

DEPARTMENT OF
ECOLOGY
State of Washington

Standard Operating Procedure for Consumer Product Sample Collection and Processing, Version 2.0

August 2018
Publication 18-04-018

Purpose of this document

The Washington State Department of Ecology develops Standard Operating Procedures (SOPs) to document agency practices related to sampling, field and laboratory analysis, and other aspects of the agency's technical operations.

Publication information

This SOP is available on the Department of Ecology's website at <https://fortress.wa.gov/ecy/publications/SummaryPages/1804018.html>.

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Washington State Department of Ecology

Hazardous Waste and Toxics Reduction Program, Reducing Toxics Threats Unit

Standard Operating Procedures for Consumer Product Sample Collection and Processing
Version 2.0

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PTP001

APPROVED: July 2018

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Please note that the Washington State Department of Ecology's Standard Operating Procedures (SOPs) are adapted from published methods, or developed by in-house technical and administrative experts. Their primary purpose is for internal Ecology use, although sampling and administrative SOPs may have a wider utility. Our SOPs do not supplant official published methods. Distribution of these SOPs does not constitute an endorsement of a particular procedure or method.

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Although Ecology follows the SOP in most instances, there may be instances in which the Ecology uses an alternative methodology, procedure, or process.

SOP Revision History

| Revision Date | Revision History | Summary of changes | Sections | Reviser(s) |
|---------------|------------------|--|----------|---|
| 9/1/2016 | PTP001 1.0 | New | All | Wiseman, Inch, Sekerak, Van Bergen |
| 11/17/2016 | PTP001 1.0 | New | All | Iwenofu |
| May/June 2018 | PTP001 2.0 | <ul style="list-style-type: none"> • Removed HWTR Approval page • Condensed sections of text and Appendix G (elements of Chemical Hygiene Plan) by changing format • Updated with location changes, online purchasing and site visits. • Revise to summarize Low-level analysis procedures. • Made minor edits Approved Version 2.0 | All | Wiseman, Trumbull, Sekerak, Van Bergen, Gries |

Standard Operating Procedure for Consumer Product Sample Collection and Processing

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1.0 Purpose and Scope

- 1.1 This document serves as the Product Testing (PT) Program's Standard Operating Procedure (SOP) for Sample Collection and Processing (PTP001).
- 1.2 The PT Program regularly conducts studies on products to assess compliance with current regulations, investigate priority and emerging chemicals of concern, and provide recommendations in the development of new legislation or rules. This SOP details techniques developed to ensure that the collection and processing of samples from consumer products is consistent, repeatable, and well-documented. The SOP is also intended to be used in conjunction with study-specific Quality Assurance Project Plans (QAPPs) and other studies/projects developed under the Universal QAPP for PT.
- 1.3 This SOP includes methods for training, product purchasing, tool cleaning, product deconstruction, sample processing, and safety.

2.0 Applicability

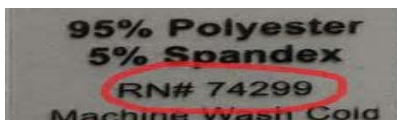
- 2.1 The procedures detailed in this SOP will be followed for all product testing QAPPs.
- 2.2 This SOP standardizes sample collection and sample processing of consumer goods, raw materials, and other types of product samples detailed in specific study QAPPs.
- 2.3 All staff collecting samples and processing samples will follow the requirements of this SOP, except as noted in Section 2.4.
- 2.4 Substantive deviations from this SOP must be incorporated into an updated version of the SOP that is recertified prior to beginning work. Minor deviations from the SOP, if anticipated, must be described in the approved study-specific QAPP. Minor deviations that are unexpected must be detailed in the final project report.

3.0 Definitions

- 3.1 *Chain of Custody (COC)* is the unbroken trail of accountability that ensures the physical security of samples, data, and records. The Chain of Custody Room is a secure access location where Ecology's sample containers are dropped off, samples are refrigerated or frozen in order to maintain holding temperatures, and samples are picked up by the Manchester Environmental Laboratory courier.
- 3.2 *Client* is the person requiring Product Testing Program services. Clients require data for enforcement efforts, to determine which state-purchased products contain chemicals of concern, to support recommendations or fill in data gaps, for research that would support future product law or to evaluate effectiveness of current laws. In general, clients are staff in HWTR or other Ecology programs but in some circumstances, can be an external party.
- 3.3 *Component* is an individual piece or part of a product containing different colors, functions, and/or material (i.e., a sweater may be comprised of several components such as, the woven fabric, trim fabric and buttons).
- 3.4 *Cryomilling* is the process of reducing a sample to very small particle sizes by lowering the product to cryogenic temperatures and mechanically milling it.

- 3.5 *Deconstruction* is the physical separation of a product into individual components. For example, a tube of lip-gloss can be separated into the product (lip-gloss), the container used to hold and apply the lip-gloss (the external plastic tube), and any packaging material it was encased in when purchased.
- 3.6 *EAP* is the Environmental Assessment Program.
Enforcement Officer is the person who tracks compliance and enforcement with Ecology's WA state product laws.
- 3.7 *Financial Services Purchasing Officer* is the agency's designated purchasing officer.
- 3.8 *Fourier transform infrared spectroscopy (FTIR)* is a technique which is used to obtain an infrared spectrum of absorption or emission of a solid, liquid or gas. An FTIR spectrometer simultaneously collects high spectral resolution data over a wide spectral range.
- 3.9 *Good Laboratory Practice (GLP)* refers to a laboratory system where work performed is to ensure uniformity, consistency, reliability, reproducibility, quality, and integrity.
- 3.10 *HWTR* is Ecology's Hazardous Waste and Toxic Reduction Program.
HWTR HQ Cage a secured storage site at Ecology's HQ building in Lacey where products and samples remain under custody.
- 3.11 *HWTR Purchasing Coordinator (HWTR PC)* is the Hazardous Waste Program's designated purchasing coordinator places purchase orders for "State contracted" supplies and products. (Currently administered by the HWTR receptionist).
- 3.12 *Low-Level* is considered to be <1 part per million (ppm) or otherwise specified in the study-specific Quality Assurance Project Plan.
- 3.13 *Packaging* refers to a container surrounding a product that provides a means of marketing, protecting, or handling a product. This includes a unit package (packaging around one product), an intermediate package, and a shipping container. It also includes unsealed receptacles such as carrying cases, crates, cups, pails, rigid foil and other trays, wrappers and wrapping films, bags, and tubs.
- 3.14 *Product* an article or substance that is manufactured or refined for sale.
- 3.15 *PT Preparation (Prep) Staff* includes any individual (not including the Project Manager or Sample Preparation Lead) involved in study tasks including, but not limited to purchasing, organization, logging in, deconstruction, processing, database reviewing, and/or disposal. Personnel serving in this capacity are often Interns or E-techs that are hired specifically for performing these duties; this may also include Clients, Supervisors, Enforcement Leads, or any other "drop-in" Ecology staff member.
- 3.16 *Sample* a portion/component of a product that is deconstructed and separated from the product in order to be analyzed.
- 3.17 *Sample Preparation Room (OL-21)* designated uses: Secure sample storage, tool cleaning, sample deconstruction, X-Ray Fluorescence (XRF) and FTIR sample prescreening, sample preparation and documentation.
- 3.18 *Project Manager (PM)* is the subject matter expert for all study-specific activities described in a Quality Assurance Project Plan. The PM is to be point of contact for questions concerning study-specific objectives, specifications, deliverables, timelines, and tasks.

- 3.19 *Quality Assurance Project Plan (QAPP)* is a document that describes the objectives of a study and the processes and activities necessary to develop data that will support those objectives.
- 3.20 *RN number* is a Registered Identification Number issued by the Federal Trades Commission to U.S. businesses that manufacture, import, distribute, or sell products covered by the Textile, Wool, and Fur Acts. Businesses can use this number on product labels in lieu of the company.



- 3.21 *Room Safety Coordinator* is the Product Testing employee responsible for the safety aspects of the room including equipment maintenance and safe equipment processing procedures. The room safety coordinator's role is currently managed by the sample prep lead.
- 3.22 *Sample Prep Lead (SPL)* coordinates schedules and activities conducted in the Product Sample Preparation Room. Supports the PM as necessary in order to maintain steady progress, QA/QC requirements, and enforcement requirements such as chain of custody and maintains process consistency and replicability.
- 3.23 *Sample Preparation Log* a log used to record tools used during samples deconstruction and or preparation of Low-level samples.
- 3.24 *UPC* is the Universal Product Code, an 8, 12, 13 or 14 digit code found at the bottom of a scan code on product packaging. The UPC includes all numbers shown with the bar code (including the first and last).



- 3.23 *X-ray fluorescence (XRF)* is a non-destructive analytical technique used to determine the elemental composition of materials. XRF analyzers determine the chemistry of a sample by measuring the fluorescent (or secondary) X-ray emitted from a sample when it is excited by a primary X-ray source.

4.0 Personnel Qualifications/Responsibilities

- 4.1 All staff performing any level of PT prep work must:
- Complete the PT training/orientation provided by the SPL and/or the PM.
 - Complete the Training Checklist or "Drop-in" Training Checklist version.
 - Read this SOP (PTP001) and have access to all needed references.

- Read the study specific QAPP prior to starting working on that study.
- Follow the Good Lab Practice (GLP)
- Wear closed-toed shoes when handling and preparing samples.
- Wear all appropriate personal protective equipment as appropriate.
- Store all food and beverages in the designated office space.
- Store all other personal gear in the designated office area.
- Observe signs with study-specific room restrictions.

4.2 PM or SPL duties are to:

- Provide a training/orientation for all new PT Prep Staff and collect completed and signed training checklists.
- Ensure a lead person is available for assistance throughout the duration of sample collection and processing.
- Complete a MEL Pre-sample Notification Form upon QAPP approval (see Appendix A).
- Order the correct type and quantity of sample containers using MEL Sample Container Request Form (Appendix B) unless containers are provided by a contract laboratory.
- Schedule reservations for the Product Sample Prep Rm. (OL-21) on the Product Sample Preparation Room calendar.
- Assume responsibility of handling and diluting solvents and concentrated acids, as well as properly labeling and storing reagents.
- Complete the necessary training forms for operating the X-ray fluorescence (XRF) and Fourier transform infrared (FTIR) prescreening instrumentation and will conduct the XRF and FTIR sample prescreening.
- Put up signs at the entry to the Product Sample Preparation Room for specific studies restrictions during sample preparation. Define restrictions in the study QAPP.
- Create and maintain Chain of Custody (COC) form(s).
- Prepare, send, and track samples being transported to analytical laboratories, maintained under COC, as necessary.

4.3 Project Manager (PM) responsibilities:

- Write the study-specific QAPP as the subject matter expert for all activities conducted under that study plan.
- Conduct study “kick-off” meeting to: create a sample collection and processing plan, designate specific tasks, and review study specific requirements/restrictions.
- Conduct study-specific training of PT Prep Staff.
- Track and report the study’s purchase expenditures and laboratory analysis cost to the PT Steering Committee, and/or Program Budget Coordinators.
- Provide for assistance and answer questions throughout the duration of the study sample collection and processing.
- Verify that the components selected for analysis have been photographed before processed.

- Provide the Contracts and Purchasing Manager with purchasing plans prior to purchase event.

4.4 Responsibilities of Sample Prep Lead (SPL)

- Meet with PMs prior to study to provide research assistance.
- Order study-specific supplies
- Conduct general training of all new PT Prep Staff
- Provide hands-on training with study specific details.
- Ensure PT Prep Staff are following GLP and are abiding by the study-specific requirements.
- Ensure the deionized water (DIW) system, hood, computers, cameras, XRF, and FTIR instrumentation are maintained and operating appropriately.
- Ensure that the general processing supplies are kept in stock.
- Oversee all activities conducted in the PT Prep Room.
- Serve as PT Prep Room Coordinator (OL-21).
- Ensure that all store receipts, Ecology generated purchase order numbers, online purchase orders/receipts, are appropriately acquired and cataloged in the PT database, X: drive, purchasing folders, and/or logbooks.
- Update Product/Sample Inventory log.

4.5 Training for New PT Prep Staff includes:

- A Product Testing Preparation Staff Training Checklist (Appendix F) will be provided for all new PT Prep Staff, which will be signed upon completion by the trainee, the trainer either the SPL or the PM and the PT Supervisor. The SPL or PM will distribute completed form to trainee's management and it will be kept in the employee's personnel file. A copy of the completed PT training checklists will be kept in PT Prep Staff Training folder in the PT Prep Room.
- A modified version of the training form can be utilized for staff that perform limited duties for limited duration of time. It is designed to allow quick on-boarding of any staff member. This "Product Testing Preparation Drop-in Staff Training Checklist" (Appendix E) covers the health and safety aspects of the PT Prep Room as well as assigned study specific tasks. This checklist will be signed upon completion by the trainee, the trainer either the Prep Lead or the PM. The signed checklist will be kept in a folder in the PT Prep Room.
- Training will be conducted by the SPL and / or PM, and will include the location of the following items within the PT Prep Room:
 - DIW System (OL-21)
 - Equipment cabinets.
 - First aid kit and eye wash bottles.
 - Fume Hood (OL-21)
 - Keys for the cabinets in the Product Sample Preparation Room and the HWTR HQ cage.
 - Personal Protective Equipment (PPE) and discussion of when to use PPE.
 - Tools used for physical product deconstruction and sample processing.
- Training will include familiarization with the location of the following rooms:

- COC Room (OL-15) (Limited access to key personnel)
- Dangerous Waste Storage Room (OL-12) (Limited access to key personnel)
- Evacuation route and emergency meeting location
- Hazardous Material Storage (OL-14) (Limited access to key personnel)
- HWTR HQ cage (OS-23) (Limited access to key personnel)
- Laundry Room (2S-15)
- Mail Room (OL-04)
- Product Sample Preparation Room (OL-21) (Limited access to key personnel)
- Shipping and Receiving (OL-05)
- The following documents will be reviewed:
 - COC forms, explanation and instructions
 - Electronic PT Inventory Log (found on the PT X: drive)
 - HWTR Product Testing Checklist (Appendix A)
 - Product Documentation Log (Appendix G) (kept on shelf in PT Prep Room)
 - PT Enforcement Sample Documentation/Disposal Log (kept on shelf in PT Prep Room)
 - PT Prep Log (kept on shelf in PT Prep Room)
 - PT Sample Collection and Processing SOP (PTP001)
 - Relevant Sections of the Chemical Hygiene Plan (Appendix G)
 - Safety Data Sheets (SDSs)
 - Study-specific QAPP

5.0 Comprehensive List of Equipment, Reagents, and Supplies

5.1 Equipment

(Note: tools followed by * that come in contact with samples should be made of stainless steel, unless an alternative material is specified in the study QAPP.)

- Camera(s) (agency camera only)
- Camera Lights
- Clamps
- Coolers
- DI Water System (PURELAB Option-R 7/15)
- Drill and drill bits*
- FTIR
- Fume hood (OL-21)
- Hammer
- Lab coat
- Lab spatula*

- Large and small KimWipes
- Needle nose * and regular pliers*
- Photo backdrops cloths
- Precleaned sample containers (USEPA specifications)
- Razor blades/carpet knives/scalpel*
- Safety glasses/goggles/face shield
- Saw*
- Scissors (various sizes and types)*
- Seam rippers*
- Stainless steel bowls for collecting used solvents
- Vacuum with HEPA filter
- Wash bottles for soap solution
- Wire cutters*
- XRF and XRF Stand

5.2 Supplies

- Aluminum foil
- Blue Ice –reusable ice packs
- Blue Tape
- Chain of Custody tags
- Dust masks
- Enforcement sample documentation/disposal log
- Glass funnel
- Glass transfer pipettes
- Hanging label/tags
- Lab coat
- Lab spatula*
- Large and small KimWipes
- Markers
- Nitrile gloves
- Organizational totes
- Paper clips
- Paper towels
- Pliers*
- Precleaned sample containers (USEPA specifications)
- Product documentation log
- Razor blades/carpet knives/scalpel*

- Rubber bands
- Safety glasses/goggles/face shield
- Safety pins
- Sample labels
- Twist ties
- Zip-top plastic bags (various sizes)

5.3 Reagents

- 10% Nitric acid. Dilute trace metals grade nitric acid to 10% with DI water; slowly add one part acid to nine parts DI water.
- 24% ethanol. Dilute reagent grade ethanol to 24% with DI water.
- Acceptable reagents are posted on the Chemistry Inventory list outside of the Product Sample Preparation Room (OL-21). The Chemistry Inventory list includes Acetone, Ethyl alcohol, Hexane, Isopropyl alcohol, Methyl alcohol, Nitric Acid. This list will be updated accordingly.
- Acetone, Certified ACS HPLC Grade $\geq 99.5\%$ (occasionally used with FTIR).
- Concentrated nitric acid, trace metals grade.
- Deionized (DI) water using the PURELAB Option-R 7/15 system.
- Ethanol, ACS grade, $\geq 99.5\%$ (200 proof), food-grade or equivalent.
- Hexane, Certified ACS HPLC Grade $\geq 99.5\%$.
- Laboratory detergent: Liquinox or equivalent biodegradable, phosphate-free, interfering-residue free, concentrated soap. Dilute to 1% with DI water for working solution.
- Methanol, Certified ACS Reagent Grade $\geq 99.8\%$.
- The following reagents are only to be used in the PT Prep. Room and Cleaning Room hoods: Concentrated nitric acid, 10% nitric acid, hexane, and methanol.

Acetone as a general rule should be used in the PT hood. Acetone has an exemption as a small amount may be utilized outside the hood for occasional FTIR cleaning. The FTIR acetone will be kept in a sealed 2 Oz glass sample jar and used with a pipette. The amount allotted by the agency's Safety officer for acetone use outside the hood, in the Pt Prep Room is 500 ml.

The original acetone bottle and the 2 Oz sample jar of acetone will be stored in Hazardous Material Storage Room (OL-14).

PT Reagents are stored in the Hazardous Material Storage Room (OL-14) in the appropriate organic solvent or acid cabinet.

Each original reagent container must be labeled with a hazard label that includes the PT contact information, and date opened.

Reagent squirt bottles must be clearly labeled with the chemical name, concentration, hazard label, and program name. Reagent squirt bottles must be kept in secondary containment while in use and when stored.

Safety Data Sheets for all chemicals listed here are readily available in the PT Prep Room next to the fume hood.

6.0 Procedures for Sample Collection

6.1 Planning for Product and Sample Collection

- A Project kickoff meeting will be held by the Study PM, client, SPL and PT Prep Staff to cover the scope, type of products, timing, issues critical to the project (product handling, decontamination procedures, sample holding times or temperatures, etc.).
- All PT Prep Staff must read the study-specific QAPP. The PM and or the SPL will review the scope and intent of the study, the types of products to be purchased and as well as the analytes of interest with the PT Prep staff.
- Preliminary product research may need to be conducted to determine product location and availability.
- As needed the PM and SPL may compile a study-specific information collection sheet with the targeted analyte synonyms or precursors found in the ingredients label or other target labels. Include the specific number of products or amount needed (volume or mass of product/sample to meet analytical analysis volume requirements), and the names of specific manufacturers or targeted labels.
- Sample collection may occur in person at a retail stores, at specific sites or through online purchases. *(Note: to request the use of the agency credit card (in store purchases) notify the agencies Financial Services Purchasing Officer (PO) or the (emergency card) for online transactions, provide a minimum of two-week prior notification to the agencies Contracts and Purchasing Manager.*

6.2 Vehicle

- Reservation vehicle by contacting Building Services (ext. 7-4357 and press “2”) or email Staff Services (ecydlhqstaffserviceshelpdesk@ecy.wa.gov) prior to the purchasing event, providing your:
 - Destination
 - Estimated time of pick up and drop off
 - Name
 - Phone number
 - Vehicle type needed

6.3 The Product Documentation Log

- The Product Documentation Log will be used for product collection documentation and will be kept in the Product Sample Preparation Room.
- Fill out the Product Documentation Log upon arrival and at the end of every the store purchase or sampling event at a collection site.
- Record the following information at each site/retail location:
 - Study QAPP name
 - PM name
 - Collectors/samplers name
 - Collection date

- Store/location name and address
- Brief purpose of product collection effort (optional)
- Explanation of marketing, shelving, store, or location (photos)
- Arrival time at the store
- Number of products purchased or collected (ex. From state agency)
- Location contact name/number (if any)
- Miscellaneous/comments
- Time/date of return to Ecology
- Return to Ecology
 - Label all shopping bag(s) with the date of purchase and ensure that the bag(s) are marked with the store name. If store name is missing from bag, label with name and purchase date.
 - Verify that bulky items have hanging tags attached that include the store name and purchase date.
 - Confirm that Sample Purchasing Log is completely filled in at the end of the day.
 - Return vehicle and vehicle log.
 - Place and lock items in the cabinet with the associated study label.
 - Scan each receipt and send it to the SPL and the PM for tracking.
 - Return credit card and original receipts to the Financial Services (PO).

6.4 In-Store Purchase Instructions

- Review with PM the type, number and budget for products that need be purchased. Determine and document if there are criteria that can help with sample selection. Follow any study-special handling requirements for these products.
- Equipment required for in-store purchasing events:
 - Agency camera
 - Agency credit card
 - Agency vehicle and Vehicle log (reference section above)
 - Bag labels if necessary
 - Bags (for separating products if required by study)
 - Hanging tags
 - Pencils
 - Pens
 - Study-specific information collection sheet
 - Safety pins
 - Sample Purchasing Log (reference section above)
 - Sharpie markers
- Credit card for in-store purchasing events:
 - Check out the credit card from the Purchasing Unit in Fiscal Office (after 8 am, return credit card by 3 pm or get permission on alternative times the day before).

- Fill in the Credit Card Check-Out Log with:
 - ✓ Name and phone number of individual that will be using the credit card.
 - ✓ Name of at least one store you will be visiting
 - ✓ Name of the study.
 - ✓ Master Index Code (MIC) (verify with SPL or the PM).
- When returning the credit card complete the Credit Card Log per transaction.
 - ✓ Type of products and analysis (example metals samples) the products are purchased for.
- The purchasing limit is \$700 per transaction. If there is a possibility that a purchase/s at any individual store might exceed \$700, make arrangements with the Contracts Purchasing Manager in advance.
- Marketing documentation for in-store purchasing events
- Photographs of in-store marketing, such as store displays and product location on shelving, may be necessary to build a case for a specific products inclusion in a study (and/or for enforcement).
- Store/site photographs may also be needed for other reasons on other projects. Details will be provided by the PM and/or will be described in the study QAPP.
- Place all photos in the PT X: drive. See PT Data Entry and Database SOP PTP002 for photo upload instructions.
- A study may require the collection of additional documentation such as SDS's for products, store advertisements.

6.5 Equipment required for Off-site Product Collection

- Agency camera
- Agency vehicle and vehicle log (reference section above)
- Boxes or totes labeled with cite name/s
- Clean tools in clean tool tote or clean zip top bag.
- Cooler/s with or without ice (study-specific)
- Dirty tool tote or zip top bag/s label dirty tools
- Disposable gloves
- Foil (study-specific)
- Garbage bags
- Hanging tags and safety pins for larger items- add site name and date.
- Kim Wipes large and small (for wiping off sample jars)
- Pens and pencils
- Sample bags
- Sample containers
- Sample labels

- Sample Purchasing Log (reference section above)
- Sharpie markers
- Scissors

6.6 Off-site Product Collection Sampling Procedures

- Site collection requires the PM or SPL to schedule collection of products or samples.
- Organize and pack equipment, tools, and supplies required for product collection and transport.
- Pick up vehicle and Vehicle Log
- Complete an entry in the Sample Purchase Log for every location where products are acquired. Follow the same procedures mentioned in sections above (6.3).
- Photograph the site or products if necessary – to be determined by the PM.
- Return vehicle and Vehicle Log
- Place and lock items in the cabinet with the associated study label.
- Process returning supplies. (Dispose of sample event rubbish, place used tools in “Dirty Tool tote” and restock sampling supplies if necessary).

6.7 Online Purchasing for State Contracts

- Submit all product/supply orders from State Contracts via email to the HWTR PC and CC the RTT Unit Supervisor, PM and SPL. The purchase request will include the study QAPP name, product identification number, the number of products requested and cost.
- The HWTR PC completes a Purchase Request (PR) which generates a PR# which is forwarded to the PM and SPL. The PR# recorded into the PTDB.
- The HWTR PC will populate the electronic “Purchase Sample Tracking Log.” This log is intended to track received products and will be populated with the following information:
 - Date the online order was placed
 - Date the order is received by Ecology
 - List of the items purchased for that order
 - Name of the state contact, the product item number and the associated URL
 - PM Name
 - Purchase Request numbers (PR#s)
 - Study QAPP
- The Purchase Sample Tracking Log will be saved on the PT X-drive specific study folder.
- The HWTR PC will print out a copy of each online order confirmation for the project file, which will be delivered to the PM.
- The HWTR PC will provide the PM and SPL with weekly updates on the status of the ordered products until they have all been received.

6.8 State Contract Product Arrival and Check In At Ecology

- State contract products are delivered to Ecology Headquarters Shipping and Receiving department.

- When products arrive, the Warehouse Operator will make copies of all packing slips and contact one of the following: the name on the package or the SPL and cc HWTR PC or Lead Secretary. If purchaser of product is unavailable/out of office, the HWTR PC/Lead Secretary can contact another product testing staff.
- Products will remain in the Shipping and Receiving Department's locked cage until received by PT staff.
- All original packing slips must be checked in with the HWTR PC who will scan and send digital copies (.pdf) to the PM and SPL, and save them under the PT X-drive the study-specific Packing Slips/Receipts folder.
- The digital image (.pdf file) of all Packing Slips/Receipts will be uploaded to the PTDB.
- The HWTR PC will send original Packing Slips/Receipts to the Financial Services Purchasing Officer PO.
- Products delivered and delivery date will be recorded in the Purchase Sample Tracking Log.
- The HWTR PC will cross-reference the delivered products to verify the distribution source of online retailers. If products came from different sources than the original order, it is noted on the Purchase Sample Tracking Log.
- All incoming products will be kept in locked cabinets in the PT Sample Prep. Room or HWTR HQ cage to maintain Chain of Custody (COC). Those locations will be labeled with the Study Name, PM and PM phone #. Ensure that any additional study-specific storage requirements are met.
- If products are not received or on back order the HWTR PC will update PM.
- *Note: Limitations for all online purchases and purchase arrival may include product availability and shipping delays. Some orders may need to be cancelled if products are on back order and may not be received with the scheduled sampling window.*

6.9 Emergency Credit Card Instructions

- The Emergency Credit Card is used when purchasing any products online that are NOT available on state contracts or found in local stores, subject Contracts and Purchasing Manager's approval.
- The Emergency Credit Card is assigned to a Primary User. All use of the credit card must be coordinated with Primary User and follow all of Fiscals tracking requirements mentioned below.
- Staff intending to make purchases with the Emergency card must review the Purchasing Directive, Credit Card Use section, which is located on Ecology's Financial Services Intranet site.
- Each Credit card user must read and sign the Credit Cardholder Agreement form and return it as instructed on the form and copy to the Contracts and Purchasing Manager. PT Staff intending to make purchases with the Emergency Credit Card need to resign the Credit Card Holder Agreement every year in January.
- A minimum of one week notice is recommended for the Contracts and Purchasing Manager's approval. Provide a summary of the study, include:
 - Title/Name of study

- Categories of products being purchased (e.g., auto parts)
- Type of samples that will be analyzed (e.g., car brake pads)
- Estimated amount allotted for the study-specific online purchases
- Purchasing Schedule
- Who will be doing the online purchases
- Type of businesses the purchases will be made from (e.g., major retailers)
- Before using the credit card, email the Contracts and Purchasing Manager a request a day or two before intended use.
- The Contracts and Purchasing Manager grants permission via email to the Fiscal Program Support Staff / Main Receptionist. This serves as a study specific reminder to the Contracts and Purchasing Manager and allows the Main reception to officially hand out the card. The Emergency Credit Card must be picked up /returned to the Fiscal Administrative Support staff. If they are away from their desks, return the card to the Payables Unit Manager, Fiscal Manager, Sr. Financial Advisor, or Contracts and Purchasing Manager.
- No overnight possession is allowed.
- The purchasing limit is \$700 per transaction. If there is a possibility that a purchase might exceed \$700, make prior arrangements with the Contracts and Purchasing Manager.
 - ONLY order from online vendors that appear legitimate; they must provide the following information on their website. If questionable, do not use the vendor. Take a screenshot of the following, print and place in the Active Monthly Credit Card Log:
 - Billing address
 - Telephone number
 - Email address
 - Product price
 - Tracking numbers
- Purchasing is prohibited if the associated vendor website does not include the information mentioned above. Capture all required information mentioned above and store on the X-drive under the study-specific purchasing folder under online study receipts.
- Next, fill in the electronic version of the Credit Card Log; coordinate with the Primary Cardholder for instructions. The following information will be required.
 - Credit Card Name (Emergency 1 or 2)
 - Date
 - Time
 - Users Name
 - Item Purchased
 - Justification and PR # (if needed)
 - Vendor name/Invoice #
 - Invoice amount
 - MIC (Master Index Code)

A copy of the credit card log is found in Ecology's Intranet under Forms/Purchasing /Credit Card Log:

- An electronic as well as a physical log must be created for each card used during the month.
- After the order is placed print three copies of the online receipt/Purchase Request. Place one copy in the Study-specific Purchasing folder, one in the Active Monthly Emergency Credit Card Log, and the other in or on a labeled store/online vendor tote.
Verify that the printed invoice/purchase request contains the price and product/s identification information and shipping cost. Do not rely on incoming packing slips as they may have limited information.
- The Study-specific Purchasing folder should be divided into two sections, complete and incomplete orders. Once the order is placed add online receipt/Purchase Request to the incomplete order section.
- Next, print and fill in the electronic version of the Credit Card Log; found in Ecology's Intranet under Forms/Purchasing /Credit Card Log with the following: Date, Time, Users Name, Item Purchased, Justification and PR # (if needed), Vendor name/Invoice #, Invoice amount, MIC (Master Index Code).
- Using the link above create a combined Active Monthly Credit Card Log for all PT studies. This physical log is required to be filled out by each credit card user for every purchase.
 - Card user must print and sign their name and attach the original invoice and packing slips.
 - Verify that each shipment received has a printed invoice that contains the cost of each product purchased as well as the shipping cost.
 - If a packing slip arrives without the itemized price of the product/s and the shipping cost we are required to go back to the original vendor link and print out the specifics for each portion of the order received.
 - Group orders with multiple products for delivery and tracking ease. If orders for more than one product are placed from an online vendor/website: add order grouping clues to the shipping information. Products may come from multiple suppliers and adding this level of detail to shipping information may help track incoming products. i.e.: Chrissy Wiseman Product Testing (Group A) - Product Testing Program - Loading Dock –ECY HQ addresses. Next order add the (Group B).
- The Contracts and Purchasing Manager will provide a monthly bank statement for each credit card. Reconcile any differences between the monthly statement and the PT Credit Card logs.
- Create an electronic Credit Card Log for each study with all study specific purchasing information. Date of Purchase, Card user's name, Vendor Name, Product description and price including shipping costs, and a program billing code. Update log as purchases are made and add status (partial order, complete, not yet received) comments for those purchases by the 25th of each month. This will help with any tracking reconciliation when multiple studies are combined into to the on monthly electronic log.
- The Study-specific electronic log will be kept in the PT X: drive under the associated study.

- The Primary Cardholder will populate a combined PT studies electronic version of the Active Monthly Credit Card log and email it to Ecology's designated Financial Service Accounts Payable Analysts monthly by the 27th.

The PT combined version stored on the PT X: drive under Active Monthly Credit Card Folder.

Both the Study-Specific and Combined Credit Card electronic logs required to be populated by each credit card user for every purchase.

- Save the invoices in the receipts folder of the appropriate study. Name receipts with the format (Store name - Study – date – receipt).
- To let the account settle, don't purchase from the 23rd to the 27th of the month unless necessary.
- Create totes labeled with the online vendor names and place a copy of the invoice on top of or in the totes. Totes may be stored in or on top of PT Prep Room cabinets.
- Emergency Card Online product delivery may be delivered to the PT Prep Room if PT Staff are present. If prearranged PM's may also request to pick up products directly from the Ecology's Shipping and Receiving departments secure cage.
- As products arrive, place the original packing slip/s in the Active Monthly Credit Card Log. Again, verify that each shipment received has a printed invoice that contains the itemized cost of each product as well as the shipping cost.
- Make two copies of the packing slip (if received).
 - Place one copy in the Study-specific Purchasing folder with a received date and the initials of the employee that received it.
 - Keep another copy with the incoming product/s in the store labeled tote. Keep all shipping address information with the incoming product/s.
- Cross off received item/s on the stores tote/s invoice and in the Study-specific Purchasing folder and the physical copy of Active Monthly Credit Card Folder.
- When orders have been received completely move all receipts/packing slips in both the Study-specific Purchasing Credit Card Log and the physical copy of Active Monthly Credit Card Log from the incomplete order section to the completely received order section.
 - For all canceled or incomplete orders, attach an in-detail memo to their original invoices. Group all packing slips and invoices together by vendor for every shipment.
 - For orders that have not been completely received by the end of the month, attach an in-detail memo to the original invoice and place in the next month's log. Record the payment amount as well as shipping and handling costs for the remaining products in the Active Monthly electronic and physical logs. Note the month of the original order and line number of the Credit log from the order in the Active Monthly Credit Card Log that the order was completely received.
 - Also, reference the record of the partial purchase from the previous month's Credit Card Log in the next month's memo attached with the remaining receipts.
- Update the agency Study-specific and Combined Active Monthly Credit Card Logs when the order has been received in total. Only log in products to the PTDB once the whole order has been received. Do not log in incomplete orders unless the sample processing window is closing.

Study PM will advise. Refer to Data Entry and Database SOP PTP002 data entry for instructions.

- Obtain signatures on the Study-specific and Combined Active Monthly Credit Card Logs from Cardholder and Approving Hazardous Waste Section Manager P2RA.
- Turn in the combined PT studies Active Credit Card Log on the 27th to Ecology's designated Procurement & Supply Specialist. Due within five days after the 25th of each month.

6.10 Product Storage

- Clean cabinets and sample totes between studies with water, 24% Ethanol and Kim Wipes
- Label all shopping bag(s) with the date of purchase and ensure that the bag(s) are marked with the store name.
- Verify that bulky items have hanging tags attached that include the store name and purchase date.
- The *Electronic PT Sample Inventory Log* tracks the location of all products and samples by study. This log will be used when products/samples are brought in to the PT Prep Room, and updated when products/samples move between the PT Prep Room, the HWTR HQ cage and are disposed of. This is done after a majority study's sample processing has been performed and is updated upon sample return and again after product/sample disposal.
- Verify that products/samples that are disposed are documented in the log at the point of disposal (recycling, reuse, donation, and trash) or when relocated to Ecology's Dangerous Waste Storage Room.
- If products are donated, archive all donation receipts in the PT enforcement Sample Documentation/Disposal Log.
- If samples are donated to other government agencies/research institutions to be used for research purposes a Sample Donation form is required to be completed and signed and stored on PT SharePoint site.

6.11 Purchase Documentation

- Upon return to Ecology, save and log the itemized receipt from the purchase:
- Scan each receipt and email to the Product Prep Lead and the PM.
- Save the receipt scan within the appropriate study folder with the naming convention: "Store Name, Study Name Day Month Year" (e.g., JC Penny Seasonal Study Valentine's 15Jan2015) for uploading into the purchase record in the PTDB. See PT Data Entry and Database PTP002.
- In accordance with the Agency Credit Card Rules of Use, the original paper receipt will be returned to *Financial Services Purchasing Officer (PO)*. Record the receipt's tracking number and the amount spent at each store on the Credit Card Check-out Log. Return the card by 3 pm unless you have agreed on a different time.
- If the receipt is over \$125 per store, send a copy of the receipt to the HWTR PC who will process it and provide a PR# to the Sample Prep Lead.
- The Sample Prep Lead will upload the PR# into the PTDB under the associated purchase.

- Scan advertising or additional documents associated with the purchase and name the file with the naming convention: “Store Name Study Name Day Month Year item” (e.g., JC Penny Seasonal Study Valentine’s 15Jan2015 Sales Flyer).
- A purchase record for each store or site is created in the PTDB by the PM or the SPL where all product digital records will be stored.

6.12 Product Documentation and Labeling

- Take the following pictures of each product on a neutral background (consult the study QAPP and the PM for additional photo requirements. All photos should be properly rotated when saving. Consult PM if it is a Low-level study, prior to photographing products for any special instructions (for example if required to change gloves between products, photograph products on a piece of tin foil dull side up, etc.).
 - Brand name, distributor name, logo
 - Close up images of:
 - Composition label
 - Individual components selected for analysis – prior to size reduction (recommended if they are not clearly visible in the product photo).
 - Ingredients list (personal care products)
 - Lot and batch numbers
 - RN number (found on textile products, including fur, cloth, wool)
 - The contents of the product if they are not visible in the packaging.
 - The product in the packaging, full front and back images.
 - UPC codes
 - Warning labels/technical bulletins
- Save photographs under the correlating store folder for that specific study in the PT X-drive.
- Enter a product record for each product in the PTDB, detailed in the Data Entry and Database SOP (PTP002). The database will generate a specific Product ID.
- Create a product label to include:
 - Product ID
 - Product Testing Program
 - Study Name
 - WA State DOE
- Place the product in a zip-top bag and stick the label on the inside of the bag.
- If more than one of the same product was purchased to obtain sufficient sample size, put all products in one bag. If additional product is purchased at a different time or from a different location, a new purchase is created and the product is logged in and bagged separately.
- If more than one bag is needed, label all bags with the identical Product ID.
- If the product is too large to place in a zip-top bag, either:
- Stick the label onto the original packaging of the product.

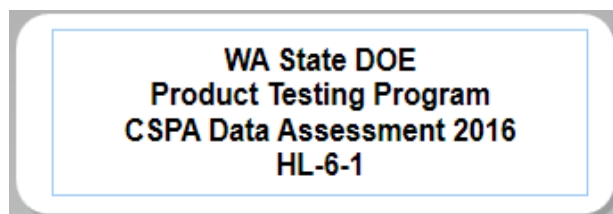


Figure 1. Product label.

- Place the label on a hanging tag and attach it to the product.
- Place the product in a large plastic kitchen bag (if approved by PM) and place label to the outside of bag.
- Products are organized by study and store/product location and kept in locked cabinets in the Product Sample Preparation Room or the HWTR HQ cage.
- Update the *Electronic PT Sample Inventory Log* located on the PT X: drive.

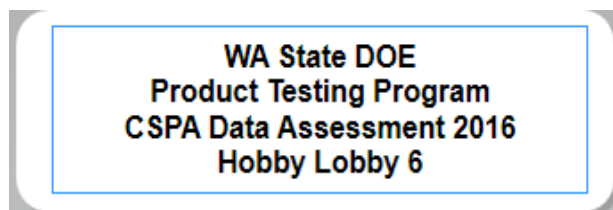


Figure 2. Tote label.

6.13 Standard Sample Preparations

Wash lab coats between studies or whenever soiled. Lab coats must be washed with a laundry soap that carries one of the following certifications (Safer Choice, Ecologo, or GreenSeal) and does not contain the chemicals to be assessed. Place the lab coat wash date on Lab Coat sign directly above coats.

Prior to use, all tools and materials used in product physical deconstruction and sample preparation are pre-screened with the X-Ray Fluorescence (XRF) (for metal tools) and the FTIR (for tools with soft plastic material) to verify that they do not contain analytes of concern.

6.13.1 Cleaning Equipment and Supplies

- 24% ethanol, ACS or food grade quality
- Aluminum foil
- De-ionized water (DI water) (except for PFAS studies, use only tap water for cleaning).
- Detergent: Alconox, Liquinox
- Disposable glass Pasteur pipettes (dispose of in broken glass container when all solvent is evaporated)
- Empty glass bottles for properly disposing of used solvents
- Face shield
- Glass funnel
- Hexane, certified ACS HPLC grade > 99.5% (Use only in fume hood, keep in glass bottle)
- Isopropyl alcohol pads
- Lab coat
- Large and small KimWipes
- Latex pipette bulbs
- Methanol, certified ACS reagent > 99.8% (Use only in fume hood)
- Nitric acid, 10% solution (if specified in QAPP)
- Nitrile gloves
- Polyethylene rinse bottles for solvents (methanol or ethanol only)
- Safety glasses/goggles

- Scrub brush
- Stainless steel bowls for collecting used solvents
- Wash bottle for dilute Liquinox

Review Section 9 Safety prior to tool cleaning.

6.13.2 Procedures for Cleaning Equipment and Tools

6.13.2.1 Beginning and End of Day Tool Cleaning Instructions

- Wear appropriate PPE (e.g. gloves, eyewear, and lab coat) while cleaning tools. Nitrile gloves are recommended for all tool decontamination processes.
- Clean all tools at the beginning and end of each day. Refer to the study-specific QAPP for additional cleaning protocols as well as the Tool Cleaning Procedure by Chemical for Sample Collection and Processing summary tables found in (Appendix D).
- Tool cleaning is conducted in the Product Sample Preparation Room (OL-21).
- Set up a drying location for clean tools by placing a large piece of aluminum foil (dull side up) and cover with KimWipes.
- Replace wipes, gloves, and foil as necessary throughout the process to prevent cross contamination.
- Wash the “Prep Room Clean Tool Bin” with Liquinox and DI water prior to use and line with aluminum foil and KimWipes (Some studies may require the use of tap water, verify with PM or SPL). Use this bin to transport and store clean tools.
- Use a diluted 1% solution of 10 ml cleaning agent (Liquinox) to 1 Liter DI water in pre-labeled PT soap wash bottles.
- Use DI water tap system from the Product Sample Preparation Room.
- The remaining cleaning solution will be kept in the Product Sample Preparation Room.
- Follow steps 1 through 5 to clean one tool at a time:
 - Step 1: Squirt a small amount of the diluted 1% Liquinox cleaning solution onto a clean scrub brush and scrub each tool thoroughly for at least 30 seconds, or longer if there are visible pieces of product on the tool.
 - Step 2: Rinse the tool with cold tap water and follow with a DI water rinse at least three times.
 - Step 3: Place tools on aluminum foil covered with KimWipes to air dry.
 - Step 4: Thoroughly rinse the scrub brush prior to cleaning the next tool and set in pre-rinsed stainless bowl between uses.
 - Step 5: Dry tools with KimWipes or allow tools air dry covered with Kim Wipes. Place dry tools, in the “Prep Room Clean Tool Bin.” Place all tools in the same direction – handles and cutting edges. Study-specific QAPPs will indicate if the tools require individual foil wrapping.
 - Step 6: For individual wrapping of each tool, lay out aluminum foil (dull side up) large enough to encapsulate the tool.
- Repeat the process above until all tools are clean.

6.13.2.2 Cleaning tools between samples

- Procedures that permit cleaning tools between samples are determined by the study and target analytes.
- Tools should be cleaned between samples by using KimWipes moistened with DI water, 24% ethanol, or isopropyl alcohol wipes.
- Tool Selection and Recording for Product Deconstruction and Sample Preparation
- Reduction of product size to a sample size for laboratory analysis or for pre-screening will be conducted first using hand tools made of stainless steel, categorized in group A.
- If tools in group A are not sufficient for breaking down components, use tools in group B, then resort to tool group C.

| Product Testing Tool Categories Designation by XRF screen | | |
|---|--|--------------------------------|
| Group A | Group B | Group C |
| < Detection Limit of Sb, Cd, Pb, Hg, Co, As | <Detection - 0.5 ppm of Sb, Cd, Pb, Hg, Co, As | <0.5 of Sb, Cd, Pb, Hg, Co, As |

- All new PT tools will be pre-screened and added to the Electronic Supply Inventory List retained on the X-drive.

6.13.3 Product Deconstruction (Creating a Sample) for XRF Screening

- The PM or Sample Lead Prep will reserve time on the Product Sample Preparation Room Calendar to avoid scheduling conflicts.

6.13.3.1 Equipment Needed

- PPE's, safety glasses/goggles or a face shield, safety goggles, face shield, nitrile gloves, and closed-toed shoes.
- 24% Ethanol
- Aluminum Foil
- Clean pre-screened scissors and other cutting tool
- Disposable nitrile gloves
- Kim Wipes
- Lab coat (when handling products)
- Liquinox squirt bottle (1% solution)
- Safety glasses/goggles, or a face shield
- Scrub brush
- Sharpies
- Pre-screened sample bags

6.13.3.2 Procedures for Deconstruction - (Creating a Sample) for XRF Screening

- Clean workspace with KimWipes, 1% solution Liquinox, DI water, and 24% ethanol.
- Work on a clean stainless steel surface or aluminum foil (dull side up) lined with KimWipes.
- At the start of the day, ensure all needed tools were cleaned as described in the Tool Cleaning Sections 6.13. Review the Prescreening table of the Tool Cleaning Procedure by Chemical in the Sample Collection and Processing summary tables in (Appendix D).
- Use tools from Tool Category A. Stainless steel tools are recommended.
- Locate and take products out of locked cabinets. Remove products one at a time from the bags and place on the clean workspace.
- In order to determine the target component/s navigate to the associated purchase/product page in the PTDB (refer to PT Database Entry and Database SOP PTP002).
- Deconstruct the product into the components (including packaging, if required) specified in the PTDB. If additional components of interest are identified, enter them into the PTDB.
- Once a component has been isolated for screening, place it into an appropriately sized zip-top bag and label the bag with the Component ID.
- When all components, or components of interest, have been isolated and labeled in zip-top bags, clip the component bags together in numerical order, and place back into the product bag with the remains of the initial product.
- Before deconstructing another product, clean the used tool(s) with 24% ethanol and KimWipes, unless additional cleaning requirements are specified in the study QAPP.
- Replace KimWipes used at the workspace between samples or clean the stainless steel table with 24% ethanol and KimWipes.
- If it is being used, aluminum foil should be replaced between products.
- Replace gloves between products.

6.13.4 Product Deconstruction (Creating a Sample) for Lab Analysis

6.13.4.1 Equipment Needed

- PPE's, safety glasses/goggles or a face shield, safety goggles, face shield, nitrile gloves, and closed-toed shoes.
 - 24% Ethanol
 - Disposable nitrile gloves
 - Aluminum Foil
 - Kim Wipes
 - Lab coat (when handling products)
 - Liquinox squirt bottle (1% solution)
 - Safety glasses/goggles, or a face shield

- Scrub brush
- EPA pre-cleaned certified sample jars
- Sharpies
- Clean pre-screened scissors and other cutting tools

6.13.4.2 Procedures for Deconstruction - (Creating a Sample) for Lab Analysis

The basic product testing sample preparation procedure listed here describes protocols staff should use when the project plan requires a laboratory analysis quantitation limit of ≥ 1 ppm.

- The PM or SPL will reserve time in the Product Sample Prep Room on the PT SharePoint Calendar to avoid scheduling conflicts. Provide details with specific tasks such as, preparation space, as well as the need for specific equipment like the hood, XRF and the FTIR.
- Prepare samples that are under pressure, off-gas (fertilizers and pesticides), squirt/spray in the fume hood.
- If necessary vacuum with a HEPA filter prior to sample preparation. It may be necessary to vacuum in between sample preparation as well. The Study PM will determine and provide those details to Prep Staff (PT vacuum is stored in the HTWR cage).
- Use clean lab coats when preparing samples. Verify the wash date on Lab Coat sign. Lab coats must be washed with a laundry soap that carries one of the following certifications (Safer Choice, Ecologo or GreenSeal) and does not contain the chemicals to be assessed.
- Wear nitrile gloves, a lab coat, safety glasses/goggles or a face shield, and closed-toed shoes when handling and preparing samples.
- Locate and take products out of locked cabinets. Remove products one at a time and place on clean workspace.
- When component level photos are required, photograph the component or verify that the component has been photographed, before proceeding with sample reduction.
- Reconfirm with the PM and/or the SPL for required sample volume, mass and size needed.
- Use a lab scale to determine the sample weight if necessary. Place a clean Kim wipe on the scale between samples.
- When reducing samples work on a clean stainless steel surface or aluminum foil (dull side up) or with KimWipes. Maintain a clean work area throughout the process.
- Before processing samples, clean the stainless tabletop with a 1% solution of Liquinox.
- Rinse with DI water and then use 24% ethanol to wipe down the surface.
- If using KimWipes replace between samples.
- Replace foil (working on dull side of surface) as needed.
- If working directly on a stainless steel surface, clean between each sample with 24% ethanol.
- If there is any residual material, use a 1% solution Liquinox.
- Rinse with DI water.
- Clean with 24% ethanol.

- Use properly cleaned tools. Review study-specific instructions located in the Tool Cleaning Procedure by Chemical in the Sample Collection and Processing summary tables, Appendix D.
- If needed, vacuum between samples if remnants from a previous sample compromise the cleanliness of the preparation space.
- Place prepared samples into pre-cleaned certified sample containers that have been maintained under custody. Verify that the sample containers came with a pre-cleaned certified *Certificate of Compliance*. Label certificate of compliance sheets from open sample boxes with the study name and date and place them into the QA/QC Folder under the designated study.
- When preparing liquid samples, securely wrap Parafilm around the lid after sealing the jar. This will help prevent spills during transportation (optional).
- Label sample containers with the following information:
 - Analysis method
 - Component ID
 - Date
 - Lab# provided by the lab
 - Sample preparation time (optional)
 - Sampler's initials or name
 - Study name
- Place used tools into the "Prep Room Dirty Tool Bin."
- Store prepared samples for laboratory analysis in locked cabinets in the Product Sample Preparation Room, the COC Room, or the walk-in cooler within the COC Room (when required in study QAPP).
- If receiving analytical results while continuing to process current study products, it is important to have a check-in with the PM disclosing those results. This information may warrant additional use of PPE and allow for samples to be handled with more caution.

6.13.5 Recordkeeping

6.13.5.1 Sample Preparation Log

- Use the PT Prep Log to document individual sample preparation information, such as the tool used, whether there is sample left, if a composite was prepared using multiple components, or indicating what part of the product was used for a sample. PT Prep Log use to be determined by PM on a study specific basis.

6.13.5.2 Chain of Custody

- Record the following information on an appropriate laboratory analysis Chain of Custody form found on the Product Testing Share Point site when preparing samples for laboratory analysis:
 - Analysis method
 - Component ID
 - MEL Work Order number
 - Number of sample containers per sample
 - PM contact information

- Print, sign, and scan the COC form and save on the PT X-drive under the study folder
- Sample matrix
- Sample time and date
- Sampler's name
- Shipment date and time
- Source code – Describes the types of matrix

6.14 *Low Level* (<1 ppm) Sample Preparations

6.14.1 Tool Cleaning Equipment and Supplies

- Di Water system (exception PFAS research)
- Disposable nitrile gloves – required for Hexane and Methanol
- Foil
- Funnel (as needed) – glass or plastic
- Hood
- Kim Wipes
- Lab coats
- Labeled rinsate container
- Liquinox
- Low-level Clean Tool Tote
- New scrub brush
- Pipettes and bulbs
- PPE's, face shield, safety goggles, apron
- Silver shield gloves - required for acetone, optional use for Methanol and Hexane.
- Solvent
- Solvent rinse bottle (solvent compatible)
- Stainless bowl
- Wash bottle for dilute Liquinox
- Note: Although Silver shield gloves are not required for Methanol and Hexane they provide more effective at wrist and arm coverage and should be considered based on the process/need.
- Open sash of fume hood to appropriate level and ensure the fume hood ventilation is on and is venting properly (test by placing a Kim Wipe near the open sash verifying that the wipe is pulled into hood gently). Clean surface in fume hood with a Kim Wipe and 24% ethanol or with appropriate solvent that tools will be cleaned with. Line the inside of the fume hood with aluminum foil (dull side up).
- Solvents and solvent rinse bottles are located in the corrosive and flammable cabinets in the Hazardous Material Storage Room (OL-14) and labeled specifically for the product testing

program. Transport solvents or acids from storage using a secondary container and place directly into fume hood.

- Use the rinse bottles for rinsing tools during the cleaning process. Use a funnel (as needed) to pour the solvent from original container into rinse bottle (glass or plastic depending on solvent compatibility) for ease of rinsing tools and to reduce contamination in original solvent container.

6.14.2 Procedures for Beginning- and End-of-Day Equipment and Tool Cleaning

- Follow steps 1 through 5 to clean one tool at a time:
- Step 1: Squirt a small amount of the diluted cleaning solution prepared using DI water or tap water (determined by the QAPP requirements) onto a clean scrub brush and scrub each tool thoroughly for at least 30 seconds, or longer if there are visible pieces of product on the tool.
- Step 2: Rinse the tool at least three times using designated water (tap water or DI water) to remove the cleaning solution. Point the cutting edge of the tool upward when rinsing allowing water to run down both sides of cutting surface of the tool away from handle to ensure complete rinse.
- Step 3: Place tools on aluminum foil (dull side up) and covered with KimWipes. Gently pat tool dry with a clean Kim Wipe and place on a piece of clean dull side up aluminum foil (no Kim Wipe layer).
 - Thoroughly rinse scrub brush before cleaning the next tool, set in pre-rinsed stainless bowl.
- Step 4: Replace gloves and use longer that cover the forearm (Silver shield or longer nitrile gloves). Only hold tool at the handle to avoid touching cutting surface. In the Fume Hood: Use the solvent rinse bottle or glass bottle with glass pipette equipped with pipette bulb (for hexanes) to rinse both sides of the stainless steel tool surface (avoid handle especially if handle is plastic). Place rinsed tool on the clean aluminum foil lined surface of the hood and allow all solvent to evaporate until tool is dry. Leave tool surfaces open and do not overlay tools.
 - If collecting rinsate blanks, rinse the tool over a collection pre-labeled container (HDPE or glass container) that is set inside a clean stainless steel collection tray or bowl.
 - If not collecting rinsate blank, then rinse tool into the stainless steel collection tray or bowl (collect at the end of cleaning process by pouring waste solvent into a labeled glass solvent container with a funnel used specifically for waste solvents). Place waste solvent in the appropriate cabinet in the Hazardous Material Storage Room (OL-14).
 - Leave all collection containers in the fume hood until all residual solvent has evaporated. Clean the stainless steel collection tray, bowl, and funnel as described above and store in the Low-level cleaning tote.
- Step 5: For individual wrapping of each tool, lay out a small piece of foil dull side up, place clean tool surface on the dull side of foil, and gently fold foil around tool (okay to avoid wrapping handle of tool if placing tool directly into clean tool bin).
 - Place all tools in the same direction – handles and cutting edges.
 - Continue with the above process until all tools are clean. Use new gloves when moving from cleaning to rinsing to wrapping tools.

- Collect used solvent and acids (not rinsate samples) and store properly until disposal as described in section 11.0 of the Chemical Hygiene Plan (Appendix G).
- Store rinsate samples in a labeled box in the Hazardous Material Storage Room (OL-14) with the following information; program name, study name, rinsate (hexane or methanol), PM information (name & phone number) and date.
- Tools may not be reused between processing different samples and must be cleaned again following the above process.

6.14.3 Product Deconstruction (Creating a Sample) for XRF Screening

6.14.3.1 Equipment Needed

- Aluminum Foil
- Di Water system (exception PFAS research)
- Disposable nitrile gloves – required for Hexane and Methanol
- Funnel (as needed) – glass or plastic
- Hood
- Kim Wipes
- Lab coats
- Labeled rinsate container
- Liquinox
- Low-level Clean Tool Tote
- New scrub brush
- Pipettes and bulbs
- PPE's, face shield, safety goggles, apron
- Sample bags, pre-screened
- Scissors and other pre-screened cutting tools
- Sharpies
- Silver shield gloves - required for acetone, optional use for Methanol and Hexane.
- Solvent
- Solvent container
- Solvent rinse bottle (solvent compatible)
- Stainless bowl
- Wash bottle for dilute Liquinox
- Note: Although Silver shield gloves are not required for Methanol and Hexane they provide more effective at wrist and arm coverage and should be considered based on the process/need.
- Open sash of fume hood to appropriate level and ensure the fume hood ventilation is on and is venting properly (test by placing a Kim Wipe near the open sash verifying that the wipe is pulled into hood gently). Clean surface in fume hood with a Kim Wipe and 24% ethanol or with

appropriate solvent that tools will be cleaned with. Line the inside of the fume hood with tin foil (dull side up).

- Solvents and solvent rinse bottles are located in the corrosive and flammable cabinets in the Hazardous Material Storage Room (OL-14) and labeled specifically for the product testing program. Transport solvents or acids from storage using a secondary container and place directly into fume hood.
- Use the rinse bottles for rinsing tools during the cleaning process. Use a funnel (as needed) to pour the solvent from original container into rinse bottle (glass or plastic depending on solvent compatibility) for ease of rinsing tools and to reduce contamination in original solvent container

6.14.3.2 Procedures for Deconstruction (Creating a Sample) for XRF Screening

- For hand-reduced samples:
 - Clean workspace with KimWipes, 1% solution Liquinox, DI water (or tap water as applicable), and 24% ethanol.
 - Line workspace table with foil (dull side up) as applicable.
- Between each sample:
 - Replace aluminum foil working on dull side of foil and KimWipes as applicable.
 - Change gloves between each sample.
 - Use new pre-cleaned tool wrapped in foil (cleaned by low level cleaning procedure) for every sample that is being deconstructed.
 - Hand-reduce sample, place in pre-screened bag.
 - For aliquot samples:
 - If collecting an aliquot of a sample in the field or from a product too large to ship to lab then open lid of sample container with clean gloves and pour a well-mixed aliquot of the original product into a clean jar. Replace lid without touching inside of jar or lid.
- Make sure that the aliquot pouring from original container does not run down outside of container but is a clean pour directly from original container into clean sample container. If needed, use a pre-cleaned funnel for collecting sample in container.
- Obtain a representative sample without contaminating the remaining product for future analysis.
- If product/sample is volatile, collect aliquot in the fume hood.
- See Product Testing In-House Product /Sample Processing Procedures summary table in (Appendix D) and review study QAPP for specific details.

6.14.6 Product Deconstruction (Creating a Sample) for Lab Analysis

6.14.4.1 Equipment Needed

- Aluminum Foil
- DI Water system (exception PFAS research)
- Disposable nitrile gloves – required for Hexane and Methanol

- Funnel (as needed) – glass or plastic
- Hood
- Kim Wipes
- Lab coats
- Labeled rinsate container
- Liquinox
- Low-level Clean Tool Tote
- New scrub brush
- Pipettes and bulbs
- PPE's, face shield, safety goggles, apron
- Sample containers
- Scissors and other pre-screened cutting tools
- Sharpies
- Silver shield gloves - required for acetone, optional use for Methanol and Hexane.
- Solvent
- Solvent container
- Solvent rinse bottle (solvent compatible)
- Stainless bowl
- Wash bottle for dilute Liquinox
- Note: Although Silver shield gloves are not required for Methanol and Hexane they provide more effective at wrist and arm coverage and should be considered based on the process/need.
- Open sash of fume hood to appropriate level and ensure the fume hood ventilation is on and is venting properly (test by placing a Kim Wipe near the open sash verifying that the wipe is pulled into hood gently). Clean surface in fume hood with a Kim Wipe and 24% ethanol or with appropriate solvent that tools will be cleaned with. Line the inside of the fume hood with aluminum foil (dull side up).
- Solvents and solvent rinse bottles are located in the corrosive and flammable cabinets in the Hazardous Material Storage Room (OL-14) and labeled specifically for the product testing program. Transport solvents or acids from storage using a secondary container and place directly into fume hood.
- Use the rinse bottles for rinsing tools during the cleaning process. Use a funnel (as needed) to pour the solvent from original container into rinse bottle (glass or plastic depending on solvent compatibility) for ease of rinsing tools and to reduce contamination in original solvent container.

6.14.4.2 Procedures for Deconstruction and Sample Preparation.

- For low-level (<1 ppm) analyses, refer to the study QAPP and summary tables in Appendix D for specific details.
 - For hand-reduced sample
 - Clean workspace with KimWipes, 1% solution Liquinox, DI water (or tap water as applicable), and 24% ethanol.
 - Line workspace table with foil (dull side up) as applicable.
 - Between each sample:
 - Replace aluminum foil working on dull side of foil and KimWipes as applicable.
 - Change gloves between each sample.
 - Use new pre-cleaned tool wrapped in foil (cleaned by low level cleaning procedure Section 6.14.1) for every sample that is being deconstructed.
 - Hand-reduce sample into pre-weighed and pre-labeled clean jar.
- For aliquot sample
 - If possible, send sample in original container, unopened.
 - If collecting an aliquot of a sample in the field or from a product too large to ship to lab then open lid of sample container with clean gloves and pour a well-mixed aliquot of the original product into a clean jar. Replace lid without touching inside of jar or lid.
 - Make sure that the aliquot pouring from original container does not run down outside of container but is a clean pour directly from original container into clean sample container. If needed, use a pre-cleaned funnel for collecting sample in container.
 - If possible, collect aliquot in the fume hood.

6.14.5 Recordkeeping

6.14.5.1 Sample Preparation Log

- Low level samples require tool use documentation of both physical destruction for prescreening as well as sample preparation. Record whether there is sample left, if a composite was prepared using multiple components, or indicating what part of the product was used for a sample
- Record this information on a PT Prep Log:
 - Name of study PM
 - Pre-screen date/sample date
 - Sample availability
 - Sample time
 - Sample weight
 - Sampler's name
 - Study name
 - Tool designation will be outlined in the summary tables in (Appendix H)

| Product Testing Tool Categories Designation by XRF screen | | |
|---|--|--------------------------------|
| Group A | Group B | Group C |
| < Detection Limit of Sb, Cd, Pb, Hg, Co, As | <Detection - 0.5 ppm of Sb, Cd, Pb, Hg, Co, As | <0.5 of Sb, Cd, Pb, Hg, Co, As |

- Tool(s) used to reduce the sample
- Work order number (if available)

6.14.5.2 Chain of Custody

- Record the following information on an appropriate laboratory analysis Chain of Custody form found on the Product Testing Share Point site when preparing samples for laboratory analysis:
 - Analysis method
 - Component ID
 - MEL Work Order number
 - Number of sample containers per sample
 - PM contact information
 - Print, sign, and scan the COC form and save on the PT X-drive under the study folder
 - Sample matrix
 - Sample time and date
 - Sampler's name
 - Shipment date and time
 - Source code – Describes the types of matrix

6.15 Sample Shipment

- Supplies required for Sample Shipment
 - Blue ice
 - Boxes for sample containers
 - Chain of custody forms
 - Chain of custody seals
 - Clean coolers
 - Packing materials
 - Samples
 - Shipping Labels if necessary
 - Shipping tape
- Samples must remain under COC during the entire shipping process. The locked COC Room serves as an approved secured holding area for samples.
- It is advisable that sample containers be kept in their original shipping boxes and the boxes then placed into coolers. Use packing materials (e.g., bubble wrap, packing peanuts) or ice packs (when required by study) to surround loose samples and fill voids in coolers.

- Samples may be analyzed by either Ecology's Manchester Environmental Laboratory (MEL) or a contracted laboratory. Follow appropriate procedures when preparing the samples for shipment.

6.16 For Manchester Environmental Laboratory (MEL)

- The PM or Sample Prep Lead submits a *Pre-Sampling Notification form* (PSN) and *Sample Container Request form* to MEL at least three weeks prior to sampling. MEL will provide a work order number.
- Fill out the Laboratory Analyses Required (LAR) form, which will serve as the COC documentation located on the PT Share Point site under forms. MEL work order number/sample numbers will need to be added to sample containers and to the LAR/COC forms.
- Finalize the LAR form by verifying that it is complete and that all samples are recorded appropriately, then sign and date the form.
- Place the sample containers in a cooler.
- Seal the clearly labeled cooler with a COC seal and secure it the COC Room on the table or walk-in cooler (when specified in the QAPP).
- Place a completed LAR form in the courier box on the lab bench. The location of the samples must be clearly marked on the LAR form.
- Notify MEL's Sample receiving staff when the samples are ready for pickup and the storage location. MEL courier staff will pick the samples up and deliver them to the laboratory for analysis.

6.17 For Contract Laboratory:

- The PM or SPL will submit a *Pre-Sampling Notification form* (PSN) (Appendix A) and *Sample Container Request form* (Appendix B) to MEL at least three weeks prior to sampling. MEL will provide a work order number. MEL work order number/sample numbers will need to be added to sample containers and to the contract laboratory's COC forms.
- If sending samples directly to a contracted laboratory, follow any specific guidelines for that particular laboratory.
- Use the appropriate COC form for the contract laboratory.
- Fill out the COC form, carefully verifying that it is complete and that all samples are recorded appropriately.
- Place the sample containers in a cooler.
- Place the completed COC form and contact information for the analytical laboratory in a zip-top bag and place the documents in the cooler before sealing.
- If using more than one cooler, place a copy of the COC in each cooler going to the laboratory.
- Seal the cooler with a COC seal.
- Close the cooler with shipping tape and add the laboratory shipping address to the outside of the cooler.
- Contact the laboratory before sending samples, to confirm that the contract laboratory is prepared to receive them.

- Take the samples to the Ecology mailroom. Provide:
 - study MIC code
 - your email
 - your name
 - your phone number
- If the samples are not going to be shipped within two hours and ice packs are required, place the samples back in the sample storage refrigerator until just before shipping.
- Ship the samples using over-night services to reduce transit time, making sure this coordinates with the corresponding lab's schedule.
- Provide the tracking information to the contract laboratory.

6.18 Sample Retention

- Products/samples from the active PT studies must be placed in secured locations before and after processing to ensure custody protocol. The active PT studies products/samples are kept in locked cabinets in the Product Prep Room (OL-21) and or the HWTR HQ cage (OS-23). Products and samples from previous studies may also be retained in the HWTR HQ cage (OS-23) in order to maintain the Chain of Custody. The previous studies samples/products may provide value for potential future analysis, research and development or educational opportunities.
- The samples and original products will be maintained under custody until all data is received, reports are written, and all compliance actions have been settled.

6.19 Disposal Protocol for Products/Samples

- For each study, the Enforcement Officer and PM will verify which products/samples need to be retained.
- Send this information to the Sample Prep Lead, print, and place into the "Enforcement Sample Documentation/Disposal," log located in the Product Sample Preparation Room.
- The enforcement products/samples will be boxed and labeled "Enforcement Samples" with the corresponding study name, a copy of the "Enforcement Sample Documentation/ Disposal," log and placed in the Enforcement cabinets (#17, 18) in the HWTR HQ cage. The enforcement samples will be retained in the HTWR cage until the enforceable case has been settled.
- This update will be documented on the PT X: drive *Electronic PT Sample Inventory Log*.

6.20 Disposal/Donation

- Place WA State and Federal Designated waste codes on lab samples and products required to be processed as hazardous waste.
- Donate, recycle, and designate/dispose of remaining products and samples from specified study, using appropriate PPE (gloves, eyewear, face shield, and lab coats) when needed.
- The samples that are designated as hazardous waste are moved to the HQ Dangerous Waste Storage Room.
- Disposal boxes are labeled with the proper hazardous waste designation labels and waste codes.
- The label will include the following information:
 - Correct state and federal disposal codes

- Current date
- Item number
- Weigh all boxes.
- Record the following information on Ecology HQ's *Building Disposal Log*:
 - Box weight
 - Current date
 - Disposal codes
 - Examples of the items being disposed (i.e. paint, fertilizer, pesticides, aerosol cans with residual solvents).
 - Item number
 - Study name
- If disposal questions arise, contact staff from the HWTR Regulatory Assistance Unit.
- The remaining products from the specific study will be separated into bags/boxes labeled "Donation," "Disposal," and "Recycle,"
- Items that were collected for donation are delivered to the donation site(s).
 - Collect donation receipts and record which studies the donated items came from.
 - Keep donation receipts in the "Enforcement Sample Documentation/Disposal" log.
- Dispose of non-designated laboratory samples into the garbage that contain large pieces of the sampled product and recycle the glass sample jar. If the sample is a powder or liquid, it is to remain in the glass sample jar and be disposed of into the garbage to avoid exposure.

7.0 Records Management

7.1 Form templates are located on the PT Share Point Site.

- Electronic PT Sample Inventory - Log PT X: drive
- Laboratory Analyses Required (LAR) form, which will serve as the COC - PT Share Point Site
- Pre-Sampling Notification form (PSN) - PT Share Point Site
- Product Documentation Log kept in the PT Prep Room
- Product Testing Preparation Staff - Training Checklist - PT Share Point Site
- Purchase Sample Tracking Log- PT Share Point Site
- Sample Container Request form - PT Share Point Site

7.2 Upon completion of a study, PM's must record any recommended additions or changes to the working version of the PT Universal QAPP, e.g., new chemical group, methods, and reporting limits with specific matrices. Staff will not follow procedures in the working version of the Universal QAPP until it or an addendum has been approved.

7.3 Paper record retention for PT Studies

- Paper records will be kept in the designated PM's cubicle or programs central files for 3 years and or enforceable action has been completed/resolved. The records should be achieved in an expandable folders with labeled manila folders.

- After the records have been kept for 3 years, the HTWR Public Disclosure Coordinator will send it to the Records Center, where they will keep it for 17 years (total 20 years retention period).
- The Records Center will send it to the State Archives, where it will be kept indefinitely.

8.0 Quality Control and Quality Assurance Section

- Quality Assurance checks for study-specific data entered into the PTDB are described in Product Testing Data Entry and Database SOP PTP 002 Version 2.0.
- Purchase, sample processing, and sample deconstruction log records will be reviewed for inaccurate missing information prior to sending samples for laboratory analysis.
- All Chain of Custody forms will be reviewed for completion to ensure no lapse in custody.
- QC samples for both screening and lab analyses will be specified either in the Universal QAPP or an individual QAPP. These will typically include various blanks, LCS, replicates, and/or standards for recovery. Screening and analytical results for these QC samples will be compared to any quality objectives and used to evaluate uncertainty and usability of the final project results.

9.0 Health and Safety

Consumer products may pose a hazard and should be handled with caution. Contaminants found in consumer products may include carcinogens, pesticides, flame retardants, corrosives, and metals. Staff handling and processing consumer products and samples derived from them should review:

- The Ecology Safety Office SharePoint Website, which includes links to the Ecology Safety Manual, Employee Personal Injury/Accident Report, and Vehicle Accident Report.
- The Relevant Sections of the Agencies Chemical Hygiene Plan, (Appendix G).
- The Product Testing In House Product/Sample Processing Procedures for appropriate glove protection (Appendix D).

Staff cleaning equipment and tools prior to product sampling or processing must be familiar with the hazards, as described in SDSs that may be associated with any of the chemicals they handle. Safety Data Sheets for all chemical materials handled during consumer product sample processing will be maintained in the Product Sample Preparation Room, and can be found on the agency's Intranet QA webpage.

10.0 References

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www.ecology.wa.gov/services/es/Safety/ChemicalHygiene.pdf#search=chemical%20hygieneKammin,2010
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- 10.8 RCW 70.95G.010 Packaging Law. <http://app.leg.wa.gov/RCW/default.aspx?cite=70.95G.010>
- 10.9 U.S. Environmental Protection Agency, 1997. Glossary of Quality Assurance Terms and Related Acronyms. www.ecy.wa.gov/programs/eap/qa/docs/EPA_Quality_Glossary.pdf
- 10.10 Washington State Department of Ecology, 2010. Credit Card Log, ECY 010-142.
<http://awwecology/sites/asi/forms/Shared%20Documents/010-142.docx>
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- 10.13 Washington State Department of Ecology, April 2017. Ecology Safety Manual.
<http://awwecology/sites/hri/safetyOffice/Shared%20Documents/Ecology%20Safety%20Manual%20-%20Compiled%204-2017.docx>
- 10.14 Washington State Department of Ecology, 2018. Ecology’s Safety Office Intranet Website.
<http://awwecology/sites/hri/safetyOffice/SitePages/Home.aspx>

Appendix A Pre-Sampling Notification Form



Pre-Sampling Notification Form

Fax to Manchester Laboratory: (360) 871-8850

OR email to Nancy Rosenbower: nros461@ecy.wa.gov AND cc: Leon Weiks: lwei@ecy.wa.gov

Project Name: _____ **SIC:** _____ ☐ Enforcement
Requested by: _____ **Sampling Date(s):** _____ ☐ Monitoring
Program: _____ **Date to Lab:** _____ ☐ Emergency
Phone No.: _____ **Sample Pickup Location:** _____ ☐ Class II
Date results needed by: _____ **EIM Study ID (if available):** _____ ☐ Preliminary Invest
Reference # of QAPP: _____ ☐ Special turnaround

| General Chemistry | W | S | O | Microbiology | W | S | O | Organic Chemistry | W | S | O |
|--|---|---|---|--|----------------|----------------|---|---------------------------------|--|---|---|
| Alkalinity | | | | Fecal Coliforms <input type="checkbox"/> MF <input type="checkbox"/> MPN | | | | Base/Neutral/Acids (BNA) | | | |
| Conductivity | | | | E. Coli MF | | | | Polynuclear Aromatics (PAH) | | | |
| Hardness | | | | E. Coli MPN | | | | | | | |
| pH | | | | | | | | Volatile Organic Analysis (VOA) | | | |
| Turbidity | | | | | | | | BTEX | | | |
| <input type="checkbox"/> Fluoride <input type="checkbox"/> Chloride <input type="checkbox"/> Sulfate | | | | | | | | Pest/PCBs (Organochlorine) | | | |
| Cyanide <input type="checkbox"/> Total <input type="checkbox"/> Dissociable | | | | Metals | W _T | W _D | S | O | Pesticides only (Organochlorine) | | |
| Total Solids | | | | Priority Pollutant Metals (13 elements) | | | | | PCBs only | | |
| Total Nonvolatile Solids (TNVS) | | | | TCLP metals | | | | | OP - Pests (Organophosphorous) | | |
| Total Suspended Solids (TSS) | | | | Hardness | | | | | Herbicides (Chlorophenoxy) | | |
| Total Nonvolatile Suspended Solids (TNVSS) | | | | | | | | | Nitrogen Pesticides | | |
| Total Dissolved Solids (TDS) | | | | Mercury (Hg) <input type="checkbox"/> Regular <input type="checkbox"/> Low Level | | | | | Organochlorine Pesticides by GCMS 8270 | | |
| Chlorophyll <input type="checkbox"/> Filtered in field <input type="checkbox"/> Filtered at lab | | | | Other: List individual elements below: | | | | | PBDEs | | |
| % Solids | | | | | | | | | Hydrocarbon ID (match to source) | | |
| % Volatile Solids (TVS) | | | | | | | | | TPH-ID (gas/diesel/oil) | | |
| Total Organic Carbon | | | | | | | | | TPH-D _x | | |
| Dissolved Organic Carbon | | | | | | | | | TPH-G _x | | |
| Biochemical Oxygen Demand (BOD) 5 day | | | | | | | | | | | |
| BOD - Inhibited | | | | | | | | | | | |
| BOD - Ultimate | | | | | | | | | | | |
| Ammonia | | | | | | | | | | | |
| Nitrate-Nitrite | | | | | | | | | | | |
| Orthophosphate | | | | | | | | | | | |
| Total Phosphorous | | | | | | | | | | | |
| <input type="checkbox"/> TPN <input type="checkbox"/> TKN | | | | | | | | | | | |

Comments:

Enter the number of samples in the appropriate box(es) above

W = water S = soil/sediment O = other (please specify)

W_{TR} = water total W_D = water dissolved

Appendix B Sample Container Request Form



Sample Container Request Form

Please FAX to: (360) 871-8850

Contact: Leon Weiks, Lab Assistant and Courier

Phone: (360) 871-8825 Email: lwei461@ecy.wa.gov

Please allow about 2 weeks for typical requests; longer for special requests

Requestor: _____

Project Name: _____

Phone: _____

Today's Date: _____

Location for Delivery: _____

Date Needed by: _____


| Index # | Description | Qty. |
|---------|---|------|
| 1 | 1 gallon jar WM, CLR (BNA) | |
| 2 | 1/2 gallon jar WM, CLR | |
| 3 | 1 liter jar WM, CLR (Organics) for HCID only, no preservative | |
| 4 | 1 liter jar NM, CLR w/ 1:1 HCl 15mL dropper bottle included (Oil & Grease) | |
| 7 | 16 oz short jar WM, CLR | |
| 5 | 8 oz short jar WM, CLR | |
| 8 | 4 oz short jar WM, CLR | |
| 34 | 2 oz short jar WM, CLR | |
| 13 | 2 oz short jar WM, CLR, w/septum | |
| 11 | 40mL vial AMB w/septum <input type="checkbox"/> pre-preserved with HCl <input type="checkbox"/> dropper bottle of HCl <input type="checkbox"/> ascorbic acid for chlorinated VOA samples | |
| 14 | 20mL vial w/acetic acid (Carbamates) | |
| 39 | 1 liter glass NM, AMB (TPH-D) | |
| 15 | 1 liter glass NM, AMB (All other Organics) | |
| 16 | 500mL HDPE bottle w/5mL 1:1 nitric acid (Metals including standard level mercury) | |
| 17 | 1 gallon cubitainer (BOD) | |
| 19 | 125mL Nalgene WM, CLR w/1:1 sulfuric acid (Nutrients or COD) | |
| 20 | 125mL Nalgene WM, AMB (filters and syringe also required for orthophosphate) | |
| 21 | 125mL poly NM, CLR (Hardness) w/ 1:1 sulfuric acid <i>Hexachrome request w/o acid</i> | |

| Index # | Description | Qty. |
|----------------|--|------|
| 22 | 500mL poly WM, CLR (General Chem.) | |
| 23 | 1000mL poly WM, CLR (TSS) | |
| 24 | 1000mL poly WM, AMB (Chlorophyll) | |
| 25 | 250mL poly NM, AMB (Cyanide) | |
| 26 | 125mL poly WM, CLR w/ 1:1 hydrochloric acid (TOC/DOC or TP) <input type="checkbox"/> Filters and syringe for DOC | |
| 27 | 250mL poly WM, CLR (Fecal Coli) | |
| 28 | 500mL poly WM, CLR (Multiple Micro Tests) | |
| 29 | 250mL poly WM, CLR w/thiosulfate (Fecal Coliform - Chlorinated) | |
| 30 | 500mL poly WM, CLR w/thiosulfate (Multiple Micro Tests - Chlorinated) | |
| 31 | 8oz plastic jar (Grain size only) | |
| 32 | 1 liter jar WM, CLR w/sulfuric acid (Phenolics) | |
| 33 | 4oz sterile specimen cup (Micro - sediment) | |
| 35 | Soil VOA/BTEX Airtight Sampling Capsules (3 per sample) | |
| 36 | Soil VOA/BTEX Sampling Handle (1 per sampling event) | |
| 37 | 500mL Teflon NM, CLR (low level mercury ONLY) <input type="checkbox"/> Total , Recoverable - nitric acid and no filter <input type="checkbox"/> Dissolved w/filter and nitric acid | |
| 38 | Nalgene Metals Filters 0.45um | |
| | | |
| Other Supplies | | |

All containers for organics are organic free with Teflon lined lids

WM = Wide Mouth NM = Narrow Mouth CLR = Clear AMB = Amber

Appendix C Product Documentation Log

| | | |
|---|---|---|
|  | DEPARTMENT OF ECOLOGY State of Washington | Hazardous Waste and Toxics Reduction Program |
| | | Product Documentation Log |
| Study QAPP Name: _____ | | |
| PM Name: _____ | | |
| Collector/Sampler Name: _____ | | |
| Collection Date: _____ | | |
| Store: Name: _____ | | |
| Address 1: _____ | | |
| Address 2: _____ | | |
| City State Zip: _____ | | |
| Purpose of Product Collection: _____ | | |
| (optional) _____ | | |
| Explanation of Marketing: _____ | | |
| _____ | | |
| _____ | | |
| Arrival Time: _____ am pm (circle one) | | |
| Number of Products | | |
| Purchased/Collected: _____ | | |
| Location Contact: Name: _____ | | |
| Phone Number: _____ | | |
| Email Address: _____ | | |
| Miscellaneous/Comments: _____ | | |
| _____ | | |
| _____ | | |
| _____ | | |
| Return to Ecology Time _____ am pm (circle one) | | |

Appendix D Product Testing Sample Processing Procedures

| Product Testing In House Product/Sample Processing Procedures | | | | | | | |
|---|---------------------------------|---|--|--|--|--|----------|
| Note: these are the minimum requirements, refer to Study QAPP | | | | | | | |
| Pre-screening | | | | | | | |
| Chemical or Chemical Group Name | Type of Pre-screening conducted | Glove change: Between product/component or when compromised | Type of Tool Cleaning for Screening: Standard ppm level or low level | Solvent type if additional rinse is required | Frequency of tool change: Use pre-cleaned tool between every product/component or May clean tool between samples w/ 24% ethanol or DI water. | Additional Requirements per QAPP (signage?) - DELETE from here - add to training | Comments |
| CSPA Metals, Parabens, Flame Retardants, Formaldehyde, D4, MEK, Styrene | XRF | When compromised | Standard ppm | --- | May clean tool between samples w/ 24% ethanol or DI water. | --- | --- |
| Phthalates | XRF/FTIR | When compromised | Standard ppm | --- | May clean tool between samples w/ 24% ethanol or DI water. | Acetone occasionally used during FTIR prescreening. | --- |
| PCB - Low Level | XRF (optional) | Between product | Low level | Hexanes | Use pre-cleaned tool between every product/component | Pre-screened sample collected carefully to preserve untouched portion of the product for analytical analysis | --- |
| Hg -Low level | XRF | Between product | Low level | 10% Nitric Acid | May clean tool between samples with 24% ethanol or DI water. If limited sample amount use pre-cleaned tool between every product/component | Pre-screened sample collected carefully to preserve untouched portion of the product for analytical analysis | --- |
| PFAS | N/A | N/A | N/A | N/A | N/A | --- | --- |
| Brake Pads | N/A | N/A | N/A | N/A | N/A | --- | --- |

Product Testing In House Product/Sample Processing Procedures

Note: these are the minimum requirements, refer to Study QAPP

Sample Preparation

| Chemical or Chemical Group Name | Glove change between: product/ component or when compromised | Type of Tool Cleaning for Screening: Standard ppm level or low level | Solvent type if additional rinse is required | Frequency of tool change: Use pre-cleaned tool between every sample or May clean tool between samples w/ 24% ethanol or DI water. | Additional Requirements | Comments | Holding Temp. | Hold. Time |
|---|---|---|---|--|---|--|----------------------|-------------------|
| CSPA Metals, Parabens, Flame Retardants, D4, MEK, Styrene | Glove change between component | Standard ppm | None | May clean tool between samples w/ 24% ethanol or DI water. | No: smoking or hair/personal care products with target compounds. Some samples may require cryomilling. | All tools used are washed w/ Liquinox and rinsed with DI water at the beginning of the day | --- | --- |
| Formaldehyde | Glove change between component | Standard ppm | Ethanol | May clean tool between samples w/ 24% ethanol or DI water. | Do not size reduce samples that have the potential to volatilize. Place large chunk of sample in container and refrigerate. Analytical labs will process. | All tools used are washed w/ Liquinox and rinsed with DI water at the beginning of the day | N/A | N/A |
| Brake Pads | When compromised | Standard ppm | N/A | N/A | --- | Wear gloves for PPE, not to avoid sample contamination. Handle brake pads as little as possible. | N/A | N/A |

Product Testing In House Product/Sample Processing Procedures

Note: these are the minimum requirements, refer to Study QAPP

Sample Preparation

| Chemical or Chemical Group Name | Glove change between: product/ component or when compromised | Type of Tool Cleaning for Screening: Standard ppm level or low level | Solvent type if additional rinse is required | Frequency of tool change: Use pre-cleaned tool between every sample or May clean tool between samples w/ 24% ethanol or DI water. | Additional Requirements | Comments | Holding Temp. | Hold. Time |
|--|---|---|---|--|--|---|--|-------------------|
| PCB - Low Level | Glove change between component | Low level | Hexanes | Use pre-cleaned tool between every sample | Send liquid samples in original unopened container, if possible, to lab for analysis. Keep samples shielded from prolonged exposure to light. Optional: keep processed samples at reduced temperature. | All tools used are washed with Liquinox and rinsed with DI water followed by a hexane rinse at beginning of day, keep covered until use. Use an untouched sample for lab analysis if undergoing optional screening. | | --- |
| PFAS – Low Level | Glove change between component | Low level | Methanol | Use pre-cleaned tool between every sample | Send liquid samples in original unopened container, if possible, to lab for analysis. | Wash all used tools with Liquinox. Rinse with tap water. At beginning of day, rinse with methanol. Cover until used. | Keep samples at room temp., shielded from light. | --- |

| Product Testing In House Product/Sample Processing Procedures | | | | | | | | |
|---|--|--|--|---|---|--|---------------|------------|
| Note: these are the minimum requirements, refer to Study QAPP | | | | | | | | |
| Sample Preparation | | | | | | | | |
| Chemical or Chemical Group Name | Glove change between: product/ component or when compromised | Type of Tool Cleaning for Screening: Standard ppm level or low level | Solvent type if additional rinse is required | Frequency of tool change: Use pre-cleaned tool between every sample or May clean tool between samples w/ 24% ethanol or DI water. | Additional Requirements | Comments | Holding Temp. | Hold. Time |
| Hg -Low level | Glove change between component | Low level | 10% Nitric Acid | Clean tool, change between every component | Do not size reduce samples that have the potential to volatilize. Place large chunk of sample in container and refrigerate. Analytical labs will process. | Do not use pre-screened sample to create laboratory sample. Use an untouched portion of the product. | --- | --- |

Silver Shield Gloves Manufacture's Specification

Silver Shield Gloves provide excellent permeation protection against 280 hazardous chemicals and mixtures including acetone, benzene, epoxy, methanol, MEK, sodium hydroxide, sulfuric acid (93%), toluene, and trichloroethylene. Gloves feature a five-layer fabric compacted to a thickness of 2.7 mil. Laminating a high-energy polymer (EVOH) with a low-energy polymer (PE) creates a fabric impervious to at least 90% of all organic chemicals for four hours at 35° C. Each layer acts as a barrier against various epoxies and industrial chemicals

Nitrile Gloves Specification (7th edition Ansell Chemical Resistance Guide Permeation & Degradation Data)

Nitrile Gloves are good for methanol, hexane, and methyl alcohol (ethanol).

Product Testing Tool Decontamination Procedures

Note: these are the minimum requirements, refer to Study QAPP

| Chemical or Chemical Group Name | Type of Tool Cleaning for Screening: Standard ppm level or Low level | Solvent type if additional rinse is required | Hood use required | Required PPE's | Additional Requirements | Comments |
|---|---|---|--------------------------|--|--|--|
| CSPA Metals, Parabens, Flame Retardants, Formaldehyde, D4, MEK, Styrene | Standard ppm | NA | No | Safety glasses, gloves, and lab coat | No: smoking or hair/personal care products with target compounds | All tool used were decontaminated (wash w/ Liquinox, rinse with DI water) at the beginning of the day |
| PCB | Low level | Hexanes | Yes | Face shield, gloves, lab coat, and plastic apron | --- | Decontaminate (Liquinox/DI water rinse/hexanes rinse) all tools at beginning of day, keep individually wrapped tools covered until use |
| Hg | Low level | 10% Nitric Acid | No | Face shield, gloves, lab coat, and plastic apron | --- | Do not use pre-screened sample to create laboratory sample. Use an untouched portion of the product. |
| PFAS | Low level | Methanol | Yes | Face shield, gloves, lab coat, and plastic apron | Use tap water for washing and making Liquinox diluted solution (No DI Water) | Decontaminate (liquinox/tap water rinse/methanol rinse) all tools at beginning of day, keep individually wrapped tools covered until use |

Appendix E Drop-in Staff Training Checklist



Product Testing Preparation Drop-in Staff - Training Checklist

Established: March 2, 2018
Revision Effective: March 2, 2018

This checklist provides the Health and Safety information required to conduct work in the Product Testing (PT) Preparation Room. Note: If one Project Manager signs off on a trainee, this checklist does not serve as approval for work on a different study. If PT Trainee “drops in for more than one study, complete the full PT Training Checklist.

Shown the location of:

- ☐ Personal Protective Equipment (PPE) and discussion of when to use PPE
- ☐ First aid kit and eye wash station, bottles and shower
- ☐ Tools used for physical product deconstruction and sample processing
- ☐ Product Sample Preparation Room (OL-21)
 - ☐ The Emergency Evacuation Route and designated meeting location.
 - ☐ The PT Prep Room hood and solvent storage cabinets
 - ☐ The PT Prep Room DI Water System
- ☐ Safety Data Sheets (SDSs), Standard Operating Procedures (SOPs) and Quality Assurance Project Plans (QAPPs)

Documents for review:

- ☐ PT Sample Collection and Processing SOP (individual tasks can receive verbal instruction as long as the Drop-in staff are supervised by the PM or Sample Prep Lead)
- ☐ Study-specific QAPP (verbal description of the study’s overall objectives can be provided by the PM or Sample Prep Lead)
- ☐ Safety Data Sheets (SDSs) of reagents if used

☐ COC procedure explanation and instructions

PT Trainee:

For Study:

Specific work described as:

Signature:

PT Trainee

Dates approved to do
work:_____

Date:

Signature:

PT Prep Lead /Safety Coordinator or Project Manager

Date:

Appendix F Product Testing Preparation Staff Training Checklist



Product Testing Preparation Staff - Training Checklist

Established: March 2, 2018

Revision Effective: March 2, 2018

This checklist provides the Health and Safety information required to conduct sample preparation work in the Product Testing (PT) Preparation Room OL-21. Once this training checklist has been completed and signed off it will be kept in staffs personnel file.

Shown the location of:

- ☐ Product Sample Preparation Room (OL-21)
 - ☐ Personal Protective Equipment (PPE) and discussion of when to use PPE
 - ☐ First aid kit, eye wash and shower
 - ☐ The Emergency Evacuation Route and designated meeting location
 - ☐ Tools used for physical product deconstruction and sample processing
 - ☐ The PT Prep Room fume hood and solvent storage cabinets
 - ☐ The PT Prep Room DI Water System
 - ☐ Equipment cabinets
 - ☐ Cabinet keys for Product Sample Preparation Room and HWTR HQ cage
- ☐ Cleaning Room (OL-16), HWTR HQ cage (OS-23), Mail Room (OL-04), Shipping and Receiving (OL-05), Dangerous Waste Storage Room (OL-12), the COC Room (OL-15), and the Laundry Room (2S-15)
- ☐ Safety Data Sheets (SDSs), Standard Operating Procedures (SOPs) and Quality Assurance Project Plans (QAPPs)

Documents for review:

- ☐ PT Sample Collection and Processing SOP PTP001
 - ☐ Product Documentation Log
 - ☐ PT Prep Log
 - ☐ COC procedure explanation and instructions
 - ☐ PT Checklist (Appendix A) from SOP PTP001

- ☐ Ecology Safety Manual
- ☐ Ecology's Safety Office Intranet Website
- ☐ Relevant sections of the Chemical Hygiene Plan
 - ☐ 1.0 Employee Training Requirements
 - ☐ 2.0 Chemical Safety Procedures
 - ☐ 3.0 Chemical Use Location
 - ☐ 4.0 Safety Equipment
 - ☐ 5.0 Emergency Lighting
 - ☐ 6.0 Personal Protective Equipment
 - ☐ 7.0 Pouring Chemicals
 - ☐ 8.0 Transporting Chemicals
 - ☐ 9.0 Chemical Distribution
 - ☐ 10.0 Signs and Labels
 - ☐ 11.0 Chemical Waste Disposal
 - ☐ 12.0 Chemical Spill Emergency Procedures
 - ☐ 13.0 Evacuation
 - ☐ 14.0 Emergency Action Plan
 - ☐ 15.0 Incidental Spill Cleanup
 - ☐ 16.0 Standard Operating Procedures: SOPs involving use for acids
 - ☐ 17.0 Laboratory Room Specific Operating Procedures
 - ☐ 22.0 Responsibility for Implementation of the Chemical Hygiene Plan
- ☐ PT Database Entry and Database SOP PTP002
- ☐ Electronic PT Inventory Log (stored on X-Drive)
- ☐ Study-specific QAPP (stored on the PT SharePoint site)
- ☐ Safety Data Sheets (SDSs)
- ☐ Litigation Hold instructions if relevant

Signature: _____
PT Trainee

Date: _____

Signature: _____
PT Prep Lead/ Safety Coordinator or Project Manager

Date: _____

Signature: _____
PT Supervisor

Date: _____

Appendix G Chemical Hygiene Plan

Sections Relevant to Product Testing Sample Processing

1.0 EMPLOYEE TRAINING REQUIREMENTS

1.1 Responsibility

Each employee's direct supervisor is responsible for ensuring that the following training requirements are met. Training forms must be completed for each training activity and sent to Employee Services, who will maintain training records for all employees.

1.2 Laboratory Orientation

All lab employees must receive a laboratory safety orientation before they begin lab work. A *general* lab orientation will be given by the Chemical Hygiene Officer or designee. Topics for the general laboratory orientation session must include:

- a. Chemical Hygiene Plan regulation [WAC 296-828-20005](#)
- b. Contents of the Chemical Hygiene Plan and availability to lab staff
- c. Lab rules and safe work practices
- d. General information about health and physical hazards of chemicals used in the lab, including:
 - 1) Location and content of Safety Data Sheets (SDS)/other reference materials available
 - 2) The meaning of various exposure limits, including Permissible Exposure Limit, Time Weighted Average and Threshold Limit Value
 - 3) Signs and symptoms of exposure to chemicals; finding this information on an SDS
 - 4) Detection methods for chemical vapors
 - 5) Personal Protective Equipment, including the various types available, how to procure the equipment you need, and how to determine what gear is appropriate for a task
 - 6) Engineering controls at Ecology
 - 7) Emergency procedures, including spill and evacuation procedures

1.3 Job-Specific Orientation

Before they begin work, lab employees must also receive information about the hazards and precautionary measures to be taken for the specific chemicals and procedures with which they will work, the location and operation of safety equipment in the laboratory area and any operating guidelines for the laboratory room itself. This job-specific briefing will be given by the supervisor or his/her designee, and must include:

- a. Location of the Chemical Hygiene Plan and Safety Data Sheet (SDS) files
- b. Specific rules, safe work practices and location of safety equipment in the room

- c. Specific information about health and physical hazards of the chemicals and procedures with which they will work and those used by other workers in the lab to which they could be exposed, including:
 - 1) Copies of the Safety Data Sheets (SDS) for each chemical to be used/other reference materials available
 - 2) The Permissible Exposure Limit or Threshold Limit Value for each
 - 3) Signs and symptoms of exposure to each chemical used
 - 4) Detection methods
 - 5) Personal Protective Equipment required for use of each chemical and/or procedure
 - 6) Engineering controls required for each procedure
 - 7) Physical hazards posed by each procedure, if any
 - 8) Emergency procedures if specific measures apply
 - 9) Safe handling, storage, and disposal of each chemical

1.4 New Chemicals, Process or Equipment

Employees must be trained in the physical and health hazards, protective measures, and methods for detecting a hazardous condition each time a new chemical, process or equipment is introduced to their job responsibilities. If a new chemical is being introduced, a copy of the Safety Data Sheet (SDS) must be distributed and discussed. This requirement also applies to employees who are reassigned to an area or job where they have not had specific training on the chemical hazards.

1.5 Supervisors Conduct Routine Safety Discussions

Supervisors must routinely include safety issues on the agendas of unit and section meetings with their employees, to review the topics listed above or other topics pertinent to the safety and health of their employees.

2.0 CHEMICAL SAFETY PROCEDURES

2.1 Direct Methods of Control

Direct methods of control for chemical safety involve reduction of the exposure potential itself. They may include specifications for safe work practices, a reduction in the amount of chemical used, alternating staff using the toxicant (thereby reducing individual exposure), substitution with a less toxic agent, or a change in procedure eliminating the need for the toxicant. Direct methods of control are always preferred over other methods.

2.2 Engineering Controls

The goal of engineering control measures is to redirect the toxicant away from the worker in some fashion; they do not reduce the actual potential for exposure. Engineering controls can therefore be considered an *indirect* method of control, and thus are not a first choice for control. Engineering methods include local and general ventilation, equipment and work area modifications. Personal protective equipment is a form of engineering control, and is the least preferable option.

2.3 Basic Lab Rules

Supervisors of lab workers must ensure that employees follow safe work practices:

- When mixing acid with water, remember the **AAA** rule. **Always Add Acid** to water. Adding water to acid can produce a violent reaction. An analogous rule applies when mixing bases with water - always add base to water.
- For any job that requires handling corrosive chemicals, wear shoes that are closed at the toe, have minimal or no ventilation or decorative holes, and a heel not more than one inch high.
- Do not wear neckties, dangling jewelry, and other loose clothing or accessories when working with hazardous chemicals or machinery.
- Secure long hair so there is no danger of it contacting chemicals, open flame, or entangling in machinery.
- Do not work with chemicals if you don't know the hazards, required safety procedures and equipment.
- Do not leave hazardous chemicals open and unattended.
- Avoid practical jokes or other behavior that might confuse, startle, or distract another worker.
- Report lab accidents or near accidents to your supervisor immediately.
- Wash hands, arms, face and neck as soon as practical after leaving the lab and always before eating, drinking or smoking.
- Remove lab coats and other protective clothing prior to leaving the lab area.
- Never use mouth suction for pipetting or starting a siphon.
- Do not smoke, eat, drink, chew gum or apply cosmetics in the lab area.
- Do not store food, beverages, tobacco or cosmetics in chemical use areas.
- Never lick, taste or smell chemicals as a means of identification or for any other reason.
- Do not wash hands with solvents.
- Do not remove or deface chemical labels.
- When transferring a chemical from the original container into a secondary container such as a beaker, flask, graduated cylinder, etc., you must first place an approved label on the secondary container. The only exception is if you will be using the entire amount of the transferred chemical yourself during that work shift.

2.4 Housekeeping

- Keep floors and surface working areas (e.g., benches, tables) clean and dry. Clean up spills immediately.
- Clean glassware and equipment after use.
- Store all laboratory equipment and supplies in their designated areas when not in use.
- Clean the outsides of chemical containers before storage.

- Store chemicals in the appropriate safety cabinets. Chemical containers must not be left out on the bench or in the fume hood overnight.
- Keep emergency eyewashes, fire extinguishers, and drench showers immediately accessible and clear of obstruction at all times.
- Keep exits, aisles, hallways, and walkways clear.
- Sweep up broken glassware and dispose of it in a sharps box.

3.0 CHEMICAL USE LOCATION

A list of designated uses and approved chemicals is posted next to the door of each laboratory and storage room, or see Appendix 2 - Designated Use List - Laboratory Rooms. Use and store chemicals only in approved locations and permitted quantities.

Chemicals shall not be used in locations where the breathing zone concentrations could exceed one half of the Permissible Exposure Limit (PEL). Where possible, chemicals shall be used in work areas with exhaust ventilation.

4.0 SAFETY EQUIPMENT

All laboratory rooms and work areas shall have access to the following safety equipment:

- Eyewash or eyewash and shower
- First aid kit
- Fire extinguisher
- Spill control kit
- Telephones
- Fire alarm manual pull stations

Access shall be defined as being within 50 feet or 10 seconds from workers.

Telephones in laboratory areas include:

- Room 0L-13, Staging Area, 407-6168
- Room 0L-15, Chain of Custody, 407-6148

There are four fire alarm manual pull stations in or near the lab areas:

- in the hallway outside Room 0L-21
- outside the building next to the exterior door of Room 0L-12, Dangerous Waste Storage Room
- in the hallway outside Room 0S-13, Copy/Coffee bar
- next to the main elevators

4.1 Eyewashes and Showers

Eyewash fountains and safety showers are provided in all areas where chemicals are handled. Employees should know the location of the nearest shower or eyewash and not hesitate to use it if they suspect they have been contaminated with chemicals. A water rinse is the most important treatment for a chemical exposure to the eyes and skin.

It's important to get the rinse started immediately. Don't wait. Thirty seconds can make the difference between pink skin and a deep chemical burn. Once started, the rinse should be continued for at least 15 minutes. During a chemical spill, it may not be safe to use the nearest shower because of fumes from the spill. In this situation, go to the nearest shower in a safe location away from the spill.

4.2 Eyewash and Shower Testing

Eyewash fountains and safety showers shall be tested once each quarter. The test shall be recorded on the test record tag attached to the eyewash or shower. Check test record tag to verify that the wash station has had quarterly maintenance before beginning decontamination procedures.

4.3 Fume Hoods

Reduce your exposure to chemicals by using a fume hood whenever possible while working with chemicals. The Standard Operating Procedures in Sections 16.0 must be performed in fume hoods.

The operation and controls of the room ventilation equipment for the Cleaning Rooms were upgraded in early 2003 to compensate when the fume hood is operating. This change is designed to keep the room at a negative pressure even when the hood sash is closed.

Do not store or use incompatible materials at the same time in a fume hood. Remove chemicals from the fume hood and place them in an appropriate storage cabinet immediately after you complete work with the materials.

4.4 Fume Hood Maintenance and Testing

Fume hood exhaust fans are routinely checked and maintained by maintenance contractors. Fume hood function is tested and certified annually by contracted specialists, overseen by Building Management staff. Hoods shall maintain a minimum capture or face velocity of 100 feet per minute. Copies of the test velocity readings shall be forwarded to the site Chemical Hygiene Officer.

4.5 Fume Hoods and Power Outages

The exhaust fan that serves the two (2) fume hoods in the Lacey Building is not on emergency power, and so is not connected to the generator.

When utility power comes back on, the exhaust fan for the fume hoods will automatically restart with no assistance. However it is an electric device that can fail and or be damaged by some electrical outage conditions.

If the fan doesn't come back on after utility power has been restored (lights and other electrical devices have come on), cease operations that require fume hood use and call InfoCentre at (360) 407-4357 or report online at <https://my.info-centre.com/> to have the issue investigated and service restored.

4.6 Responsibilities for Ensuring Proper Fume Hood Performance

Although management is ultimately responsible for employee health and safety, a team approach is critical to ensuring proper performance of lab fume hood systems.

Fume hoods are set to run all of the time:

If you can't hear air movement or if you become aware of unusual chemical odors, report the situation immediately. Suspend work and call InfoCentre at (360) 407-4357 or report online at <https://my.info-centre.com>.

5.0 EMERGENCY LIGHTING

5.1 Types of Emergency Lighting

5.1.1 Night Lights

The night lights are fixtures that operate 24 hours a day and are connected to the emergency generator. There is a delay of 5 to 10 seconds between the time the main power fails and the generator starts.

5.1.2 Emergency Fixture with Ballast Pack

Battery-operated ballast packs on fluorescent fixtures light when all power sources fail, both regular power and the generator. They do not last long (approximately 15 minutes). Battery-operated backup lighting has been installed in rooms where hazardous substances or dangerous equipment are used.

If an emergency fixture is not working properly the battery may need to be changed. Please contact the Staff Services office to request a replacement.

5.1.3 Wall Packs

Wall packs are battery-operated lighting packs that are mounted high on the walls.

Rooms that aren't equipped with a battery back-up type fixture will have emergency lighting only if the generator supply is available. If the use of a room has changed to include hazardous materials or operations, emergency backup lighting may need to be added for the safety of workers in the area.

The Hazardous Materials Storage Building is supplied with emergency power by the generator, which includes the lighting inside the container. However there is no battery pack unit in the unit to provide for lighting in case the generator doesn't start. Any fixture to be considered for this building would have to meet the explosion proof standards of the container, which would be a costly modification.

5.2 Emergency Lighting in Each of the Basement Laboratory Rooms

| Room # | Room Name | Emergency Lighting type | # |
|--------|---|---------------------------------------|---|
| 0L-09 | Spills Boatshed & Warehouse | 24 hr. night light wired to generator | 1 |
| 0L-12 | Dangerous Waste Storage | Wall Pack | 1 |
| 0L-13 | Staging Area | 24 hr. night light wired to generator | 1 |
| 0L-14 | Hazardous Materials Storage | 24 hr. night light wired to generator | 1 |
| 0L-15 | Chain of Custody | Wall Pack | 1 |
| 0L-16 | Cleaning Room | Wall Pack | 1 |
| 0L-17 | Bottle Room | Wall Pack | 1 |
| 0L-20 | Field Storage Room | 24 hr. night light wired to generator | 1 |
| 0L-22 | Field Storage Room | 24 hr. night light wired to generator | 2 |
| 0L-21 | Product Testing Prep Room | 24 hr. night light wired to generator | 1 |
| 0S-23 | Sample Sort & Calibration | 24 hr. night light wired to generator | 6 |
| 0S-20 | Basalt Room | 24 hr. night light wired to generator | 1 |
| 0S-21 | Conference Room | 24 hr. night light wired to generator | 1 |
| 0S-22 | Air Engineering (Quality Assurance Lab) | 24 hr. night light wired to generator | 1 |
| 0S-27 | Air Calibration & Repair | Emergency Fixture with Ballast Pack | 2 |
| 0S-26 | Temp. Control Room | 24 hr. night light wired to generator | 1 |
| 0S-25 | Soundproof Room | None | |
| 0S-24 | Tool Room | None | |
| 0S-28 | Air Quality Assurance | 24 hr. night light wired to generator | 1 |
| 0S-31 | Transportation Office | Emergency Fixture with Ballast Pack | 1 |

6.0 PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment (PPE) must be worn as described in this section and in the Standard Operating Procedures (Section 15.0) to protect employees from chemical exposures.

6.1 Use of Gloves

Wear chemical gloves during any job where there is a potential for chemical exposure to your hands. Refer to the Quick Selection Guide to Chemical Protective Clothing¹ kept in the Cleaning Room (0L-16) or the MSDS to select the best type of glove for the materials you'll be handling.

Check new gloves for leaks by filling them with air and immersing them in water. If a water bath is

¹Quick Selection Guide to Chemical Protective Clothing, Fifth Edition, John Wiley & Sons, Hoboken, New Jersey, 2007

not available, fill them with air and check them visually. If there is any question that your gloves might have sprung a leak while working with chemicals, dispose of them properly and replace with a new pair.

After using chemical gloves, rinse thoroughly with clean water *before you remove them*; hang to dry. Store gloves away from chemical use areas to avoid accidental splashing and potential degradation. Rinse, dry and remove chemical gloves before leaving the laboratory room, answering the phone or touching any surface with which other employees who are not wearing gloves will come into contact. Wash your hands after removing chemical gloves.

6.2 Eye Protection

Wear safety goggles or safety glasses whenever working with chemicals or working in area where there is a potential for chemical exposure to your eyes. Contact lenses are not recommended when handling corrosive chemicals in open containers.

Wear face shields over prescription glasses, safety glasses, or goggles whenever chemical splashing is possible and when physically deconstructing products to avoid unexpected debris fragments.

Keep your safety glasses, goggles, and face shield clean. Chemical contamination can cloud eye protection, especially those made of synthetic materials. This can obscure your vision and create a hazardous situation.

6.3 Aprons

Wear full body chemical aprons for jobs where you are likely to be splashed by chemicals.

6.4 Protective equipment for specific jobs

6.4.1 Handling and Pouring Acids and Caustics

Wear the following safety equipment whenever handling or pouring acids and caustics:

- Safety goggles
- Chemical apron
- Chemical gloves

Butyl rubber or nitrile are good glove choices for most acids, see the [Quick Selection Guide to Chemical Protective Clothing](#)² for details. However, some types and strengths of acids can cause glove degradation. Always check your gloves for damage before putting them on.

6.4.2 Handling and Pouring Solvents

Wear the following safety equipment whenever handling or pouring solvents:

- Safety goggles
- Chemical gloves

A chemical apron is also a good precaution, especially when handling full gallon sized containers.

²The [Quick Selection Guide to Chemical Protective Clothing](#), Fifth Edition, John Wiley & Sons, Hoboken, New Jersey, 2007, is kept in the MSDS/Chemical hazards information bin of the Cleaning Room, R0L-16.

Nitrile or butyl rubber are good glove selections for many organic solvents, with butyl rubber offering longer term protection in some cases.

6.4.3 Consumer Product Testing Sample Preparation

Wear the following safety equipment when preparing samples for product testing:

- Safety goggles
- Chemical gloves for work involving solvents or samples with liquid components
- Abrasion- and/or puncture-resistant gloves for sample preparation that involves physical processes such as cutting, breaking, or pulverizing materials.

7.0 POURING CHEMICALS

Handle chemicals one at a time. Keep uncapped containers of hazardous chemicals in a work area that is equipped with exhaust ventilation. Cap the container securely before removing it from the ventilated area. This is particularly important with volatile chemicals.

Chemicals that do not pose an inhalation hazard can be handled and poured in lab areas without exhaust ventilation. Cap the container securely and clean the exterior surface of the bottle before returning it to the storage cabinet.

Before refilling a secondary container, check to make sure that the chemical being transferred is the same as that listed on the label on the secondary container you're filling.

Don't use chemical containers for anything but storage of the original chemical or waste from the same chemical. If waste material is put into the container, label it clearly as waste.

8.0 TRANSPORTING CHEMICALS

Personal protective equipment required for transporting chemicals is the same as for pouring the chemical (Section 6.4).

Transport liquid and solid hazardous materials only on an approved cart with secondary containment. The only exception is that 1-2 containers can be hand-carried if they are in unbreakable containers or safety carriers. If a cart is used, incompatible hazardous materials must not be transported together. Liquids exceeding one gallon and solids exceeding 25 pounds must *always* be transported on a cart.

Return the cart to the Hazardous Materials Storage Room immediately after use. Clean the cart as soon as possible if a chemical spill occurs.

9.0 CHEMICAL DISTRIBUTION

After being received into the Ecology Receiving area, shipments of previously approved chemicals may be received by either the Room Coordinator or the person ordering. Unopened chemical shipments in their original packaging can safely remain in the Receiving area awaiting pickup. No

container can be accepted without an adequate hazard warning label. If a material is received which is not on the approved material list, it must be secured until a Chemical Control Check-off form (Appendix 5) is completed. Note that the proper procedure is to fill out the Chemical Control Check-off form *before* the chemical is ordered, see section 27.0, New Chemical Control Procedure.

The Room Coordinator is responsible for hazardous materials storage and ensures that incompatible hazardous materials are segregated in the correct storage cabinets, which are clearly labeled as follows:

- Flammable liquids
- Oxidizers
- Acids
- Bases
- Toxics

9.1 Requirements for storage of incompatible materials

From the UFC 8001.9.8, Separation of incompatible materials:

“Incompatible materials in storage and storage of materials incompatible with materials in use shall be separated when the stored materials are in containers having a capacity of more than 5 pounds (2.268 kg) or 1/2 gallon (1.89 L). Separation shall be accomplished by one of the following:

- a. Segregating incompatible materials storage by a distance of not less than 20 feet (6096 mm),
- b. Isolating incompatible materials storage by a noncombustible partition extending not less than 18 inches (457.2 mm) above and to the sides of the stored material,
- c. Storing liquid and solid materials in hazardous materials storage cabinets (Section 8003.1.10)
- d. Incompatible materials shall not be stored within the same cabinet or exhausted enclosure.

9.2 General chemical storage and handling

Hazardous materials storage cabinets are located in the Hazardous Materials Storage Room, with a smaller cabinet in the Cleaning Room. A list of approved hazardous materials and quantities can be found outside the entrance to each room. With a few exceptions, a single container of each approved hazardous material is allowed in the laboratory rooms. The balance of the hazardous materials must be stored in the Hazardous Materials Storage Room (0L-14).

Volumes of chemicals handled in the lab should be restricted as much as practical. For example, dispensing concentrated sulfuric acid from a 500 ml bottle is safer than dispensing it from a 4 liter container. However, if the container is too small and must constantly be refilled, the purpose is defeated.

All chemicals shall be stored in approved locations in the laboratory. A list of chemicals that can be stored in each cabinet shall be posted on the outside of the cabinet door. Incompatible chemicals shall not be stored in the same cabinet.

10.0 SIGNS AND LABELS

10.1 Signs

The following signs must be prominently displayed:

- Emergency telephone numbers of emergency agencies and safety personnel.
- Storage and container labels showing chemical identity and hazards.
- Warning signs for areas or equipment that pose special or unusual hazards.

If emergency equipment is not immediately visible and obvious to workers in the room, then signs must be posted. The Room Coordinator shall make this determination.

10.2 Chemical Labeling

Containers of chemicals must be clearly and correctly labeled. The label shall include:

- Chemical name
- Concentration, if appropriate
- Appropriate hazard warnings. These should be available on the original container or the Safety Data Sheet (SDS).

The only exception to these labeling requirements is when the secondary container will be used *by the person filling the container during that same workshift*.

Labels used must be strong enough to resist defacing by normal usage of the container and its contents. Labels with clear protective coverings and permanent markers are available in each chemical use area.

11.0 CHEMICAL WASTE DISPOSAL

You are responsible for properly segregating and storing any hazardous wastes generated by the laboratory procedures you use. For each hazardous waste stream generated either in a laboratory room or in the field, a properly identified waste container shall be kept in the storage cabinet. All waste containers must be labeled with the following information: the person or unit generating or storing the waste, waste description, dangerous waste number, designation, and approximate weight. This information is required to ensure appropriate segregation for storage and to facilitate safe, efficient disposal. Wastes shall be transferred to labeled waste containers in fume hoods, and the containers shall be stored in the hazardous materials cabinets.

Materials of questionable nature should not be put down the drain without first contacting the Chemical Hygiene Officer. Never allow flammable liquids, mercury, or extremely toxic substances to enter the sewer.

11.1 Liquid Chemical Wastes

For corrosive solutions that form non-hazardous products when neutralized, the Chemical Hygiene Officer is responsible to see that the solutions are neutralized before being disposed to the sanitary sewer. All other waste solvents and chemicals must be safely stored for disposal. Liquid wastes

must be properly labeled and stored by the person responsible for generating the waste. Most types of liquid wastes are stored in the Hazardous Materials Storage Room (0L-14). Waste ethanol can be stored in the Hazardous Materials Storage Building (0L-X1). Waste formalin is stored in 55 gallon drums outdoors in the loading dock area. At least once a year, usually in the fall, the designated Environmental Assessment Program (EAP) program staff member shall contact a licensed disposal contractor. The contractor shall lab pack the wastes prior to transporting them off-site for disposal.

For disposal of waste formalin the Dangerous Waste rules apply:

- If dangerous waste generated is over 220 lbs./month, but under 2200 lbs., then we have 180 days from the time 220 lbs. is generated to dispose of the waste.
- If dangerous waste generated is under 220 lbs., there is no time limit for disposal (i.e., wait until you exceed 220 lbs. to begin 180 day clock.)
- Waste will not be allowed to accumulate in an amount of 2200 lbs. or more, an amount that triggers a higher level of training, reporting and planning.

To estimate the accumulated amount of liquid waste, water is used as the density indicator of contents weight. Four drums of water weigh approximately 2200 lbs. Therefore the weight of four drums is conservatively estimated at the cut-off weight of 2200 lbs.

It is important that the Department of Ecology stays in compliance with the Dangerous Waste regulations. If there is a problem with disposal of Dangerous Waste, contact the SWRO Hazardous Waste and Toxics Reduction (HWTR) section for technical assistance.

11.2 Chemical Contaminated Solid Wastes

Laboratory workers shall place acid contaminated waste in the white plastic garbage container labeled "Acid waste only." This container can be found in the Cleaning Room (0L-16). Solvent contaminated garbage shall be placed in red metal garbage containers. This separation is necessary to meet environmental regulations and prevent fires. Garbage containers shall be lined with plastic bags. When the bags are 3/4 full or are generating any noticeable odor, the bags shall be tied off, labeled as corrosive or solvent and placed in the corresponding storage cabinet. Room Coordinators are responsible for ensuring that garbage is properly stored or disposed.

11.2.1 Handling solid wastes deposited in waste containers

Disposing of empty plastic & glass containers that have *not* contained acids or corrosives

Rinse 3 times.

Mark "Rinsed x3"

Place in the recycling bucket.

Empty plastic & glass containers that have contained acids or corrosives (Question: is 37% formaldehyde considered a corrosive or a flammable in this context?):

Rinse 3 times.

Mark "Rinsed x3"

Place in the garbage.

Empty containers that had contained solvents and alcohols:

Solvent or alcohol containers can be stored in the waste Flammables cabinet in the Hazardous Materials Storage Room for later use as a waste solvent/alcohol container;

OR:

Place empty container in fume hood with cap off;

Allow residue to evaporate;

Mark container "Vented";

Place in recycling bucket.

Broken glass and other sharps (e.g. scalpel blades):

Place in the "Sharps" container,

Room coordinator disposes of sharps in appropriate container in garbage waste stream (eventually to the dumpster).

Acid contaminated material from the "Acid Waste Only" bucket in the Cleaning Room:

Room coordinator neutralizes (if appropriate) and then disposes of container in garbage;

OR

Room coordinator packages, labels, and places in a waste storage cabinet in the Hazardous Materials Storage Room for later pick up by contractor.

Solvent contaminated material from the "Solvent Waste Only" bucket in the Cleaning Room:

Room coordinator disposes of waste in garbage after venting material in the fume hood;

OR

Room coordinator packages, labels, and places in a waste storage cabinet in the Hazardous Materials Storage Room for later pick up by contractor.

Other containers and materials of questionable risk:

Check with the Room Coordinator or Chemical Hygiene Officer.

11.3 Sharps

Sharp objects such as broken glassware, knives and needles shall be disposed of in a "sharps" box which shall be a cardboard or plastic receptacle identified as such. If the material to be disposed of is contaminated with hazardous materials, an effort to decontaminate it shall be made prior to disposal. Care must be taken to decontaminate without being injured by the sharp object. This may be accomplished by placing the broken material into a strainer and rinsing with water. If it is not possible to decontaminate a sharp object without injury, contact the Chemical Hygiene Officer for advice on packaging and labeling this waste.

12.0 CHEMICAL SPILL EMERGENCY PROCEDURES

Hazardous chemical spills greater than one liter in volume or any spill of a hazardous or unknown material that generates noticeable chemical odors requires implementation of the following emergency procedures. If a spill occurs:

- Without placing yourself in danger, determine the identity of the substance if possible.
- Leave the contaminated area.
- Notify other personnel who might be affected by the spill.
- Notify the Chemical Hygiene Officer and/or Safety Office and also the Staff Services Office to manage the incident and authorize occupancy.
- Obtain the MSDS.
- Isolate (cordon off) the contaminated area so that no one can enter. Place cones, signs, stanchion type barriers and/or CAUTION tape a safe distance from the spill.
- Coordinate with the Chemical Hygiene Officer, Safety Office, or SWRO Spills Team to determine cleanup procedures.

Spills one liter or less in volume that don't generate odors shall be handled using the procedures found in Section 15.0.

13.0 EVACUATION

If a hazardous materials incident requires a building evacuation, the evacuation shall be initiated by pulling a fire alarm manual pull station. Situations that may require an evacuation include:

- Any spill or release that generates a hazardous gas or vapor. An example is a spill of a gallon of concentrated hydrochloric acid.
- Any spill or release that requires the use of respiratory protection for cleanup.
- Any spill that generates a severe skin contact hazard.

If the evacuation alarm sounds, everyone must leave the building immediately by the nearest exit. If the nearest exit is blocked or presents a hazard, use the next closest exit.

14.0 EMERGENCY ACTION PLAN

14.1 Emergency Action Plan Training

Building evacuations are managed as detailed in the *Ecology Building Safety Plan*. The goal of the emergency evacuation plan is to evacuate personnel and call for assistance from the fire department.

Emergency evacuations are implemented by an Emergency Action Team comprised of the following personnel:

- Emergency Coordinator: Interfaces with local authorities and emergency response personnel, coordinates emergency preparedness efforts, and supervises the action team members. This role is fulfilled by the Building Manager.
- Building Monitors: Monitor the building evacuation, direct personnel to assembly areas, and prohibit re-entry until the "All Clear" is given. Each section of the building must have an assigned Building Monitor, documented in Appendix H of the *Building Safety Plan*. Floor monitors may serve this function once all staff have evacuated from an area.
- Floor Monitors: Ensure their areas of responsibility are checked and evacuated. Report to the Emergency Coordinator when the evacuation is complete.
- Designated First Aid Personnel: Ensure a first aid kit is readily available in an emergency, that first aid is rendered to injured employees, and that medical assistance is directed to the injured.
- Material Safety Data Coordinator: Ensures that a Safety Data Sheets (SDS) file is available for the fire department at the assembly area. This task normally falls to the Chemical Hygiene Officer or other members of the safety committee.

14.2 Emergency Action Plan Training

Supervisors are responsible to orient both new employees and employees who have changed work locations in emergency procedures and evacuation plans. Supervisors must discuss any changes to the Emergency Action Plan with all employees.

The Chemical Hygiene Officer shall ensure that a full building evacuation occurs at least once each year. All fire drills are held in conjunction with Lacey Fire District 3.

15.0 INCIDENTAL SPILL CLEANUP

15.1 Incidental spill cleanup procedure

This is limited to spills of low toxicity chemicals that do not generate hazardous gases, vapors, or dusts and do not pose a contact hazard to area employees. The cleanup procedure is implemented by employees trained in chemical spill cleanup.

- _____ The area is cordoned off with cones, signs, or stanchions.
- _____ The Chemical Hygiene Officer (CHO) is notified and a determination is made whether the incidental spill can be cleaned up safely by DOE employees.
- _____ If hazardous gas, vapor, dust or severe contact hazard is present, an evacuation is initiated.
- _____ If there is no hazardous gas, vapor, dust, or a severe contact hazard, the following procedure may be followed.
- _____ Cleanup of incidental spills is considered a hazardous activity. Personnel shall work in teams of two.
- _____ Recommended personal protective equipment (PPE) and other equipment includes:

- Saranex laminated Tyvek coveralls
- Hazmax Boots or nuke boot covers
- SilverShield gloves
- Faceshield and safety glasses

15.2 More than an incidental spill cleanup

If respiratory protection is necessary and an evacuation is required.

15.2.1 Cleanup equipment - chemical spill kits contents

- Dust pan and mixer-scraper
- pH paper
- Plastic bags
- Labels
- Spill Kit Treatment Guide
- Spill-X-A Acid neutralizer
- Spill-X-C Caustic neutralizer
- Spill-X-S Solvent adsorbent
- Spill-X-FP Formaldehyde polymerizer

15.2.2 Clean up a chemical spill

- _____ Take the spill equipment to the area and don personal protective equipment.
- _____ Identify the spilled chemical from the bottle label, the sink or tank label, or from the equipment label. Assess the hazards presented by the chemical and ensure that all cleanup personnel are wearing the correct personal protective equipment. If there is an inhalation hazard, initiate a building evacuation.
- _____ If the identity of a spilled liquid is unknown, use pH paper or other means to determine the identity of the material.
- _____ pH paper is used to determine if an unknown liquid is acidic or basic.
- _____ If the pH is between 0-5, then the chemical is acidic (0 indicating a very strong acid).
- _____ If the pH is between 5-9, the chemical may be a solvent, water, or a buffered acid.
- _____ If the pH is between 9-14, the chemical is basic (14 indicating a very strong base).
- _____ Determine the source of the spill, such as a container, sink, or drain line. If the spill is caused by a leak, identify the source of the leak and shut off, plug, or patch the line before beginning cleanup procedures.
- _____ Eliminate all ignition sources in the vicinity of the spill.
- _____ Consult the Spill Kit Treatment Guide to determine the amount of neutralizer to use. If the spilled material is not listed in the guide, do not use the Spill-X materials on the spill. Consult with the manufacturer and the Chemical Hygiene Officer for guidance.

- _____ Apply the appropriate Spill-X agent first by encircling the spill then mixing the agent into the spill with the scraper-mixer.
- _____ Scoop up the adsorbed material and place in a lined container for proper disposal. Label the container with the date, time, contents, and name of the responsible person. Include the amount and location of the waste in the Incident Report.
- _____ Clean the floor with a detergent, rinse and dry, if necessary.
- _____ The floor is considered clean if all liquid is removed and pH on wetting the floor is 5-9.
- _____ Cleanup personnel decontaminate and restock all supplies. Personal Protective Equipment (PPE) used in the cleanup may be thrown into the trash if thoroughly decontaminated and tested. Otherwise, PPE must be bagged and labeled with the date, time, contents, and name of the responsible person.
- _____ Waste materials are moved to the Hazardous Materials Storage Room (0L-14).
- _____ The Incident Report is completed and given to the Chemical Hygiene Officer.

15.1 Mercury

Mercury and most mercury compounds are highly toxic. Mercury compounds, other than metallic mercury, are extremely difficult to dispose of. There are currently no disposal facilities in the United States capable of taking this type of waste. It is therefore important to minimize use of mercury compounds and to eliminate their use whenever possible. Elemental mercury should be stored in a non-breakable container in the fume hood.

If you break a mercury thermometer, place the broken pieces in the black sealed container kept in the EAP boatshed electronics room. When there is an accumulation of broken thermometers the boatshed manager will have them packed for proper hazardous materials disposal.

16.0 STANDARD OPERATING PROCEDURES

The following procedures describe the principal activities involving the use of hazardous chemicals in the laboratory areas. Any change in these procedures requires prior approval by the Chemical Hygiene Officer.

16.1 Dilution of Acids and Bases

SAFETY NOTES: The most important safety precaution for dilution of acids and bases is to remember to **always** add the concentrated reagent to the water.

NEVER add water to a concentrated acid or base.

16.1.1 Materials Needed

- a. Personal Protective Equipment:
 - Safety glasses
 - Gloves, butyl or nitrile (butyl offers better long-term protection)
 - Chemical apron for quantities greater than 10 ml or 10 grams.

b. Equipment:

- Deionized water (Type I)
- Acids
- Containers
- Ice bath
- Stirrers
- Labels

16.1.2 10% Nitric Acid

This is used for cleaning purposes. This concentration does not have to be exact. In an appropriate container, pour about nine volumes of deionized water (Type I or DI, also labeled Milli-Q.) Slowly add one volume of nitric acid to the water. Mix gently. Label container with chemical name and dilution. Store the unused portion in a closed, labeled container, inside the acid cabinet.

16.2 Priority Pollutant Sampling Equipment Cleaning

This procedure is suitable for all glass, stainless steel, or Teflon coated items. Some plastics may react to the acid and/or solvent rinses. Safety glasses, chemical apron and type of gloves specified below must be worn for steps 2 & 4. Steps 2 through 5 must be done in a fume hood.

16.2.1 Materials Needed

a. Personal Protective Equipment:

- Safety glasses
- Butyl gloves for handling nitric acid, acetone, and methanol (Steps 2 & 4).
- Nitrile reusable gloves for handling hexane or methanol (8 mil for double gloves, 15 mil single) – (Step 4)
- Select type of glove (see above) or disposable nitrile powder-free gloves (Steps 1, 3 , & 5)
- Chemical apron

b. Equipment:

- Gong brush
- Liquinox
- Tap water
- Milli-Q water
- Acetone, Methanol and/or Hexane
- Aluminum foil
- 10% nitric acid

16.2.2 Soap and Water, Wash and Rinse

All wash and rinse waters must be poured down a drain to the wastewater treatment plant.

- a. Bottles, stainless steel items, lid liners: Thoroughly clean all glass compositors bottles, stainless steel implements, lid liners and beakers with a Liqui-Nox solution, hot water and a brush. Rinse each item three times with generous quantities of tap water.

16.2.3 10% Nitric Acid Rinse

This step must be completed in a fume hood, using gloves as specified in “Materials Needed” above. Note: If not testing for metals, then Step 3 (10% nitric acid) can be omitted from the cleaning procedure.

- a. Stainless steel items, lid liners: Pour 450-500 ml of 10% nitric acid into a freshly cleaned stainless steel beaker. While rotating the beaker so that all of its inner surfaces are rinsed, pour the acid into a second beaker. Repeat until all beakers have been rinsed. Carefully swish spoons, spatulas, strainers, etc., in acid solution so all contact surfaces are rinsed. Minimize acid (and later, solvent) contact with non-Teflon-coated side of lid liners.
- b. Bottles, compositors, hoses: Place glass composite bottle in the compositor. Pump 10% nitric acid solution into the compositor. Remove the bottle, and swirl so that all inner surfaces are rinsed with the acid solution. Pour acid back into the beaker and repeat with each compositor. For sequential (wedge-shaped bottles, clean individually). Dispose of used nitric acid solution by pouring into the waste acid container, stored in the acid cabinet.
- c. Product testing acid rinse procedure: There are five steps to the acid rinse process. During the entire acid rinse procedure turn on and run the regular sink faucet (this will dilute the acid as it goes into the wastewater stream – do not use this water to rinse tools). Turn on the DI water spigot; this water will be used after the acid rinse for each tool. Spray trace amounts of 10% acid over the entire tool surface rotating the tool to ensure the acid rinse is thorough. Rinse the tool surface directly with running DI water and place the tool in a prepared clean location (a clean area lined with foil and prescreened absorbent towels).

16.2.4 Deionized Water Rinse

The deionized water tap systems are located in the Product Sample Preparation Room and the Cleaning Room. If (Type I, Milli-Q) is required it is available in the EAP Operations Center Wet Lab. Like tap water rinses, the deionized water rinses must be poured down a drain to the wastewater treatment plant.

- a. Stainless steel items: Rinse all implements with deionized water, three times.

16.2.5 Methanol and Hexane Rinse

This step must be done in a fume hood, with gloves specified in “Materials Needed” above.

- a. Line hood with foil and if applicable prescreened absorbent wipes.
- b. Use a glass funnel to pour methanol or hexane into an appropriately labeled clean squirt bottle. (keep Hexane in glass bottle)

- c. Place stainless catch bowl into hood.
- d. Spray trace amounts of methanol or hexane on all prewashed tools over the stainless catch bowl, rotating the tools so that all surfaces are thoroughly rinsed. Place rinsed tool on clean prepared space (a clean area lined with foil and prescreened absorbent towels). Repeat until all tools have been rinsed. Dispose of used methanol and hexane solutions by pouring the remaining solvent into the designated waste container stored in the Hazardous Material storage room.

Air-drying tools is preferred, however drying with prescreened absorbent towels is acceptable when space and time may be a concern.

16.2.6 Seal with Aluminum Foil

- a. Completely wrap the composite bowl.
- b. Stainless tools must be completely covered and sealed.

16.3 Neutralizing Acids for Disposal

16.3.1 This is a hazardous procedure; working alone is not permitted. The procedure should be done every three months or as needed.

16.3.2 Required Personal Protective Equipment (PPE):

- Full acid apron
- Safety goggles
- Face shield
- Butyl rubber gloves

16.3.3 This procedure is to be performed in the fume hood in the Wet Lab (0S-31) or the Cleaning Room (0L-16).

16.3.4 Pour the chemical to be neutralized into a Pyrex beaker. Place the container securely in ice bath, so that it will not tip the beaker (maximum size 4 liter). Take a pH measurement of the liquid. Place the beaker on a magnetic stirrer and add a magnet to the liquid.

16.3.5 Add sodium bicarbonate slowly and take a pH measurement.

16.3.6 When the pH reaches 7, the material may be poured down the lab drain.

17.0 LABORATORY ROOM-SPECIFIC OPERATING PROCEDURES

The following room-specific operating procedures detail the principal activities involving the use of hazardous chemicals in the laboratory areas.

17.1 Sample Storage - General Procedures

Depending upon the source of the samples and the sample type, many DOE samples should be considered hazardous. Collected samples can generally be categorized as either an environmental sample or as a hazardous sample

17.2 Hazardous Materials Storage Building - General Procedures

- 17.2.1** The Hazardous Materials Storage Building is built to house flammable and hazardous materials. However, all of the permits procured from the City of Lacey and the Fire Department state that we will store only ethanol and sodium azide in the building. Since that is the basis under which Ecology received the permits, any changes to the Hazardous Materials Inventory Statement for the building will require approval from the same authorities.
- 17.2.2** There are two explosion panels side by side on the north side of the Hazardous Materials Storage Building. They appear as tall vertical recesses, visible to both the interior and exterior of the building. Their function is to "blow" outward if there is an explosion inside the building. This ensures that the entire building doesn't become pressurized.

It is important that we never store anything within or in front of these panels.

- Materials can be stored *beside* these panels within the building, but not in front of them. Thus there are two areas on the North wall that are not available as storage space.
- 17.2.3** Don't stack things so high that they block the spray heads of the fire extinguisher system.
- 17.2.4** The volume of ethanol stored in the Hazardous Materials Storage Building must not exceed 400 gallons at any time. As the building reaches capacity, some samples must be discarded before further materials can be admitted.
- 17.2.5** No one shall modify the Hazardous Materials Storage Building in any way: that means no drilling, no cutting, no hanging or other modifications to the building itself. All approvals for modifications must be approved by the Ecology Program Manager, the Department of Labor & Industries and the Fire Marshal. Ecology does have a special approved tool for placing anchors onto the inside walls; this task must be done by Staff Services because they know where holes can be placed and how to do it.

22.0 RESPONSIBILITY FOR IMPLEMENTATION OF THE CHEMICAL HYGIENE PLAN

22.1 Section Managers and Unit Leaders

Section Managers and Unit Leaders are responsible for ensuring that every employee under their supervision knows and follows the approved chemical safety procedures described in this plan. This includes the training of current employees, and new employees at the time of hire or transfer into their section. Health and safety reviews should be scheduled as appropriate, particularly when:

- A new or different chemical will be in use
- New equipment will be used or will be available
- There has been a policy or procedure change
- There has been an accident, spill or leak involving a hazardous chemical

22.2 Chemical Hygiene Officer

The Headquarters Safety Officer has ultimate responsibility for laboratory chemical hygiene and serves as the Chemical Hygiene Officer (CHO). The Chemical Hygiene Officer is responsible for planning, implementing and reviewing the Chemical Hygiene Plan. The Chemical Hygiene Officer is responsible for working with management so that this plan works properly. This will be accomplished by working with management and employees to develop and implement appropriate chemical hygiene policies and practices.

The Chemical Hygiene Officer is responsible for:

- Preparing hazardous materials safety procedures
- Informing management and employees of any changes in requirements brought about by new regulations
- Monitoring the procurement, storage, handling, use, and disposal of hazardous materials
- Maintaining the master Safety Data Sheets (SDS) file
- Conducting inspections of hazardous materials storage and use areas
- Providing training in hazardous materials safety
- Making recommendations for changes in hazardous materials storage or use equipment to improve safety
- Coordinating emergency equipment testing with Staff Services
- Functioning as the emergency coordinator in the event of a hazardous materials incident
- Ensuring proper disposal of hazardous wastes
- Investigating hazardous materials incidents

22.3 Room Coordinators (formerly termed “Room Champions”)

Each laboratory room is assigned a "Room Coordinator" from a section that has a significant interest in the space and its use. Room Coordinators are responsible for the smooth operation of their area. They resolve day-to-day issues and address localized use issues/concerns or raise them to the appropriate level.

Room Coordinators are responsible for:

- Ensuring that garbage is properly stored or disposed.
- Receiving shipments of previously approved chemicals when the person ordering is unable to do so. Unopened chemical shipments in their original packaging can safely remain in the Receiving area awaiting pickup.
- Ensuring that hazardous materials are properly stored, and that incompatible hazardous materials are segregated in the correct storage cabinets.
- Ensuring that the following signs are prominently displayed:
 - Storage and container labels showing chemical identity and hazards
 - A current list of chemicals stored and used in the laboratory room and procedures

- performed in the room, posted outside the door
- Warning signs for areas or equipment that pose special or unusual hazards
- Emergency telephone numbers of emergency agencies and safety personnel.
- If emergency equipment is not immediately visible and obvious to workers in the room, then signs must be posted. The Room Coordinator makes this determination.
- Ensuring that the amounts of chemicals used and stored in the rooms do not exceed those listed in the Chemical Hygiene Plan. For example, the Room Coordinator is responsible for ensuring that the volume of ethanol stored in the Hazardous Materials Storage Building does not exceed 400 gallons at any time.
- Quarterly walk-through inspections of their areas of responsibility with the Chemical Hygiene Officer, reviewing Designated Room Uses, current inventory and volumes of chemicals used and stored in the room, and other issues as noted on the inspection checklist.

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 - Storage and container labels showing chemical identity and hazards
 - A current list of chemicals stored and used in the laboratory room and procedures performed in the room, posted outside the door
 - Warning signs for areas or equipment that pose special or unusual hazards
 - Emergency telephone numbers of emergency agencies and safety personnel.
 - If emergency equipment is not immediately visible and obvious to workers in the room, then signs must be posted. The Room Coordinator makes this determination.
- Ensuring that the amounts of chemicals used and stored in the rooms do not exceed those listed in the Chemical Hygiene Plan.
- Quarterly walk-through inspections of their areas of responsibility with the Chemical Hygiene Officer, reviewing Designated Room Uses, current inventory and volumes of chemicals used and stored in the room, and other issues as noted on the inspection checklist.

22.4 Employees

Employees are responsible for abiding by and following the safety and health requirements set forth by state and federal rules as described in the Chemical Hygiene Plan. Not following safety procedures is cause for disciplinary action up to and including termination. If you observe unhealthy or unsafe work practices, you should immediately report the problem to your supervisor.