



**Transportation, Use, Handling, and
Storage of Laboratory Chemicals Used to Preserve
Biological Samples**

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Technical Standard Operating Procedure

Office: Office of Water Quality

Branch: Watershed Assessment and Planning Branch

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Purpose

The purpose of this technical standard operating procedure (TSOP) is to provide a document that assigned personnel may reference concerning the hazards involved with chemical use in the field or laboratory.

It describes a process for managing laboratory chemicals used in preserving biological samples including basic storage, working solutions, general hazards, and personal protective equipment (PPE). It also provides a process for responding to chemical spills.

Scope

This SOP is assigned to personnel in the Office of Water Quality (OWQ) Watershed Assessment and Planning Branch (WAPB) who routinely perform tasks with chemicals in either a laboratory setting or in the field. The document shall be shared with the Indiana Department of Environmental Management (IDEM) Emergency Response On-Scene Coordinators (OSCs) and IDEM Health and Safety Director.

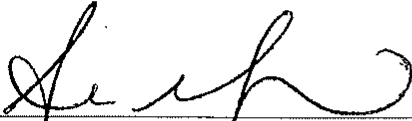
Authorizing Signatures

I approve and authorize this standard operating procedure:



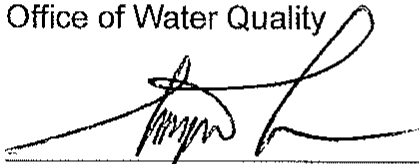
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This TSOP is consistent with agency requirements.



Quality Assurance Staff
Office of Program Support

8/30/2024
Date

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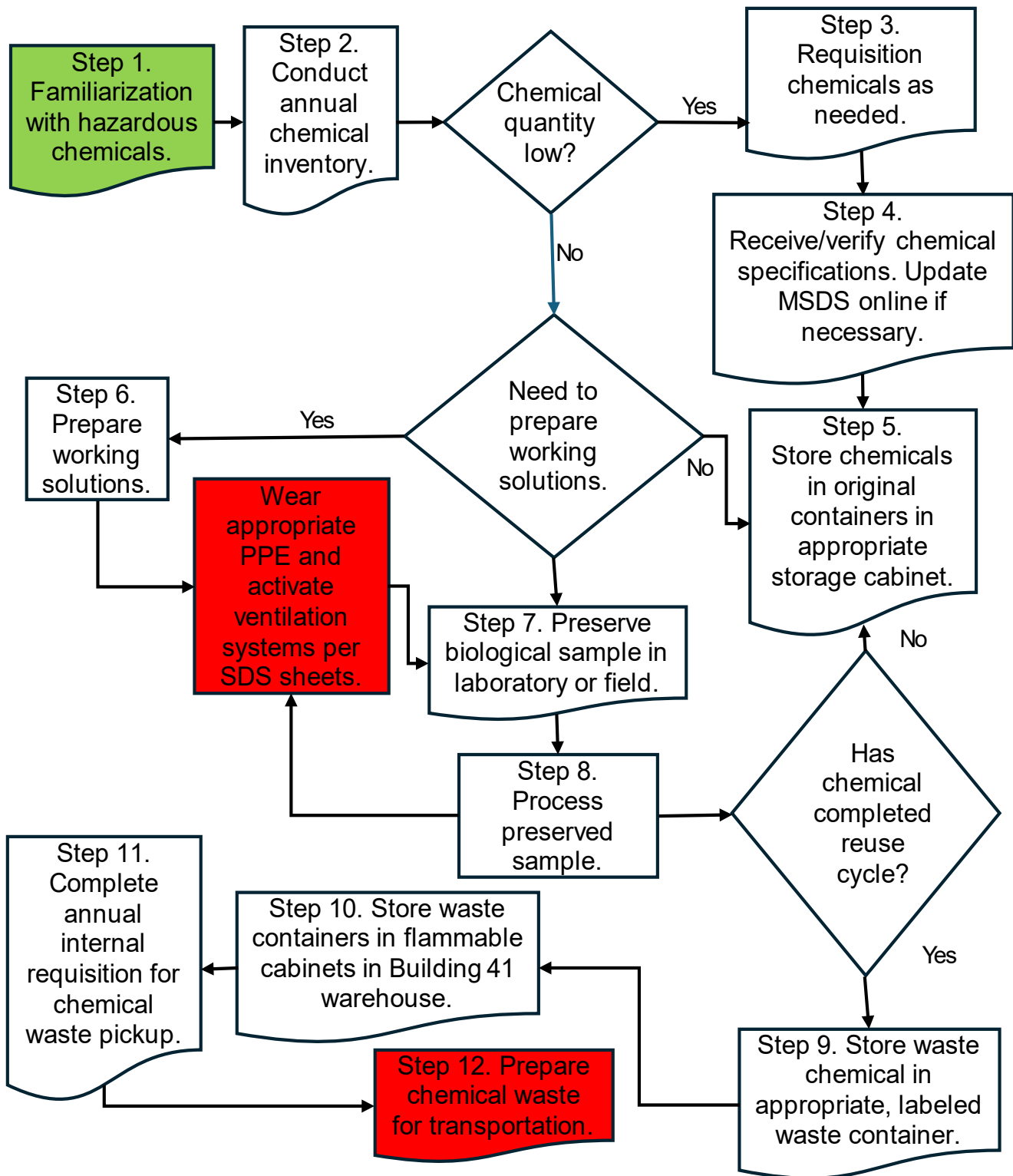
1.0 Overview of General Lab Safety Guidelines

1. Read and understand all policies, plans, and applicable SOPs in the “References” section.
2. Read Safety Data Sheets (SDS) before handling chemicals to know required PPE and First Aid response. SDS can be accessed via [MSDS On-line](#).
3. Do not place any chemical or solution in an unmarked container, and never leave solutions in beakers unattended when making dilutions.
4. Never mouth pipette solutions.
5. Use goggles with face shield for protection when working with concentrated acids, caustics, acetone, and solutions.
6. No food or drink is permitted in any laboratory or chemical storage area.
7. Smoking is prohibited.
8. Know where safety equipment is stored and be familiar with laboratory areas.

2.0 Transportation, Use, Handling, and Storage of Chemicals

The following procedure outlines steps needed to transport, use, handle, and store chemicals.

2.1 Procedural Flowchart



- Step 1. Familiarization with hazardous chemicals. All chemicals used in the field or laboratory have a corresponding SDS that can be viewed in [MSDS online](#) or in SDS binders located in the laboratories (Cyanotoxins Lab Room 124, Hoosier Riverwatch Room 111, Macroinvertebrate Lab Room 125, Surveys Lab Rooms 117 and 118, Fish and Algae Lab in Building 41, both storage rooms 121 and 122, and the Warehouse). Review the specific SDS sheets for handling procedures, potential hazards, and necessary PPE.
- Step 2. Conduct annual chemical inventory. A chemical hygiene officer (CHO) assigned to the lab will conduct an inventory of chemicals and order an appropriate quantity needed to complete yearly tasks. Record information such as product name, manufacturer, concentration, and quantity. If chemical quantity is low, proceed to Step 3. If the chemical quantity is sufficient and working solutions need to be prepared, proceed to Step 6. If working solutions do not need to be created and samples need to be preserved, proceed to Step 7.
- Step 3. Requisition chemicals as needed. CHO will contact supervisory staff for up-to-date instructions on writing a requisition if necessary. See Appendix A for example requisition.
- Step 4. Receive and verify chemical specifications. The CHO on the requisition will ensure the product received meets specifications on the requisition and purchase order. CHO will update MSDS online for the lab room, if necessary, by contacting the IDEM Health and Safety Director. If working solutions are needed, proceed to step 6. If no working solutions are needed, proceed to step 5.
- Step 5. Store chemicals in original containers in appropriate storage cabinet. Flammable chemicals should be stored in flammable cabinets until samples need to be preserved. Corrosive chemicals should be stored in corrosive cabinets. See the “General Handling Procedures” section of this SOP for more specific information on storing common chemicals used.
- Step 6. Prepare working solutions. Many biological samples cannot be preserved in the concentrated chemical received in its original container, and thus working solutions must be made. Consult the SDS for PPE. Wear PPE while making working solutions. See the “General Handling Procedures” section of this SOP for more specific information on making working solutions for common chemicals used.

- Step 7. Preserve biological samples in laboratory or field. Consult the SDS for instructions on PPE to wear. Wear PPE while combining biological samples and working solutions for preservation.
- Fish specimens collected during field operations will be preserved in 3.7% formaldehyde solution. If small enough, the specimens will be placed in a 2000 milliliter (mL) jar containing enough formaldehyde solution to properly cover the fish. The jars are stored upright in a tote for transportation to the laboratory unless lamprey are present. Jars containing lamprey are stored on their side to keep the lamprey straight during preservation.
- Macroinvertebrate samples during field operations will be preserved with an 80% working solution of isopropyl alcohol and deionized water. This working solution will also be fortified with a slight amount of 37% formaldehyde stock [approximately 25 mL per ½ gallon of isopropyl alcohol].
- Following sample collection, diatom samples are preserved in the field with 2 mL of 100% formalin for every 50 mL of sample (e.g., a 200 mL sample would be preserved with 8 mL of formalin).
- Step 8. Process preserved sample. Consult the SDS for instructions on what PPE to wear. Wear this PPE while processing preserved samples.
- Once fish samples are preserved in the field, they are returned to the fish lab in building 41 for processing. Fish must remain in the formaldehyde solution for a minimum of two weeks before processing to ensure preservation of all tissue is complete. To process a preserved sample, decant formaldehyde solution through a sieve into an appropriately labelled carboy. Then, rinse the fish in the sieve with water in the sink and put the fish in a bucket or tray of water for identification. Processed fish in the laboratory will be placed in voucher jars and then completely covered with a 40% working solution of isopropyl alcohol and deionized water. Once verified, the fish, jars, and working solution that are not needed for the reference collection are offered to Indiana colleges and universities as reference collections.
- Unprocessed macroinvertebrate samples are kept in flammable cabinets in macroinvertebrate lab room 125, or storage room 122. Contents of the sample container(s) are emptied into a stainless-steel sieve placed in an empty processing tray. Tap water is used to rinse any remaining contents from the sample container into the sieve. The remaining processing and identification steps depend on

the type of macroinvertebrate sample collected; thus, refer to the technical standard operating procedure [Processing and Identification of Macroinvertebrate Samples](#) for more information (IDEM 2023). Macroinvertebrate specimens identified in the laboratory will be placed in vials and/or glass jars and completely covered with an 80% working solution of isopropyl alcohol and deionized water. The jars are stored in macroinvertebrate lab room 125 or storage room 122 for 10 years. Unique macroinvertebrate specimens may be kept indefinitely in IDEM's museum or reference collection. After 10 years, the samples are offered to Indiana colleges and universities for classes or reference collections.

Once periphyton samples are preserved in the field, they are returned to laboratory 41 for processing. Each sample is allowed to settle, and supernatant liquid is decanted. A 5 mL aliquot is taken from each sample, centrifuged, and decanted again. The remaining portion of the aliquot is then processed using 10 mL of 30% hydrogen peroxide and a few potassium dichromate crystals. When handling potassium dichromate, additional PPE is required. The addition of potassium dichromate will cause an exothermic reaction. Once the reaction has taken place, samples are left to oxidize overnight. Each sample must then be rinsed at least three times, or until pH tests neutral with litmus paper. During the rinsing procedure, waste liquid containing potassium dichromate that is decanted off the samples must be put in a separate container, labelled, and disposed of as hazardous waste. After rinsing is complete, the periphyton sample is fully processed and can be made into microscope slides.

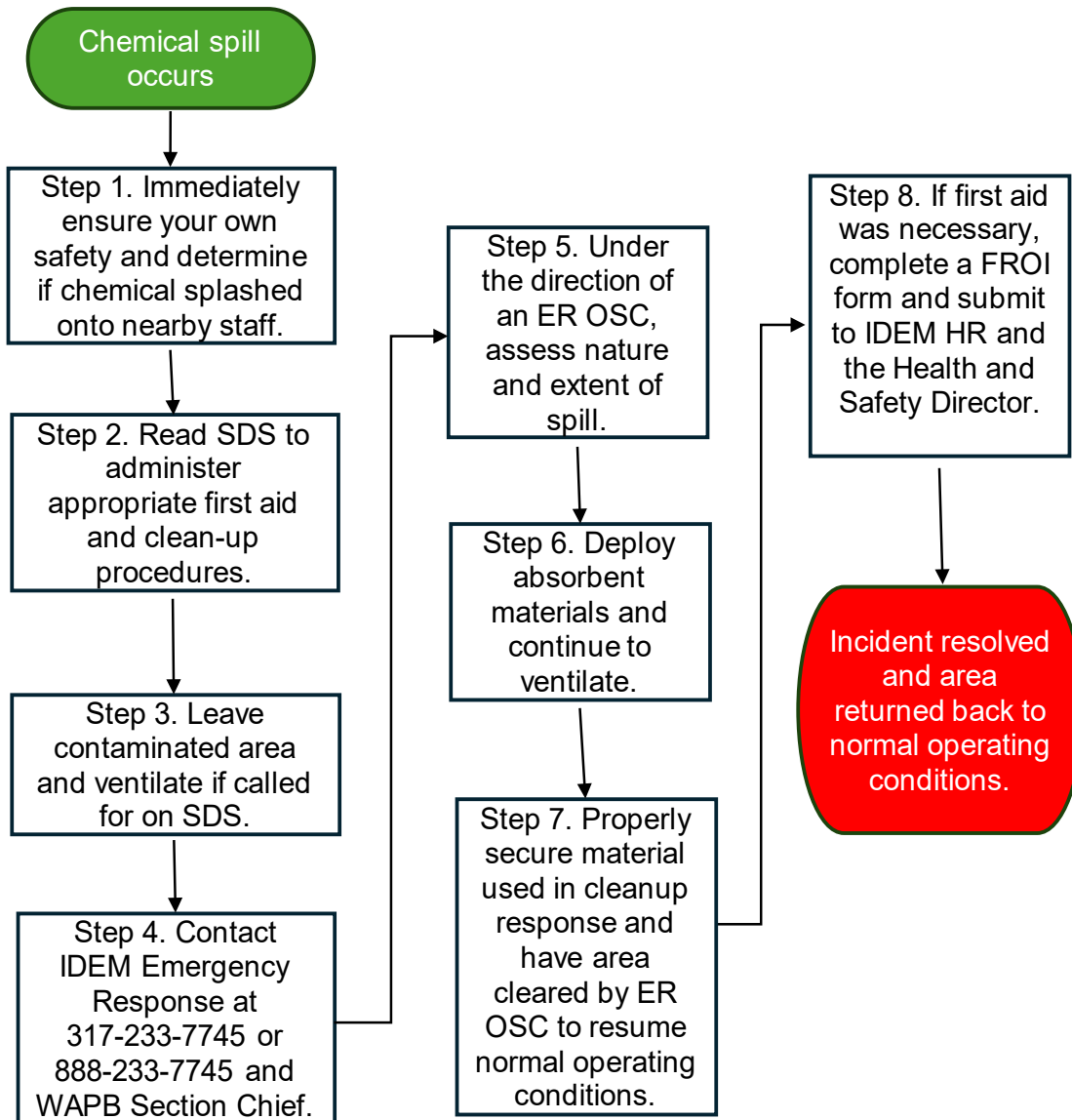
- Step 9. Store waste chemicals in appropriately labeled containers. The implementation of a reuse procedure extends the life of chemicals used in the preservation of biological samples. See the "General Handling Procedures" section for specific examples of the implementation of the reuse procedure. If the chemical has completed its reuse cycle, store waste in containers with hazardous waste labels that include the start date of collecting waste, the chemical(s) stored in the container, and appropriate hazard warning labels (HMIS). If the chemical has not completed its reuse cycle, store it in labeled container in appropriate storage cabinet.
- Step 10. Store waste containers in flammable cabinets in Building 41. The disposal of all chemicals used by staff must conform to all federal and state laws pertaining to such disposal. Standard

operating procedures are set forth for disposal of the large volume (1/2 gallon) specimen containers in which samples are preserved with isopropyl alcohol and a slight amount of 37% formaldehyde stock [approximately 25 ml per 1/2 gallon of isopropyl alcohol]. This solution, which in most cases self-dilutes to a 50% isopropyl alcohol solution, should be decanted into 5-gallon “in-process” chemical containers to be recycled.

Each 5-gallon carboy of “in-process” fluid is transported from the flame proof storage cabinet in the laboratory to a flame proof cabinet in the warehouse. A maximum of 50 gallons of “in-process” fluid is accumulated in 10 five-gallon carboys.

- Step 11. Complete internal requisition for chemical waste pickup. Once 50 gallons of “in-process” fluid is accumulated, or on a yearly basis, a CHO will write an internal requisition for pickup of hazardous waste.
- Step 12. Prepare chemical waste for pickup or transportation. A CHO and other lab staff will assist with chemical waste pickup or transportation.

2.2 Procedure for Chemical Spill Incident



Step 1. Following a chemical spill, IMMEDIATELY ensure your own safety and determine if any chemical was splashed onto nearby staff. Chemicals such as formaldehyde and isopropyl alcohol constitute a severe health and safety hazard.

Step 2. Read SDS to determine appropriate first aid measures and response to spill. An emergency eye wash and shower are located within the laboratories. Use of these wash facilities should be contingent on inherent dangers of short term and/or long-term inhalation of chemical vapors.

- Step 3. Leave contaminated area and allow for ventilation if called for on SDS. All room emergency ventilation and air evacuation fans have explosion proof switches. Note type of chemical and approximate amount for emergency responders.
- Step 4. Contact IDEM Emergency Response (ER) at (317) 233-7745 or (888) 233-7745 and one of the Watershed Assessment and Planning Branch Section Chiefs.
- Step 5. Under the supervision of an ER On-Scene Coordinator (OSC), assess if the spill is small and clean-up can be completed without exposure through inhalation or contact.
- Step 6. Use absorbent chemical spill clean-up pillows to absorb and pick up all liquid spill material. Spill containment/absorption pillows should be in the laboratory to contain and minimize vapor generation of spilled chemicals. The quick application of absorption pillows should minimize vapor generation. The fume hood and all evacuation fans should be turned on to their highest setting to vacate the air in the room. All evacuation fans are equipped with explosion proof switches.
- Step 7. Seal the absorbent pillows, as well as any of your clothing which may be contaminated, in a vapor-tight plastic bag for eventual disposal and place this in a sealed 5-gallon container for proper disposal. Clean up any exposed surfaces according to SDS. Do not re-enter contaminated area until ER OSC verifies area is clean and safe to enter.
- Step 8. If first aid was necessary, complete a [First Report of Employee Injury, Illness](#) (FROI) form (click on the link to download and complete electronically) and submit it to IDEM Human Resources and Health and Safety Director. Visit IDEM's InfoHub site for [example form](#) and instructions.

2.3 Related Technical Issues and General Handling Procedures

SDS sheets should always be understood before handling any of the following chemicals. After review of SDS sheets, a review of handling procedures should be accomplished. Staff must wear the appropriate protective equipment and activate the ventilation system if necessary. See below for an overview of general handling procedures for common chemicals used in Watershed Assessment and Planning Branch.

A. Isopropyl Alcohol

1. Storage

Original containers of isopropyl alcohol and labelled carboys of waste isopropyl alcohol are stored in flammable cabinets in the warehouse in Building 41 at the Shadeland Facility. Biological specimens preserved in 40% (fish) or 80% (macroinvertebrate) isopropyl alcohol are stored in flammable cabinets in associated laboratory spaces.

2. Working Solutions

The stock isopropyl alcohol solution is anhydrous with no denaturing agents (i.e. 100%) and is stored in well labeled containers.

Macroinvertebrate workstations are supplied with Nalgene brand Right-To-Know™ wash bottles filled with 80% isopropyl alcohol that are labeled and have a distinct yellow color-coded lid.

Prior to making diatom slides, coverslips are pre-cleaned in a beaker which contains a small amount of 70% isopropyl alcohol, enough to ensure coverslips are covered. This beaker is then sealed using parafilm and the isopropyl alcohol can be re-used for sanitization of more coverslips when needed. The ceramic tile, which is used to minimize disturbances from vibrations that could lead to breaking the surface tensions of the coverslips, is also pre-cleaned using 70% isopropyl alcohol. The original container of 70% isopropyl alcohol is stored in the flammable cabinet in Laboratory 41, and a labelled Nalgene brand Right-To-Know™ wash bottle is filled with 70% isopropyl alcohol for easier use at benchtop for sanitization of supplies. For macroinvertebrate preservation, working solutions are made in the laboratory and constitute an 80% solution of isopropyl alcohol. These working solutions are made using a graduated cylinder and are immediately placed in a flame proof, labeled stainless steel container. Chemicals used for preserving macroinvertebrate specimens in the field will not be reused, but liquid chemicals used for long term storage of processed macroinvertebrate samples will be used for three consecutive years before disposal.

For fish preservation, working solutions constitute a 40% solution of isopropyl alcohol and are placed in a 5-gallon heavy-walled plastic carboy with spigot to allow for dispensing liquid into specimen jars. Working solutions are made using deionized water to avoid precipitates. There is no reuse of chemicals because there are very few jars produced from fish community field work; and once the fish are verified, the jars with 40% isopropanol are given to Indiana colleges and universities if not kept for IDEM's reference collection.

3. Hazards

Isopropyl alcohol is flammable. The vapors of this chemical are heavier than air and can travel along the floor to a source of ignition. Vapor-air mixtures are explosive above the flash point which is 53°F with a 2% lower explosive limit. While reactivity of this chemical with most other chemicals is low, the reference toxicant chromium trioxide which is used in our laboratory would cause a spontaneous ignition if contact was made with isopropyl alcohol.

4. Personal Protective Equipment

Nitrile gloves should be worn to prevent skin drying and safety glasses/goggles should be worn to prevent minimal eye irritation.

B. Acetone

1. Storage

This solvent is stored in the flammable cabinets in the Building 41 lab.

2. Working Solutions

For processing chlorophyll-a samples, deionized water and acetone is mixed for a working solution of 90% acetone. This solution can be stored and used for up to 3 months.

3. Hazards

Acetone is a chemical which poses a fire and explosion hazard with a flash point temperature well below room temperature with an explosive vapor limit as low as 2.5%. Vapors of this chemical are heavier than air and may travel a considerable distance to a source of ignition and result in a flash back. Acetone is a skin, eye and mucous membrane irritant and central nervous system depressant. Use in the lab should involve the flame proof fume hood and great care should be exercised in preventing vapor accumulation in the laboratory. Acetone should never be allowed to come into contact with acids while washing glassware due to its reactivity which could result in an explosion. Acids used in the laboratory which are particularly reactive are hydrochloric acid, sulfuric acid, and acetic acid. Hydrogen peroxide and other oxidative compounds will result in an explosion risk if allowed to contact acetone. Laboratory use should include excessive use of tap water to be sure that all remnants of the chemical are flushed from the sink traps and associated plumbing.

4. Personal Protective Equipment

Handle with nitrile gloves, lab coat, and safety glasses to avoid contact with the skin and eyes. Use only in the fume hood.

C. Formaldehyde

1. Storage

WAPB policy is to purchase stock formaldehyde solutions in a maximum of 1-liter containers. Upon arrival each 1-liter container should be inspected for leakage and the tightness of the cap should be checked. Each box of 1-liter bottles of formaldehyde should be stored in the Building 41 lab, in a flammable storage cabinet. Formaldehyde solutions should not be stored in cold environments as this may result in the formation of a paraformaldehyde precipitant. If a precipitant begins to form, bring the solution into a warmer environment for storage as the heat should reverse and stop the polymerization process.

2. Working Solutions

Formaldehyde as purchased and utilized by WAPB is an aqueous stock solution of 37% formaldehyde with 10-15% methanol. This stock solution is usually diluted with deionized water down to a 10% working solution referred to as formalin. Tissue preservation is usually made from this stock solution which contains 3.7% formaldehyde. Working solutions for tissue fixation should be placed in 2-liter Nalgene or similar containers which are clearly labeled with Chemical Abstracting System (CAS) warning labels for formaldehyde. The external surface of the jars is rinsed with water and stored with a tightly sealed lid in a locking plastic tote when not in use. These 2-liter bottles are transported into the field in a locking plastic tote with the utmost care to avoid tipping of the container. The 2-liter bottles inside the tote should not be filled completely to reduce the possibility of spilling. If there are empty spaces in the locking plastic tote, staff will place empty 2-liter bottles to fill in the space reducing the possibility of a bottle tipping over.

3. Hazards

Formaldehyde is a sensitizing agent that can cause an immune system response upon initial exposure and is also a cancer hazard ([OSHA Factsheet for Formaldehyde](#)). Studies have indicated that airborne formaldehyde can cause irritation to the eyes, nose, throat, and pulmonary system. Dermal contact can cause skin reactions such as dermatitis, eczema, and in some cases hypersensitivity. Formaldehyde gas is extremely flammable; formalin solution is a combustible liquid. Toxic vapors may be given off in a fire. Carbon dioxide or dry chemical extinguishers should be used to fight formaldehyde fires. Formaldehyde may react violently with strong oxidizing agents, ammonia and strong alkalis, isocyanates, peracids, anhydrides, and

inorganic acids. Formaldehyde reacts with hydrochloric acid (HCl) to form the potent carcinogen, bis-chloromethyl ether. Thermal decomposition products may include carbon monoxide and carbon dioxide.

4. Personal Protective Equipment

Because of its carcinogenicity and flammability, formaldehyde should be handled using basic prudent practices, supplemented by the additional precautions for work with compounds of high chronic toxicity and extremely flammable substances. Work with formaldehyde should be conducted in a fume hood to prevent exposure by inhalation. Gas proof goggles, full face shields, rubber aprons and impermeable gloves should always be worn to prevent eye and skin contact. Formaldehyde should be used only in areas free of ignition sources.

D. Hydrochloric Acids

A. Storage

All concentrated acids should be stored in a rubber bottle boot with the lid tightly secured. Solutions of 10% acid used to rinse glassware should be well labeled in a glass container and kept within the confines of the wash basin in the bioassay lab. Concentrated HCl may be obtained from the Indiana Department of Health Laboratory by section personnel and should be transported in a rubber bottle boot and secured in such a manner that should a minor accident occur the bottle of acid would be safe from breakage.

B. Working Solutions

The proper amount of water to obtain a final concentration of 10% HCl should be placed in a beaker and only then should the concentrated HCl be slowly poured into the beaker. Personnel making glassware rinse solutions of 10% acid from concentrated solutions of HCl should always wear protective gear including rubber apron or lab coat, eye goggles, and chemical protective gloves.

C. Hazards

Never add water to containers of concentrated acids, severe exothermic reactions will occur throwing acid over a large area.

D. Personal Protective Equipment

Personnel making glassware rinse solutions of 10% acid from concentrated solutions of HCl should always wear protective gear including rubber apron or lab coat, eye goggles, and chemical protective gloves.

Care should be taken to prevent breathing vapors while working with concentrated HCl and all work should be conducted with the exhaust fans or fume hood fans on.

E. Mounting Medium (CMCP)

Note: CMCP is a non-resinous, water miscible mounting media used to make permanent transparent mounts.

1. Storage

Original containers are stored in the flammable cabinet in the Laboratory. Smaller containers used for mounting specimens are stored in the fume hood.

2. Working Solutions

CMCP is not diluted for specimen preservation.

3. Hazards

This mounting media contains phenolic compounds which require that certain safety precautions be undertaken when using. Care should be taken to prevent direct contact of this media with any part of the body since severe chemical burns can result. Breathing of the vapors generated by this media as it dries on microscope slides should be prevented. While slide preparation cannot be limited to the hood, all prepared slides should be confined to the fume hood until fully dry and then secured in a slide box.

4. Personal Protective Equipment

Eye goggles, nitrile gloves and use of fume hood/ Nederman air control arms.

F. Mounting Medium (Naphrax with toluene)

1. Storage

Naphrax is stored in the flammable cabinet in Laboratory 41. Naphrax is the primary mounting medium used for mounting diatom slides.

2. Working Solutions

N/A

3. Hazards

Naphrax is a synthetic resin that is dissolved in toluene. Naphrax by itself is non-hazardous. However, due to the addition of approximately 40% toluene as a solvent, which is hazardous, care must be taken when handling this mounting medium. According to the SDS, Naphrax with toluene is highly flammable, potentially fatal if swallowed, can potentially cause skin irritation, drowsiness, dizziness, damage to the unborn child, and damage to organs with chronic exposure. When handling, care must be taken to avoid contact with skin and eyes and

avoid formation of dusts and aerosols. Naphrax with toluene should only be used in the fume hood, and breathing of vapors generated as it dries on microscope slides should be prevented. Once microscope slides are created, they should be left in the fume hood overnight to ensure they are fully dry.

4. Personal Protective Equipment

Handle with nitrile gloves, lab coat, and safety glasses to avoid contact with the skin and eyes. Use only in the fume hood.

G. Mounting Medium (MeltMount)

1. Storage

MeltMount is stored in the cabinet under the fume hood in Laboratory 41. MeltMount is another option for mounting diatom slides.

2. Working Solutions

N/A

3. Hazards

According to the SDS, MeltMount can cause skin irritation. Therefore, when handling, care must be taken to avoid contact with the skin.

MeltMount can also cause respiratory irritation and therefore must be used under the hood. Breathing of vapors generated while drying on microscope slides should be avoided. Once microscope slides are created, they should be left in the fume hood overnight to ensure they are fully dry.

4. Personal Protective Equipment

Handle with nitrile gloves, lab coat, and safety glasses. Use only in the fume hood.

H. 30% Hydrogen Peroxide

1. Storage

30% hydrogen peroxide is stored under the fume hood in Laboratory 41.

2. Working Solutions

N/A

3. Hazards

30% hydrogen peroxide is considered hazardous and is classified as an oxidizer. According to the SDS, this chemical is harmful if swallowed and may cause serious eye damage. When handling, care must be taken to avoid inhalation and contact with skin, eyes, or clothing.

4. Personal Protective Equipment

Handle with nitrile gloves, lab coat, and safety glasses. Use only under the fume hood.

I. Potassium Dichromate ($K_2Cr_2O_7$)

1. Storage

The container of potassium dichromate is stored in the cabinet under the fume hood in Laboratory 41. The container is placed within a metal canister with a lid as an additional precaution.

2. Working Solutions

N/A

3. Hazards

This chemical is very hazardous and extra caution must be taken in handling and in storage. Potassium dichromate is an oxidizing agent, a carcinogen, and can cause reproductive harm and damage to the organs with chronic exposure. Care should be taken to avoid contact with any part of the body as it can cause burns by all exposure routes. Care should also be taken to avoid inhaling dusts or fumes as this can cause allergic reactions, asthma-like symptoms, and breathing difficulties if inhaled. It must only be used under the hood. **This chemical should only be handled after the SDS has been read and understood.**

Potassium dichromate and 30% hydrogen peroxide are used to process periphyton samples. After the processing step using potassium dichromate is complete, periphyton samples are centrifuged, decanted, and rinsed at least 3 times with deionized water. During this rinsing procedure, supernatant liquid that is decanted which contains potassium dichromate is collected in a waste container and must be disposed of as hazardous waste.

4. Personal Protective Equipment

In addition to nitrile gloves, lab coat, and safety glasses, a face shield and outer rubber gloves must also be worn when handling this chemical. Use only in the fume hood.

J. Reference Thermometer

The amount of mercury in the reference thermometers in the laboratory may contain several grams of mercury. A mercury clean-up kit is provided in the laboratory. Breakage of a mercury thermometer constitutes a major spill and the IDEM spill line or ER staff must be contacted when this occurs.

3.0 Roles

3.1 Responsibilities

A. Chemical hygiene officer (CHO)

1. Familiarization with hazardous chemicals through MSDS Online.

2. Conduct annual chemical inventory.
3. Requisition chemicals as needed.
4. Receive and verify chemical specifications.
5. Update MSDS online for the lab room.
6. Ensure chemicals are properly labeled and stored.
7. Prepare working solutions wearing appropriate PPE and following "General Handling Procedures."
8. Ensure waste chemicals are appropriately labeled.
9. Store waste containers in flammable cabinets in Building 41.
10. Complete internal requisition for chemical waste pickup.
11. Prepare chemical waste for pickup or transportation.
12. Ensure spill response kit is stocked and readily available.
13. Follow procedure for chemical spill incident.

B. Field or lab staff

1. Familiarization with hazardous chemicals through MSDS Online.
2. Ensure chemicals are properly labeled and stored.
3. Prepare working solutions wearing appropriate PPE and following "General Handling Procedures."
4. Ensure appropriate preservation of samples in laboratory or field.
5. Process samples in laboratory.
6. Store waste chemicals in appropriately labeled containers.
7. Follow procedure for chemical spill incident.

C. Section chief

1. Familiarization with hazardous chemicals through MSDS Online.
2. Provide up-to-date instructions on writing a requisition.
3. Assist with spill response actions.
4. Ensure new staff receive training.

D. IDEM Health and Safety Director

1. Familiarization with hazardous chemicals through MSDS Online.
2. Provide instructions to CHO to update MSDS Online.
3. Provide instructions following First Report of Injury and incident response.

E. Emergency Response Section, On-Scene Coordinator

1. Familiarization with hazardous chemicals through MSDS Online.
2. Provide instructions on spill response.
3. Clear the spill area for staff to resume normal working conditions.

3.2 Training requirements

- A. New staff training consists of the following:

1. Read this SOP.
2. Read and understand all policies, plans, and applicable SOPs in the “References” section.
3. Read and be very familiar with SDS sections dealing with PPE and first aid on each specific chemical before handling that chemical.
4. Trained staff will give instruction to new staff on chemical handling procedures and procedure for chemical spill incident.
5. Trained staff will supervise new staff on chemical handling until new staff are proficient in handling the chemicals.

4.0 Required Forms, Equipment, or Software List

4.1 Forms

- A. Requisition
- B. [First Report of Employee Injury, Illness](#) (FROI)

4.2 Equipment

- A. Flammable cabinet
- B. Corrosive cabinet
- C. Emergency shower
- D. Eye wash
- E. Spill kit
- F. Goggles
- G. Face shield
- H. Safety glasses
- I. Apron
- J. Ventilation hood/arms

4.3 Software

- A. [MSDS Online](#)

5.0 Records Management

Internal requisitions will be completed at two different steps in the procedural flowchart 2.1:

- Step 3: Once an inventory is completed and a determination is made for necessary chemicals, if any, are required for the next field season.
- Step 11: Hazardous waste disposal.

First Report of Injury will be completed if first aid is administered in response to an incident involving chemicals (Step 8 of Procedure for chemical spill incident).

6.0 Definitions

- 6.1 “Flash Point” – The lowest temperature at which the vapor of a combustible liquid may ignite.
- 6.2 “Hazardous Materials Information System (HMIS) Label” – An adhesive label that is attached to unmarked container to provide pertinent information to user. This system has been adopted to create a standardized method for easy interpretation.
- 6.3 “Safety Data Sheet (SDS)” – Information sheets produced by products’ manufacturer describing potential hazards, physical characteristics, fire and explosion potential, safe handling recommendations, reactivity, and proper disposal.
- 6.4 “Working Solution” – A chemical solution which has been diluted, typically with deionized water, in appropriate proportions to adequately preserve biological samples.

7.0 Quality Assurance and Quality Control

While conducting inventory of chemicals, the CHO should check the expiration date and properly dispose of the expired chemicals. CHO should check that chemicals are labeled properly and provide additional training to staff to correct errors when discovered.

8.0 References

- 8.1. (IDEM 2010) [Health and Safety Training Policy](#). A-030-OEA-10-P-R2. Office of External Affairs, IDEM, Indianapolis, Indiana.
- 8.2. (IDEM 2019) [IDEM Hazard Communication \(HazCom\) Plan](#). Office of Program Support (OPS), IDEM, Indianapolis, Indiana.
- 8.3. (IDEM 2021) [OWQ Watershed Assessment and Planning Branch Laboratory Safety Plan](#). OPS, IDEM, Indianapolis, Indiana.
- 8.4. (IDEM 2022) [IDEM Health and Safety Manual](#). OPS, IDEM, Indianapolis, Indiana.
- 8.5. (IDEM 2023) [Fish Community Field Collection Procedures](#). B-009-OWQ-WAP-XXX-23-T-R1. WAPB, OWQ, IDEM, Indianapolis, Indiana.
- 8.6. (IDEM 2023) [Multi-habitat \(MHAB\) Macroinvertebrate Collection Procedure](#). B-011-OWQ-WAP-XXX-23-T-R1. WAPB, OWQ, IDEM, Indianapolis, Indiana.
- 8.7. (IDEM 2023) [Hester-Dendy \(H-D\) Multiplate Artificial Substrate Macroinvertebrate Collection Procedure](#). B-012-OWQ-WAP-XXX-23-T-R1. WAPB, OWQ, IDEM, Indianapolis, Indiana.

- 8.8. (IDEM 2023) [Processing and Identification of Macroinvertebrate Samples](#). B-061-OWQ-WAP-XXX-23-T-R0. WAPB, OWQ, IDEM, Indianapolis, Indiana.
- 8.9. (IDEM 2023) [Processing and Identification of Diatom Samples](#). B-002-OWQ-WAP-TGM-23-T-R1. WAPB, OWQ, IDEM, Indianapolis, Indiana.
- 8.10. (IDEM 2024) [Personal Protective Equipment Policy](#). A-059-AW-24-P-R1. OPS, IDEM, Indianapolis, Indiana.
- 8.11. (IDEM 2024) [Injury and/or Illness Resulting from Occupational Exposure Policy](#). A-034-AW-24-P-R4. OPS, IDEM, Indianapolis, Indiana.
- 8.12. [MSDS Online](#).

9.0 Appendices

Appendix A. Example Requisition



REQUISITION - INTERNAL
 DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 State Form 42484 (5-88)

Req# _____ Date: _____
 Object: _____ Fund: _____
 Org: _____ Center: _____
 Sub-Class: 0 Budget YR: 2024
 Prj/Grt: _____
 Date of Svc: _____ Dsc: _____
 Prog. Int: _____ Date: _____
 Acct. Init: _____ Date: _____

QUANTITY	UOM	ARTICLE AND DESCRIPTION	UNIT PRICE	TOTAL
10	Ea.	<p>Isopropyl Alcohol 99%</p> <p>Notes: 10 5-gallon pails of isopropyl alcohol 99% (CAS 67-63-0) for the purpose of being a preservation and long-term storage solution for fish and macroinvertebrate specimens collected in the field. The isopropyl alcohol 99% is packaged in 5-gallon metal pails.</p> <p>Pick-Up and Storage Instructions: 5-gallon pails of isopropyl alcohol 99% must be picked up in person (delivery is not available). Probabilistic Section staff members will coordinate pick-up with Superior Solvents and Chemicals, located on 400 W Regent St, just 10 miles from the Shadeland Office in Indianapolis. Since the total weight of these pails is under 1,000 pounds, there are no transport restrictions. Pails will be stored in flammable cabinets.</p> <p>Justification: This solution is essential for the preservation and permanent storage of macroinvertebrates and fish specimens collected in support of IDEM's Water Quality Monitoring Strategy (WQMS). The WQMS provides data in support of the 303(d) and 305(b) Integrated Report, TMDL, NPDES, and Fish Consumption Advisory Update. Analyzing samples are also utilized for training and assisting the Office of Land Quality, Emergency Response Section. Finally, Branch analytics are required in order to obtain information to make an accurate assessment of the health of water bodies in Indiana monitored by IDEM.</p>	\$122.00	\$1,220.00
		Contact: Marissa Cubbage Phone: (317) 308-3370 E-mail: Mccubbage@idem.in.gov		
			TOTAL:	\$1,220.00
Vendor 1	Vendor 2	Vendor 3		
Superior Solvents & Chemicals ; 400 W Regent St. Indianapolis, IN 46225. (317) 781-449 https://www.relyonsuperior.com/about/0 .	Sigma-Aldrich PO Box 14508 St. Louis, MO 63178 1-800-325-3010	May's Chemical Company Vendor ID 5631 (317) 842-8722		
Vendor 4	Vendor 5	Vendor 6		
Minimum of one minority vendor required - Three preferred				
Requester/Date: Marissa Cubbage 2/9/2024	Branch Chief/Date: Kristen Arnold 2/12/2024	Asst. Comm./Office Director/Date:		
Signature and Date Required				

Appendix B. First Report of Injury

Reset Form



**INDIANA WORKER'S COMPENSATION
 FIRST REPORT OF EMPLOYEE INJURY, ILLNESS**
 State Form 34401 (R10 / 1-02)

FOR WORKER'S COMPENSATION BOARD USE ONLY		
Jurisdiction	Jurisdiction claim number	Process date

Please return completed form electronically by an approved EDI process.

PLEASE TYPE or PRINT IN INK

NOTE: Your Social Security number is being requested by this state agency in order to pursue its statutory responsibilities. Disclosure is voluntary and you will not be penalized for refusal.

EMPLOYEE INFORMATION							
Social Security number	Date of birth	Sex <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Unknown	Occupation / Job title			NCCI class code	
Name (last, first, middle)		Marital status <input type="checkbox"/> Unmarried <input type="checkbox"/> Married <input type="checkbox"/> Separated <input type="checkbox"/> Unknown	Date hired	State of hire	Employee status		
Address (number and street, city, state, ZIP code)			Hrs / Day	Days / Wk	Avg Wg / Wk	<input type="checkbox"/> Paid Day of Injury <input type="checkbox"/> Salary Continued	
Telephone number (include area)		Number of dependents	Wage Per \$ _____ <input type="checkbox"/> Hour <input type="checkbox"/> Day <input type="checkbox"/> Week <input type="checkbox"/> Month <input type="checkbox"/> Year <input type="checkbox"/> Other				
EMPLOYER INFORMATION							
Name of employer		Employer ID#	SIC code	Insured report number			
Address of employer (number and street, city, state, ZIP code)		Location number	Employer's location address (if different)				
		Telephone number					
		Carrier / Administrator claim number	OSHA log number	Report purpose code			
Actual location of accident / exposure (if not on employer's premises)							
CARRIER / CLAIMS ADMINISTRATOR INFORMATION							
Name of claims administrator		Carrier federal ID number	Check if appropriate <input type="checkbox"/> Self Insurance				
Address of claims administrator (number and street, city, state, ZIP code)		<input type="checkbox"/> Insurance Carrier <input type="checkbox"/> Third Party Admin.	Policy / Self-insured number				
Telephone number			Policy period From _____ To _____				
Name of agent		Code number					
OCCURRENCE / TREATMENT INFORMATION							
Date of Inj. / Exp.	Time of occurrence <input type="checkbox"/> AM <input type="checkbox"/> PM <input type="checkbox"/> Cannot be determined	Date employer notified	Type of injury / exposure			Type code	
Last work date	Time workday began	Date disability began	Part of body			Part code	
RTW date	Date of death	Injury / Exposure occurred on employer's premises? <input type="checkbox"/> Yes <input type="checkbox"/> No	Name of contact			Telephone number	
Department or location where accident / exposure occurred			All equipment, materials, or chemicals involved in accident				
Specific activity engaged in during accident / exposure			Work process employee engaged in during accident / exposure				
How injury / exposure occurred. Describe the sequence of events and include any relevant objects or substances.							Cause of injury code
Name of physician / health care provider							
Hospital or offsite treatment (name and address)							INITIAL TREATMENT <input type="checkbox"/> No Medical Treatment <input type="checkbox"/> Minor: By Employer <input type="checkbox"/> Minor: Clinic / Hospital <input type="checkbox"/> Emergency Care <input type="checkbox"/> Hospitalized > 24 Hours <input type="checkbox"/> Future Major Medical / Lost Time Anticipated
Name of witness		Telephone number	Date administrator notified				
Date prepared	Name of preparer	Title	Telephone number				

An employer's failure to report an occupational injury or illness may result in a \$50 fine (IC 22-3-4-13).