











Date Revised:	August 2024	Overall Task Risk Rating:	Before Controls	A	After Controls	C
Description:	Asphalt lab activities include asphalt sampling and quality testing including nuclear testing. The processes may require workers to use hazardous chemicals in addition to exposure to nuclear radiation.					
Location(s):	Asphalt Plant & Construction Projects					
Associated Documents: Housekeeping WTS, Hazardous Agents (Chemical) WTS, Hazardous Agents (Physical) WTS, Asphalt Paving WTS, Asphalt Plant Operations WTS, Equipment & Machinery WTS, Hazardous Energy Control WTS, Driving & Vehicle Operations WTS						

RED FLAGS (HOLD WORK UNTIL CORRECTED):

Note:
<ul style="list-style-type: none"> - If the worker has not been trained in WHMIS that worker must not use, transport or handle hazardous products - the SDS states required PPE to be worn when handling a product, do not proceed before obtaining and donning that PPE - do not operate, transport or handle the radiation portable gauge unless you are a trained (Radiation Safety Officer)

PERSONAL PROTECTIVE EQUIPMENT (CSA APPROVED)									
									
Head Protection	Foot Protection	High-Vis Protection	Hearing Protection	Hand Protection	Eye Protection	Respiratory Protection	Skin Protection	Face Protection	Fall Protection
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> - When onsite one must adhere to the minimum site requirements (i.e. Safety Boots, Hard Hat & High Visibility Protection). Eye and hand protection are required when taking samples from a construction site. - Additional PPE requirements specific to the hazardous product will be stated in the SDS or on the label of the product, and depending on the type of asphalt testing performed and may include Eye, hand, skin and/or respiratory protection 									

SAFE WORK PRACTICES (SWP)
Important Legislations & References: <ul style="list-style-type: none"> • Nuclear Safety Act • Transportation of Dangerous Goods • Environmental Protection Act
General Safe Work Practices: <ul style="list-style-type: none"> • Only authorized and trained workers are allowed to use and work with Asphalt lab equipment (Certified Lab Technicians) • Ensure proper access ways are available all the time and practice good housekeeping • Ensure proper ventilation for lab operations including the use of local exhaust ventilation methods (Lab fume hood) • Workers who are uncertain how to work safely with a hazards agent are to ask their supervisor for assistance before starting • Read and follow SDS and manufacturers instructions and comply with training & PPE requirements stated in the SDS • Ensure proper storage conditions & locations (found in SDS). Manufacturer supplied chemicals must be stored in their original containers • Start the work only when you are certain that you understand the work, the hazards and you have implemented the appropriate controls • Unsafe conditions and situations must be reported to the Supervisor immediately (and stop work until the hazard is controlled)
Asphalt Sampling: <ul style="list-style-type: none"> • Lab workers taking asphalt samples from construction projects must adhere to the minimum site PPE requirements including (Safety Boots, Hard Hat & High Visibility Protection). Workers must notify the site supervisor/foreman of their presence and when they are leaving the site. • Contact with hot asphalt can cause severe burns to the skin, Lab workers must be using Eye, skin and Hand protection (Insulated leather gloves) during taking asphalt samples in addition to the minimum site PPE requirements. • Lab workers must be always aware of the surrounding environment at all times and avoid the path of travel of heavy machinery and equipment. When getting close to equipment is a must for sampling purposes, lab workers must make sure they maintain eye contact with the operator and that the equipment operator acknowledges their presence.

Radiation (Nuclear Gauge):

- The nuclear gauge is used to calculate and display percent compaction of Asphalt based on user defined laboratory values.
- Gauges must be leak-tested every 12 months, in accordance with regulatory requirements. Leak tests are conducted to detect a leakage of 200 Bq or more.
- Before you start using the portable gauge, ensure to attach your radiation exposure dosimeter between your neck and waist. Dosimeter must be sent to a lab for radiation exposure results every 3 months.
- When using the gauge, don't hover over it or point it at anyone while the source is exposed.
- Keep your co-workers and anyone else in the area at least two meters away from the gauge. Once it is set, move away from the gauge.
- Gauges must always be under direct supervision by a competent and trained person (Radiation Safety Officer). The gauge must be locked safely and securely if unattended.
- All workers handling, transporting or storing the nuclear gauge must be competent and trained in accordance with the Transportation of Dangerous Goods Regulations (Class 7). Gauge operators must have their (TDG) certificate with them at all times.
- When packaging the gauge for transport, make sure the shutter is fully closed. Ensure the gauge and transport case are not damaged, and that the transport case has all the required markings and labels.
- The gauge must be locked and secured to the truck while in transport. In the asphalt plant, the gauge must be stored inside the C-container, the container must be locked.
- Notify the Canadian Nuclear Safety Committee (CNSC) duty officer immediately if:
 - lost, stolen or missing gauges
 - damaged gauge impairing normal use
 - transport accidents involving a gauge
 - gauge with a stuck/open shutter

Asphalt Testing:

- Asphalt lab testing includes various types of tests (Extraction, Density, Gradation, Void). Tests are performed using lab equipment including (Centrifuge, Shaker, Gyratory Compactor, Stability machine and water bath) in addition to industrial ovens.
- Asphalt lab is certified by Canadian Council for Independent Laboratories (CCIL), certification is renewed every 2 years upon a successful audit by the (CCIL). All testing must be performed in accordance with the procedures and measures set by the CCIL testing manual.
- All lab equipment must be maintained/calibrated in accordance with the manufacturer's instruction and the applicable regulations. Records must be maintained in the lab equipment calibration logbook.
- Inspect the equipment before use and ensure all safety devices including e-stops are functioning properly.

Extraction Test (Centrifuge):

- The extraction test is a process performed to calculate the percentage of asphalt content in an aggregate sample to ensure it is within the approved limits. The test uses Trichloroethylene (TCE) as a cleaning/degreasing agent extracting the asphalt from aggregate sample using the help of a high-speed centrifuge extraction machine.
- Trichloroethylene (TCE) is a highly hazardous organic solvent that is harmful if inhaled and is suspected of causing genetic defects and may cause cancer in addition to skin, eyes and respiratory irritation.
- Extraction test must only be performed inside the enclosed cabinet of the centrifuge. Ensure the local exhaust ventilation (fume hood and the fan) are in good working order.

Ascertaining radiation doses



- Wear your whole-body dosimeter (between the neck and waist) if assigned one
- Log every shot (practice and real) to calculate dose
 - 1 shot = approximately 1.2 microsievert (μSv) of dose

**Remember the ALARA principle:
As low as reasonably achievable**

Minimize your exposure by decreasing time, increasing distance and making use of shielding:



Time:
Minimize time by planning your actions.

Distance:
Maximize distance
by staying away from
the gauge as much
as possible.

Shielding:
Incorporate shielding whenever possible.

Always ensure the gauge shutter is fully closed before transporting:



If the shutter is open – do not transport

Best practice:

To avoid unnecessary exposure, use a radiation survey meter to confirm that the shutter is fully closed.



- Ensure proper labelling of all (TCE) containers, the SDS is available on the online database for which workplace computers have desktop links and the lab supervisor have access on his phone.
- Before handling, storing or testing using (TCE), lab workers must have all appropriate PPE including:
 - Eye Protection (Chemical Safety Goggles)
 - Foot Protection (Safety Boots)
 - Skin Protection & Hand Protection (Apron & Protective gloves – PPE material in accordance with the SDS – DO NOT USE NATURAL OR NEOPRENE RUBBER)
 - Respiratory Protection (NIOSH approved air-purifying respirator with an appropriate cartridge)
- (TCE) containers must be tightly closed all the time except when being in use. Full and empty containers to be stored in the lab C-Container equipped with proper vents, disposal of empty containers is performed only through the approved disposal company.
- Ask questions, consult the SDS, and fully understand the risks before handling a hazardous material.
- When decanting from an original container to a new container, a Workplace Label must be affixed to the new container
- Workplace labels must include the product name (as it appears on the SDS), Information for safe handling and a statement saying that the SDS is available.
- Report any new products to the Health and Safety Coordinator so the SDS can be requested and made available

Gradation Test (Shaker):

- Gradation test is performed only in the shaker machine enclosed cabinet with guards applied to minimize dust.
- Ensure the cabinet is closed properly during the test to avoid high noise levels.

Industrial Ovens:

- High temperatures, especially in enclosed spaces, like an oven, present multiple risks. Combustion or explosion is possible as both heat and temperature increase.
- Check workspaces and walkways to ensure no slip/trip hazards are present.
- Be aware of other people in the area when handling hot samples and use insulating gloves to remove samples from the oven.
- Follow the manufacturer's instructions for operating procedures and safety precautions. You may be injured if you misuse the oven.
- Check to see that door seal and inside surfaces of door and oven cavity are clean.
- Only qualified service personnel should attempt repairs and/or testing of ovens and their components.

Inspections:

- Supervisors must monitor the use/exposure to agents in the workplace, to ensure workers are not overexposed to respective allowable levels
- Workers must inspect lab equipment before use to ensure equipment is in good working order and all safety devices are functioning properly

Training:

- Employee Orientations (including roles, responsibilities, applicable workplace task standards, WHMIS, etc.)
- Lab workers must be trained in accordance with the (CCIL) regulations. (Certified Lab Technicians)
- Workers exposed to, or required to work with WHMIS controlled products / material, must be trained in WHMIS accordingly.
- Workers who are operating and/or transporting the nuclear portable gauge must be trained and maintain their certification as (Radiation Safety Officer) in addition to (TDG) Transportation of dangerous Goods training.
- Workers required to use respiratory protection must be trained on the use, fit and care of respirators.

Personal Protective Equipment:

- All workers using Chemical or Physical Agents, must wear the required personal protective equipment set out in its SDS
- Workers on construction projects must wear, at a minimum, Safety Boots, Hard Hat & High Visibility Protection). Eye and hand protection are required when taking samples from a construction site.
- Eye, skin, hand and/or respiratory protection maybe required when performing various types of testing in the asphalt lab. Ensure using the appropriate PPE based on the type of equipment and testing agent used.
- All employees shall wear the appropriate PPE where the potential exposure of a designated substance cannot be reduced below the occupational exposure limit
- When there is likelihood of exposure, appropriate PPE will be provided with instructions covering use, care and maintenance
- No modification or removal of the specified PPE will be tolerated inside identified area

JOB HAZARD AND RISK ANALYSIS		RISK RATING SYSTEM	
			<div>A</div> High risk of injury or equipment / property damage. <div>B</div> Medium risk of injury or equipment / property damage. <div>C</div> Low risk of injury or equipment / property damage.
TASK HAZARDS	RATING BEFORE CONTROLS	TASK CONTROLS	RATING AFTER CONTROLS
<ul style="list-style-type: none"> Radiation 	A	<ul style="list-style-type: none"> Minimize radiation testing time and maximize the distance of all workers from the radiation portable gauge Ensure gauge is enclosed in the approved case when not in use and is secured to the truck when transported Ensure gauge is stored properly in the assigned C-container and radiation hazard signs are posted 	C
<ul style="list-style-type: none"> Lab fumes (testing/equipment) 	A	<ul style="list-style-type: none"> Inspect all equipment before use Ensure adequate ventilation is maintained including the use of local exhaust ventilation (Lab fume hood) All employees shall wear the appropriate PPE where the potential exposure cannot be reduced below the occupational exposure limit 	C
<ul style="list-style-type: none"> Hot Asphalt 	B	<ul style="list-style-type: none"> Wear respiratory protection when asphalt fumes exposure levels are in excess Respiratory protection and filters are to be selected according to the material/ dust Use skin and hand protection (Insulated gloves) for necessary contact with hot asphalt 	C
<ul style="list-style-type: none"> Improper transportation of materials (i.e. unsecure) 	B	<ul style="list-style-type: none"> Ensure products are transported correctly with respect to any statements in the SDS and the TDG legislation Products are to be upright and secured for transportation 	C
<ul style="list-style-type: none"> Lack of training and education 	B	<ul style="list-style-type: none"> Workers receive WHIMS training during employee orientations & specific, task-related training Only trained (Certified lab technicians) to perform lab duties Workers who are involved in the operation and/or transportation of radiation portable gauges will receive training regarding the potential hazards and controls (TDG) & (Radiation Safety Officer) 	C
<ul style="list-style-type: none"> Lack of proper PPE 	B	<ul style="list-style-type: none"> Workers using hazardous Agents, must wear the required PPE set out in its SDS or this WTS Ensure all workers are trained in the PPE that they require 	C
<ul style="list-style-type: none"> Lack of Labeling/Product Identification 	C	<ul style="list-style-type: none"> Supplier labels must be affixed to containers of controlled products When transferring / decanting a controlled product, a workplace label is to be placed on the new container 	C
<ul style="list-style-type: none"> Material Handling and Storage Procedures not Followed 	C	<ul style="list-style-type: none"> Consult SDS and follow the requirements set out therein (i.e. handling, storage, & disposal procedures) Ensure products are stored in appropriate containers and locations (i.e. outdoors) as indicated in the SDS Ensure adequate signage is posted (i.e. no smoking around Flammable product storage) 	C
<ul style="list-style-type: none"> Spills 	C	<ul style="list-style-type: none"> Inform the supervisor and call any respective abatement / disposal / clean-up professionals as needed Follow spill clean-up procedures outlined in the SDS 	C

SAFE JOB PROCEDURES (SJP)

Pre-Task Commencement:

1. Gather and wear the required PPE for the task - on construction sites, all must wear head, foot and high visibility protection. Eye protection when necessary
2. Eye, skin and hand protection is required when working with hot asphalt or around asphalt fumes
3. Consult SDS for required PPE, handling and preventative measures
4. Determine what chemical agents may be encountered
5. Notify the site supervisor/foreman of your presence on site and when you are leaving the site after sampling is complete
6. Ensure controls are in place prior to commencing work so risks are mitigated / eliminated
7. Determine what equipment / machinery / tools and material, are required for the completion of the task
8. Inspect all equipment / machinery / tools prior to use and document the inspections on appropriate forms when required
9. Ensure preventative maintenance activities have been completed where required, prior to using equipment / machinery / tools
10. If Chemical containers are observed to be damaged / missing labels, remove from use and notify the Supervisor

During Task:

1. Consult the SDS and wear all appropriate additional PPE
2. Commence activities when it is safe to do so (abiding by the information presented in the SDS)
3. Supervisors are to monitor all hazardous agents within the workplace and if exposure levels are exceeded, implement corrective actions
4. Operate equipment, machinery and/or tools as per manufacturer's instructions
5. When in operation, do not leave equipment or controls unattended

Chemical Spill or Accidental Release:

1. Notify the supervisor, immediately
2. Evaluate and assess the situation and determine what was spilled / leaked and the source of the spill/leak
3. Consult the relevant SDS to determine what controls are needed when handling and containing the product
4. Contain the spill using the spill-kit materials and use a shovel to lift and dispose of materials/chemicals into spill kit containers
5. If the spill is large, prevent the spill from spreading by using spill-kit materials to dam the spill
6. Waste material must be placed in the appropriate containers and removed from site
7. If containment and disposal is not a safe possibility, inform the supervisor, assess the scene, alert workers to evacuate the area if needed and proceed to the designated muster point

Portable Gauge Accident (Radiation Leak):

1. Stop work immediately.
2. Keep people at least 2 metres away (approximately 6 feet) until the source is removed or until radiation levels are known to be safe.
3. Immediately inform the CNSC of any theft, accident or incident.
4. If the damage is minor or superficial, and the source is in the safe, shielded position, a Type A transport container (such as the gauge transport case) can be used to transport the device. If you do not have a radiation survey meter, do not move a damaged gauge until its radiation level is checked.
5. If the damage is severe or the source rod will not retract, an alternate Type A package may be used. A calibrated survey meter must be used to ensure safe radiation levels.
6. Before the site is reopened for regular use, the licensee must ensure that all sources have been recovered.
7. In case of an accident or fire, do not use the gauge until the damage is assessed. A leak test must be performed after any incident that may have resulted in source damage.

Task Completion:

1. Consult the SDS and implement storage requirements in the designated location
2. Ensure all equipment / machinery / tools are maintained and stored appropriately in the designated locations
3. Ensure the gauge is locked and secured to the truck while in transport. In the asphalt plant, the gauge must be stored inside the C-container, the container must be locked and secured and have the radiation hazard label on it.
4. Implement any housekeeping or maintenance as required