

If Project Managers suspect USTs may be present at their project site, due diligence is advised early to avoid construction delays and to protect project budgets.

Environmental consultants can arrange for tank location using magnetic and ground penetrating radar. Leaking or abandoned USTs must be emptied and decommissioned. If you become aware of a leaking or abandoned UST, call EH&S immediately at 206.616.0585. EH&S must report confirmed environmental releases to Ecology or the Pollution Liability Insurance Agency (heating oil tanks) within 24 hours of discovery.

An environmental assessment is required to determine the extent of the release and appropriate cleanup actions.

Cleanup actions must be completed by a qualified and trained environmental contractor following Ecology's Model Toxics Control Act (WAC 173-340). See the Site Contamination Design Guide for more information on managing contamination.

## **8. Hazardous Waste Management**

### **a. Common Hazardous Wastes in Projects**

Examples of hazardous waste commonly generated during construction or renovation projects include: chemical products left behind by the occupants, contaminated soils and water, cleaning solutions, PCB (polychlorinated biphenyl) containing transformers and

electrical equipment, light ballasts, fluorescent lighting tubes, PCB-containing debris, lead-containing debris, mercury in plumbing traps and switches, CFCs from refrigeration/air conditioning equipment, asbestos.

EH&S makes the determination of whether a waste is Hazardous Waste on behalf of the University based on information supplied by the project's Environmental Consultant. Plan to send analytical data for contaminated soil and water to EH&S as soon as possible. Costs Estimate as accurately as possible the type and quantity of wastes to be generated by a project early in the planning stages.

Procedures and costs associated with waste management (e.g., sampling, analytical testing, transportation, disposal) must be anticipated, budgeted, and identified in contract documents.

This practice is especially critical when a project is located on a known or suspected contaminated property.

**b. Waste Accumulation**

Hazardous waste must be in closed containers, labeled with identity of contents and project point of contact, and stored in a safe, secure location. Waste may need to be sampled, and it may take several weeks to receive the data and arrange disposal, so plan for temporary storage of large volumes of hazardous waste if appropriate. Contact EP at 206.685.3759, or email [chmwaste@u.washington.edu](mailto:chmwaste@u.washington.edu) for more information and to request containers.

**c. Disposal**

EH&S manages disposal of hazardous waste. On-site collection of hazardous waste associated with large-scale projects will be arranged by EP through the WA State Hazardous Waste Service Contract vendor. The transportation and disposal cost will be recharged to the project. Hazardous waste may only be disposed at University-approved facilities. Hazardous waste cannot be transported off University property without a Uniform Hazardous Waste Manifest signed by an EP representative. Forty-eight (48) hours advance notice is required prior to shipment.

## **9. Regulated Building Materials**

EH&S serves as the primary University liaison with local, state, and federal environmental health and safety regulatory agencies. EH&S requirements must be followed before impacting regulated building materials as referenced in APS 12.1. The following phases are required whether a minor or major renovation, decommissioning and/or demolition of an entire structure.

- Initial assessment
  - Walkthrough (pre-construction meeting)
  - Historical review

- Assessment
  - Sampling plan
  - Analysis
  - Interim plans to manage contamination between discovery and removal
- Monitoring
  - Source control
  - Drain protections
- Abatement, waste management, removal, or demolition plan
- Remediate
  - Final post survey
- Final Report
  - Statement of removal
  - All records

The following EH&S requirements are outlined below for the different types of regulated building materials that are present on UW owned and leased land, facilities, and equipment.

**a. Asbestos**

The purpose of this section is to provide guidelines for the development of specifications for asbestos surveys for any major renovation of a building as well as protection of adjacent worksites and workers, worker safety while handling asbestos and proper waste disposal.

Asbestos work must be in coordination with the APS 12.1, Managing Asbestos and Other Regulated Building Materials, and the Asbestos Management Plan.

This applies to new construction and renovation projects. Asbestos is a stringently regulated hazardous material and many requirements apply, as outlined below.

**i. Construction Projects**

Public Works Construction projects which impact existing building materials must include an environmental consultant to survey all areas impacted by construction for asbestos containing material and, if needed, develop a plan for removal and disposal.

Project managers are encouraged to employ one of the consultants on term contract with the Project Delivery Group (PDG) for this work.

The PDG Project Manager can choose to use the University term asbestos abatement contractor to perform asbestos abatement in public works projects when all the following conditions apply:

- **Cost:** The total cost of abatement and asbestos disposal is less than \$300,000.
- **Complexity:** The scope of the work is easily identified; abatement is localized and the risk of discovery of more asbestos is low.

The responsible UW Construction Manager may also authorize use of the UW Seattle asbestos term contractor for an emergency (i.e., the project abatement contractor is not immediately available, and action must proceed immediately to protect building materials, utilities, or human health).

The scope of the abatement work must be specified through a written Work Order issued by the University Designated Person.

Costs associated with the term asbestos abatement contractor's abatement services will be charged to the project. An asbestos survey (also known as a "good faith inspection") of the project work site must be conducted by an Asbestos Hazard Emergency Response Act (AHERA) accredited building inspector to determine if asbestos containing materials are present.

The University must provide a written asbestos survey to all contractors submitting a bid to undertake any project work before a bid is submitted.

Failure to comply with these requirements may subject the University to fines and delays. Do not assume that any building (new, old, or renovated) is asbestos-free.

For all projects impacting existing building materials, a copy of the asbestos survey must also be included in an appendix of the contract documents.

The asbestos survey (or an executive summary of the findings, prepared by the AHERA building inspector) must also be posted at the project site.

ii. Asbestos Awareness Training

All workers onsite who are involved in demolition, construction, installation, or excavation activities must have, at a minimum, current Asbestos Awareness Training, as required by WAC 296-62- 07722(6).

iii. Notification of Occupants

UW building coordinators must be notified of all proposed asbestos abatement to be conducted within their assigned building. The building coordinator should also be advised that they are responsible for ensuring that building occupants in areas affected by and adjacent to asbestos abatement activities are notified of those activities.

Contact information for the UW Construction Manager must be posted at the site of asbestos abatement.

iv. Agency Notification



The Contractor must submit appropriate asbestos abatement notifications to the appropriate local air pollution control authority and the Department of Labor and Industries (L&I (Labor & Industries)) at least ten (10) days prior to any asbestos abatement project start up.

The local air pollution control agency for King, Kitsap, Pierce, and Snohomish Counties is the Puget Sound Clean Air Agency (PSCAA).

The Contractor must maintain copies of the abatement notification forms at the project site throughout the asbestos abatement work.

v. Discovery of Unanticipated Asbestos

Building materials encountered during renovations or demolitions that are not identified on the asbestos survey and are suspected to contain asbestos must be avoided and not impacted.

A stop work order must be instituted and the UW construction manager notified. These building materials should be surveyed for asbestos (same as above), and necessary abatement completed by a qualified contractor. Work may resume after the asbestos materials are removed.

If asbestos-containing materials have been impacted and an uncontrolled release occurs, EH&S must be notified immediately to evaluate the area. If there is an exposure concern, the affected personnel should fill out an Online Accident Reporting System (OARS) incident report.

In addition, related waste material must be inspected to verify that no asbestos-containing material has been disposed of improperly (see below).

vi. Disposal

In the State of Washington, asbestos is a regulated waste, and the following procedures must be followed:

- Asbestos waste is contained (wet, double bagged, address of owner recorded on the bags)
- Procedures are in place for transporting waste
- Asbestos waste is promptly disposed of at a site on the List of UW-Approved Disposal Sites.
- The Waste Shipment Record is kept in the project's permanent files. On the Seattle campus, if necessary, container placement and disposal may be arranged through UW Recycling, Building Services.

New Materials Containing Asbestos UW does not allow new asbestos-containing materials to be used. Some materials still contain asbestos, so specify that these materials are to be avoided.

**b. Lead and Other Metals**

Lead is a common component in construction debris. It is most often found in pipes, copper pipes with lead solder, and interior and exterior painted wood, siding, mortar, window frames and plaster. Lead may also contaminate soils around the perimeters of buildings where exterior lead-containing coatings have failed. Depending on work practices, lead-containing materials have the potential to negatively impact the health of construction workers and others adjacent to the work area. The presence of lead contamination in soils can lead to costly site remediation efforts. Finally, all lead-containing debris, including materials with lead paint on them, must be disposed of according to state and federal law.

**i. Building Surveys**

A lead survey must be performed for each project having the potential to impact lead-containing building materials, including lead paint. Results of the survey need to be included in the contract bid documents. Based on this information, bidders need to include costs to protect workers as required by applicable regulations (i.e., exposure assessments, respirators, medical monitoring) and proper waste disposal for lead-contaminated materials even if they do not designate as hazardous waste.

**ii. Demolition Debris Testing**

If lead is found to be present in paints, coatings, or other building materials during the initial survey, then it will be necessary to conduct representative sampling of the specific waste streams using the toxicity characteristic leachate procedure (TCLP) for lead. EH&S will review analytical data and make all waste disposal determinations. Save copies of all analytical data in the project file.

**iii. Contaminated Soils**

Soil sampling is neither required nor recommended prior to the start of the project. Based on prior projects, drip-line soil is expected to contain lead and will require special handling and disposal. If the project involves removal or disturbance of soils adjacent to lead painted buildings, anticipate that soils within two feet of the building and up to two-feet deep may contain lead. Stockpile this impacted soil, conduct a TCLP, and send the analytical data to EP for a waste determination. Lead-coated materials like painted concrete and painted wood cannot be recycled at an inert waste landfill or a recycling facility. Instead, all lead-coated and lead-containing materials and soils must be disposed at a UW-approved hazardous waste disposal facility. EH&S signs all waste profile forms to ensure waste meets the acceptance criteria of each facility. When lead-coated or lead-containing debris fails a TCLP, it becomes a dangerous waste and EH&S coordinates the disposal. EH&S arranges for U.S. Department of Transportation (DOT) approved containers and signs manifests before the waste leaves the site.

c. **PCBs**

Polychlorinated biphenyls (PCBs) are toxic, persistent synthetic chemicals that were widely used as an oil additive in electrical equipment and as a plasticizer in caulk and expansion joint material starting in the 1950s. Congress banned the manufacture and use of PCBs in 1978. PCBs are subject to regulations and pose a long-term liability to the UW. The Washington State Department of Ecology regulates PCB wastes containing up to 50 ppm PCBs, and the Environmental Protection Agency (EPA) regulates PCB wastes of 50 ppm and greater. Both agencies have requirements for management and disposal of PCB wastes. Environmental Programs has a [PCB management plan](#) in place.

The Seattle campus has mechanical rooms and electrical vaults that contain oil-filled transformers and electrical equipment. Assume that any oil contains PCBs unless known otherwise. Oil-filled electrical equipment should be replaced as part of capital improvement projects whenever feasible. All PCB contamination must be removed from the vault or mechanical room. PCB concentrations must be determined before disposal. The UW also restricts the transporters and disposal facilities used for those wastes.

For any construction activity in mechanical rooms, review the existing analytical data or plan to obtain an environmental contractor for a sampling survey. A work plan must be submitted to EH&S for review and comment. The work plan must show that proper precautions will prevent personnel exposure and further contamination. Contact the PCB Coordinator for information about specific transformers and other electrical equipment.

i. PCB Encapsulation (Seattle campus)

There are several mechanical rooms on the Seattle campus where PCB floor and wall contamination has been encapsulated in place. EPA regulations require that encapsulated surfaces be marked with the yellow "Caution Contains PCBs" sticker typically used for labeling PCB transformers (>500 ppm PCBs). Signs posted inside these rooms warn against disturbing encapsulated surfaces without first contacting EH&S.

The following rooms have PCB contamination encapsulated in place: Haggett Hall North, G203 and South, G206 (pending demolition); Health Sciences Building, B123A and D005; Mechanical Engineering, B009; and Power Plant, 027.

If drilling or other activity will disturb an encapsulated surface, you must submit a work plan to EH&S for review prior to the start of work. There is not a prohibition against drilling into encapsulated surfaces, but the work plan must show that proper precautions will prevent personnel exposure and further contamination.

ii. PCB Contaminated Caulking

Buildings constructed or renovated between 1950 and 1978 or later may have PCBs at high levels in window caulk, expansion joints and possibly in neoprene pipe insulation. Exposure may occur if the caulk has begun to degrade or has been disturbed. EH&S

requires sampling for PCBs in caulk and expansion joint material on renovations or building demolition before going out to bid. Full EPA characterization sampling is recommended.

Sampling is also required for maintenance that will disturb window caulk or expansion joints. If the caulk contains very high concentrations of PCBs, more sampling around surrounding building materials may be necessary to determine whether other surfaces or substrates are contaminated.

Caulk containing more than 50 ppm PCBs must be removed and disposed of as dangerous waste through EHS EH&S. There is a PCB [Caulking Work Plan](#) as a template.

Current Ecology and EPA documents will guide the identification, management, and removal of PCBs in building materials.

PCB concentrations must be determined in all construction and demolition debris before disposal.

PCB mitigation may be required if elevated PCB concentrations are found. Consult with the EH&S PCB Coordinator for any existing samples in that location.

Any work plan must include precautions to prevent personnel exposure and further contamination.

Other equipment containing PCBs Other types of older oil-filled electrical equipment must be removed whenever feasible and disposed of properly through EH&S. Examples of items include old x-ray machines and other older laboratory equipment with power sources, power generators and capacitors. Light ballasts that contain PCBs are managed as dangerous waste and disposed at a UW-approved incinerator.

Records pertaining to PCB cleanup, contamination, and ongoing surveys are maintained by EH&S. UW is required to notify and report annually to EPA on cleanup projects and PCB inventories.

#### **d. Mercury**

Mercury has been used in many laboratory areas on campus. All laboratory areas and former laboratory areas should be surveyed for mercury contamination before construction. Some non-laboratory buildings, listed below, also have a history of mercury contamination and should also be suspected to have high levels of mercury. Cleanup by a hazardous materials contractor is required before demolition or construction can begin.

##### **i. Likely Locations of Mercury Contamination**

Laboratories often have mercury contamination in crevices: inside drawers and cabinets, under and behind benches and furniture, under and behind fume hoods, along baseboards, under sinks and near floor drains, and in drain traps. In addition, medical and dental exam and treatment rooms contain mercury.

In addition to buildings currently containing laboratories, the following buildings are likely contaminated with mercury: Harris Hydraulics Laboratory, Kincaid Hall, Old Oceanography Building, Raitt Hall, Quaternary Research Center, and the Power Plant.

ii. Mercury Monitoring

If there is risk of mercury contamination, monitoring for airborne mercury levels and a visual survey is required. If airborne levels exceed background levels, the Environmental Consultant should do another survey (airborne and visual) after the space is vacated and prior to the start of construction or demolition. If measured airborne mercury levels are greater than 0.05 mg/m<sup>3</sup>, immediately disclose this information to the EH&S Occupational Health & Safety Office at 206.543.7388.

If mercury is detected, it must be cleaned up by a hazardous materials clean-up contractor prior to the start of construction. All waste from the cleanup will be managed by EH&S as hazardous waste.

iii. Drain Traps

Drain traps from demolitions or remodels of laboratory areas are assumed mercury-containing/contaminated and should be managed as such. Call Environmental Programs at 206.685.2849 prior to the start of work to obtain appropriate waste containers. ([US Plastics 5-gallon ultimate pails for liquids](#))

Make an appointment to pick up the following supplies and forms from the [Environmental Safety Storage Building](#):

- 5-gallon pails with lids.
- [Chemical collection request form](#)
- [Container labels](#)

Wearing nitrile gloves and safety glasses, prepare the pail with a liner and waste labels. Place a small amount of absorbent or a few gray pads at the bottom of the pail, as there can be no free liquids. Remove the trap and place the trap in the waste container. Be careful not to spill residual liquids. You can put more than one trap per pail, if it will fit without too much effort (avoid any breakage or compaction). Once done, secure the lid. Make sure that full pails are secure within the job site. Submit chemical collection request form and schedule waste pick up with staff assigned. Shipment records are kept at EH&S.

This work only covers waste packaging and disposal, not any exposure concerns.

iv. Fluorescent Lights and Ballasts

Fluorescent lights contain mercury and must be recycled according to federal and state law. Whole fluorescent light tubes can be recycled and are much cheaper to dispose of

than broken light tubes. Broken light tubes are disposed of as dangerous waste through EH&S.

Fluorescent light ballasts may contain PCBs and must be disposed of in accordance with state and federal regulations. Light ballasts that contain PCBs are managed as dangerous waste and disposed at a UW-approved incinerator.

Whole fluorescent light tubes are recycled through UW Recycling and the process is initiated through the [Fluorescent Lamps Recycling web site](#) at least a few weeks prior to the scheduled removal of lamps.

For construction projects at UW Bothell and UW Tacoma, the local Facilities Services arrange for billing and delivery of fluorescent tube containers.

For other **offsite locations**, the EH&S Environmental Programs (EP) will arrange directly with the recycling contractor for services. Call EP at 206.616.5837 email [chmwaste@u.washington.edu](mailto:chmwaste@u.washington.edu) a few weeks prior to the scheduled removal of lamps. In any location, the fluorescent tube recycling contractor will drop off and subsequently pick up the appropriate number of fiber drums at the project location on specified dates.

The project will be billed directly for tube recycling. Fluorescent tubes must be managed under the state Universal Waste rules. This means that all fluorescent tube drums must be labeled as Universal Waste (usually the recycling contractor does this, but it is the ultimate responsibility of the Project Manager to label them.)

Containers with spent tubes must closed, and properly labeled with a "start date." They also need to be under the generator's control and must be stored at a covered or indoor site.

All light ballasts manufactured through 1978 contain PCBs. Ballasts manufactured after 1978 still may contain PCBs. Those not specifically labeled "No PCBs" are assumed to contain PCBs. PCB-containing ballasts are dangerous waste and need to be managed through EH&S.

Leaking PCB ballasts are dangerous waste and can contribute to worker exposure and site contamination. Any residual PCBs must be cleaned up.

Electronic ballasts and ballasts that are labeled "No-PCBs" can be put in the trash if they have plastic covers or recycled with scrap metal if they have metal covers. Contact the PCB Coordinator at 206.616.5837.