Chemical Hygiene Plan – Appendix E
New Wales Laboratory Task Risk Analysis

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Contents

1 Changing the Combustion Tube in the LECO Nitrogen Analyzer

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-01			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Changing the Combustion Tube in the LECO Nitrogen Analyzer			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Removing and replacing the carousel assembly and the loading head	Falling objects (tools and/or Leco components) Pinch points and/or strains Thermal burns.	Standard PPE for the lab is: proper eye protection, lab coat and disposable gloves. Ensure there is room (away from the edge of the counter) to place the tools and the Leco components/parts. Use a lab cart if needed. Be aware of the weight of the carousel assembly and the loader head. Use caution when lifting and laying down the heavy components. The bottom of the loader head could be hot; handle it with caution.	
2	Removing the lance tube, and the lance tube assembly, from the combustion tube; and replacing it with a new lance tube	Thermal burns Cuts	Caution: The lance tube is extremely hot (nearly 2,000o F) when removed from the instrument. Use the lance extractor tool to remove and replace the lance tube assembly. Make sure the tool is properly attached to the lance tube assembly before lifting. Use caution when handling glass quality quartz. If the lance tube or combustion tube breaks, wear cut resistant gloves for cleaning the cool shards.	
3	Removing and replacing the crucible from the combustion tube	Thermal burns Cuts	Caution: The crucible is extremely hot (nearly 2,000o F) when removed from the instrument. Make sure the area is clear of other employees to prevent touching someone with the hot crucible.	

			Use the crucible extractor tool and extract the crucible by applying firm pressure on the handle of the tool. Transfer the crucible to a cooling tray. Note: for added safety, carry the crucible with the extractor tool and a stainless-steel tray under the crucible in case the crucible breaks or falls. Put a "HOT" sign by the crucible to warn other employees that the crucible is hot. When replacing the crucible, make sure the crucible extractor tool is cool before using. Apply firm pressure to the handle and use the crucible extractor tool to lower the new crucible on the wool strips
4	Removing and replacing the quartz wool strips from the combustion tube	Thermal burns	Use the quartz wool extractor to remove the old quartz strips. Place the quartz wool in fume hood by the crucibles to cool. Note: for added safety, carry the quartz wool in a stainless-steel tray, in case it breaks up or falls. When replacing the strips, make sure the quartz wool extractor tool is cool before using.

2 Changing the Combustion Tube in the LECO Sulfur Analyzer

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-02			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Changing the Combustion Tube in the LECO Sulfur Analyzer			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Prepare the instrument for maintenance	Thermal and electrical exposures. Pinch Point	Standard PPE for the lab is: proper eye protection, lab coat and disposable gloves. Allow furnace assembly to cool, at room temperature, for a minimum of six hours. Preferably cool overnight. Turn furnace temperature off and unplug the instrument from the energy source. Keep body parts away from the sliding tabletop	
2	Removing and reinstalling the following components: carousel assembly, loader head assembly, loader head block and the secondary side interface block	Falling objects (tools and/or Leco components) Pinch points and/or strains.	Ensure there is room (away from the edge of the counter) to place the tools and the Leco components/parts. Use a lab cart if needed. Use caution when lifting and laying down the heavy Leco components.	
3	Removing the old combustion tube and installing a new one	Pinch Points Cuts	Maintain control of the furnace assembly, or ask for help, while working. Make sure you are ready, and well positioned, before you start to extract the tube. Maintain control of the tube. Cut resistant gloves must be worn when handling the combustion tube.	

4	Place the instrument back in service	Thermal and electrical exposures Pinch Point	Close any access panel opened during the service before plugging in the instrument; and look around the instrument for pinched lines and cords. Plug the instrument to the energy source and turn the instrument on. Monitor to ensure is working properly. Keep body parts away from the sliding tabletop

3 Handling Sodium Fluoride and Sodium Fluoride Solutions

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-03			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Handling Sodium Fluoride and Sodium Fluoride Solutions			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Drying, weighing and transferring weighed portions into a volumetric flask	Toxic chemical if contact with skin, eyes, inhalation and ingestion.	Standard PPE for the lab is: eye protection, lab coat and disposable gloves. Wearing apron and disposable sleeves is mandatory for this task. Secondary eye protection for this task is: face shield and goggles or face shield and safety glasses is mandatory. There is no alternate secondary eye protection for this task In case of skin contact, apply gluconate and flush with water for 15 minutes. If eye contact, flush with water for 15 minutes. In both cases, contact your supervisor and get medical attention immediately. Respiratory protection (respirator N95) is needed while weighing and transferring NaF2. Keep all sodium fluoride containers tightly sealed when not in use.	
2	Adding 1:1 hydrochloric acid to weighed sodium fluoride; and digesting samples	Chemical exposure and Inhalation of toxic fumes	Wear primary and secondary PPE as covered in step 1. Ensure fume hood is on. In case of skin contact, apply gluconate and flush with water for 15 minutes. If eye contact, flush with water for 15 minutes. In both case, contact your supervisor and get medical attention immediately.	

			Add D.I. water to flask first and shake to dissolve the sodium fluoride salt before adding hydrochloric acid.
3	Mixing, transferring, pipetting and running solutions of NaF2	Chemical exposure, inhalation or absorption	Wear primary and secondary PPE as covered in step 1. Notes about sodium fluoride solutions: solutions of 4ppm or lower are considered relatively save because 4ppm is the maximum allowed in potable water. However, prolong contact with solutions above 0.7 ppm is not advised. For this reason, gloves are required when handling all fluoride solutions. When mixing, use a stirrer bar and a stirrer plate. No shaking by hand or inverting the volumetric flask is allowed. Only use plastic bottles for long storage of the solutions. Exposures of 5 minutes or more, with solutions of 4ppm or higher, need to be flush for 15 minutes and they need to be reported to the supervisor. The technician(s) involved need to be evaluated by medical. In case of skin exposure with solutions of 4 ppm or lower, regardless of the time, flush the area for 15 minutes and report it to your supervisor. Medical care is not needed. In case of eye exposure, regardless of the time and concentration, flush the eyes for 15 minutes. Contact your supervisor and get medical attention.
4	Disposal of sodium fluoride solutions and sodium fluoride/sodium citrate mixed solutions	Chemical exposure, inhalation or absorption	Wear primary and secondary PPE as covered in step 1. See controls in step 3 Use caution to avoid contact with skin/eyes. Flush down the lab sink with copious amount of water.

4 Emptying Waste Product Containers

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-04			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Handling Sodium Fluoride and Sodium Fluoride Solutions			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Handling sample waste containers This includes: moving the containers to the dumpsters, lifting and emptying waste containers in the dumpsters	Strains, pinch points and trips and slips	Standard PPE for the lab is: eye protection, lab coat and disposable gloves. Work gloves are recommended, but not mandatory. Do not fill the waste containers all the way to the top. Empty containers when half full, or less. When lifting, use proper lifting techniques by using your leg muscles for lifting, not your back. Always hug the load when possible. Get help if container is too heavy to lift or to carry comfortably and safely. Be aware of surroundings and be alert for slipping hazards. techniques.	

5 Using the Screen Shaker

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-05			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Using the Screen Shaker			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Loading, unloading shaker screens and working around the shaker when it is in operation	Pinch points. Cuts/abrasions Strains Noise	Standard PPE for the lab is: eye protection, lab coat and disposable gloves. Avoid placing fingers in potential pinch points including under the base plate and the lid. Inspect screens for damage before using. Replace damaged screens, or screens that do not fit correctly. Use proper tool for separating screens. Wearing hearing protection when running screens is mandatory.	

6 Changing Reagents on the LECO Sulfur Analyzer

Dept/Area: New Wales Quality Control Lab				
TRA No: NW-07			**Reviewed by:** Angel Hernandez	**Date:** 1/30/2025
Task: Changing Reagents on the LECO Sulfur Analyzer			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Removing reagents tubes and installing reagents tubes	Exposure to chemicals. Cuts	Standard PPE for the lab is: eye protection, lab coat and disposable gloves. Wear cut resistant gloves when handling glassware. Do not apply excessive force when removing or reinserting the reagents tubes. Slide the tube upward until the bottom end can swing free and remove or install as needed.	
2	Emptying, cleaning and refilling the reagents tubes	Exposure to chemicals. Cuts	Empty and refill the tubes under the fume hood. Keep the bulk regent bottles and waste receptacles closed as much as possible. Wear cut resistant gloves when handling glassware. Inspect tubes for cracks or defects and discard all defective tubes.	

7 Viscometry Measurements

Dept/Area: New Wales Quality Control Laboratory				
TRA No: NW – 07			**Reviewed by:** Julio Gonzalez	**Date:** 1/30/2025
Task: Viscometry Measurement			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Adding Fluid to the Reservoir	Ergonomic Splash	If it is not possible to lift a large container of coolant to pour into the reservoir of the chiller in an ergonomic way, transfer smaller aliquots to a container of a more manageable size. Use a funnel and pour slowly to avoid spilling or splashing fluid.	
2	Chiller use	Temperature exposure	The coils on the chiller can get very cold (in chilled mode) or very hot (in heating mode). Never touch the coils directly. Always wear appropriate lab PPE when operating the chiller. The chiller has a safety temperature that prevents it from getting too hot. Do not change this temperature.	

8 Handling Sulfuric Acid Samples

Dept/Area: New Wales Quality Control Laboratory				
TRA No: NW – 08			**Reviewed by:** Julio Gonzalez	**Date:** 1/30/2025
Task: Handling Sulfuric Acid Samples			**Approved by:** Alan Shobert	**Date:** 1/30/2025
Step	**Task Steps**	**Potential Hazards**	**Controls**	
1	Sample receiving	Oxidizer Skin irritant	Ensure that received samples are in appropriate container (either polyethylene or FEP), the lid is securely fastened, the bottle is adequately labeled, there are no visible defects to the container, and there is secondary containment (i.e. a bucket).	
2	Sample handling	Oxidizer Skin irritant	Ensure proper PPE is worn at all times: nitrile gloves, safety glasses, face shield, arm covers, and apron. Always handle concentrated sulfuric acid in well-ventilated areas.	
3	Sample preparation	Oxidizer Skin irritant	Never add water to concentrated sulfuric acid. Always add the acid to the water to prevent violent changes in temperatures and splashing. For volumetric glassware, add water to the container, then slowly add the acid, and finally volume to the mark.	
4	Sample Storage	Oxidizer Skin irritant	If using an LDPE container, the maximum retention time for the acid is 30 days. For all other polyethylene containers, the retention time is one week. Always store sulfuric acid samples in a secondary containment vessel.	