Mill Representative:_____ **(PIC)**

Telephone: _____ **Email:** _____

Company: _____

Site Supervisor: _____

Telephone: _____ **Email:**_____

Contractor Safety Coordinator: _____

Telephone: _____ **Email:**_____

Document – Contractor Supervisor/Owner	Doc. Number	Initial	☒
Contractor Handbook – Received and Understood it is contract company responsibility to review with employees	**TRAC-20.00**		☐
Received Lock and Vehicle Pass (Complete and return to mill PIC)	**TRAC-02.00**		☐
Hazardous Chemical, Conditions and Substances Book	**SPPM-04.00**		☐
Received, Understand and Agree to "Sign In and Sign out " employees on site with Protection using Contractor Crew List	**TRAC-22.00**		☐
Received Contact information for Mill Representative	**TRAC-00.01**		☐
Received the Hazard Assessment from Mill Representative for area/space to be worked on			☐
Provided to the Mill Contact: ○ Safe Work Plan/Job Hazard Assessment ○ SDS for any specific chemicals brought to site			☐ ☐
Check the Training Package Below that Applies – Contractor Employees			
Contractor Employee – Safety Training – General (without Locks)	**TRAC-35.00**		☐
Contractor Employee – Safety Training – General (without Locks) REVIEW CSE PERMIT with MILL PIC	**TRAC-36.00**		☐

Company: _____

Signature: _____

Print Name: _____

Date: _____

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

CONTRACTOR PROCEDURES & REGULATIONS

2017

August

Table of Contents

MACKENZIE PULP MILL CORP PHONE LIST TRAC 02.00

Protection Emergency	**250-997-2400**	**RADIO Channel 1**
Protection- non Emergency	**250-997-2409**	**250-997-2911**
General Manager	**250-997-2432**	**250-421-7709**
Production Manager	**250-997-2405**	**306-314-1167**
Management Administrative Assistant	**250-997-2411**	
Loss Prevention Supervisor	**250-997-1189**	**250-997-2429**
Safety Co-ordinator	**250-997-2474**	**250-997-1037**
Loss Prevention Manager	**250-997-7843**	**250-997-2429**
Power & Recovery Manager	**250-997-2435**	**250-997-8177**
Power & Recovery Steam Chief	**250-997-2448**	**250-997-7737**
Human Resources Manager	**250-997-2451**	**250-997-2909**

CONTRACTOR INDOCTRINATION – TRAC 01.00

Welcome to Mackenzie Pulp. During the time you are here first aid services will be covered by our Protection Department.

Our mill emergency number is **"2400"** and is posted on all mill phones. If you are phoning in a first aid or fire emergency, be sure to give adequate information to the Protection Officer.

1. **Type of emergency**
2. **Location**
3. **Who is calling**

- The First Aid room is located within the Protection Office just inside the main mill site entrance.
- If the Protection Officer is not in, use the phone on the wall next to the door. Dial the emergency number **"2400"** and you will hear a phone ring in the First Aid room. Also, the Protection Officer will receive your call on his radio telephone.
- Use wall mounted radio on wall
- Tell the Protection Officer the type and seriousness of the injury and they will respond accordingly.

All piping, storage vessels and chemical containers are labeled to conform to the Workplace Hazardous Material Information System known as WHMIS.

Our workplace labels consist of four (4) sections:

1. **FLAMMABILITY RISK - RED**
2. **HEALTH RISK - BLUE**
3. **REACTIVITY RISK - YELLOW**
4. **PERSONAL PROTECTION REQUIRED**

The risk factor is designated by numbers 0- 4.

0 Minimal risk
1 Slight risk
2 Moderate risk
3 Serious risk
4 Severe risk

- The type of personal protection required is in the form of pictures at the bottom of the label.
- Pocket charts covering our labels are available at the Safety Office. Posters explaining labeling systems are available in Control Rooms and on the wall near the main entrance.
- If you wish to obtain further information on a product, material safety data sheets are located at the Safety Office , Protection Office or on the Mill Web page – Doliphin MSDS online.
- We have several alarms in our mill which indicate a hazard. When you hear one, leave the area you are working in and report to your supervisor at the crew trailer. For total mill gas evacuation procedure refer to **SPPM-09.00**
- If the mill is shut down, the chances of exposure to hazardous chemicals or gases has been greatly reduced.
- The most common hazardous chemical is cooking liquor which is a highly caustic liquid material. It may be white, black or green in colour, and may be found in the power and recovery, digester, and recaust areas.
- Various types and strength of acids are also used. Both caustic and acids are highly corrosive and if contacted, flushing with water of 15 or 20 minutes must be carried out, then report to first aid.
- If you come in contact with a chemical and are not able to determine what it is, flush with water then report to first aid.

- While working on site, safety-toes footwear must be worn, as well as safety glasses, hard hats and hearing protection.
- Any contractor working or walking inside the mill must carry an escape respirator; this includes coming into and leaving the work site.
- All vehicles must be parked in the designated contractor parking area.
- All contractor work trucks must obtain a vehicle pass from the Protection Office, and authorized by the Loss Prevention Manager or Supervisor and MUST be required for the performance of the job – not as a means of transportation.
- A list of all contractor employees must be given and kept up-to-date with our Protection Department.
- If fire extinguishers or hoses are used, contact our Protection Department.
- Mill lock-out and confined space entry procedures must be followed.
- Welding, burning, and cutting regulations must be followed.
- If you suspect a material to contain asbestos, do not handle it - contact your foreman.
- Mill shops, Stores, and Main Locker Room are out of bounds to all contractors. Washroom facilities will be provided.
- Please keep your workplace clean, you will be responsible for clean-up before you leave.

CORRECTING UNSAFE CONDITIONS

The pulp mill management is committed to providing a safe and healthful work environment for all employees and contractors. The identification and correction of unsafe conditions in the mill is an important part of our health and safety system, and mill employees have an important role in this activity.

When an employee or contractor observes unsafe conditions there is a process that should be followed to correct those conditions:

1. An employee or contractor may correct the unsafe condition, if it is safe to so. For example, replace the missing sewer grating or rope off the area to warn others of the hazard.

2. Inform your supervisor of the unsafe condition so that immediate corrective action may be taken if necessary. Unsafe conditions which present an immediate risk of injury must be reported and corrected without delay. If the unsafe condition does not present an immediate hazard then a Safety Work Order may be developed to be completed at a later date.

3. If an employee or contractor believes a reported unsafe condition has not been given the attention it deserves, then a Hazard Memo may be completed by the employee and reviewed with the employee's immediate supervisor. The supervisor is required to respond to the Hazard Memo within three days of the review. The progress of the Hazard Memo is tracked by members of the Joint Health and Safety Committee who may intervene if they believe insufficient or inappropriate action has been taken.

OVERVIEW -SPPM 08.00

First aid coverage:

The First Aid room is located in the Protection Office. To obtain first aid, you may need to call the Protection Officer using the radio inside the front entrance to the Protection Office.

To contact a Protection Officer/F.A. Attendant:

Channel 1	**Radio**
2400	**Phone (emergency)**
2409	**Phone (non-emergency)**

Procedure if calling by phone or radio:

- Identify yourself
- Give location and closest emergency door number
- State nature of emergency
- Stay on line for instructions until Protection Office breaks contact

PERSONAL PROTECTIVE EQUIPMENT:

Eye Protection	Safety glasses or prescription glasses equipped with safety lenses & side shields must be worn at all times. Must meet CSA Standard Z94.3-92.
Steel-toed Safety Footwear	To be worn at all times.
Respirators	Bite Block Respirators to be carried at all times. Escape units are located in the mill elevators.
Hard Hats	Must be worn at all times.
Hearing Protection	To be worn where posted.
Clothing	Full length pants must be worn at all times. Long sleeve shirts in the Power & Recovery.
Vis-Vests	In around entire mill site (offices only exception office)

MILL RULES AND REGULATIONS

Smoking: Is allowed **only** in 2 designated areas:

- rear of Protection adjacent to the double doors of P & R in the blue framed shelter
- maintenance courtyard in the blue framed designated shelter

Permits: Permits are required for excavation, welding, and burning. If a permit is required it can be obtained at the Protection Office.

Confined space

There is a mill procedure for entry of a confined space and this is outlined by the Contractor Procedures and Regulations booklet. This includes the presence of a safety watch and proper gas testing. The Contractor Procedures and Regulations booklet should be available from the Contractor Supervisor.

Lockout: There is a strict mill procedure for the lockout of equipment. This can also be found in the Contractor Procedures and Regulations booklet. Locks are issued at the Protection Office and must be returned at the end of the job in the original condition they were issued. Do not park the locks in anyway. Cardboard disks are provided for personal identification of locks.

Breathing apparatus:

No contractor shall be allowed to use a self-contained breathing apparatus unless properly trained. Training and fitting of Scott-Air Packs is provided by the Protection Department.

Asbestos: Asbestos removal may only be handled by trained personnel. Asbestos is labeled but asbestos gaskets may not be, if it is unknown whether the gasket is asbestos have it checked by the mill lab. Report all asbestos removal to the Mill Representative prior to handling and arrangements will be made for its removal and disposal.

Vehicles: Personal vehicles must be left at the parking lot. Passes will be issued only to work vehicles that are required on site for the job. Any vehicle not following posted vehicle signs or not stopping at rail way crossings will have their vehicle pass revoked for a week, should this occur more than once the vehicle will not be allowed on site.

Plastic: Please be aware of any plastic on site at the mill. Plastic is detrimental to our pulp production and hence extreme care must be taken to see that no plastic is left on site where it might get involved with the pulping process.

Off limits Areas:

Generally all areas of the mill are accessible to the contractor with the following exemptions: Union/Staff lunch room and mill stores.

Environment

The Mackenzie Pulp Mill has developed an Environmental Management System which is registered to the ISO 14001 standard. As a contractor, your actions are very important to our efforts to protect the environment. In particular, we need your help meeting the following parts of the Environmental Policy:

- We will meet the obligations of all environmental legislation applicable to our operations
- We will apply the principle of pollution prevention to the use of resources and to the generation of by-products
- All employees are collectively responsible for day to day environmental performance of the mill.

The contractor indoctrination includes procedures which help up protect the environment. See the following procedures which relate to your work:

SAFETY REGULATIONS TRAC 04.00

All Contractor's personnel shall comply with the safety regulations established by the Workers' Compensation Board and the following company regulations:

1. Safety footwear must be worn at all times.
2. Eye protection must be worn at all times. Minimum eye protection is safety glasses with side shields.
3. Hard hats must be worn.
4. Personal escape respirators must be carried.
5. Hearing protection must be worn.
6. Mill welding, cutting and burning regulations must be followed.
7. Mill lockout procedures must be followed.
8. Mill confined space entry procedures must be followed.
9. Mill regulations for asbestos and transite removal must be followed.
10. WHMIS must be followed. Contractors must have valid WHMIS training before coming on site and be able to prove such training. This training is to have been taken within the prior year.
11. Documentation of fit testing for any form of respiratory protection must be provided when required.
12. All man lifts and cranes brought on site must be in good repair, safe operating condition and have up-to-date logbooks available for inspection. Operators of such equipment must be available to provide documentation of adequate training.
13. When working in the vicinity of railcars, the General Operating Rules of the BC Department of Commercial Transport Railways Branch must be followed.
14. Stationary diesel operated machinery must be vented externally.
15. All 575 volt portable electrical generators must be tested for correct operation prior to shipment to site. A test certificate must be provided. A qualified electrician shall inspect the equipment for proper installation and operation during the start up. All generators must be grounded.

All Contractors' personnel must be indoctrinated ***prior*** to commencing work in:

1. Mill chemicals
2. Safety regulations
3. Emergency alarms and procedures
4. First Aid services
5. Environmental Procedures

The Contractor must be able to provide proof of employee indoctrination to the company or to Worksafe BC if requested. The contractor must also provide proof of insurance and/or a company safety program before commencing work, as well as a WorkSafe BC registration number.

EYE WASH EMERGENCY SHOWER LOCATIONS SPPM 05.11

Emergency Eyewash and Shower Stations are located throughout the mill.
Make yourself aware of where they are.

Although periodically checked, it is up to you to conduct a pre-check to ensure functionality if you are working in an area that you may require its use.

Report all non-functioning equipment **immediately** to your supervisor.

Practice safe housekeeping! Do not block access to ANY emergency eyewash and shower station.

Mill respirator areas

Personal escape respirators must be carried at all times within the mill by contractor personnel.

Selection:

Only NIOSH-MSHA or other respirators acceptable to the Worksafe BC will be used.

The Mill Safety Coordinator is responsible for approval of all respiratory equipment purchased.

Workers entering areas of unknown gas concentration must wear SCBA or supplied air with egress bottle.

Personal Escape Respirator:

Mackenzie Pulp will ensure all Contractors have personal escape respirators.

Bite Block respirators are for escape only.

These respirators have a protection factor of 10.

HARASSMENT & BULLYING PPM-8.00

Introduction

Mackenzie Pulp Mill Corporation is proud to affirm that every employee is entitled to enjoy a work environment where respect, which includes physical and psychological security, is one of the most important values promoted by the company.

Purpose

The purpose of this statement is to define the policy and process that must be observed by all Mackenzie Pulp Mill Corporation employees in all aspects of the employment relationship.

Scope

This policy applies to all employees, and contractors. Harassment, bullying, workplace violence and discrimination are behaviour that can occur with or be directed towards colleagues, subordinates, supervisors, manager and or contractors. It may also originate from or be directed at an individual or group of individuals. This policy applies in the workplace, as well as in every location where business or social activities take place when the alleged conduct affects an individual in the context of work.

Harassment Policy Statement

At Mackenzie Pulp Mill Corporation every employee is entitled to an environment free from harassment, bullying, workplace violence, or discrimination of any form.

Through this policy, Mackenzie Pulp Mill Corporation is demonstrating a commitment to respect the laws that govern it, to discourage behaviour that contravenes the company's commitment to taking appropriate action.

Mackenzie Pulp Mill Corporation has implemented efficient, impartial and confidential mechanisms at the disposal of all of its employees to deal with complaints and prevent problematic situations and support employees throughout the process.

This policy is also designed to protect the reputation of individuals in the case of unfounded or malicious complaints or accusations.

This policy is not intended to constrain normal social interactions.

Managing and/or coaching that include counseling, performance management, work assignment and progressive discipline are not considered discrimination, harassment or bullying, this does not restrict a Manager's/Supervisor's responsibilities in these areas.

Personal harassment does not include every workplace conflict or interaction that an employee may find unpleasant. The harassment process should not be used to vent feelings of minor discontent or generalized dissatisfaction with life in the work place.

Regardless of the outcome, when a harassment complaint is made in good faith, the complainant and anyone providing information will be protected from all forms of retaliation by co-workers and superiors.

Definitions:

Discrimination- Every person has a right to full and equal recognition and exercise of his/her human rights and freedoms with distinction, exclusion or preference as set out in the *Human Rights Code of British Columbia*, namely: race, colour, ancestry, place of origin, political belief, religion, marital status, family status, physical or mental disability, sex, sexual orientation, age, or conviction for a criminal or summary conviction offence that is unrelated to employment; and

i) is unwelcome or is of such a nature that it would be reasonable to assume that it is unwelcome; and
ii) detrimentally affects the work environment or leads to adverse job-related consequences for the complainant

Types of discriminatory harassment may include, but are not limited to:

- Displays of derogatory, or sexually explicit pictures, photographs, cartoons, drawings, symbols, and other material
- Unwanted and unnecessary touching
- Offensive remarks about sexual orientation
- Racist language, slurs, derogatory comments, stereotypes
- Telling racist or ethnic jokes that are by their nature embarrassing or offensive
- Threats or abuse based on colour, language, or ethnic background
- Retaliation
- Displaying or distributing racist cartoons, posters, graffiti, books, or pamphlets

Harassment- Includes any offensive conduct or comment and can consist of a single incident or several incidents over a period of time and may include bullying, ostracism, or hazing. Personal harassment may or may not be intended to cause harm to the recipient(s) has a clear and demonstrably negative effect on the complainant; and would reasonably be known or ought to be known; to be offensive, humiliating or intimidating.

Types of behaviours that may constitute harassment include, but are not limited to:

- Physical harassment
- Threats
- Derogatory comments, slurs, jokes, gossip, innuendo, abusive comments, ridicule, or yelling

Sexual harassment and physical abuse are also included- any conduct of a sexual nature that is unwelcome, or ought to be known to be unwelcome. Including:
Sexual Coercion: examples of but not limited to-

- Demands of a sexual nature for employment opportunities
- Using power over salary, scheduling, promotions or preferred work

Sexual Annoyance: examples of but not limited to:

- Sexual conduct that is hostile, intimidating or offensive with no tangible link to employment benefit or loss
- Creates bothersome or unwelcome work environment

Bullying - is an act of repeated health harming mistreatment, verbal abuse, or conduct which is threatening, humiliating, intimidating, or sabotage that interferes with work or some combination in order to intentionally hurt another person whether mental or physical.

Types of bullying may include, but are not limited to:

- using physical force or aggression against another person (e.g., hitting)
- Verbal bullying (e.g., name-calling)
- Social/relational bullying (e.g., gossiping)
- Cyber-bullying (e.g., sending threatening text messages).
- Retaliation

Procedures

This policy is intended to respect the rights of all who may be involved in a complaint. The guidelines, requirements, and procedures contained in this policy are designed to ensure that individuals feel as comfortable as possible in coming forward with a complaint without fear of reprisal or retaliation. This process can never substitute for other recourses called for under applicable legislation.

False or malicious complaints

False or malicious complaints allegations of harassment may cause both the accused person and Mackenzie Pulp Mill Corporation significant damage. If it is determined the person knowingly made false statements immediate discipline action will be taken and could possibly lead to termination.

Expected Respectful Workplace Standards of Conduct

All employees are expected to promote and maintain a respectful work environment by adhering to the following expected standards of conduct and personally responsible behaviour.

- Being courteous polite, respectful and considerate towards others;
- Acting with honesty and integrity, abiding by and upholding all rules and regulations and
- Expressing disagreement in a professional manner and engage in good faith when there are differences of opinion;
- The inclusion of all people, including those with different strengths and opinions;
- Managing workplace conflicts using conflict resolution processes;
- Encouraging and supporting individuals to learn and practice personal conflict resolution and respectful workplace skills;

Each employee of Mackenzie Pulp Corporation is responsible for conducting himself/herself within the spirit and intent of the Policy as well as contributing towards a safe and inclusive work environment free from harassment, bullying, workplace violence, and discrimination.

Responsibilities

All employees

Everyone in the workplace has a role in building a workplace free of harassment. All Mackenzie Pulp Mill Corporation employees must:

- Review and accept the terms of this policy
- Abide by the policy's principles
    - Communicate behaviour observed that contravenes the policy, with complete respect for those involved
    - Collaborate as fully as possible in the investigation process

Ensure they understand the policy. Lack of awareness of the policy is not a defence for discriminatory, harassing or bullying behaviour.

- Attend scheduled training sessions designed to familiarize them with the policy

Employees are encouraged to discuss any behaviour that they may witness and that they believe may be harassing in nature with their supervisor or shop steward.

Management

Management sets the tone in the workplace and are role models for other employees. All managers must:

- Model inclusive and professional behaviour , not participate in discriminatory or harassing behaviour
- Follow and lead by example the Harassment & / Bullying Policy
- Ensure that all employees are aware of, understand and follow the policy.
- Take action when they receive complaints of, or personally observe, harassment in any form
- Report incidents of harassment to the Human Resources department

Human Resources Department

The Human Resources department and/or Supervisor provide leadership. The Human Resource Department is the guardian of the Harassment Policy.

- Promote and communicate the policy
- Ensure that all employees are informed
- Collect & maintain the acceptance forms form management and employees
- Make sure that policy is applied fully
- Provide support to managers and employees
- Ensure that corrective measures are applied when applicable
- Conduct Investigations
- Recommend appropriate course of action in case of non-compliance

Notification Procedures

Mackenzie Pulp Mill Corporation provides employees who are allegedly exposed to harassment, bullying, workplace violence or discrimination the option of taking confidential action, without prejudice or fear of reprisal. This process can never substitute for other recourses called for under applicable legislation.

The employees can, at any time and in complete confidentiality, turn to the Human Resources Manager, his/her immediate supervisor, union representative or Employee Family Assistance Program for guidance.

Informal Resolution

A resolution should be initiated as soon as possible after the incident. Where you think it is appropriate, try to resolve the situation yourself, you may wish to:

- Let the person responsible for the harassment know their behaviour is offensive
- Involve your supervisor
- Involve your shop steward/company representative
- Talk to the Human Resources Department

Formal Resolution

If the matter cannot be resolved informally an employee may initiate a formal complaint. The complainant files a written complaint with Human Resources in person and may be accompanied by a Union or company representative as appropriate. It is recommended that the complaint is filed as quickly as possible. The written form should include:

- Detail the nature of the act,
- Name of persons involved, relation between those involved,
- Date of the incident as well as the period
- Description of the event
- Name of Witnesses

The complaint must be filed within a period of 30 days from the time that the informal resolution failed unless exceptional circumstances justify a delay. Human Resources, and or a Union representative when applicable will investigate and conclude as soon as possible, normally within 30 working days of the request.

- Human Resources will convey the decision and recommendation to both parties within 10 working days of the conclusion of the investigation.
- If any legal action has been initiated by either party prior to the formal resolution stage no further action will be taken until the conclusion of the legal action.

Six-month limitation Human Rights Tribunal will not normally pursue a complaint that is reported more than six months after the date of the incident(s) on which the complaint is based. The limitation period may be extended if the delay was incurred in good faith or if the delay does not result in prejudice against any of the individuals involved.

Policies or references

- Collective agreement: 2013 – 2017 Mackenzie Pulp Mill Corp Labour Agreement
- www.worksafe.bc.com
- Workers compensation Act and Prevention Policies, D3-115, D3-116, D3-117
- Article 5.04 Personal Harassment Policy, Article 5.05 Discrimination

ELECTRONIC DEVICE POLICY – PPM 52.00

Purpose

Mackenzie Pulp Mill Corporation recognizes the increasing use of smart phone technology throughout our business operations. This policy outlines the use of personal cell phones and other electronic devices at work.

Policy Guidelines

Department Managers, with Mill Manager's approval, will identify the requirement for company issued communication devices, based on employee roles and responsibilities. The IT Department will set the standard for smart phone technology based on security and infrastructure requirements. The use of a cell phone or other electronic device for legitimate business purposes is permitted.

Personal calls during the work hours, regardless of the phone used can interfere with employee productivity, safety and may be distracting to others. The use of personal cell phones or any other electronic devices for non-business use, during work hours, is prohibited. All electronics should remain locked up or put away.

Employees are encouraged to make personal calls during breaks and lunch and to ensure that friends and family members are aware of the Company policy. (Mackenzie Pulp Mill Corporation will not be liable for the loss of personal cellular phones or other electronic device brought into the workplace.) Cellular telephones may not be used to defame, harass, intimidate, or threaten any other person. Employees are prohibited from using their cell phones in any illegal, illicit or offensive manner.

Administration and Interpretation

The Human Resources Manager is responsible for this policy. The Human Resources Department will provide advice and assistance in the interpretation and administration of this policy.

Failure to follow this policy may result in disciplinary action, including and up to termination.

PLANT RULES – TRAC-03.00

Admittance and parking

The Contractor's personnel will use the designated Contractor parking area for all vehicles. Plant admittance of necessary mobile equipment shall be via the main gate only unless approved by the Loss Prevention Manager or Supervisor.

The Contractor's personnel shall enter the plant site at the Main Gate when properly identified by a Mackenzie Pulp Protection Officer from a crew roster provided by the Contractor. They shall proceed to job site by an approved route.

Access to the plant shall be confined to the work site. Visits to other areas within the plant will not be permitted.

Contractor's employees without identification (i.e., new employees reporting for work) shall be escorted from the Main Gate to the work site by a Contractor's responsible representative.

If it is necessary for the Contractor's union business agent to visit the work site, he shall be escorted to and from the work site by the Contractor. Prior to Admittance, he shall sign the "Guest Log" and be issued a plant pass.

In-plant vehicles

Authorized vehicles shall follow an established route to and from the work site.

An Authorized vehicle is one, which has obtained a vehicle pass from their mill representative. The Protection office requires a copy of this vehicle pass. Any unauthorized vehicles which, are on site without a vehicle pass will be towed at the owner's expense.

Authorized in-plant vehicles shall observe safe driving practices. Traffic signs and speed limits shall be observed.

Drivers of delivery trucks, etc. who do not know the location of the work site, shall be met at the main gate and be escorted to the work site by the Contractor's representative.

It shall be the Contractor's responsibility to ensure that all motor vehicles brought onto Mackenzie Pulp's property (whether privately owned, leased or Contractor owned) are properly and adequately insured.

Personnel facilities

The Contractor shall ensure disposal of office and lunch trailer waste such as papers, bottles, etc. is properly done as per Mackenzie Pulp's solid waste disposal policy.

Office, lunch and washroom facilities will be discussed and agreed to prior to the contractor coming on site. Use of mill washroom facilities by contractor personnel is strictly prohibited.

Plant facilities

Plant facilities and equipment shall not be available for the Contractor's use unless specific prior agreement has been made with the owner.

A cellular telephone is recommended for each Contractor Supervisor or PIC. The telephone number shall be listed with the Maintenance Administrative Assistant (2419) and with the Protection Office (2409), and listed on lock and sign in sheets. If there is no telephone in the Construction trailer, use of the Owner's telephone system will be permitted on an as needed basis only.

Plant protection procedures

Welding and burning shall follow the welding, cutting and heating regulations.

No welding or burning shall be done without a permit. (Permits shall be obtained from the Protection Officer.)

Smoking is permitted in designated areas only.

No photographs of installations shall be permitted without written permission of a senior Mackenzie Pulp Mill Corp. representative.

The mill lock-out and confined space entry procedures shall be strictly observed as outlined in this manual under Contractor Lock Out Policy, Section 5 and Confined Space Entry Procedure, Section 6.

CONTRACTOR VEHICLES ON SITE – SPPM 07.01

1. You must park your private vehicles in the designated Contractor parking lot.

2. If for any reason there is need to drive a vehicle, for the purposes of work only, onto the mill site you must obtain a temporary parking permit through your mill representative.

    - the permit must be clearly visible through the windshield
    - Speed limit is 20 kilometers per hour.
    - Seat belts are mandatory in all vehicles when they are in motion.
    - Stop at all Stop signs, proceed only when it is safe to do so.
    - Yield to mill vehicles such as the trackmobile, bobcats, loaders etc. They have the right of way at all times.
    - Keep roadways and mill entrances clear.

3. If you must block access, before you do, contact your mill representative to discuss your needs.

- A temporary blockage may be authorized as long as emergency vehicles can use an alternate route.
- Reports of violations will be reviewed with the onsite representative.
- Repeat violations could lead to the driver being banned from the site.

EMERGENCY COMMUNICATION- SPPM 09.04

EMERGENCY FIRE AND FIRST AID

DIAL 2400

OR

CALL *"PROTECTION"* ON RADIO *CHANNEL 1*

REPORTING EMERGENCIES

When reporting emergencies, it is very important that adequate information is given to the Protection Department.

1. Person making call must give name and the location from which they are calling.

2. Relate the nature of the incident and give as much information as possible:
   - exact location
   - type of incident
   - number of injured
   - Extent of injuries if known, etc.

3. Stay on the line until the Protection Officer has all the information needed.

4. Contact the Shift Supervisor or Foreman of the injured worker to respond to the incident.

5. Be prepared to take the Protection Officer to the scene of the incident and give assistance as required.

EMERGENCY SHUT DOWN AWARENESS- TRAC 09.50

Emergency shutdown of a recovery unit is to be performed whenever water in any amount is know or suspected to be entering the furnace and cannot be stopped immediately.

The recovery operator has the authority after having reviewed the situation and determined from his best judgment that an E.S.P. (Emergency Shutdown Procedure) is required.

The recovery operator will activate the warning system which is as follows:

1. Warning lights go on
2. Sirens sound

All personnel in the area are to leave immediately by the safest route and go to the muster station.

Alarms:

There are 3 different alarms in the mill:

1. Total Mill Evacuation – Deep Fog Horn
2. Power and Recovery Evacuation – Siren
3. Bleach Plant Evacuation – Horn

The Total Mill Evacuation Alarm is tested every Wednesday at approximately 11:45 AM. This is the only time the alarm can be ignored. In the event of a Total Mill Evacuation, you must report to the Muster Station at the chain link fence beyond the 2nd set of railroad tracks.

In the event of a gas problem within the mill, the alarms will sound and revolving red lights will surround the area where the gas is detected. If you are in that area, put on your escape respirator and evacuate the area until the alarm and lights go off.

P&R TAG-IN PROCEDURE:

When working in the Power and Recovery area while a boiler is running, there is a tag in procedure. All workers must report to the P&R control room located on the second floor and fill out a tag indicating their name, company, and the location of their, job. This tag must then be placed on the tag-in board, prior to work, on the hook which corresponds to the floor that will be worked on. This tag must be removed when leaving the area.

Area Gas Alarms- SPPM – 03.00

1. If an area gas alarm activates then all personnel in the area of the activated alarm must immediately leave the area.
2. When a gaseous condition is confirmed and an area alarm has not activated, the #1 Area Operator will activate the area alarm, and all personnel in the area of the activated alarm must immediately leave the area.
3. An area operator will investigate the reason for the alarm. If the gas concentration is unknown in the area where the alarm has activated, the operator must wear a Self-Contained Breathing Apparatus during the investigation. If the gas concentration IS known, the operator will wear the appropriate respiratory protection see SPPM-03.12 (working in ClO2) and TRAC -05.00 (Respirators).
4. No one must enter an area where the alarm is activated unless they are wearing appropriate respiratory protection.
5. When the gaseous condition has been rectified, and if the alarm was activated by the #1 Operator (see 2. above) the gas concentration in the area must be measured and the absence of gas confirmed before the alarm is shut off by the #1 Operator. Employees may then re-enter the area without respiratory protection.
6. If a gas alarm was activated through the sensor as in 1. above, when the gas concentration drops below the activation level, the alarm will cease and the sensor will re-set itself. Employees may now re-enter the area without respiratory protection.

AMBIENT GAS ALARM SET POINT LEVELS

The alarm points for hydrogen sulphide (H2S), chlorine dioxide (ClO2) and dimethyl sulphide (DMS) are set very conservatively to alarm at half of the 8 hour TWA exposure limit for H2S and DMS, and at the Short Term (15 minute) Exposure Limit for ClO2. The ClO2 alarm point is set at the STEL because of the inability of the gas sensor for ClO2 to measure accurately at the 8 hour exposure limit.

- Hydrogen Sulphide (H_2S) gas alarms are set at 5 ppm
- Dimethyl Sulphide (DMS) gas alarms are set at 5 ppm.
- Chlorine Dioxide (ClO_2) alarms are set at 0.2 ppm

BLEACH, DIGESTER & MACHINE ROOM TAG IN – PPM 03.13

1. Maintenance personnel planning to work in the Bleach /Digester or Machine Room areas are to complete 1 (one) Tag per job with the number of workers, date and time.
2. The Tags must be placed at the appropriate spot on the Tag-In board in the Bleach /Digester Control Room or Machine Room Wet End Control Room **BEFORE** proceeding to any area.
3. The tag must be removed if you leave the work area for more than one hour.
4. The Tag-in Board in the Bleach /Digester is divided into two main areas, and those are subdivided as follows:

   Bleach Plant: Ground Floor, Mixer Floor, Operating Floor, Turbotak / Tower tops, R8, and Chemical Unloading.

   Digesters: Kamyr and Brownstock Ground Floor, Kamyr Shell, M & D, DD Washer, Inside Chip System, Outside Chip System.
5. If Tags are not removed by the owners from the Tag-in board at the end of the maintenance employees' shift, the shift supervisor will return the tag to the owners' supervisor for review with the owners.

WORKING WHERE CHLORINE DIOXIDE IS PRESENT SPPM 03.12

Procedure

In some parts of the Bleach Plant the gas concentrations are measured by sensors, and gas concentrations in an area can be determined from PARCview. When chlorine dioxide is suspected to be in an area not serviced by a gas sensor, the gas concentration will be determined by Laboratory staff or another qualified person who **must** wear SCBA while in the area. The person taking the gas test must be accompanied by an Observer also equipped with SCBA as required by Procedure GTSP -103 (Special Gas tests). A Gastech hand pump and chlorine dioxide tubes are available in the Bleach Plant Control Room.

If the concentration of chlorine dioxide in a work area is known to be between 0.1 and 0.5 ppm, then a half mask respirator (or a respirator offering better protection) with combination cartridges must be worn by **anyone** working in the area.

If the concentration of chlorine dioxide in a work area is known to be between 0.5 and 2.5 ppm, then a full face respirator with combination cartridges (or SCBA) must be worn by **anyone** working in the area.

If the concentration of chlorine dioxide is unknown or greater than 2.5 ppm then a Self-Contained Breathing Apparatus must be worn by **anyone** working in the area.

No one may use a respirator (half mask, full face piece or SCBA) unless a fit test has been carried out as described in the Respiratory Protection Program SPPM-5.04.

Bite Block Respirators offer protection against chlorine dioxide but must be used for **escape purposes only**, and it is **NOT** acceptable for anyone to work in an atmosphere containing chlorine dioxide while using a bite block respirator.

Supervisors will be accountable to instruct their employees to wear the appropriate respirators to work in areas when chlorine dioxide is present, and to ensure the respirators are worn while the possibility of exposure exists.

LOCKOUT POLICY TRAC 06.00

Purpose

The purpose of the lock-out policy is to prevent accidental operation of equipment that could cause injury.

Locks

- All contractor locks and keys are issued and controlled by the Protection Department.
- A form is issued by the contractor's mill representative for locks issued.
- Each contractor will be issued a lock set containing one (1), two (2), or six (6) personal locks as required by the job.
- Each contractor lock is painted black and stamped with a unique identification number.
- No other lock sets are permitted for contractors.
- The locks shall not be defaced in an attempt to further identify a contractors lock.
- Any damaged or incomplete personal lock sets must be returned to the Protection Department for repair or replacement.

Application of the Lock-Out Procedure

- The mill representative responsible for the contractors must identify all equipment that will be locked for work or inspection.

- Contractors must report to Operations in the appropriate area to identify the equipment isolation points(s) to place personal locks. The contractor must place his personal lock(s) on each isolation point. No person shall work under another persons' personal lock.

- Before commencing work, the contractor must attempt to **"START"** or **"JOG"** the equipment at the local control station. Once the contractor is satisfied that the equipment is isolated, leave the equipment in the **"STOP"** or **"OFF"** position.

Multi-Point Lock-Out Procedure

In most cases, a Multi-Point Lock-Out procedure will be used to isolate equipment in preparation for contractor maintenance.

Once operations have completed a multi-point lock-out, a multi-point lock-out board will be displayed in a central location. The lock-out board will contain a number of distinguishing features when complete:

1. a signed multi-point lock-out sheet identifying the work to be performed and outlining the steps required to isolate the equipment
2. a key rack containing the keys and remaining locks for the lock set used to isolate the equipment
3. a lock-out seal securing the key rack.

Shift Change

All locks must be removed at the end of the shift, unless specified by the mill representative. If the job is not complete, the mill representative will place a white Supervisor's Hold Lock on the equipment (multi-point, lock-out board) to notify operations.

Job Completion

On the completion of a job, the contractor will remove all tools and materials from the job site and notify the mill representative for a final inspection of the work. The last person to remove their personal lock MUST inform operations department that all work is complete. The lock sets must be returned to the Protection Department prior to departure from the job site.

Special Rules and Procedures

Personal Lock Removal

- If a contractor leaves his personal lock on equipment following the end of a shift without direction from the mill representative, the contractor may be called into the mill to remove the lock at his expense.

Inoperative Lock

- If a lock is inoperative, the Protection Officer must be called to remove the lock.

Cross-line Disconnects

- Cross-line disconnects do not require an electrician to de-energize. Personal locks and locking clamp are applied to these devices.

Live Electrical Equipment Procedure

- Work on live electrical equipment must be carried out under the supervisor's direct authorization as per WCB regulations.

Soft-Wired Equipment Procedure

- The equipment must first be disconnected from the electrical source. The electrical plug must be locked inoperative if the male end of the plug is not in view at all times or the worker leaves the equipment before completing the maintenance.

Sprinkler System Procedure

- When repairs to the sprinkler system require that the main isolation valve be closed, the valve will be closed and an Underwriters Valve Closed Tag attached in place of a lock. Under these conditions, the contractor and Protection Officer must be in radio contact.
- In the event of a fire, the contractor or Protection Officer may open the main isolation valve. In the case of the Protection Officer, he must first contact the contractor to ensure his safety.

Hydraulic and Pneumatic System Procedure

- For maintenance of hydraulic and pneumatic equipment, stored system pressure must be removed and the accumulator vent and drain lines locked open.
- The lock-out of solenoid valves is not acceptable.

Definition of Him

- All reference to gender shall refer to both male and female workers.

CONFINED SPACE TRAC 07.00

General

- Confined Space Entry (CSE) lock-outs are posted when employees are required to enter a confined space. The CSE lock-outs comply with the rules and procedures identified for multi-point lock-outs and are printed on goldenrod colored paper.

- When CSE procedure requires blanking or piping disconnects, a separate multi-point procedure will be used to ensure the safety of the workers installing the blanks and disconnecting the piping.

- ***For entry into a confined space, a contractor must only place a personal lock on the CSE lock-out board. The contractor DOES NOT place a personal lock on the multi-point lock-out for blanking or piping disconnects.***

SECTION 19.0 - CONFINED SPACE ENTRY PERMIT

19.1 A Confined Space entry permit is to be posted at the entrance to a Confined Space prior to entry.

19.2 If all workers authorized to enter are informed of the location of the posted entry permits, the entry permit may be posted at a minimum of one designated point of entry. The identification at other designated points of entry must include up-to-date information on whether it is safe to enter.

19.3 The Confined Space entry permit shall be reviewed with the crew prior to entry, and updated as necessary to ensure the ongoing safety of the workers inside the space.

The Confined Space Entry permit must be completed and signed by the immediate supervisor of the crew entering the confined space.

19.4 The Confined Space entry permit must be re-authorized and signed by the responsible supervisor if there is a change in the work crew, after each shift change, or after a change of the responsible supervisor.

19.5 Every worker in the Confined Space must be made aware of any of the changes made to the Confined Space entry permit.

19.6 Once the Confined Space permit has been removed, the supervisor will notify Protection that the Confined Space has been vacated.

Atmospheric venting requirements

- Continuous ventilation of a confined space is required whenever a worker is inside. Ventilation requirements for entering and working in a confined space are appended to this document.

- The contractor is responsible for providing and installing the necessary equipment to satisfy the ventilation requirements.

Atmospheric testing requirements

- Prior to entry, the confined space must be tested by a qualified tester and determined safe for entry. The time, date and results of the initial test must be written on the CSE sheet.

- If the atmosphere is considered safe, the tester will hang a completed green “Air Quality Safe” tag at the entry of the confined space.

- If the confined space is left vacant for 20 minutes or more, the atmosphere must be tested and the results entered on the tag prior to re-entry.

- If the atmospheric tests fall outside the permissible TLV concentrations specified on the CSE sheet, the tester will remove the “Air Quality Safe” tag and hang a completed red “Do Not Enter” tag at the entry of the confined space.

- Welding and burning are not permitted inside a confined space if the level of combustibles exceeds 10% of the lower explosive level (LEL).

- If work must be done in a confined space with hazardous atmospheric conditions present, or when the work being performed will create hazardous atmospheric conditions, special rules apply.

Entry precautions

- Prior to entry, the contractor must be familiar with the locations of deluge showers and eyewash stations in the area.
- The contractor must wear suitable protective clothing as determined by the previous contents of the confined space.
- Upon entry, the contractor must check for hazards. Where extension cord lighting is required, portable ground fault detector boxes must be used.

Safety watch

- Unless directed by the mill representative, the contractor must provide a safety watch trained and certified in accordance with WCB regulations.
- The safety watch MUST be at or near the point of entry while the confined space is occupied.
- The safety watch must maintain direct communication with the workers inside the vessel with verbal line of sight or radio.
- If the safety watch is required to break the plane of entry of the confined space, they must lock-out.
- The safety watch must have a list of names of those working in the confined space and must be able to account for them in the event of an evacuation.
- The safety watch is encouraged to notify the signing supervisor of any unauthorized worker entry.
- The safety watch must be familiar with the person in charge of the job, exist near the work area and the location of emergency phones, showers and alarms.
- The safety watch must ensure the “air quality state” tag is hung at the point of entry and that the vessel had been tested within 20 minutes prior to entry.
- The safety watch must not abandon his duties unless relieved by another safety watch. The workers in the confined space must be made aware of this change.
- The safety watch may assist workers inside by passing equipment in and preventing entanglement of life lines.
- The safety watch must be alert to any changes in the conditions or work being performed and must alert the workers inside of the change so they can exit if required.

Response to an emergency situation

Should a situation develop and workers in the confined space are unable to exit, the safety watch initiates rescue by contacting the Protection Office by phone at “2400”, radio or by sending someone for help. In addition, the safety watch should contact the Shift Supervisor.

- The safety watch must inform Protection of the nature of the situation, the number of people involved the location of the incident, the hazard involved, and the best access route.

- If the injured worker is attached to a life line, the safety watch may attempt to remove the worker while remaining outside the vessel.

- In the event of an emergency situation, the Mill Emergency Response Team (ERT), under the direction of the Protection Officer will perform rescue operations using proper procedures and equipment.

- Under **NO** circumstances should anyone enter the confined space to assist the injured or effect a rescue without assistance, lifeline and protective breathing apparatus as required.

Response to an emergency call

- The Protection Officer will proceed to the entry point of the confined space to assess the situation.

- The ERT will be called by the Protection Officer.

- The Protection Officer's responsibility will be directed to the injured worker.

- The Shift Supervisor will be responsible for directing the removal of the injured worker under the guidance of the Protection Officer.

VENTILATION REQUIREMENTS FOR ENTERING & WORKING IN A CONFINED SPACE TRAC 08.00

The following document is a description of the ventilation procedures that are required when employees are working in confined spaces.

It provides step-by-step instructions on the methods for installing air horns and lists the air horn size required for many of the confined spaces located in the mill.

Each confined space entry is unique. Therefore, the information contained in this document should only be used a general guideline. Also, ventilation is just one of the many precautions that must be taken before entering confined spaces. Ensure that all points on the Confined Space Entry Procedure form have been checked.

*Should you require further information on this or any other subject related to confined space entry, contact the Loss Prevention Supervisor or a member of the Lockout Committee.

Confined space ventilation - overview

- Natural ventilation is not a reliable means of ensuring the atmosphere in a confined space is safe. Mechanical ventilation through the use of airhorns, fans and fume hoods are necessary to control against an oxygen deficient atmosphere or the build up of toxic air contaminants. Continuous ventilation must also be provided where flammable or explosive atmospheres exist or could develop.

There are two types of mechanical ventilation - they are:

1. **General (or dilution) Ventilation:**

   This is the most common method of ventilating confined spaces. It refers to the dilution or replacement of atmosphere in a space by uncontaminated air which is blown into it.

2. **Local Exhaust Ventilation:**

   This form of ventilation involves the removal of contaminated air at its sources before it has had a chance to spread throughout the space. As a supplementary type of ventilation, it can be useful where a point source of contamination is found inside the confined space. Two good examples include a work station where welding, grinding, or painting is being done, or at a waste sump location.

General Precautions to observe with both types of ventilation systems are:

1. Locate operating controls outside the confined space.
2. When possible, locate fans outside the space to minimize noise.
3. Where flammable atmospheres are present, use explosion-proof fans and bond ventilation equipment to structures made of metal.
4. Ensure contaminated air discharged from the confined space is not a hazard to outside workers.

Air horn Chart Information:

The air horn sizes provided in the accompanying tank chart are based on the Workers' Compensation Board recommendation. Air horn velocity has been calculated based on 4,000 cfm for a 6in. horn and 6,000 for an 8in horn.

WorkSafe BC's recommendation of 20 air changes an hour is a guide and must be interpreted as such. For example, in large vessels like stock storage and liquor tanks, 20 air changes an hour will be impossible to achieve. In this instance, general ventilation should be provided for the area in which the crew is working and gas monitors strategically located for continuous readings.

In short, this entire package is intended to provide departments with the minimum standards required in addressing the proper ventilation of confined spaces. It is suggested that all departments use the information provided to develop procedures that are specific to your needs.

HAZARD TAPE SPPM 03.01

There are two instances when Hazard Tape and an explanatory tag must be put up to warn workers of a hazard:

CAUTION TAPE

Yellow Caution tape is used to advise workers of a hazard in the area. Workers may enter the area inside the yellow tape after reading the tag and making sure the area is safe to enter.

The person who put up the yellow tape must attach to it an explanatory tag describing the hazard. A yellow caution tag must be hung on the tape at each point of entry to the area and must be signed and dated by the person who put up the tape.

When the hazard is removed from the area, the tape must be taken down. The tape must not be removed until it has been confirmed with the Shift Supervisor or Shift Engineer that it is safe to do so.

DANGER TAPE

Red Danger tape must be used when there is a risk of serious injury to anyone entering the taped-off area. No one, except specifically authorized people, may enter the area when the tape and tag are up.

The person who put up the red tape must attach to it an explanatory tag describing the hazard. A red danger tag must be hung on the tape at each point of entry to the area and must be signed and dated by the person who put up the tape.

HOT WORK SPPM 03.09

Purpose

The aim of this regulation is to control welding, cutting and heating operations in the pulp mill and surrounding areas in a manner that will prevent fire and explosion.

General

Hot Work permits are required for all hot work (cutting, grinding, welding, brazing, etc) outside of the shop area.

Permit issuing procedure

1. The Job/mechanical Supervisor or designate will complete the hot work permit. **Top copy (1st)** of the permit shall be delivered to the protection office and contact made with the Protection Officer on duty informing them of the hot work to be completed.

2. TAG in to the appropriate control room – to assist in the sharing of information and to allow all parties to be alerted to abnormal conditions in the immediate area.

3. **Third copy(3rd)**- **Hard copy** of the Hot Work permit shall be placed in the field at a safe location next adjacent to where the hot work is to be completed.

4. For Hot work being completed in High Hazard areas, The Safety Department will assist in reviewing hazards, inspecting the area and provide equipment and advice as needed.

5. Hot work will not begin until all sections of the hot work permit have been filled out and copies placed in the appropriate areas and have the permit in his possession.

6. The spark watch will notify the Protection Office by giving them the **Second (2nd) copy of the hot work permit -** so they can be relieved of his responsibility, following the conditions of the hot work permit. At this point PO's should inquire if the spark watch worker has signed off on the hard copy of the permit.

7. Permits will be issued for no longer than 12 hours.

Supervisory responsibilities

The Maintenance Manager is directly responsible for the enforcement and administration of these regulations:

The Mechanical Supervisor or designate is responsible that:

a. The person completing hot work has an authorized permit hung at the location of the hot work with additional copies delivered to Protection and area control rooms prior to performing hot work.
b. A trained spark watcher is present throughout the job and, in accordance with the BC Fire Code, present for 60 (sixty) minutes in the area after the hot work completed.
c. The hot work is done in accordance with these regulations and the conditions of the permit.

Their workers place the spark watch equipment at the job site and return the equipment to the maintenance extinguisher board when the job is completed

Protection department responsibility

The Safety Supervisor is responsible that:

a. All Protection Officers are qualified to act as his representative.
b. He or his representative will provide advice and equipment as required for any areas requested.
c. A record of all hot work jobs will be retained for 2 years.
d. The Protection Officer will perform periodic safety inspections.
e. The Protection Officers will co-operate with the workers involved and assist, if needed, in placing the spark watch equipment at the job site.
f. When the Protection Office is informed by the spark watch that the job is complete, inspection of the area by the shift Protection Officer shall continue an additional (3) hours after where conditions dictate. This time frame may be extended dependent on conditions and circumstance.
g. When a sprinkler system is shut down or out of service, no hot work will be allowed unless the Safety Supervisor authorizes the hot work.

Worker completing hot work and spark watcher responsibilities

Worker completing Hot Work and/or spark watchers are responsible to the Supervisor that:

a. The Worker completing hot work has an authorized permit hung at the location of the hot work with additional copies delivered to protection and area control rooms prior to performing hot work.
b. The trained spark watch person must be present throughout the job.
c. The hot work is done in accordance with these regulations and the conditions of the hot work permit.
d. Prior to beginning of the Hot Work, trained spark watch persons shall have appropriate firefighting equipment located at the job site.
e. On completion of the job, the job supervisor or their designate will notify the Protection Office.
f. The trained spark watch will ensure that the fire protection equipment is retained and shall remain at that location for 30 minutes for low hazard areas, 60 (sixty) minutes in high hazard areas after the hot work completed.

The spark watch will then notify the Protection Officer that he has left the site so he can be relieved of his responsibility.

All workers responsibility

If unsafe conditions exist any worker has the ability to stop work.

EXCAVATION SPPM 03.06

Whenever excavation by bulldozer, grader, loader, jack-hammer or any other equipment is required in any building or anywhere on site, the following procedures must be adhered to by the engineer or supervisor responsible for the work.

1. Check with the Protection Officer for the location of all underground fire protection lines anywhere in the vicinity.
   - Check with the area Project Engineering Manager for the location of all underground sewers and water mains.
   - Check with the pulp mill Electrical Engineer for the location of all underground electrical services.
2. After each of the above three personnel have checked all records and drawings, they are to proceed to the area of the work with the person in charge, and supervise the staking out and marking of possible services locations.
3. Following this, each of the above three must authorize the excavation permit and clearance must be obtained from the Engineering Supervisor before work commences.
4. If necessary, exploratory holes are to be dug by hand (as required to establish beyond doubt the location of services), and locations are then to be re-staked.
5. The equipment operator, whether "mill" or "contractor" is to be given detailed instructions by the Foreman, or the Engineer in charge, in precisely where to excavate and how deep before work commences. The work is to be supervised at all times by the Foreman, or the Engineer in charge, or their responsible delegates. The Supervisor is to stop work immediately if there are any doubts and re-conduct an investigation.
6. Every possibility of interference must be checked out. A copy of the procedure is to be issued to those concerned every six months. If there are any doubts as to the intent of the procedure, please see the pulp mill area engineer.

7. A copy of the excavation permit will be kept in the Excavation Procedure book maintained by the area engineers.

LINE OR EQUIPMENT BREAKING SPPM 03.10

Purpose

To establish a standard procedure for minimum safe preparation and opening of equipment or pipelines which have or could contain hazardous materials? Individual circumstances may require more stringent procedures.

Procedure

1. Before personnel break into equipment or pipelines it should be determined which have or could contain hazardous materials classified as Class I or II below.

2. **CLASSIFICATION**
   a. **CLASS I MATERIALS** – Those that will burn the skin on immediate contact. Immediate contact is defined as materials that will inflict chemical or thermal burns before a person can reach the nearest safety shower.
   All liquids above 600 ºC (1400 ºF) or below -300 ºC (-220 ºF) are put in Class I. Unidentified material pipelines or equipment shall be treated as Class I.

   b. **CLASS II MATERIALS** – Those that will burn the eyes on immediate contact and/or skin after extended contact
   Extended contact means that a burn will result if a person fails to go immediately to the nearest safety shower or eye wash.

   c. These materials are attached to this safety policy

3. **REQUIRED PROTECTIVE APPAREL** (See Table I) at back of this section 2.1..

4. **DURATION OF CLASS I AND/OR CLASS II MODE OF OPERATION:** The protective equipment specified in Table I must be worn when employees open an isolated line or equipment for the first time and work on open lines and/or equipment as long as the hazard of exposure exists. The hazard of exposure may be considered eliminated and operating supervision may approve removal of protective equipment to the minimum requirement of goggles, gloves, respirator, and hard hats when all the following exist:

    a. The line or equipment is drained and vented to a proper means of containment.
    b. The line is physically disconnected (opened) at all low points.
    c. Interconnecting lines are blanked or locked out and tested not to leak through.
    d. Lines which have contained materials capable of inflicting chemical burns or equipment have been flushed.
    e. Lines which have contained hot or aced materials have reached the temperature range of 600 ºC (1400 ºF) or below 300 ºC (220 ºF).

    NOTE: In the case of steam, steam condensate, brine, etc., cotton gloves may be substituted for liquid-proof gloves when condition 2,3, and 5 above have been attained.

Barricading area:

Before the moment of breaking occurs, the surrounding work area shall be barricaded for maximum protection of passerby and nearby workers.

Downtime after line breaking:

a. When line breaking includes a period of downtime greater that the shift in which the breaking occurred, the open system shall be secured or closed by one of the following means. Blue transparancy required if used in space entry procedure
    i. Double block and bleed – double lock-out and tag.
    ii. Blind flanges – refer to blank flange sizes (attached).
    iii. A properly designed closure.
        Exceptions to 6(a) would be where a crew can maintain continuity through a shift change. Where there is a possibility of a line refilling and no other drain exists, a drain valve shall be attached to the blank flange or closure.
b. Safeguards such as locked switches and locked valves shall be continued until the system is again closed.

Safety showers:

Before breaking into equipment or lines, the person or persons making the break shall locate and test the nearest safety shower.

Cast iron piping and fittings in hazardous service including plastic piping:

a. Due to the low ductility of cast iron, special precautions must be exercised to prevent bursting due to stresses and avoid subsequent exposure of personnel to the hazardous content of pipelines by closing valve off or otherwise positively isolating the supply line side of the line at a minimum distance of 50 feet from the work zone. Isolation may be less than 50 feet if a substantial barrier such as a building wall separates the work zone from the cast iron.
b. When cast iron is found during the course of a job, it must be reported to supervision so action can be taken to replace this piping and/or fitting.
c. Some forms of plastic piping can become brittle with age and chemical exposure; other are affected by extreme temperatures. Care must be exercised when working with these plastics.

Locks and "danger – do not operate" tags must be installed on closed valves when:

a. Where possible, when pipelines are worked on, valves that stop material flow must be closed, locked, tagged and tried and tested for leakage.
b. Where possible, at least two valves on the upstream side of the point of work should be closed, locked, tagged and tried (exception liquefied gases, such as chlorine due to expansion problems). No dependence should ever be placed upon check valves to prevent flow of materials.

If lines are tied to a common header, it may also be necessary to lock-out and tag additional valves to prevent back flow.

All material should be bled from the lines and, where possible, a positive means of keeping the lines vented, such as double block and bleed should be used.

When a bleed point is not available, if possible, the source of pressure on the material in a pipeline should be removed (shutting down and blocking out a pump feeding the line).

Classification of chemicals for line breaking

Safety policy guide

CLASS I	CLASS II
HF (Hydrofluoric Acid – Anhydrous or Aqueous)	Muriatic Acid Trichloroethylene
Sulfuric Acid	Perchloroethylene
Cl_2 (Liquid)	Residues
Caustic Soda (all strengths)	NaCl Brine
Hydrogen Peroxide ($H2_0$)	Liquid Na_2 CO_3
Sodium Chlorate	Liquid CO_2
Sodium Hyproxide	Phosphoric Acid
Liquors – Black/GreenWhite	

TABLE I		
	CLASS I	CLASS II
Face Shield and Goggles	X	X
Safety Hard Hat	X	X
Liquid Proof Gauntlet Gloves	X	X
Protective Footwear Covered by Chemical Protective Clothing	X	X
Polyethylene Hood or Chemical Suit		
	NOTE I	NOTE II
Graylite Hood or Proximity Suit	Note I	Note II
Respiratory Equipment as required	X	X

LEGEND:

X = Required

Note I = Polyethylene Hood or Chemical suit shall be used when working with Class I materials when hazardous material is not thermal and/or high pressure.

Note II = Graylite Hood or Proximity Suit will be used when working with high pressure and/or thermal hazardous material.

ELEVATORS: Digester, P&R, Bleach Plant Frieght

The Bleach Plant Freight Elevator is equipped with a 2 door (inside and out) stage door. The doors have a warning audible alarm prior to closing, and will automatically reopen if something blocks its path while trying to close. Do not pry on on the door.

The following procedure should be used in the event you are in an elevator which has stalled between floors:

1. Telephone the Emergency Protection number **(2400)**.
   - Identify yourself to the Protection Officer:
   - Identify the elevator (Kamyr Digester, P & R, or Bleach Plant Freight)
   - Identify, if possible, the location of the stalled elevator in the elevator shaft (at which floor in the shaft it has stalled).
   - Identify by name all the occupants of the elevator.

Do not hang up the telephone, stay on the line until you are instructed by the Protection Officer to disconnect.

2. The Protection Officer will contact the electrical supervisor or shift electrician who will respond on an emergency basis. It is very probable the electrician will be able to re-start the elevator within a few minutes.

3. If the electrician believes it will take longer than one hour to re-start the elevator, the elevator occupants will be instructed to leave the elevator by the roof hatch, following the instructions on the wall inside the elevator.

   Before anyone leaves through the hatch, the Protection Officer will confirm with the electrician that the elevator power supply has been switched off and locked out with an Electrical Department lock, and occupants will leave the elevator **only after being directed** to do so by the Protection Officer.

4. In the event of a gas situation developing, each occupant must put on one of the ELSA escape respirators located in the elevator, following donning instructions on the case, and exit the car through the hatch. The first person to leave should open the hatch and press the **Red** button located on top of the car to disconnect the power supply, and then exit through the hatch.

COMPRESSED GAS CYLINDERS IN ELEVATOR SPPM- 04.05

PURPOSE

Mackenzie Pulp and the Joint Health & Safety Committee have adopted the following industry Best Practice for the transportation of compressed gas cylinders in elevators.

Procedure

Signs posted in the elevators outline the procedure to be followed.
The signs read:

"DO NOT ENTER ELEVATOR WHEN COMPRESSED GAS IS IN TRANSIT"

The procedure to follow for transporting cylinders is:

- Secure cylinder to the gas cylinder cart
- Place cart in elevator
- Send car to desired floor
- Use buddy system - have a designated person meet car at destination and remove the cart

MOBILE EQUIPMENT PRE USE

Mackenzie Pulp Mill Corporation is committed to the safe operation of all Mobile Equipment in accordance with WSBC OH&S Regulation 16, Mobile Equipment.

Pre-Use Inspection Guidelines

1. Mobile Equipment, including overhead cranes, must be checked by the operator before the start of operation on each shift and thereafter as required to ensure the safe operating condition of the equipment.

2. The pre-use inspection is to be recorded in or on the Mobile Equipment Operator's Maintenance Check and Repair Log book, form or WCB Logbook.

3. The operator observing defects and conditions affecting the safe operation of the equipment must tag out the equipment using **DO NOT OPERATE** tags which are kept with the log book, in the Shift Superintendent's office or at the tool crib and promptly report these conditions to their immediate supervisor.

4. The designated supervisor is responsible to initiate repairs to render the equipment safe.

5. The required repairs must be completed prior to removal of the tag and operating the equipment. A certified mechanic only can remove the tag.

The designated supervisor is responsible to check the log of the mobile equipment, initial and date it, on a weekly basis.

FALL PROTECTION SPPM 05.06

Fall Protection must be used when working anywhere on the mill site at heights above 10 feet (3 metres) or when there is an unusual risk of injury for example, working at a height of five feet above operating machinery.

There are four types of fall protection: **See parts 4 and 11 of Worksafe BC and OHS Regulations**

1. **CONVENTIONAL** – permanent or temporary guard rails or ladder cages.

2. **FALL RESTRAINT** – does not allow a worker to reach the unguarded edge.

3. **FALL ARREST** – the worker's fall will be stopped if the worker goes over the unguarded edge.

4. **WORK PROCEDURES** – work procedures are developed and followed that are acceptable to the Board and minimize the risk of injury to a worker from a fall. This usually means the development of a Control Zone and Monitor procedure.

The hierarchy of choice for fall protection is first to eliminate the hazard, and if that is not possible choose in the following order, conventional, fall restraint, fall arrest and work procedures. The use of work procedures is a last resort when other methods are not possible.

A Fall Protection Work Plan must be developed when

(a) work is being done at a location where workers are not protected by permanent guardrails, from which a fall of 7.5 meters (25 feet) or more may occur, or

(b) a safety monitor and control zone or other work procedure is used as the means of fall protection.

NOTE**:** The use of temporary rather than permanent guardrails requires a fall protection work plan.

Equipment

Full body harnesses and related equipment meeting CSA or ANSI standards are provided for all employees who require them.

The equipment must be

- inspected by a qualified person before use on each work shift,
- kept free from substances and conditions that could contribute to its deterioration, and
- Maintained in good working order.

A worker qualified to inspect the equipment is one who has received training in fall protection at the mill.

Man Lifts (Scissor lift or Boom Lift)

A fall arrest system must be used inside the basket, when operating the JLG or Scissorlift. The OH&S regulations require the worker to wear a properly fitted full body harness and be attached to a proper fall arrest anchor with a lanyard and shock absorber.

Training

Workers must have received training in fall protection before working at elevated heights. The training will be provided by a qualified trainer selected by the mill, as necessary.

Scaffolding

Scaffolds erected in the mill must comply with the requirements of WSBC's Occupational Health and Safety Regulation Division 4, Sections 13.13 to 13.19.

Scaffolds in the mill are erected by a contractor scaffolding company, the mill's carpenters or any tradesman who has been trained to erect scaffolds.

Scaffolds will be posted with scaffolding tags indicating the status of the scaffold.

A **GREEN** tag means the scaffolding has been completed, approved by the workers who erected it, and is ready for use.

A **YELLOW** tag scaffold is not completed, for example, guardrails may only be partially installed. You may use the scaffold but use extreme caution at all times.

A **RED** tag means the scaffolding has not been completed or is not safe to use.
RED tagged scaffolding must not be used.

Scaffolds must be inspected before use and the green tag must be signed and dated. The before-use inspections will continue until the scaffold is dismantled.

TEMPORARY RIGGING AND HOISTING TRAC – 10.00

Contractors shall identify during the job planning process those locations where structures will be used for temporary rigging or hoisting purposes.

The mill liaison to the contractor shall be advised of the location and the lifting requirements. He will confirm that the contractor has determined the suitability of the structure prior to the lift taking place.

Consideration will be given to the load-carrying capacity of the structure as well as any special considerations or conditions, such as the possibility of multiple loads.

LIGHTNING SAFETY – SPPM 03.17

SCOPE:

To ensure all workers on-site are aware of the need to react to lightning in the areas when completing certain types of work.

When thunder and lightning is near the mill, use the 30/30 Rule recommended by the National Lightning Safety Institute.

- If the lightning is visible and the time between "flash" and "bang" is 30 seconds or less – the below actions should be taken.

Thunder is seldom heard beyond 10 miles under ideal conditions.

- Work can restart 30 minutes after hearing the last sound of thunder or from seeing the last lightning.

Vessels

All outside vessels including those extruding through the roofs of buildings are to be evacuated during lightning activity.

High and Exposed Work Activity

All activity on roofs of buildings or exterior staircases that are above adjacent roof level shall cease immediately. Workers in these areas are to move to lower ground or inside adjacent buildings

Crane Activity

All outdoor crane activity must cease during lightning activity including Boom lift/scissor lift work. Where safe to do so crane booms should be lowered.

WILDLIFE POLICY – SPPM 02.11

The Mackenzie Pulp Mill's location in Northern British Columbia is frequented by many species of wildlife, including black and grizzly bears, deer, moose, coyotes, elk and caribou. These are wild animals and are not to be approached at any time.

Wild animals may become aggressive from simple gestures made by unsuspecting people, caution must be made whenever you are working out-of-doors and encounter wildlife.

When working outdoors:

- Keep alert for signs of wildlife like fresh tracks or fresh scat.
- If you encounter fresh bear scat leave the area and report to protection and your supervisor.
- If you see wild animals, never approach them. Speak in a calm but loud speech to alert them of your presence.
- If the animal begins to approach you back away, never run.

It is an offence against the wildlife act to feed wild animals. This causes familiarity in the animals and almost always leads to the destruction of the animal.

Excerpt from the WILDLIFE ACT - [RSBC 1996] CHAPTER 488

Attracting dangerous wildlife

33.1 (1) A person must not

(a) Intentionally feed or attempt to feed dangerous wildlife, or

(b) Provide, leave or place an attractant in, on or about any land or premises with the intent of attracting dangerous wildlife.

RADIATION SAFETY POLICY AND PROCEDURE RSPM 29.00

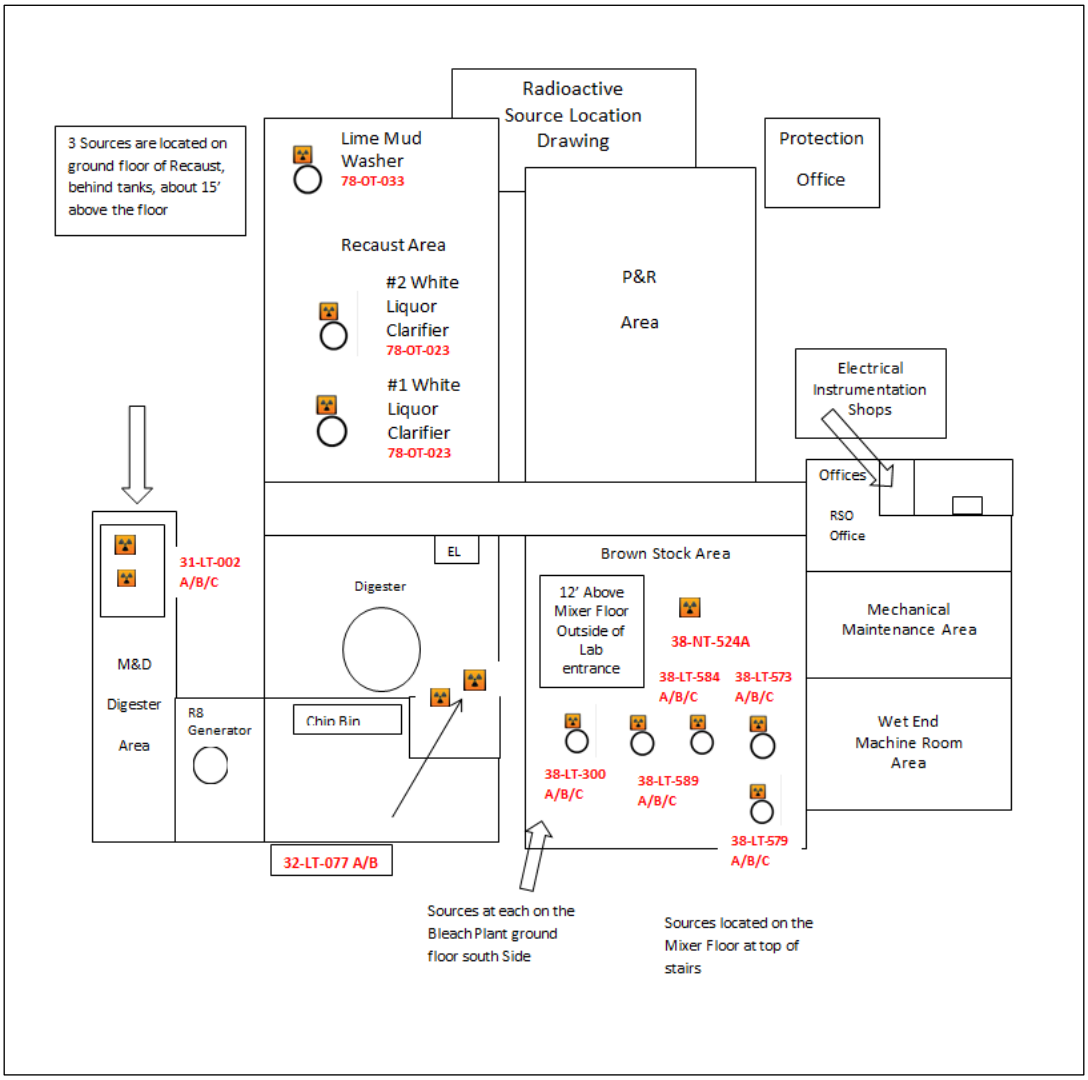
Situations Requiring Emergency Response Action

Emergency response procedures shall be initiated whenever a nuclear gauge is exposed to fire, explosion, and excessive corrosion or has experienced physical damage. The individual who discovers the problem shall initiate the following action.

1. While remaining at a safe distance (greater than 5 meters) prevent personnel from entering the area around the damaged source housing. (Rope area off)
2. Contact by radio **Channel 1** or phone the protection officer on duty – **2400.**

3. *The protection officer will then contact the Radiation Safety Officer – Alternate Radiation Safety Officer and/or employees trained in Radiation Safety from the current list of qualified personnel.

Emergency Response Action



COMBUSTIBLE DUST MANAGEMENT SPPM 03.14

The short fibre and long fibre systems from the reclaims to the final fiber destinations, Chip Bin for long fibre and the Kone Wood Bin for short fibre, are areas where wood dust has been shown to escape from the systems and settle on horizontal surfaces. Accumulations of wood dust present a significant fire risk and ongoing efforts need to be made to reduce that risk.

WSBC has established, as a guide, limiting accumulations of wood to < 1/8 inch on any horizontal surface. 1/8 inch is equivalent to the thickness of two nickels.

In order to meet the < 1/8 inch guideline, the following dust abatement procedures are to be followed:

- Daily cleaning, utilizing methods that minimize the dispersion of dust into the air(see below), of the fibre system to maintain<1/8 dust accumulation
- Minimize fines build up at head and tail pulleys
- Regular inspections and cleaning of the areas, looking at elevated horizontal and vertical surfaces where dust can settle, such as beams, cable trays, machine tops and other hidden spots to ensure no build- up of combustible dust in excess of 1/8 inch is allowed to accumulate
- Repair and maintenance of the vacuum system in the short fibre tunnel and conveyors
- Preventative maintenance on skirting on conveyors
- Repair holes/gaps in conveying systems promptly

To reduce possible sources of ignition the Digester Utility and the #3 Digester Operator should monitor each shift, and report to the #1 Operator any observations of:

- Noisy or hot bearings
- Conveyors tracking poorly
- Motors running hot
- Low oil levels
- Noisy drive chains

All employees who work in the fibre systems should be aware of, and are reminded by means of signs, that the area presents a significant fire risk, and that all necessary precautions must be taken to prevent fires. This includes strict adherence to the Hot Work Policy, SPPM 3.09 and Smoking Policy SPPM 2.09.
Cleaning practices should not generate dust in the air. Recommended cleaning methods are:

- Vacuuming, with a system approved for dust collection
- Water wash, where/when appropriate, avoiding close proximity to electrical equipment
- Brooms and shovels, long handled brooms can be used to clean high areas
- Compressed air should only be used as a last resort, shovel or vacuum all accessible dust first, then air, at 15 psig maximum , can be used to move dust from inaccessible areas, then be removed manually
- Appropriate PPE must be worn while cleaning

WHMIS TRAC 13.00

The Workplace Hazardous Materials Information System, or WHMIS as it is often called, is a national system designed to ensure that all employers obtain the information that they need to inform and train their employees properly about hazardous materials used in the workplace. Through legislation, the WHMIS consensus establishes uniform requirements to ensure that the hazards of materials produced or sold in, imported into, or used within workplaces in Canada are identified by suppliers and employers using standard classification criteria.

WHMIS is consistent with the workers' "right to know' what the hazards are and what needs to be done to control them in the workplace. Existing occupational safety and health legislation in Canada requires that workers be informed about the risks they may encounter on the job. WHMIS provides employers and workers with one additional tool to improve their understanding of hazardous materials. To make the best use of this tool, suppliers and employers have certain responsibilities.

A “supplier” is a manufacture, processor, or package of a controlled product or a person who, in the course of business, imports or sells controlled products. A “controlled product” is defined for WHMIS under the federal Hazardous Products Act as meaning any product, material, or substance specified by the regulations to be included in any of the classes listed in Schedule II of the Act. An “employer” is, for the purposes of WHMIS, the user of a controlled product in the workplace or the producer of a controlled product as part of a workplace process.

Suppliers must convey hazard information to purchasers in a specified manner by means of labeling on the controlled products or confiners of the controlled products, and by proving more detailed information concerning the controlled product in the form of a material safety data sheet (MSDS).

Under occupational safety and health legislation, employers are also required to provide their employees with hazard information received from suppliers and in respect of controlled products produced in the workplace.

Employer’s responsibilities

Use of Labels and Other Forms of Warning in the Workplace

Employers must ensure that supplier-provided containers of controlled products are labeled with WHMIS supplier labels. As long as a controlled product remains in its supplier-provided container, the supplier label must remain attached to the container and be legible.

For workplace processes, employers are required to furnish some form of workplace warnings such as labels, tags, or markings. Although there is no specified format for workplace labeling and other forms of hazard warnings, information on the safe handling, storage, and use of the controlled product and a product identifier (i.e. brand name, code name, or the chemical name of the product) must be provided. Reference must also be made to the availability of a material safety data sheet.

Where a controlled product at the workplace is contained in a pipe, a piping system including valves, a process or reaction vessel, a tank car or tank truck, or car, conveyor belt, or similar conveyance, the employer must ensure that the content is clearly identified to workers through portable containers and decanted products under various circumstances, as well as for labeling procedures in laboratories.

For controlled products or containers of controlled products received in bulk or multi-container shipments, employers are required to provide the supplier information on a supplier or workplace label or by any other appropriate form of hazard warning.

Use of Material Safety Data Sheets (MSDS’s)

Employers are responsible for obtaining from suppliers an MSDS for each controlled product used in their workplaces. The employer may also develop and MSDS to use at the workplace in place of a supplier MSDS, providing that the employer MSDS contains at least the same content found on the supplier MSDS and indicates that a supplier MSDS is available. MSDS’s are to be updated at least every three years or as soon as further information related to the hazard becomes available for a material.

The format in which the MSDS information is provided is not specified. However, while the information can be computerized or stored by the most practicable and cost effective means, there are minimum content requirements for MSDS’s. Employers should become aware of what the MSDS requirements are for a controlled product produced in a workplace process by referring to the Controlled Products regulations of the Federal Hazardous Product Act.

As an important source of detailed information on controlled products, supplier and employer MSDS’s for controlled products are to be readily accessible to employees at each work site and supplier or made accessible to safety and health committees or representatives.

Employee Education and Training

Besides disclosing to workers hazard information on controlled products, employers are to ensure that instruction is provided for employees who handle, are exposed to, or are likely to handle or be exposed to hazardous materials. This should result in the employees becoming more aware of and better able to apply hazard information to ensure their safety and health.

The instruction should include a description of all the mandatory and performance-oriented aspects of WHMIS and of the responsibilities of the employer and employees. The employee education program should include:

a. Instructions with respect to the product identifier.
b. Instruction on the content required on the supplier and workplace label and the purpose and significance of the information contained on the label.
c. Instruction on the content required on an MSDS and the purpose and significance of the information contained on an MSDS.
d. Procedures for the safe handling, use, storage, and disposal of a controlled product, including information related to the disposal of a controlled product contained or transported in piping systems and vessels.
e. Procedures to be followed in the case of an emergency involving a controlled product.

Employers are required to consult with safety and health committees or representatives, where they exist, during the development of education and training activities with respect to exposure to hazardous materials. Employers are required to review the information and training provided to workers concerning hazardous materials in consultation with the safety and health committees or representatives at least annually, or more frequently if new hazard information becomes available or if required by a change of conditions.

Hazard Identification and Ingredient Disclosure

Employers are responsible for evaluating those products produced in a workplace process using the hazard criteria in the Controlled Products Regulations.

Subject to a confidential business information exemption and specific concentration cutoff limits, all ingredients of a controlled product that fall into any of the following categories must be disclosed on an employer-developed MSDS:

a. an ingredient identified as being hazardous under the WHMIS criteria or
b. an ingredient included on the Ingredient Disclosure List established by the Hazardous Products Act, or
c. an ingredient that the employer has reasonable grounds to believe may be harmful, or
d. an ingredient whose toxicological properties are not know.

WHMIS SPPM 04.01

Workplace Hazardous Materials Information System (WHMIS) is a legislated system that informs people who work with or around hazardous materials about hazards and safe work procedures. The legislation applies only to the workplace and does not apply to the transportation of dangerous goods (see TDG in this section), or hazardous materials used by the general public (see Consumer Products in this section). The intention is to increase awareness of potential dangers, and reduce the impact of hazardous materials on employee health. WHMIS facilitates this through four main legislated requirements:

1. **labeling** of hazardous materials containers
2. providing hazard and safe procedures information through **material safety data sheets**
3. **educating** employees on how to access and interpret hazard information delivered through the WHMIS system
4. **training** employees in the safe handling procedures to prevent ill health effects

Mackenzie Pulp Operation will comply with this system and use it to help prevent employee exposure to hazardous materials.

WHMIS Classified Materials

WHMIS materials have six classifications, each with their own distinctive hazard symbol:

- Class A - Compressed gas
- Class B - Flammable and combustible materials
- Class C - Oxidizing material
- Class D - Poisonous and infectious materials
  - Division 1: Materials causing immediate and serious toxic effects
  - Division 2: Materials causing other toxic effects
  - Division 3: Biohazardous Infectious Materials
- Class E - Corrosive material
- Class F - Dangerously reactive material

These hazard classes and corresponding hazard symbols are explained in the booklet *Hazardous Chemicals at Mackenzie Pulp.*

Ordering materials

When new hazardous materials are ordered, the:

1. Purchase order will indicate that WHMIS documentation is required for acceptance of the order.
2. MSDS will be submitted to the Loss Prevention Supervisor to review and approve.
3. MSDS will be copied and distributed for updating the MSDS files once the material has been approved for use.
4. Materials not approved by the Loss Prevention Supervisor must be substituted with a new less hazardous chemical, which must then be approved.

Receiving materials

Mackenzie personnel that receive WHMIS regulated materials will check to ensure that the supplier is delivering the products in compliance with WHMIS requirements. When products are delivered that do not have appropriate documentation, then the receiver will refuse to receive the delivery.

Check documentation and ensure there is:

- ✓ proper supplier labeling affixed to the packaging
- ✓ an MSDS accompanying the materials that meets WHMIS requirements and is not more than three years old

Inspect the products to ensure that the containers are:

- ✓ intact/undamaged
- ✓ properly segregated (incompatible products not packaged together)
- ✓ free of leaks

Obtain the delivery person's signature and record the date of delivery

Maintain a hazardous materials logbook that includes information on the item received, quantity, date, delivery person, and their own name.

Labeling

WHMIS controlled products will not be used unless they have appropriate labeling. Products received from the supplier will have supplier labels affixed in order to be approved for delivery. In some circumstances workplace labels will be affixed, such as when the:

- material lacks a supplier label and must be used
- supplier label has been damaged or is missing
- material is decanted from a properly marked container and placed into another container

An exception is allowed for this labeling requirement if the person de-canting the product:

✓ de-cants the product from a container that has a proper WHMIS label

✓ uses all of the product in the same shift that it is de-canted

✓ keeps the product under their total control, **and**

✓ there is no potential for another person using it

If all of the above conditions are present, the person will only be required to mark the container with the name of the product.

Material Safety Data Sheets (MSDS)

WHMIS regulated materials will not be used unless there is an up-to-date material safety data sheet (MSDS) is on file, and available to all affected employees.

MSDS are located in the Protection Department Office and on the Dolphin computer program available on most staff computers.

When a MSDS is observed to be out-of date, or it does not meet the standard for content, the deficiency will be reported to the Loss Prevention Supervisor.

Education and Training

WHMIS education and training will be part of the new employee indoctrination. Training will be repeated annually. Records of this education and training will be kept.

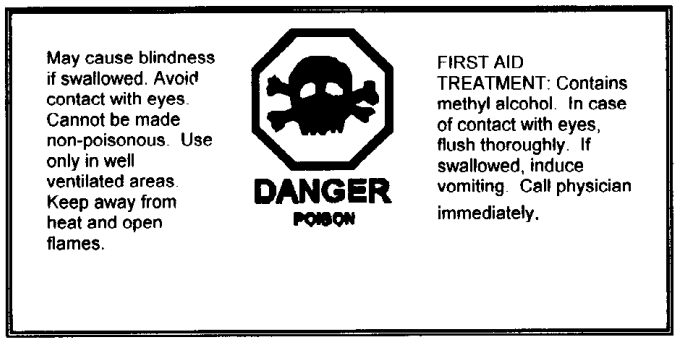
Safety Committees

WHMIS compliance will be done in conjunction and cooperation with the Safety Committees. The Committees will help to ensure that the WHMIS program is successful. This will include checking to ensure that all employees are educated and trained, and label & MSDS requirements are met. WHMIS should be a regularly scheduled item on the Safety Committees' agenda.

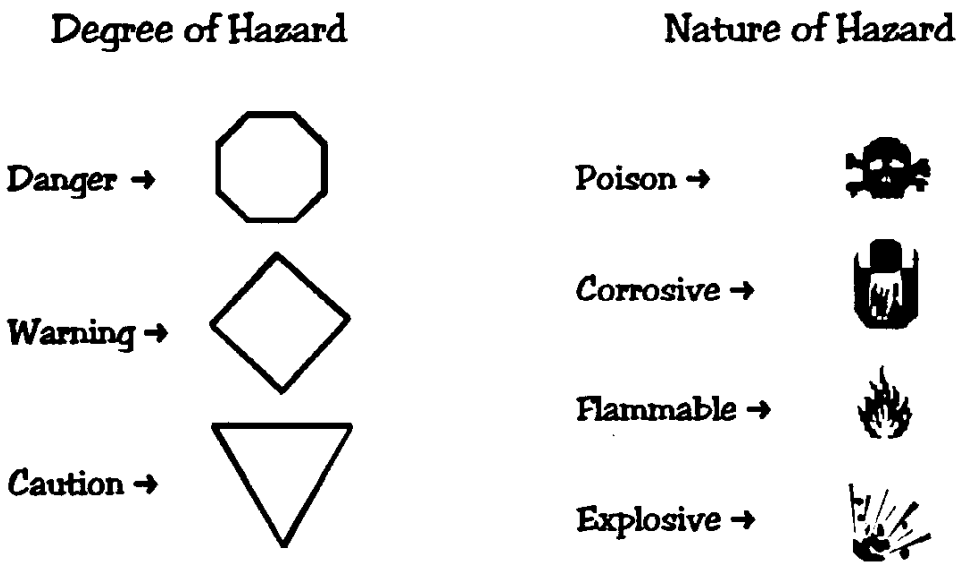
Consumer Products

Hazardous materials used in the workplace may be regulated by Consumer Products legislation. Consumer Product regulated materials become a WHMIS regulated item if they are present in the workplace "in quantities greater that a normal consumer would purchase". Mackenzie Pulp Operations will treat all Consumer Products as if they are WHMIS regulated materials.

Consumer Product labelling is different than WHMIS labelling. It will suffice as WHMIS workplace labelling if personnel are trained in the use of this labelling system. Consumer Product labels have visual symbols, which consist of a hazard symbol and a border indicating the degree of hazard. The borders and symbols are combined, and are accompanied by a written warning and first aid instruction. An example of a consumer product label is as follows:



An explanation of the pictograms used for consumer product labelling is as follows:



PLASTIC CONTROL- TRAC 12.00

The new generation of paper machines is very sensitive to certain types of plastic, which can ruin tons of finished paper, and if a shutdown is required to clean the system of plastic contamination, large financial losses can quickly occur. For this reason, our customers have become ***VERY INTOLERANT*** of pulp suppliers who do not supply a plastic free pulp and quickly terminate pulp purchases.

Equipment is not available to effectively remove plastic from pulp slurry, consequently, the use of plastic synthetic materials in the pulp mill must be strictly controlled. Most plastic materials have been tested and we have basically eliminated, or apply strict control, to plastic articles, which we know, are harmful. Polyethylene, polypropylene, and Styrofoam are the primary cause of plastic contamination. Controlled disposal of these items is essential when these materials must be used.

As a Contractor working on site, you have the obligation and responsibility to minimize the quantity of harmful plastics entering the mill, and whenever these contaminants are used, careful usage and control must be exercised.

The following are **SOME** guidelines involved in successful plastic control:

1. Roping off areas - polypropylene rope (yellow in colour) must not be used. Use jute or hemp rope.
2. Slings - polypropylene slings are banned. Use steel cable, hemp or nylon slings as alternatives.
3. Signs - if plastic signs are used, they must be securely fastened to ropes, walls, sign posts, etc. to prevent the wind from carrying them away or to prevent contact with the manufacturing process.
4. Consumable Items - packaging of consumables usually involves polyethylene films and containers. These must be promptly disposed in an approved manner as soon as possible. Examples include oil and coolant containers needed by portable welders and compressors, welding rod packaging, etc.
5. Packaging - our Mill Stores will remove plastic packaging whenever possible. In the case of hydraulic valves, precision bolts, etc. the thread protectors and caps will remain in place (see Item 4 above).
6. Employee Items - combs, ball point pens, thermos bottles, lunch kits and associated items are serious problems if they enter the system. Employees take care of thermos bottles and lunch kits, but they must be aware that saran wrap, baggies, etc. should be taken home or carefully discarded in garbage cans. They can also help by using pencils in place of ball point pens and purchasing combs that are nylon. Nylon is an acceptable product.
7. Styrofoam - cups, insulation, and packaging materials are banned.
8. Safety Items - hard hats, hearing, nasal and eye protection devices can be potential plastic contaminants.
9. There are numerous other sources - therefore, vigilance is the key.

Plastic Standard

Any item which has:

a) a specific gravity less than 1.0 and
b) a melting point between 100 and 165 degrees centigrade is a plastic contaminant and has to be banned or strictly controlled at the plant site.

Control of plastic is essential to the mill, consequently, your co-operation and effectiveness in controlling plastic is a prerequisite to our success.

N.B. Pulp that has been contaminated with plastic that is traced back a specific contractor may incur all of the following penalties:

1. *No future business with Mackenzie Pulp*
2. *A fine of $10K per incident.*

ASBESTOS

Asbestos Exposure Control Plan- SPPM – 04.06

Purpose of Asbestos Control Plan:

The purpose of the Asbestos Control Plan is to provide a system for protecting the mill personnel from harmful asbestos exposure by identification, risk assessment, proper documentation, control of asbestos materials in the mill, by education and training, by providing written procedures for safe asbestos handling and systematic reviewing and updating of the Plan.

1.0 General Notes

a) Historical Background:

The mill was built in 1970/71. At this time asbestos products were widely used for construction.

In the past ten years Mackenzie Pulp Operations had an intensive program of asbestos removal and elimination of asbestos from new purchases.

b) Present Condition

Most of the friable asbestos (loosely bound fibers) was removed and replaced with non-asbestos products. In some locations friable asbestos was encapsulated in inert material.

Most of the remaining asbestos was marked with warning signs and equipment freed from asbestos was marked with “asbestos free” signs.

There still remains in the mill asbestos in friable form and asbestos bound with non-asbestos materials (asbestos cement panels, pipes, floor tiles etc.)

c) Exposure Control Plan

The present document is prepared in compliance with WCB Occupational Health and Safety Regulations, BC Regulation 296/97. It replaces the former “Asbestos Control Program”.

2. Asbestos Inventory, Risk Assessment and Control

A separate document titles “Asbestos Inventory, Risk Assessment and Control” contains the pertinent information. (Document in development)

To facilitate the inventory the document includes: asbestos inventory contents list, key plan, grids and asbestos inventory, risk assessment and control sheets.

The mill is divided into major areas, each area is divided into grid (along the baylines) and information on asbestos occurrences, conditions, risks, proposed action and results is included in the “Asbestos Inventory, Risk Assessment and Control Sheet”.

For a sample of “Asbestos Inventory, Risk Assessment and Control Sheet” see Appendix A.

3. Education and Training

All new Pope & Talbot employees will be given training on asbestos using the WCB Safe Work Practices for Handling Asbestos handbook. They will be given instruction about Mackenzie Pulp’s asbestos issues which are detailed in the Asbestos Exposure Control Plan and how to obtain a copy of the “Asbestos Control Plan for Mackenzie Pulp” if they so desire. Retraining and refreshers for employees will be done on a biannual basis.

4. Work Procedures – General Notes

Work Procedures are kept in electronic form on QUEST.

The following procedures regulate asbestos handling and disposal:

- Minor asbestos insulation removal – Procedure SPPM-4.07
- Asbestos environmental disposal policy – Procedure TMH-3.01

Waste Asbestos Environmental Disposal – TMH 03.01

LEGISLATION

Asbestos becomes a **"Hazardous Waste"** under the Environmental Management Act at the time that the asbestos is removed from piping, walls, etc.

Employees must follow asbestos safe handling procedure **"Minor Asbestos Insulation Removal SPPM 04.07"**.

WASTE ASBESTOS CONTAINMENT AND IDENTIFICATION

Yellow plastic bags/sheets are used to contain waste asbestos. The bags/sheets are identified with a warning label **"Caution, Hazardous Material, Contains Asbestos"**.

WASTE ASBESTOS STORAGE AND OPERATION

A Box Car is located on the south side of the mill for short term asbestos storage. In accordance with the Hazardous Waste Regulation, the short term asbestos storage may be used under the following conditions:

1. The maximum quantity of asbestos which may be stored is 1000 kg;
2. The asbestos box car is locked
3. The proper labeling is applied

Under no circumstances shall any asbestos waste created at Mackenzie Pulp Mill Corporation be disposed to a location other than the authorized landfill site or the Asbestos Box Car.

RESPONSIBILITY

TECHNICAL DEPARTMENT

1. Operation and maintenance of the Asbestos Landfill Site.
2. Operation and maintenance of the Asbestos Box Car.
3. Maintain possession of the asbestos box car key.
4. Disposal of asbestos in the Asbestos Box Car .

AREA MECHANICAL ENGINEERS

Ensure both project engineers and contractors retained by Mackenzie Pulp Mill Corporation for asbestos removal, understand and follow the asbestos disposal procedure.

ASBESTOS DISPOSAL CONTRACTORS

1. Notify the Technical Department prior to an asbestos disposal project.
2. Ensure that the Technical Department is notified when asbestos is removed from use in the mill and is ready for the Asbestos Landfill Site.

Provide weight and volume information to the Technical Department.

Maintenance Supervisors

1. Ensure mill employees dispose of waste asbestos to the Sea Can.

Any unauthorized **"dumping"** of asbestos into the Sea Can by the workers doing removal will result in the people responsible for the asbestos retaining responsibility for the asbestos.

ASBESTOS DISPOSAL PROCEDURE

Asbestos Disposal Procedure for Contractors

1. Prior to an asbestos disposal project, the Contractor and/or Project Engineer will notify the Technical Department that asbestos is to be removed from the mill and the approximate quantity to be removed.
2. When the Contractor is ready to dispose asbestos, the Contractor will provide information to the Technical Department.
3. When the asbestos is to be disposed to the Sea Can, the Contractor will obtain the key from the Technical Department.

Asbestos Disposal Procedure for Mill Employees

1. Mill employee will obtain the Asbestos Box Car key from the Technical Department.
2. Mill employee disposes the asbestos to Sea Can.

RECORDS

ASBESTOS DISPOSAL RECORDS

- *Responsibility of the The Technical Department*
- *Retained for a minimum of 7 years in Technical Department electronic filing system.*

ASBESTOS MINOR INSULATION REMOVAL- SPPM – 04.07

This procedure is designed for minor asbestos removal jobs, for example, valves, pipe flanges, and pipe insulation.

PROCEDURE – GENERAL

Anytime work is performed that affects the state of asbestos on site the Safety Coordinator must be informed so that the *Asbestos Inventory and Assessment* can be updated. The supervisor in charge of the work is required to inform the Safety Coordinator **BEFORE** the work commences.

The worker will wear paper, disposable coveralls (taped at wrists and ankles), hoods, rubbers boots, and air purifying respirator with HEPA-filters.

The work area is to be identified with barricades and signs.

The following are general instructions for the use of the "Profo-Bag" (or similar) and it may be necessary to modify them in some manner to fit the needs of a specific use or project i.e., the shape, size, location, temperature, space allowance, etc.

Step 1: Cut the sides of the Profo-Bag to fit the equipment to be worked on and insert tools into attached pocket.

Step 2: Attach the Profo-Bag to the working area by folding the open edges together and sealing with staples and tape. (This sealed area will be supporting the weight of the debris, so additional support may be necessary.)

Step 3: Seal the edges of the Profo-Bag around the working area with tape to form a tight seal. Slice open the side port to allow entry of the wetting tube and HEPA vacuum hose. Insert nozzle of portable sprayer and thoroughly wet area to be removed. Then insert HEPA vacuum hose into side port and seal with tape.

Step 4: Insert arms into gloved armholes and proceed to remove asbestos from equipment. When completed, turn on HEPA vacuum to remove air from the bag.

Step 5: With the air being removed from the Profo-Bag, squeeze the bag tightly (as close to the top as possible) and twist seal and tape closed to keep the asbestos material safely at the bottom of the bag. Turn off the HEPA vacuum and remove the hose from the side port, taking care to seal the side port with staples and tape

Asbestos Insulation & Transite Sheeting Removal TRAC – 15.00

All pipe insulation in the mill is assumed to contain asbestos insulation unless marked “no asbestos” for non-asbestos insulation. If you require the removal of any pipe insulation in the mill, contact the Mill Engineering Department.

The transite sheeting and roofing around the mill also contains asbestos material. Transite should never be broken, as this will release asbestos fibers into the air. Should you require a hole in the transite, the whole sheet must be removed by qualified personnel. Contact the Mill Engineering Department if transite removal is required.

If any damaged pipe insulation or transite is found, contact the mill-engineering department immediately. Keep the area isolated and prevent any personnel from entering the immediate area until the asbestos material can be contained.

WASTE

Collection and Disposal of Waste Oil EMP-21.00

LEGISLATION

Waste oil is regulated by the BC Special Waste Regulations and the Transportation of Dangerous Goods Act (TDG).

SCOPE AND APPLICABILITY

This procedure applies to the collection and disposal of waste oil. Mill lubrication mechanics and Contractors generate waste oil throughout the site, which is stored at the Waste Oil Storage Tank.

RESPONSIBILITY

Reliability Engineer has direct responsibility for waste oil collected in the Waste Oil Storage Tank, and disposal of waste oil from all areas.

PROCEDURES

COLLECTION

Lubrication mechanics take waste oil to the waste oil sump and pump it to the Waste Oil Storage Tank. Contractors notify the Reliability Engineer that waste oil requires disposal and transport the oil to the waste oil sump. A Lubrication Mechanic transfers the waste oil to the Waste Oil Storage Tank.

DISPOSAL

When the Waste Oil Storage Tank is nearing capacity the Reliability Engineer notifies Purchasing. Purchasing arranges for a Contractor to collect and dispose of the waste oil.

Varsol cannot be added to waste oil.

When the Waste Oil Storage Tank Berm has sufficient water/oil to warrant removal the Reliability Coordinator will notify Purchasing. Purchasing will arrange for a Contractor to collect and dispose of the contents.

RECORDS

Purchasing follows the manifest system of the TDG Act for disposal of waste oil. The Lubrication Mechanic dips the tank on a bi-monthly basis as per the schedule generated by the computerized lubrication program. The tank level is then entered into the program by the reliability coordinator and stored in a history file.

CHEMICAL DISPOSAL – TRAC -14.00

All chemical and chemical container wastes are not to be taken off site. At the time that these materials are to be disposed, the contractor is to follow the proper disposal procedure as listed below.

1. The contractor provides an entry in the waste chemical storage log book maintained by the Supply Chain Manager.
2. The contractor obtains the key for the waste chemical storage compound.
3. The contractor properly stores the waste chemical and/or container into the appropriate compartment of the waste chemical storage building.
4. The contractor returns the key to the Supply Chain Manager.
5. The Supply Chain Manager signs off the entry.

SOLID WASTE DISPOSAL PROCEDURE – TRAC 18.00

This procedure is for solid waste generated on site. Under no circumstances may waste be brought on site.

It is the responsibility of the contractors to ensure the job site is maintained clean throughout the entire project and all solid waste generated is disposed of according to the procedure listed below.

Unless authorization is given by the Loss Prevention Supervisor or Manager, contractors are prohibited from entering the mill landfill sites.

1. **DOMESTIC GARBAGE** must be placed in the white steel bins located around the mill site. It is important to note that under no circumstances are the lids to these bins to remain open creating the potential for plastic to exit the containers.

2. **METAL WASTE** is to be segregated from all other wastes will then be taken to the scrap metal bin in the courtyard.

3. **HAZARDOUS WASTES**
   a. Waste Oil – see procedure
   b. Materials – locked up in Hazardous waste lock-up (located beside ComStock Building).
      i. Key is kept in the Technical Department.
      ii. Ensure containers are labeled and are fitted with lids and on secondary containment or in building.
      iii. Ensure log book in Technical Department (Lab) is filled out.

4. **INERT CONSTRUCTION WASTE** - arrangements made with the Loss Prevention Supervisor or Manager

5. **ADDITIONAL BINS** can be obtained by contacting the Loss Prevention Supervisor or Manager.

Before leaving the mill site at the completion of the job, the work site must be checked by the owner's representative to ensure that the area is clean and left in a safe condition. All borrowed mill equipment must be returned to Stores or the appropriate department. Failure to do so will result in back charges against the contractor.

The job site has been checked and the mill equipment returned.

_____ _____

Contractor Representative Owner Representative

SPILL CONTROL AND DISPOSAL – LPM 05.00

SPILL CONTROL STATION

Location: The spill control station is located in the mill laboratory.

Equipment List:

- Flammable Solvent Spill Control Kit
- Spill Control Pillows
- Mercury Spill Control Kit
- Calcium carbonate, bentonite, sand mixture (1:1:1)
- Hazardous waste bags
- Salvage drum
- Protective equipment
  - goggles
  - face shield
  - gloves
  - apron
  - organic vapor/acid gas respirator
  - Hazardous Chemicals Information and Disposal Guide
  - Procedure Manual

GENERAL PROCEDURE

a) Establish the identity and volume of the chemical involved.
b) Contact the Technical Services Supervisor and notify of the spill.
c) The observer may attempt to contain the spill **ONLY** if the observer is familiar with the chemical and its related hazards.
   Otherwise the observer shall:
   1. eliminate all sources of ignition in the event of a flammable liquid/solid spill and
   2. keep people away from the spill area.
d) When cleaning up a spill the proper protective equipment must be worn (gloves, eye and respiratory protection, etc.). This equipment is stored at the Spill Control Station located in the centre of the laboratory.
e) Spill control procedures for individual chemicals are listed according to the D.O.T. chemical classifications. Consult the chemical inventory list to determine classifications of individual chemicals.

FLAMMABLE LIQUIDS - CLASS 3

1. Use the Flammable Solvent Spill Kit located in the Spill Control Station.
2. One carton of absorbent is sufficient to absorb 4 litres of solvent.
3. Sprinkle contents of the "Pure Pac" carton onto the spill.
4. Mix the absorbent thoroughly, if necessary add more absorbent until the mixture is dry.
5. Scoop up the absorbent and place it in a Hazardous Waste Disposal Bag.
6. Place the disposal bag into the Salvage Drum and seal the drum.
7. Dispose of the material by burning.

Flammable Solids - Class 4

SODIUM HYDROSULFITE

1. Cover the spill with the carbonate, bentonite, sand mixture.
2. Scoop into a container and place in the fume hood.
3. Slowly add the mixture to a large volume of water.
4. Slowly add household bleach until the reaction is complete.
5. Let stand until solids settle.
6. Decant liquid into the drain with large volume of water.
7. Discard solid residue in landfill.

Oxidizers - class 5

1. POTASSIUM PERMANGANATE
   a) Cover the spill with the carbonate, bentonite, sand mixture or use spill control pillows.
   b) Place pillows or sand mixture in disposal bags.
   c) Dispose in landfill or follow neutralization procedure in the Hazardous Chemicals Information and Disposal Guide.
2. SODIUM NITRATE
   a) Shovel into a bucket of water and run to waste using large amounts of dilution water.
   b) Thoroughly wash down site of spill.

Toxic substances - class 6

- consult Material Safety Data Sheet section for:
  1. Arsenic Trioxide - Arsenic Compounds.
  2. Sodium Azide.

CORROSIVES - CLASS 8

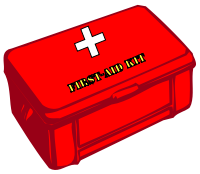
1. **ACID - CAUSTIC SOLUTIONS** (excluding Hydrofluoric Acid)
   Equipment: Spill Control Pillows or
   1:1:1 mixture of Calcium Carbonate, Bentonite, Sand.
   a) Contain and adsorb the spill using the pillows or by covering it with the Carbonate, Bentonite, Sand mixture.
   b) Place the used pillows or sand mixture in a Hazardous Waste Disposal Bag.
   c) Place the disposal bag in the Salvage Drum and seal the drum.
   d) Dispose in landfill or follow neutralizing procedures as outlined in the Hazardous Chemicals Information and Disposal Guide.

WASTE HANDLING SEGREGATION TABLE - TMH 3.02.A

Any hazardous waste material not listed here needs to be identified and brought to the hazardous waste collection compound next to the Comstock building. The key and inventory list is in the Technical Supervisors office.

Waste Type	Container	Prohibited Items	Endpoint
Lunch Waste (food, plastic containers, office waste etc.)	-Office trash can -Galvanized trash can -**WHITE** dumpster	-Grease & oil -Hazardous chemicals -Liquids	Mackenzie Municipal Landfill
Janitorial Waste Material	-**WHITE** dumpster (containers must be rinsed)	-Grease & oil -Hazardous chemicals -Liquids	Mackenzie Municipal Landfill
LARGE Industrial Waste Material (wood, plastic, rubber & cardboard.)	**-GREEN** dumpster in courtyard	-Lunch waste (including pop cans plastic bottles and paper towels) -Hazardous Material -Metal	Onsite Landfill
Asbestos	*Handled by licensed contractor/Mill Representative*		Hazardous Waste Landfill
Metal	**-BLACK** dumpster in Machine Shop -**Red** scrap metal dumpsters	-Garbage	Recycled (Allan's) ***Proceeds to MPMC charitable fund**
Pop Cans	labeled boxes in lunchrooms	-Non recyclable containers	Recycled (various charitable organizations)
Domestic Sewage	-Toilets	**-**Chemicals (excepting for cleaning solutions) -Garbage -Feminine hygiene products	On-site Domestic Sewage Treatment system
Oil Waste (In area next to Oilers Shop)			
Waste Oil	-Drum (pumped to waste oil tank)	-Solvents and glycol	Recycled
Oily Rags	-Labeled Bin/Drum	-Anything that is not oily rags	Recycled
Oil Filters	-Labeled Bin/Drum	-Anything that is not oil filters	Recycled
Other Hazardous Wastes			
Batteries (NiCad/Lithium and Lead Acid)	-Specially marked containers	-Garbage	Recycled
Aerosol Cans	-Specially marked Drum	-Garbage	Recycled
Fluorescent Bulbs	-Cardboard/wood packing boxes (kept whole)	-Non-hazardous bulbs	Recycled

FIRST AID COVERAGE:



The First Aid Room is located in the Protection Office.
To obtain First Aid, you may enter through the front door to Protection, however direct access is through the door on the west side of the building.

- To contact a Protection Officer/First Aid Attendant
  - By Radio: **CHANNEL 1**
  - By Phone: **2400** – **EMERGENCY SYSTEM ONLY**
  - By Phone: **250 997 2911 – select option 1**
  - By Phone: **2409** – non Emergency

- Procedure if calling by phone or radio
  - Identify yourself
  - Give your location
  - State Nature of Emergency
  - Stay on the Line for instructions until given OK to hang up.

PERSONAL PROTECTIVE EQUIPMENT

Eye Protection:

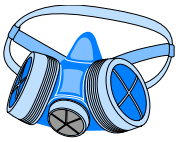
Safety glasses or prescription glasses with safety lenses & side shields must be worn at all times when leaving cab of Vehicle or Mobile Equipment.

Steel-Toed Safety Footwear

To be worn at all times.

Respirators

Escape respirators must be carried when entering or working In Bleach, Digester, Recaust, P&R, Chem Unloading, Filter Buildings and Elevators.

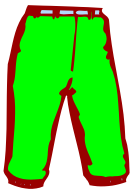


Hard Hats

To be worn at all times when working on or in mill structures.

Clothing

Full length pants must be worn.



Hi-Vis Vests or Clothing

Must be worn wherever a worker may be exposed to mobile equipment WSBS Regulation 8.24.

TOTAL MILL ALARM

When outside of Mill, the Total Mill Alarm sounds like a fog horn (continuous, every 10 seconds). On hearing this alarm, go to the Protection Office (Muster Station #1).

NOTE: The alarm is tested every Wednesday usually between 11:45 and 12:00pm. This is the only time the alarm can be ignored.

GASES

If you suspect the presence of gas in the area, leave that area and contact Mill personnel. Access to the MSDS information is available through the Protection Office. The two primary gases that can be encountered are:

TYPE OF GAS	IDENTIFIERS
H_2S	Colorless, sweet odor; possible rotten egg smell
$CL0_2$	Yellowish Green color; biting acrid odor

MILL RULES

Smoking: Is allowed ONLY in 2 designated areas:

1. **rear of Protection adjacent to the double doors of P & R**
2. **maintenance courtyard in the designated shelter**
3. **Smoking is prohibited within 3 meters (10 feet) inside all mill buildings, structures, company vehicles, windows and ventilation intakes.**

- **Smoking at Chip Pile is prohibited.**

- **Keep Worksite Clean ….. Keep *PLASTIC* out of the Mill.**

- **Stop at Railway Crossings. The flashing yellow light at the crossing onto Mill site and at Recaust indicate rail movement on tracks between the flags and the chip pile.**

- **STOP at all STOP signs and obey posted speed limits.**

- **Forklifts and Loaders have the Right-of-Way.**

- **NO PARKING on site unless a parking pass is obtained from their MPMC representative.**

- **Trucks making deliveries may enter onto the mill site.**

NOTE:

If you must enter a mill building, you must obtain the necessary respirator, hearing protection and hard hat from the protection office, as well as make arrangements for a Safety indoctrination through either the human resources department or engineering.

Related Documents

FSM-0.00 **Fibre Supply Manual**

GTSW 01.03 – Confined Space Entry Check In/Out form

MACKENZIE PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

Confined Space Entry Check In / Out Form GTSW-01.03

Page 1 of

Fill out ALL FIELDS on this form and return to the MPMC Safety Coordinator at end each of shift

SAFETY WATCH: _____ **DATE:** _____

PLANT AREA: _____ **VESSEL:** _____

EMERGENCY RESPONSE (FIRST AID/FIRE): 2400 by Mill Telephone / Mill Radio Channel #1

Gas Monitor Serial#	Start Time	End Time

SUPERVISOR: _____

☐ SUPERVISOR Notified ERT

☐ CSE ☐ HAZARD ASSESSMENT ☐ RESCUE PLAN

☐ WORK ENTRY PERMIT POSTED ☐ AIR MOVER IN PLACE ☑ FIRE EXTINGUISHER CHARGED

PHONE LOCATION: _____ **EYE WASH LOCATION:** _____

FIRE EXTINGUISHER: _____ **MUSTER STATION:** _____

EVACUATION ROUTE: _____

INITIAL GAS TEST

OTHER: _____ OTHER_____ OTHER_____

OXYGEN_____ CARBON MONOXIDE_____ METHYL MERCAPTAN_____

HYDROGEN SULFIDE_____ DIMETHYL SULFIDE_____ CLO2_____

TESTER_____ DATE_____

The Initial Gas Test can be obtained from the Confined Space Hazard Assessment

Worker's Full Name	Company	In (/) Out (X)

EXAMPLES OF SITE FORMS

CONFINED SPACE ENTRY PERMIT SPPM 06.01

MACKENZIE PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

CONFINED SPACE PERMIT

CSE 01.00

VESSEL:	LOCATION:	LA#
Supervisor:	Date:	Expiry:

Permit to be signed by direct supervisor of workers working in the space. Expires after each shift or change in responsible supervisor or change in work crew

☐ TAGGED IN	☐ PERSONAL LOCKS	☐ CSE LOCKOUT	☐ HAZARD ASSESSMENT	☐ RESCUE PLAN

	NOTES:	WORKERS AUTHORIZED TO ENTER SPACE	
☐ VENTILATION			
☐ GAS TEST/SAFETY WATCH			
☐ PROTECTION NOTIFIED			
☐ FALL PROTECTION REQUIRED			
☐ FIRE PERMIT REQUIRED			
☐ ELECTRICAL HAZARDS			
☐ EYE WASH /SHOWER STATIONS			
☐ SAFE WORK PLAN COMPLETE			
☐ PPE			

Scope of Work and Precautions

Every worker affected must be informed of an alteration of an entry permit regarding a change in the required precautions or work activity. OHS regulation 9.15

CONTRACTOR COMPLIANCE MONITORING SPPM – 08.04 (WEEKLY)

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

CONTRACTOR COMPLIANCE MONITORING (WEEKLY)

SPPM-8.04

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Page 1 of 1

Contractor:		**Date:**	
Contractor Supervisor:		**Time:**	
Job Monitored:		**Completed by:**	
Site Audited:			

ITEM	√	COMMENTS
Is the Contractor Supervisor on site?		
Has a pre-job meeting to discuss hazards and their control been held with representatives of the Contractor?		
Is the contractor aware of the need to comply with all WSBC regulations?		
Have all contractor employees completed the MPMC Safety Orientation?		
Has the company carried out its own orientation for their employees?		
Are daily toolbox meetings held, and are copies of the notes being provided to the mill representative?		
Have Job Hazard Assessments been done?		
Are workers aware of the hazards of the work?		
Are the contractor employees using all the required personal protective equipment?		
Are the contractor employees complying with other required regulations? For example, Fall Protection, Lockout, Mobile Equipment regulations?		
Is the 'housekeeping' of the work site adequate?		
Other items/comments :		

Distribution:

Contract Supervisor

Loss Prevention Supervisor

CONTRACTOR CREW LIST PDP -20.00

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

CONTRACTOR CREW LIST

PDP-20.00

Page 1 of 1

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COMPLETE IN FULL

COMPANY:		**DATE:**	
SUPERVISOR:		**CELL:**	
JOB LOCATION:			
SHIFT	☐ **DAYS**	**SHIFT START TIME:**	
	☐ **NIGHTS**	**SHIFT END TIME:**	

Print Names Clearly			
1.		**16.**	
2.		**17.**	
3.		**18.**	
4.		**19.**	
5.		**20.**	
6.		**21**	
7.		**22.**	
8.		**23.**	
9.		**24.**	
10.		**25.**	
11.		**26.**	
12.		**27.**	
13.		**28.**	
14.		**29.**	
15.		**30.**	

CONTRACTOR MONITORING CHECKLIST SPPM -8.03

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

CONTRACTOR MONITORING CHECKLIST

SPPM-08.03

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Page 1 of 1

Contractor:		**Date:**	
Craft:		**Time:**	
Job Monitored:		**Completed by:**	
Site Audited:		**Contractor Supervisor:**	

ITEM	√	COMMENTS
Supervisor on job site?		
Employees wearing proper eye protection/hard hat?		
Wearing adequate work or safety shoes? Gloves?		
All wearing hearing protection where necessary?		
All wearing protective clothing where necessary?		
All wearing respiratory protection where necessary?		
All overhead workers using safety belts/line?		
Is proper permit on job site?		
Safety watch alert & knowledgeable of responsibilities		
Equipment properly locked out/tagged out?		
Electrical connections/cords in good condition?		
Welding machines, sandblasters and other equipment		
All necessary blinds installed/blind list okay?		
Air movers properly installed?		
Has shoring been done as necessary?		
Is overhead work properly marked off at ground level?		
Scaffolding properly installed? Ladders properly used?		
Right tools used properly & in good condition?		
Proper lifting methods/materials handling ?		
Retainer pins on air hose/tool connections?		
Compressed gas cylinders secured upright?		
Good housekeeping?(If "No", detail problem areas.)		
Eye washes and safety showers operational?		
Labels affixed to chemical containers?		
Commend worker on conditions/actions that meet or exceed		
Correct substandard acts and/or conditions?		
Other items/comments :		

Distribution: ***Loss Prevention Supervisor*** ***Maintenance Manager***	***Area Manager*** ***Contract Manager*** ***File Copy***	Discussed with Contractor Supervisor: Name:

EXCAVATION PERMIT SPPM 03.07

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

EXCAVATION PERMIT

SPPM-03.07
Page 1 of 1

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PRE-EXCAVATION			
PERMIT NUMBER:		DATE:	
ENGINEER:		SUPERVISOR:	
Group Performing Excavation:			
Training Performed within past 12 months:			☐ YES ☐ NO ☐ N/A
Supervisor directly responsible for excavation:			
Contractor employees will be indoctrinated prior to working on site			☐ YES ☐ NO ☐ N/A
Location of Excavation:			
Site drawings and/or sketches attached:			☐ YES ☐ NO
Notice of Project Number:			☐ N/A
Are Mackenzie Pulp Mill employees involved in project?			☐ YES ☐ NO
If YES, which employees?			
Are all Mackenzie Pulp Mill employees involved trained on excavations?			☐ YES ☐ NO ☐ N/A
Purpose of excavation:	☐ Power Lines ☐ Power ☐ Gas ☐ Piping ☐ Foundation ☐ Other		
BC Hydro & Fortis Gas notified:			☐ YES ☐ NO ☐ N/A
Number of days excavation will be open:			
Maximum depth of excavation:		Maximum width:	
Shoring designed by a Professional Engineer per WCB & Mackenzie Pulp Mill policy:			☐ YES ☐ NO ☐ N/A
Notes:			

AUTHORIZATION SIGNATURES Pre-excavation section MUST be filled out entirely before signatures can be given. All signatures required before ground is broken. Signatures must be obtained in order.			
1. Engineer:		3. Supervisor:	
2. Electrical Dept:		4. Safety Coordinator:	

PRE-ENTRY INSPECTION				
Sides to be sloped at appropriate angles as per WCB and Mackenzie Pulp Mill Policy				☐ YES ☐ NO ☐ N/A
Sloping inspected by:				
Shoring in place and appropriate as per WCB and Mackenzie Pulp Mill Policy				☐ YES ☐ NO ☐ N/A
Excavation roped off:				☐ YES ☐ NO ☐ N/A
Pre-Entry inspection by Mackenzie Pulp Mill & JHSC members	1 Mgmt Initials		1 CEP Initials	

AUTHORIZATION SIGNATURE		DATE:	

(Mackenzie Pulp Mill representative in charge of project)

FALL PROTECTION WORK PLAN FORM SPPM -05.07

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

Safety Policy and Procedure Manual

FALL PROTECTION WORK PLAN FORM | SPPM-05.07

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Report necessary updates by completing a 'Change Request' in Intelex.
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Page 1 of 5

Planning plays a key role in protecting workers from fall hazards. The fall protection plan template below is provided to assist in the planning process. Employers should ensure that fall protection plans are

- Designed and completed to address site-specific conditions
- Compliant with the Occupational Health and Safety Regulation

Area:	Start date:

Site description: Supervisor

Work area:
Tasks:

Site-specific fall hazards *see diagram on page 2 for more details.*

Type of fall protection to be used *see definitions on page 3.*

Max Height (peak)_____Max Height (eaves):_____Max Height (other)_____

Roof slope (s), if applicable:_____

Proximity to high voltage power lines_____

Ground cover/hazards:_____

Other comments:_____
_____

❑ Fall restraint	❑ Fall arrest	❑ Temporary guardrail system

Equipment inspection

Item	Comment/defect	Item	Comment/defect
❑ Full body harness		❑ Anchors	
❑ Vertical lifelines		❑ Ladders	
❑ Lanyards		❑ Ladder hoist	
❑ Rope grabs		❑ Toeboards	

Prior to accessing the work location

Checklist	Comments
Protection Department has been notified	
ERT is notified	
Safety monitor #1: _____ Safety monitor #2: _____	Training (for this role): _____ Training (for this role):_____
The Crew Supervisor must provide the Protection Office with a copy of the Fall Protection Work Plan – the protection officer must visit site.	
The Worker is provided with the Rescue Plan	

Site roof diagram *include anchor locations*

Ladder setup

Set up on a firm, level base	Extends approx. 1 metre (3 feet) past edge of roof
Set up 4:1 (vertical: horizontal)	Secured/tied off

Fall protection system special assembly procedure

_____

_____

_____

_____

_____

Rescue procedures for a fallen worker

_____

_____

_____

_____

_____

Fall Protection Definitions

- Fall restraint means a system to prevent a worker from falling from a work position, or from travelling to an unguarded edge from which the worker could fall.
- Fall arrest means a system that will stop a worker's fall before the worker hits the surface below.
- Guardrail means a guard consisting of a top rail 102 cm to 112 cm (40 in. to 44 in.) above the work surface, and an intermediate rail located approximately midway between the underside of the top rail and the top of the toe board, if one is provided, or the work surface if no toe board is provided.

Notes:

Worker sign-off

By signing below, I acknowledge that I have reviewed the fall protection requirements and procedures for this site with my supervisor and understand my responsibilities, specifically the requirement to use personal fall protection.

Name: (please print)	Signature:	Area
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

Supervisor:_____ Date:_____

LOCK AND VEHICLE PASS TRAC -02.00

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

CONTRACTOR PROCEDURES
& REGULATIONS

LOCK AND VEHICLE PASS

TRAC-02.00

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Page 1 of 1

This form MUST be sent to the Protection Office at least 24 hours prior to the arrival of the Contractor (Emergencies exempted)
A copy MUST also be sent to The Loss Prevention Supervisor

THIS SECTION TO BE COMPLETED BY THE MACKENZIE PULP REPRESENTATIVE IN CHARGE.

Name of Contractor _____ **Cell Phone #** _____

Date of Arrival _____ **Duration (days)** _____

Contractor Supervisor _____ **Job or Project Title** _____

Location _____ **Trailer Location** _____

Mackenzie Pulp Representative _____

VEHICLE PASS(ES):
To be eligible for a Vehicle Pass the vehicle MUST be required for the performance of the job, not merely to transport workers.

Parking Passes must be displayed on the dash of the vehicle with the information and expiration date visible.

Department Manager's Authorization _____

THIS SECTION TO BE COMPLETED PRIOR TO ARRIVING AT PROTECTION

Vehicle #1 Description _____

License # _____ **Colour** _____

Vehicle #2 Description _____

License # _____ **Colour** _____

CONTRACTOR LOCKS REQUIRED: Date required: _____

Contractors will be held responsible for the cost of locks not returned.

No. of sets of 2 required _____ **No. of sets of 6 required** _____

LOCKS ISSUED BY _____

LOCKS RECEIVED BY _____ **DATE** _____

MULTIPLE LOCK ISSUE FORM PDP -40.00

_____

Contractor Name

Foreman _____

Date Issuec _____

Issued By _____

PLEASE DO NOT MARK LOCKS IN ANY WAY.

DO NOT USE ANY TYPE OF TAPE, MARKER, PAINT MARKER, NAIL POLISH, ETC.

USE TAGS PROVIDED

0	Print Name Signature	10	Print Name Signature
1	Print Name Signature	11	Print Name Signature
2	Print Name Signature	12	Print Name Signature
3	Print Name Signature	13	Print Name Signature
4	Print Name Signature	14	Print Name Signature
5	Print Name Signature	15	Print Name Signature
6	Print Name Signature	16	Print Name Signature
7	Print Name Signature	17	Print Name Signature
8	Print Name Signature	18	Print Name Signature
9	Print Name Signature	19	Print Name Signature

This form MUST be sent to the Protection Office at least 24 hours prior to the arrival of the Contractor (Emergencies exempted)
A copy MUST also be sent to Safety Manager

THIS SECTION TO BE COMPLETED BY THE MACKENZIE PULP REPRESENTATIVE IN CHARGE.

Name of Contractor _____ **Cell Phone #** _____

Date of Arrival _____ **Duration (days)** _____

Contractor Supervisor _____ **Job or Project Title** _____

Location _____ **Trailer Location** _____

Mackenzie Pulp Representative _____

VEHICLE PASS(ES):

To be eligible for a Vehicle Pass the vehicle MUST be required for the performance of the job, not merely to transport workers.

Parking Passes must be displayed on the dash of the vehicle with the information and expiration date visible.

Department Manager's Authorization _____

THIS SECTION TO BE COMPLETED PRIOR TO ARRIVING AT PROTECTION

Vehicle #1 Description _____

License # _____ **Colour** _____

Vehicle #2 Description _____

License # _____ **Colour** _____

CONTRACTOR LOCKS REQUIRED: Date required: _____

Contractors will be held responsible for the cost of locks not returned.

No. of sets of 2 required _____ **No. of sets of 6 required** _____

LOCKS ISSUED BY _____

LOCKS RECEIVED BY _____ **DATE** _____

MACKENZIE
PULP MILL
CORPORATION

HAZARDOUS CHEMICALS, CONDITIONS AND SUBSTANCES

AT

MACKENZIE PULP

This information booklet on Chemical Hazards was put together by the Hygiene Department and local 1123 Safety. Only chemicals that are considered high risk, are used in large quantities or are handled frequently are included.

The information was gathered mainly from:

- current Safety Data Sheets
- National Institute of Occupational Safety and Health/Occupational Safety and Health Association (NIOSH/OSHA) Health Guidelines for Occupational Hazards (received 1995)
- Documentation of Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) Sixth Edition (received 1995)
- Patty's Industrial Hygiene and Toxicology (fourth edition)
- Workers' Compensation Board (WCB) Occupational Health & Safety Regulation (1998-2017)

and is limited to the accuracy of these sources.

Revised April 27, 2017

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) SYMBOLS

As of 2015, Canada has adopted the standard GHS symbols for hazard identification within the WHMIS program.

This table provides a comparison of the old WHMIS 1988 symbols, and the new WHMIS 2015 symbols.

For more information on the WHMIS 2015 System, WHMIS requirements, or consumer product labelling, see ***SPPM-04.01***.

Enlarged WHMIS 2015 pictograms and a brief description of each are below.

The Dolphin System contains SDSs for all of Mackenzie Pulp Mill's hazardous chemicals and substances, and is the best resource available for finding information on specific chemical and substance hazards.

Image #1 displays how to locate the Dolphin SDS System on the MKWEB homepage.

Image #2 displays the search bar and button to be used for locating SDSs within the Dolphin System.

WHMIS Chemical Hazards Pictograms 2015

WHMIS 1988 Hazard Class	WHMIS 1988 Symbols	WHMIS 2015 Symbols	WHMIS 2015 Hazard Class
A			Gases Under Pressure
B1 to B6			Flammables, Self-Heating, Emit Flammable Gases, Pyrophoric Gases, Liquids & Solids Organic Peroxides
C			Oxidizing Gases, Liquids, Solids
D1			Acute Toxicity - Oral, Dermal, Inhalation
D2			Eye Irritation, Skin Irritation Skin/Respiratory Sensitization, Carcinogenicity Mutagenicity Reproductive Hazards
D3			Biohazardous Infectious Materials
E			Skin/Eye Corrosion Corrosive to Metals
F			Self-Reactive Substances Organic Peroxides
N/A	N/A		Explosive Substances (Explosives are still covered under WHMIS exclusions for now)
N/A	N/A		Aspiration, STOT (Single Exposure, Repeated Exposure)
N/A	N/A	N/A	Combustible Dusts
N/A	N/A	N/A	Simple Asphyxiants
N/A	N/A	Use appropriate symbol	Physical Hazards Not Otherwise Classified, Health Hazards Not Otherwise Classified

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)
	**Biohazardous Infectious Materials** (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by

Enlarged Pictograms

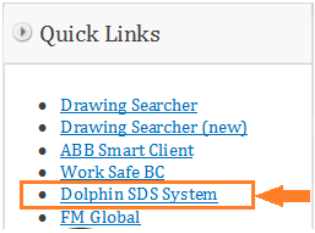


Image #1

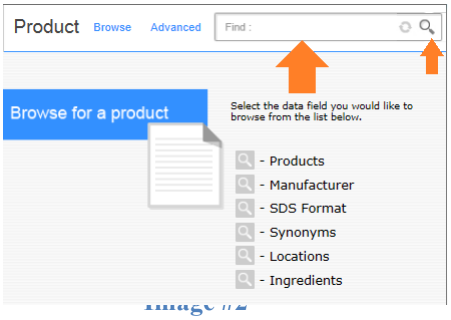
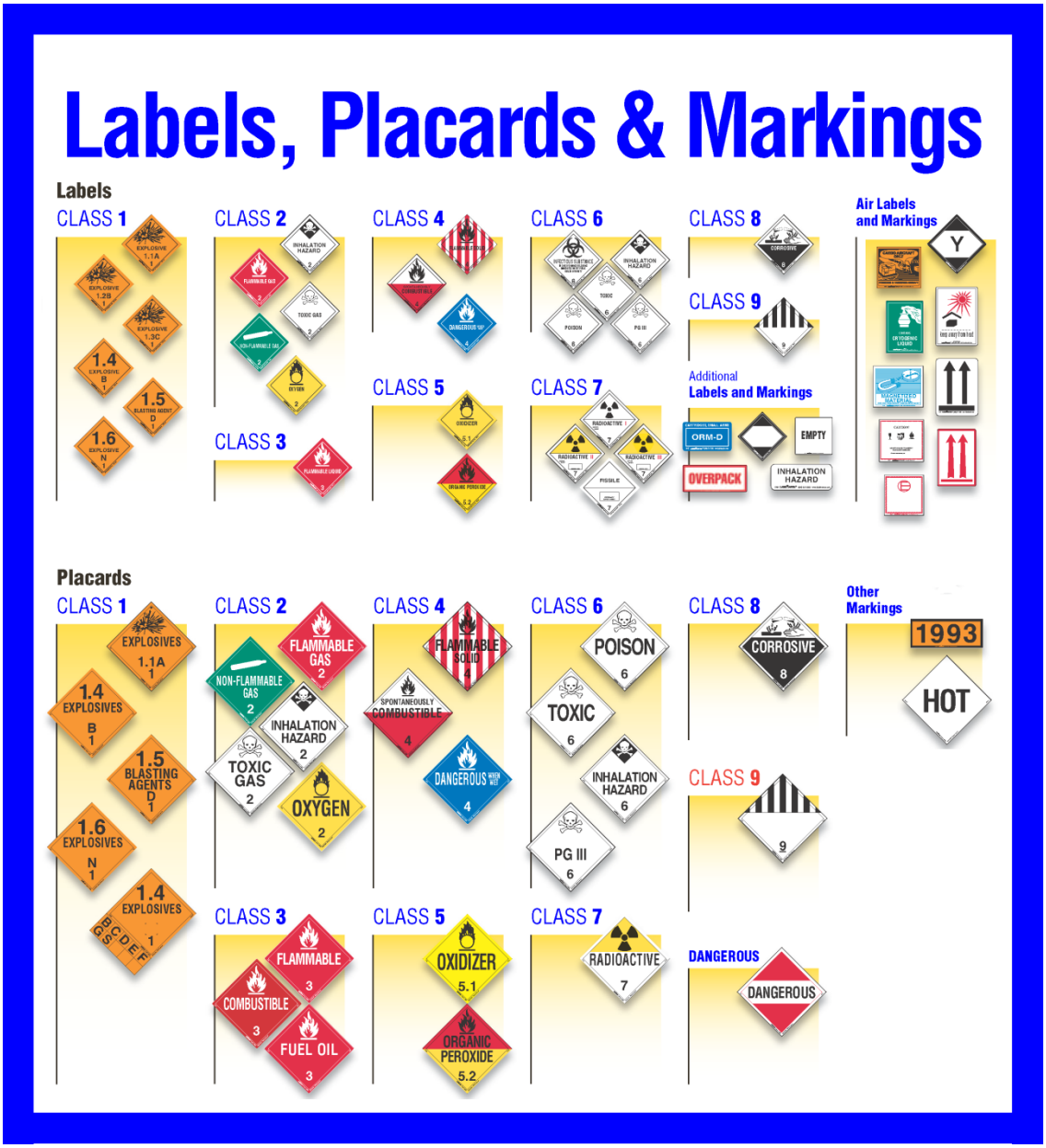


Image #2

TRANSPORTATION OF DANGEROUS GOODS SYMBOLS & CLASSES



More information on the Transportation of Dangerous Goods symbols, classes, and regulations can be found in the Transportation of Dangerous Goods Regulations at Stores Shipping Office, or in the Canutec (Canadian Transport Emergency Centre) Guide can be located at the Protection Office.

A copy of the Canutec Guide is also kept in the Protection Fire Truck so as to be on hand during emergencies.

PRODUCT IDENTIFICATION NUMBER (PIN)

CHEMICAL	PRODUCT IDENTIFICATION NUMBER (PIN)
LIQUIDS	
Ammonia (NH_3)	UN1005
Black Liquor	
Borol	UN1824
Bunker C (Fuel Oil)	UN1993
Caustic (NaOH)	UN1824
Diesel	UN1202
Gasoline	UN1203
Green Liquor	
Hydrogen Peroxide	UN2015
H_2O_2, 70%	UN2014
H_2O_2, 50%	UN1230
Methanol (CH_3OH)	UN1977
Nitrogen (N_2)	UN1073
Oxygen (O_2)	UN1978
Propane (C_3H_6)	UN2428
Sodium Chlorate	UN1830
($NaClO_3$)	UN1830
Sulphuric Acid (H_2SO_4)	
Weak Wash	
White Liquor	

CHEMICAL	PRODUCT IDENTIFICATION NUMBER (PIN)
GASES	
Carbon Monoxide (CO)	UN1016
Chlorine Dioxide (ClO_2)	UN9191
Compressed Air	UN1002
Dimethyl Sulphide (C_2H_6S)	UN1164
Hydrogen Sulphide (H_2S)	UN1053
Methyl Mercaptan (CH_3SH)	UN1064
Natural Gas (CH_4)	UN1971
Sulphur Dioxide (SO_2)	UN1079
Welding Fumes	

CHEMICAL	PRODUCT IDENTIFICATION NUMBER (PIN)
DUSTS	
Lime Dust (CaO)	UN1910
Lime Mud ($CaCO_3$)	
Wood Dust	

UN Numbers are a 4-digit number that identifies the dangerous goods. These numbers are an international designation, with the "UN" standing for United Nations.

Placards bearing the UN Number help firefighters and emergency responders identify what substances they are dealing with.

GLOSSARY OF TERMS

(Units of Measure)

ACGIH	American Conference of Governmental Industrial Hygienists	**SCBA**	Self Contained Breathing Apparatus
AR	Artificial Respiration	**STEL**	Short Term Exposure Limit
CANUTEC	Canadian Transport Emergency Centre	**TCLo**	Toxic Concentration low
CNS	Central Nervous System	**TDLo**	Toxic Dose low
HEPA	High Efficiency Particulate (filter)	**TLV**	Threshold Limit Value
IARC	International Agency for Research on Cancer	**TWA**	Time Weighted Average
IDLH	Immediately Dangerous to Life and Health [30 min. in which to escape]	**UN**	United Nations
LCLo	Lethal Concentration low	**WCB**	Workers' Compensation Board
LDLo	Lethal Dose low	**g**	grams
MSDS	Material Safety Data Sheet	**MICRONS**	10^{-6} meters
PIN	Product Identification Number	**mg/kg**	milligrams per kilogram
SAR	Supplied Air Respirator	**mg/m^3**	milligrams per cubic meter (air)
		ppm	parts per million
		<	less than
		>	greater than

GLOSSARY OF TERMS

(Definitions)

ASPHYXIANT	Causes suffocation by lack of oxygen due to displacement
CARCINOGEN	Cancer-causing agent
CRYOGENIC	Low temperature
CYANOSIS	A dark blue to purplish coloration of the skin and the mucous membrane caused by lack of oxygen
CONJUNCTIVITIS	Irritation and inflammation of the lining of the eye and eyelids
DEHYDRATE	To lose or remove water or moisture
DELIQUESCENT	Dissolves and becomes liquid by absorbing moisture from the air
DYSPNEA	Difficult breathing
GASTROINTESTINAL	The stomach and intestine
HALOGEN	Chlorine, fluorine, bromine, iodine
INEBRIATION	Intoxication, state of drunkenness
NARCOSIS	A reversible state of central nervous system depression threshold
ODOUR THRESHOLD	The point at which most people can begin to detect a given odour
OLFACTORY	Relating to the sense of smell
OXIDIZER	Formerly Class C on MSDS, now represented by the "Flame over Circle" pictogram in WHMIS 2015 - material that may cause fires or explosions if in contact with combustible material
PNUEMONITIS	Inflammation of lung tissue
PULMONARY EDEMA	Fluid in the lung

HAZARDOUS GASES

CARBON MONOXIDE (CO)

- odourless gas approximately the same weight as air
- explosive at high concentrations and in the presence of sufficient oxygen, and a spark source

Source: internal combustion engines, and incomplete combustion of organic material, also a calibration gas
Some Locations: Warehouses, Steam and Recovery, Instrument Shop, aisleways

HAZARDS of CARBON MONOXIDE	
GAS	
25 ppm	WCB allowable 8 hour time weighted average (TWA)
25 - 50 ppm	health impairments would not be expected
100 ppm	WCB 15 minute allowable short term exposure limit (STEL) -- causes headaches and nausea
180 ppm	cigarette smoking can result in levels this high and 5 to 10 percent saturation of hemoglobin
200 ppm	headache, tinnitus (ringing in the ears), and sense of discomfort
650 ppm	Toxic Concentration low (TCLo)/ 45 min
1500 ppm	Immediately Dangerous to Life and Health (NIOSH IDLH)
>1600 ppm	narcosis, coma and eventually death
4000 ppm	Lethal Concentration low (LCLo)

GENERAL
CO poisoning is the most common occupational gas poisoning leading to death
CO displaces oxygen in hemoglobin which can lead to death from lack of oxygen
CO has an affinity for hemoglobin 200 times greater than oxygen, so poisoning can occur even when there is plenty of oxygen available in the air
CO will gradually be released from the hemoglobin and replaced with oxygen when CO or the person is removed from the environment -- takes approximately 3.5 hours for 1/2 to be cleared from the body
CO exposure may aggravate heart and artery disease
PROTECTION and FIRST AID
Ensure confined spaces are well ventilated and monitored for CO -- evacuate to fresh air immediately -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Minimum Required Respiratory Protection For Work in a CO Contaminated Environment: 25 - 250 ppm — Supplied air respirator (SAR) or SCBA 250 - 750 ppm — SAR with a full face piece, helmet or hood or SCBA >750 ppm — Positive pressure SAR (see plant protection officer or hygienist for information)  **Note: face sealing respirators must be fit-tested on issue and then yearly after that.**

CHLORINE DIOXIDE (ClO_2)

- a yellow-green to orange gas with a pungent, sharp, biting acrid smell - at low concentration similar to chlorine smell in public swimming pools
- heavier than air and a strong oxidizing agent
- generated on site in the R8 Generator because it is extremely reactive and cannot be transported

Use: bleaching agent of kraft pulp
Location: R8 Generator, Kraft Mill, Bleach Plant

HAZARDS of CHLORINE DIOXIDE	
GAS	
0.1 ppm	WCB allowable 8 hour time weighted average (TWA) -- also the point at which most people can begin to detect the odour
0.3 ppm	WCB 15 minute allowable short term exposure limit (STEL)
1.0 ppm	irritation to nose and eyes; visual halo effect when looking at light fixtures
5.0 ppm	Immediately Dangerous to Life and Health (IDLH NIOSH)
19.0 ppm	fatality reported
>100,000 ppm	explosive -- can be ignited by almost any form of energy such as sunlight, heat, or sparks

GENERAL
Avoid heat, sparks and high temperatures
Repeated high level exposure to ClO_2 may cause chronic bronchitis
PROTECTION and FIRST AID
Avoid breathing vapours -- provide adequate dilution ventilation -- evacuate to fresh air immediately -- if breathing has stopped call 2400 for medical assistance, begin artificial respiration (AR)
Avoid skin and eye contact -- ClO_2 causes irritation and burns to eyes and skin -- wear chemical safety goggles -- contact lenses may hinder eye washing
Flush eyes immediately with large amount of fresh water for at least 15 minutes
Remove contaminated clothing and wash skin with soap, then rinse with water for 15 minutes
Minimum Required Respiratory Protection For Work in a ClO_2 Contaminated Environment: 0.1 - 5 ppm: **Fit-tested** full face piece respirator with ClO_2 cartridge 5 - 10 ppm: Positive pressure supplied air respirator (SAR) or SCBA (see plant protection officer or hygienist) **Note: face sealing respirators must be fit-tested on issue and then yearly after that.**

DIMETHYL SULPHIDE (DMS)

- a clear colorless to straw colored liquid with a disagreeable odour
- heavier than air and slightly soluble in water

Use: by-product of kraft pulping
Location: Kraft Mill, Power & Recovery

HAZARDS of DIMETHYL SULPHIDE	
GAS	
0.063 ppm	Typical odour threshold – most people can begin to detect the odour
10 ppm	WCB allowable 8 hour time weighted average (TWA)
30 ppm	Safe for 30 minutes per day
50 ppm	Workers must not under any circumstances work in levels at or exceeding this point for any length of time
22,000 – 197,000 ppm	Highly flammable / explosive within this range

GENERAL
Highly flammable liquid and vapor, no spark or open flame
Repeated high level exposure to ClO_2 may cause chronic bronchitis
Concentrated DMS can be rendered non-flammable and non-odorous by spraying with dilute liquid sodium hypochlorite solution. This will convert the DMS to dimethyl sulfoxide, which can be treated in approved wastewater treatment systems
DMS is heavier than air, and is prone to settle in low areas
Liquid DMS will boil at 37.3° Celsius, and auto-ignite at 206° Celsius

PROTECTION and FIRST AID
Avoid breathing vapours -- provide adequate dilution ventilation -- evacuate to fresh air immediately -- if breathing has stopped call 2400 for medical assistance, begin artificial respiration (AR)
If unconscious, place victim in the recovery position and seek immediate medical attention
Avoid skin and eye contact -- DMS causes irritation and burns to skin, and can cause severe eye damage.
Flush eyes immediately with large amount of fresh water for at least 15 minutes
Remove contaminated clothing and wash skin with soap and water, then rinse with water for 15 minutes
If ingested, induce vomiting if victim is conscious. Never give anything by mouth to an unconscious person
Extinguish fires with foam, CO_2, or powder
Minimum Required Respiratory Protection For Work in a ClO_2 Contaminated Environment:
10 - 25 ppm: **Fit-tested** full face respirator with organic vapor cartridge
25 - 100 ppm: Positive pressure supplied air respirator (SAR) or SCBA (see plant protection officer or hygienist)
Note: face sealing respirators must be fit-tested on issue and then yearly after that.

HYDROGEN SULPHIDE (H_2S)

- a gas with a rotten egg smell at low concentrations
- at high concentrations will poison the olfactory nerves resulting in loss of smell
- heavier than air
- explosive at high concentrations in the presence of sufficient oxygen and a spark source

Source: a by-product of the Kraft process and a by-product of rotting organic material -- i.e. pulp
Location: Batch Digesters, Kamyr and M&D Digesters, Recovery Building, Brown Stock Washers and related equipment such as: Seal Tanks, Blow tanks

HAZARDS of HYDROGEN SULPHIDE	
GAS	
0.008 ppm	Odour Threshold -- the point at which most people can begin to detect the odour
10 ppm	WCB ceiling exposure limit
20 - 25 ppm	irritation of respiratory tract, headaches, eye disorders (clouding and blurring)
100 ppm	destroys sense of smell within 15 minutes
200 ppm	**instant loss of smell, burning of eyes and throat**
250 ppm	lung tissue swells and fills with fluid impairing respiration
300 ppm	Immediately Dangerous to Life and Health
500 ppm	loss of reasoning, balance, respiratory problems
700 ppm	loss of consciousness, breathing will stop
1000 ppm	respiratory paralysis, convulsions, DEATH
40000 - 440000 ppm	Explosive / flammability range of H_2S

GENERAL
H_2S affects the ability to breathe and in high enough concentrations can lead to death
Low concentrations will cause headache, dizziness or nausea
H2S is flammable and explosive under some conditions.
Extinguish fires with water spray, dry chemical or carbon dioxide
PROTECTION and FIRST AID
Avoid eye and skin contact -- may cause irritation of moist skin and mucous membranes
Flush eyes for 15 minutes with fresh water -- Note: contact lenses will hinder eye washing
Avoid inhalation -- evacuate to fresh air immediately -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Minimum Required Respiratory Protection For Work in an H_2S Contaminated Environment:
10 - 300 ppm: Supplied air respirator (SAR) with a full face piece, helmet or hood or SCBA
> 300 ppm: Positive pressure SAR or SCBA (see plant protection officer or hygienist for information)
40,000 – 440,000 ppm: H_2S is flammable and / or explosive within this range of concentration
Note: face sealing respirators must be fit-tested on issue and then yearly after that.

METHYL MERCAPTAN (CH_3SH)

- a colourless gas at room temperature and pressure with an extremely disagreeable odour of rotten cabbage
- heavier than air and may travel a considerable distance to a source of ignition and flash back
- can form explosive mixtures with air
- burned in the Lime Kiln

Source: by-product of kraft pulping processes and Recovery
Location: Batch Digesters, Kamyr and M&D Digesters, Recovery Building, Brown stock washers and related equipment such as: Seal Tanks, Blow tanks

HAZARDS of METHYL MERCAPTAN	
GAS	
0.002 ppm	Odour Threshold -- very good odour warning properties
0.5 ppm	WCB allowable 8 hour time weighted average (TWA) -- also the ceiling limit
4 ppm	headaches and nausea
400 ppm	Immediately Dangerous to Life and Health (IDLH)
>10,000 ppm	a few minutes exposure – 45 minutes later – DEATH
39,000 - 218,000 ppm	Flammable

GENERAL
Methyl, ethyl, propyl & butyl mercaptans along with reduced sulphur gases (i.e. dimethyl disulphide, dimethyl sulphide) are noted for causing discomfort from the strong, offensive smell and, at high enough concentrations, respiratory difficulties that can ultimately lead to death
Irritating to eyes, skin nose ,throat and lungs
Chronic exposure may cause fatigue, headache, dizziness, hoarseness, cough and irritability
Incompatible with strong oxidizing agents
Can react with steam to produce toxic, flammable H_2S gas
Extinguish fires with alcohol type foam, carbon dioxide or dry chemical
PROTECTION and FIRST AID
Avoid eye and skin contact -- wear chemical safety goggles -- flush eyes with freshwater for 15 minutes
Avoid inhalation -- evacuate to fresh air immediately -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Minimum Required Respiratory Protection For Work in a Mercaptan Contaminated Environment: 3 - 5 ppm — **Fit-tested** chemical cartridge respirator with organic vapour cartridge 5 - 12.5 ppm — **Fit-tested** powered air purifying respirator with organic vapour cartridge 12.5-25 ppm — Chemical cartridge respirator with full face piece and organic vapour cartridge 25 - 400 ppm — Supplied air respirator (SAR) with half mask and operated in a pressure-demand or other positive pressure mode or SCBA **Note: face sealing respirators must be fit-tested on issue and then yearly after that.**

NATURAL GAS, METHANE (CH_4)

- an odourless, colourless, tasteless gas (mercaptan is added as an odorizer)
- transported via pipeline from the Pacific Coast Energy Pipeline, "Island" pipeline
- also received as a calibration gas in compressed gas cylinders
- **FLAMMABLE**
-

Use: fuel for power boilers, calibration gas
Location: Natural Gas Station and Pipeline Steam Plant, Lab

HAZARDS of NATURAL GAS
GAS
Natural gas is a simple asphyxiant - which means it causes suffocation by lack of oxygen due to displacement below 18 % oxygen
Initially with slow developing asphyxia there may be rapid respiration and pulse, air hunger, dizziness, reduced awareness, tightness in the head, tingling sensations, incoordination, faulty judgement, emotional instability, and rapid fatigue
As asphyxia progresses, nausea, vomiting, collapse, unconsciousness, convulsions, deep coma, and death are possible

GENERAL
Extreme fire hazard when natural gas is exposed to heat or flame
Extinguish unwanted fires with dry chemical or carbon dioxide, for larger fires use water spray, fog or regular foam
Ensure general dilution ventilation in confined spaces
PROTECTION and FIRST AID
Avoid confined spaces where natural gas could be released -- remove from exposure area to fresh air immediately -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Avoid work that could create sparks in areas where natural gas could be confined

WELDING FUMES

- Very fine solid particulates formed when metal is heated above its boiling point.
- Particles are generally smaller than 0.1 micron in diameter.
- May be present while welding / grinding without having a visible smoke plume.
- Welding fumes are also produced from oxy-fuel and plasma cutting, brazing, gouging.
- Different types of metal contain different hazards.

Use: by-product produced from welding, cutting, and other hot work which involves the heating of metal.

Location: Welding Shop, Field Hot Work Locations

HAZARDS of WELDING FUMES
Vapour / Airborne Solids
Stainless steel contains hexavalent chromium, which is highly toxic. Hexavalent chromium can damage eyes, skin, nose, throat, and lungs and can cause cancer.
Welding fumes can contain metals such as Aluminium, Antimony, Arsenic, Beryllium, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Titanium, Vanadium and Zinc.
Welding gasses used for shielding can include Argon, Helium, Nitrogen, and Carbon Dioxide.
Process gasses for welding can include Nitric Oxide, Nitrogen Dioxide, Carbon Monoxide, Ozone, Phosgene, Hydrogen Fluoride, and Carbon Dioxide.
Recent studies show that welding fumes may be associated with neurological diseases like Parkinson's.

GENERAL
Extreme fire hazard when natural gas is exposed to heat or flame
Flux core arc welding (FCAW) and shielded metal arc welding (SMAW) produce the most welding fume.
Tungsten inert gas (TIG) welding produces the least welding fume.
Welding outdoors or in open work spaces does not guarantee adequate ventilation.

PROTECTION and FIRST AID
Welding Fumes penetrate into the alveoli regions of the lungs.
Acute short term exposure to welding fumes can cause eye, nose, and throat irritation, dizziness, and nausea.
Workers should try to stay upwind of welding fume sources.
Exhaust systems should be used to prevent welders and other workers from harmful fumes.
When welding in the Welding Shop ensure that blast gates on unused hoods are closed to improve exhaust flow at the location of welding.
Ensure adequate ventilation prior to welding / hot work.
A filter type respirator is recommended, especially in areas that do not have good ventilation or exhaust.
Workers feeling symptoms such as dizziness or nausea should report to First Aid. If symptoms persist, seem attention from a health care professional.

COMPRESSED AIR

* Non-flammable gaseous mixture containing normal atmospheric concentrations and mixture of gasses.
* Present in compressed air lines, as well as compressed air bottles.
* Bottles must be stored with valves closed and capped, and must be secured while in storage and use.
* Inspect compressed air tools, tanks, bottles, hoses, regulators, and other components regularly.

Use: Cleaning, Pneumatic Equipment, SCBA Bottles, Produced by Compressors
Location: Mill wide including chip system and Protection Office

HAZARDS of COMPRESSED AIR
Gas
Compressed air is quite forceful and can dislodge particles various. These particles can then enter eyes, ears, or abrade skin.
Dislodged dirt and dust particles become airborne and present a respiratory hazard.
Compressed air can enter the body where skin is not present and cause damage. Normal routes of entry include nose, mouth, eyes, ears, rectum, navel, and any punctured or missing skin.
Air bubbles can be forced into a person's bloodstream and cause an embolism. An embolism can block blood vessels and arteries quickly causing coma, paralysis, or death depending on the size of the embolism.
Compressed air at only 5 PSI can rupture the oesophagus or lungs.
40 PSI air at 4" distance can rupture eardrums and potentially cause brain damage.
As low as 12 PSI can blow an eyeball from its socket.
The sound from a compressed air hose can reach 120-130 dB, which is well above the permissible limit.
Whenever possible, use sweeping or vacuuming techniques in place of compressed air cleaning.
Never use compressed air to clean clothing or hair.
Never point a compressed air source at yourself or another person.

PROTECTION and FIRST AID
Use goggles suitable for dust exposure when working with compressed air. Wear a face shield if needed.
For cleaning activities with compressed air, use a dust mask to protect your respiratory system.
Plan ahead. Workers should try to stay upwind of airborne particles dislodged by compressed air.
Hearing protection must be worn while working with compressed air.
Seek medical attention immediately if you suspect that compressed air has breached or bypassed your skin and entered your body. Besides the serious risks of embolism; even a small amount of air can cause infection, resulting in possible amputation.
Cylinders and tanks exposed to fire or extreme temperatures can vent or rupture violently. Cool by spraying with water.
Compressed air supports combustion by replenishing the fire's oxygen. In the event of fire, shut off sources of compressed air whenever possible.

HAZARDOUS LIQUIDS

AMMONIA (NH_3)

* a colourless gas with a sharp, penetrating, pungent, suffocating, intensely irritating odour detectable at 1 - 5 ppm
* reacts vigorously with water, producing heat to form ammonium hydroxide which is strongly alkaline
* delivered by truck as a liquid under pressure

Use: used at pulp mills as a source of nitrogen for bacteria in secondary treatment plants

HAZARDS of AMMONIA

LIQUID

Eye contact -- serious injury or blindness

Skin contact -- 1st and 2nd degree burns that can be severe and FATAL

Ingestion -- will produce headaches, salivation, nausea, vomiting, severe pain in the mouth, chest and abdomen

GAS

1 - 5 ppm	Odour Threshold
20 - 25 ppm	most people complain of the smell
25 ppm	WCB 8 hour time weighted average
35 ppm	WCB 15 minute short term exposure limit
100 ppm	respiratory tract irritation
140 ppm	eye irritant
500 ppm (NIOSH)	Immediately Dangerous to Life and Health
2500-6500 ppm	dyspnea, bronchospasm, chest pain and pulmonary edema -- FATAL
10000 ppm	mildly irritating to moist skin
>30000 ppm *(skin)*	stinging sensation and may produce burns and blistering
160000-250000 ppm	flammable

Eye contact -- slight irritation, tearing to severe irritation, **swollen eyelids -- cornea damage -- blindness could result**

Inhalation -- coughing, breathing difficulties, death due to suffocation or edema

Long term exposure to NH_3 gas -- painful breathing, severe burns to nose and throat, asthma, persistent cough, headache, drowsiness and laryngitis

GENERAL

Liquid ammonia in contact with strong oxidizers may cause fires and explosions

Liquid NH_3 in contact with halogens may cause violent spattering

Liquid ammonia in contact with hypochlorite bleaches may form highly explosive products

Mixing Liquid NH_3 with regular bleach: The bleach will break down into Hydrochloric Acid (HCl), which reacts with the ammonia to produce toxic chlorine gas.

Mixing liquid NH_3 with bleach can produce and spatter liquid hydrazine if enough ammonia is present.

Liquid form attacks some plastics, rubber and coatings

PROTECTION and FIRST AID

Avoid skin and eye contact -- NO contact lenses as they hinder eye washing -- wear chemical safety goggles

Wear rubber or neoprene gloves and boots

Flush eyes immediately with warm water for at least 20 minutes while holding eyelids open --seek Medical Aid

Remove contaminated clothing and wash skin with warm water for 20 minutes -- seek Medical Aid

Avoid inhalation -- evacuate to fresh air immediately -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

Minimum Required Respiratory Protection For Work in an Environment Contaminated with Ammonia:

25 - 50 ppm	**Fit-tested** half face piece respirator with ammonia cartridge
50 - 150 ppm	**Fit-tested** full face piece respirator with ammonia cartridge
150 - 250 ppm	Supplied air respirator (SAR) with full face piece, helmet or hood -- SCBA for emergency
>250 ppm	Positive pressure SAR (see plant protection officer or hygienist)
>500 ppm	Wear vapour proof suit (kept in the SET plant storage room)

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

BLACK LIQUOR

* a thick, black, slippery liquid that looks like molasses with a rotten egg odour
* spent kraft pulping liquor (15-70 % solids)
* pH 11-13
* not flammable under normal conditions
* black liquor is often hot while in use or extraction, and can cause thermal burns in addition to chemical burns.

Use: burned in mill recovery boiler for energy value of organic portion and for recovery of inorganic fraction for re-use

Location: Batch Digesters, Kamyr and M&D Digesters, Recovery Building, Brown stock washers and related equipment such as: Seal Tanks, Blow tank

HAZARDS of BLACK LIQUOR
LIQUID
Eye contact -- corneal scaring and possible blindness.
Skin contact – potentially serious thermal and chemical burns -- soapy feeling.
Ingestion -- serious damage to mouth, throat and stomach. Toxic if swallowed.
VAPOUR or MIST
Breathing mist or vapour will irritate upper respiratory tract.

GENERAL
Black liquor is typically very hot -- thermal and chemical burns
If in contact with acids can release H_2S gas – see hazards of Hydrogen Sulphide (H_2S)
Vessels which have contained black liquor should be checked for Hydrogen Sulphide (H_2S) and initially tested for Methyl Mercaptans before entering
Hazardous ingredient to be aware of: NaOH – see hazards of Caustic (NaOH)
Can decompose to form reduced sulphur gases (mercaptans) -- see hazards of Methyl Mercaptans
Corrosive to brass (due to NaOH content)
Corrosive to aluminum, zinc or tin and contact may produce explosive hydrogen gas
PROTECTION and FIRST AID
Avoid eye and skin contact Note: contact lenses will hinder eye washing because of the NaOH content – wear chemical safety goggles
Wear alkaline resistant rubber gloves
Flush eyes immediately with fresh water for at least 15 minutes, holding lids apart to ensure entire eye is flushed -- seek Medical Aid
Wash skin immediately with fresh water until after the slippery feeling is gone -- seek Medical Aid
Avoid breathing mist or vapour -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

BUNKER C, FUEL OIL

* a clear to yellow viscous liquid with a petroleum oil odour
* delivered to the mill by petroleum truck or railcar
* **FLAMMABLE**.

Use: fuel for lime kilns, auxiliary fuel for power and recovery boilers
Location: Lime kilns, Steam Plant and Recovery, Storage Tank by Chip Dump

HAZARDS of BUNKER C
LIQUID
Eye contact -- may be irritating to the eyes
Skin contact -- practically non-toxic, may be slightly to moderately irritating -- repeated or prolonged contact may result in defatting, oil acne, redness, itching, inflammation, cracking and possible secondary infection
Ingestion -- practically non-toxic, may cause gastrointestinal disturbances -- symptoms may include irritation, nausea vomiting and diarrhea
VAPOUR or MIST
Inhalation may cause respiratory tract irritation, and harmful central nervous system (CNS) effects: excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma respiratory arrest and DEATH

GENERAL
Dangerous when exposed to heat or flame – containers may explode in heat (<60°C) or fire
Flammable light hydrocarbons may be present in confined tank headspaces
Irritating and toxic hydrogen sulphide gas may be found in confined vapour space
Contact with heated oil may cause thermal burns
Avoid contact with strong acids, peroxides, alkalis and oxidizers -- fire hazard – extinguish fires with water spray, dry chemical, foam or carbon dioxide
PROTECTION and FIRST AID
Avoid breathing oil mists -- oil coats lungs and oxygen transfer cannot take place -- possible brain damage and death -- evacuate to fresh air -- if breathing has stopped call 2400 for medical assistance, begin artificial respiration (AR)
Avoid eye contact -- wear safety glasses or chemical safety goggles -- flush eyes immediately with large amounts of water for at least 15 minutes -- seek Medical Aid – Note: contact lenses may hinder eye washing
Avoid skin contact -- wear Sol-Vex Nitrile gloves
Remove contaminated clothing immediately and wash skin thoroughly with soap and water -- seek Medical Aid

CAUSTIC, SODIUM HYDROXIDE (NaOH)

* a clear to milky white, slippery, odourless liquid
* pure NaOH is a white corrosive, alkaline, deliquescent solid
* least expensive soluble strong base
* delivered by railcar as a 50 % solution.

Use: widely used throughout pulp and paper mills -- TMP, Kraft, Stock Prep, SET Plant, Steam Plant, Recovery
Location: Recaust, Digesters, Bleach Plant, R8 Generator, Steam Plant, Recovery, Chemical Unloading

HAZARDS of CAUSTIC SODA

LIQUID

Eye contact -- causes disintegration and sloughing of conjunctival and corneal opacification -- complications of severe eye burn are <u>adhesion of the lid to the eyeball</u>
-- NO contact lenses

Skin contact -- soapy feeling -- may lead to severe burns and deep ulceration if not washed

Ingestion -- 1.95 g ingested may cause DEATH

Very corrosive to all body tissues -- eyes, mucous membranes and skin

VAPOUR or MIST

noticeable irritation of the nose, throat and eyes

WCB allowable 8 hour ceiling (TLV) threshold limit value

Immediately Dangerous to Life and Health (IDLH)\

Inhalation of concentrated mists can cause damage to the upper respiratory tract, can be mild irritation to destructive burns -- severe pneumonitis may occur

Exposure to mist may cause multiple small burns with hair loss

GENERAL

Considerable heat is generated when liquid Caustic Soda is added to water -- boiling may occur and spattering may result

When heated to decomposition NaOH emits toxic fumes of NaO_2

Violent reaction with acids

Corrosive to containers and handling equipment -- *no brass* (use plastic or other non-metals)

Corrosive to aluminum, zinc or tin and contact may produce explosive hydrogen gas

PROTECTION and FIRST AID

Avoid skin and eye contact -- wear chemical safety goggles -- NO contact lenses

Wear gloves -- Butyl (17 mil), Sol-Vex Nitrile NBR, neoprene unsupported, Neox supported neoprene, polyvinyl chloride PVC

If caustic gets into eyes wash immediately with warm water for at least 30 minutes -- 50 % caustic will gel at 50° F (20 % caustic is okay to wash with water above 0° F) -- seek Medical Aid

Wash skin with plenty of fresh warm water until the slippery feeling is gone, at least 15 minutes -- seek Medical Aid

Avoid inhalation of vapour or mist -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR) -- seek Medical Aid

Minimum Required Respiratory Protection For Work in an Environment Contaminated with Caustic Mist:

2 - 100 mg/m^3	**Fit-tested** full face piece respirator with a high efficiency particulate (HEPA) filter
100 - 200 mg/m^3	**Fit-tested** powered air purifying respirator with a full face piece and a HEPA filter
>200 mg/m^3	Positive pressure supplied air respirator (SAR) or SCBA (see plant protection officer or hygienist)

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

DIESEL

* a clear to slightly yellow petroleum derived liquid with a distinct petroleum oil smell
* may be dyed red for taxation purposes
* gasoline is a mix of chemicals including alkenes and other hydrocarbons
* delivered by fuel truck to the mill filling station
* keep away from heat and sources of ignition

Use: commonly used as engine fuel
Location: gas pumps, vehicles, mobile equipment, auxiliary drives

HAZARDS of DIESEL

LIQUID

Eye contact – causes irritation
Skin contact – causes irritation - wash with soap and water
Ingestion – Abdominal pain, bloody stools, burning of the oesophagus, vomiting with possible blood. Rinse mouth with water. Do not induce vomiting unless directed by a medical professional.
Aspiration hazard if swallowed – can enter the lungs and cause damage
Nervous System – headache, dizziness, fatigue, muscular weakness, drowsiness, and loss of consciousness

VAPOUR or MIST

noticeable irritation of the nose, throat and eyes
Airways & Lungs – causes difficulty breathing and throat swelling
15 ppm ACGIH TWA, 8 hour exposure maximum

GENERAL

Highly flammable, keep away from spark and open flame.
Avoid exposure to high temperatures and direct sunlight.
Diesel can auto-ignite at around 225° Celsius.
Diesel can accumulate static charge and self-ignite.
Diesel evaporates more easily in warm weather, releasing more volatile organic compounds that contribute to health.
Vapours are heavier than air and may travel a considerable distance to an ignition source and flash back.
Combustion of diesel produces carbon monoxide, carbon dioxide, nitrogen oxides (NO_x), sulphur oxides (SO_x) smoke, and irritating vapours as products of incomplete combustion.
Decomposition of diesel can also release H_2S when heated or decomposing.
Incompatible with oxidising agents and acids.
Explosive at concentrations ranging from 0.7% to 6.0% by volume.

PROTECTION and FIRST AID

Avoid skin and eye contact. If you get diesel on your skin, wash with soapy water right away to avoid potential skin irritations.
Wear gloves – PVA (polyvinyl acetate) or Viton gloves, or another approved chemical protective glove. Change gloves at the first sign of hardening or cracks.
If diesel gets into eyes remove contact lenses and wash immediately with warm water for 15 minutes. Seek medical assistance.
Wash skin with plenty of fresh warm water for at least 15 minutes -- seek Medical Aid
Avoid inhalation of vapour or mist -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR) -- seek Medical Aid
Extinguish with dry chemical, carbon dioxide, water fog, or foam. Do NOT use water jets. Keep containers exposed to fire cool with water spray.
Prevent fire extinguishing water from contaminating surface or ground water. Soak up with inert absorbent material. Non-sparking tools must be used for clean-up.

Minimum Required Respiratory Protection:

<=15 ppm	**Fit-tested** full face piece respirator with an organic vapour cartridge 
>15 ppm	A Hazard / Risk Assessment and a Safe Work Plan (SWP) must be completed to determine the required respiratory protective equipment. Review the Diesel SDS for more information.

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

GASOLINE

* a clear to slightly yellow or green petroleum derived liquid with a distinct smell
* may be dyed red for taxation purposes
* gasoline is a mix of chemicals including alkenes and other hydrocarbons
* delivered by fuel truck to the mill filling station
* keep away from heat and sources of ignition

Use: commonly used as engine fuel
Location: gas pumps, vehicles, mobile equipment, auxiliary drives

HAZARDS of GASOLINE

LIQUID

Eye contact – causes pain and potential loss of vision

Skin contact – wash with soap and water immediately -- irritation and burns

Ingestion – Abdominal pain, bloody stools, burning of the oesophagus, vomiting with possible blood. Rinse mouth with water. Do not induce vomiting unless directed by a medical professional to do so.

Aspiration hazard if swallowed – can enter the lungs and cause damage

Nervous System – Convulsions, depression, dizziness, drowsiness, euphoria, headache, staggering, seizures, weakness, and loss of alertness

VAPOUR or MIST

noticeable irritation of the nose, throat and eyes

Airways & Lungs – causes difficulty breathing and throat swelling

Contains benzene. Chronic exposure can increase the risk of leukemia and other blood disorders

300 ppm	OSHA TWA, 8 hour exposure maximum
500 ppm	OSHA STEL, 15 minute exposure maximum

GENERAL

Gasoline contains benzene, which is a group 1 carcinogen and can contribute to causing cancer

Highly flammable, keep away from spark and open flame

Gasoline can auto-ignite at around 257° Celsius.

Gasoline evaporates more easily in warm weather, releasing more volatile organic compounds that contribute to health problems and to the formation of ground-level ozone and smog.

Vapours are heavier than air and may travel a considerable distance to an ignition source and flash back.

It takes 15 kilograms of oxygenated air to burn 1 kilogram of gasoline. This reaction will consume oxygen from an area quickly.

Combustion of gasoline produces carbon monoxide, carbon dioxide, nitrogen oxides (NO_x), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke, and irritating vapours as products of incomplete combustion.

PROTECTION and FIRST AID

Avoid skin and eye contact. If you get gasoline on your skin, wash with soapy water right away to avoid potential skin irritations

Wear gloves – PVA (polyvinyl acetate) or Viton gloves, or another approved chemical protective glove. Change gloves at the first sign of hardening or cracks.

If gasoline gets into eyes wash immediately with warm water for 15 minutes. Do not rub the eye. Seek medical assistance.

Wash skin with plenty of fresh warm water until the slippery feeling is gone, at least 15 minutes -- seek Medical Aid

Avoid inhalation of vapour or mist -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR) -- seek Medical Aid

Extinguish with dry chemical, carbon dioxide, water fog, or foam. Do NOT use water jets. Keep containers exposed to fire cool with water spray.

Prevent fire extinguishing water from contaminating surface or ground water. Soak up with inert absorbent material. Non-sparking tools must be used for clean-up.

Minimum Required Respiratory Protection:

<300 ppm	**Fit-tested** full face piece respirator with an organic vapour cartridge 
>=300 ppm	A Hazard / Risk Assessment and a Safe Work Plan (SWP) must be completed to determine the required respiratory protective equipment Review the Gasoline SDS for more information.

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

GREEN LIQUOR

* a green, slippery liquid with a pH ~13
* the product of smelt (inorganics recovered from incineration of black liquor in a recovery boiler) dissolving in weak wash

Use: conversion to white liquor
Location: Recovery Building, Recaust, Storage Tank

HAZARDS of GREEN LIQUOR
LIQUID
Eye contact -- corneal scaring and possible blindness
Skin contact -- thermal and chemical burns -- soapy feeling
Ingestion -- serious damage to mouth, throat and stomach
VAPOUR or MIST
Breathing mist or vapour will irritate upper respiratory tract

GENERAL
Green liquor is typically very hot -- thermal and chemical burns
If in contact with acids can release H_2S gas --see hazards of Hydrogen Sulphide (H_2S)
Hazardous ingredient to be aware of: NaOH -- see hazards of Caustic (NaOH)
Corrosive to brass (due to NaOH content)
Corrosive to aluminum, zinc or tin and contact may produce explosive H_2 gas
PROTECTION and FIRST AID
Avoid eye and skin contact -- Note: contact lenses may hinder eye washing
Wear chemical safety goggles and rubber alkaline resistant gloves
Flush eyes immediately with fresh water for at least 15 minutes -- seek Medical Aid
Wash skin immediately with fresh water until the slippery feeling is gone -- seek Medical Aid
Avoid breathing mist or vapour -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

HYDROGEN PEROXIDE (H_2O_2)

* a clear, colourless liquid with a slight, sharp odour
* strong oxidizer -- very corrosive
* delivered by railcar or truck as a 70 % (or 59%) solution

Use: bleaching agent for pulp and paper
Location: Bleach Plant, Kraft Mill, Storage Tanks

HAZARDS of HYDROGEN PEROXIDE	
LIQUID	
Eye contact -- can cause ulceration of the cornea and <u>blindness</u> -- may not appear until later -- **loss of sight can result in 40 seconds after eye contact with 70% H_2O_2**	
Skin contact -- very corrosive to skin -- skin whitens temporarily after contact -- H_2O_2 decomposes to water and oxygen	
Ingestion -- corrosion of gastrointestinal tract -- could be life threatening	
Severe systemic poisoning may also cause headache, dizziness, vomiting, diarrhea, tremors, numbness, convulsions, pulmonary edema, unconsciousness, and shock	
VAPOUR or MIST	
1 ppm	WCB allowable 8 hour time weighted average
2 ppm	WCB 15 minute short term exposure limit
100 ppm	irritating to eyes
Short term exposure to high concentrations of liquid vapour or mist is a greater concern than long term exposure to low concentrations	
If inhaled will irritate upper respiratory tract with inflammation of the nose and throat	
H_2O_2 vapour can irritate eyes and skin and bleach hair	
GENERAL	
Solutions as low as 16 % H_2O_2 can start fires	
H_2O_2 solutions over 20 % are considered dangerous substances	
Splashes on clothing (cotton, rayon, wool, leather) could start a fire after drying occurs -- wear polyester or acrylic	
Extinguish fires with water only	
Solutions of >60 % H_2O_2 can react extremely violently, sometimes explosively with many substances: acids, bases, metals, salts of metals, reducing agents, organic materials, flammable materials 	
Avoid contaminating, confining, or contacting H_2O_2	
Always have water available around H_2O_2	

PROTECTION and FIRST AID	
Avoid eye and skin contact -- wear chemical safety goggles and face shield -- Note: contact lenses may hinder eye washing	
Flush eyes immediately with fresh water for at least 15 minutes while holding eyelids open -- seek Medical Aid	
Wear special protective clothing -- goggles and face shield, neoprene or rubber coats, pants, boots, hat and gloves (Sol-Vex Nitrile NBR, polyvinyl chloride PVC or natural rubber)	
Remove contaminated clothing and wash skin with large amounts of water -- seek Medical Aid	
Avoid inhalation -- do ***not*** use respirator cartridges that contain an oxidizable sorbant because of excessive heat -- evacuate to fresh air seek Medical Aid	
Minimum Required Respiratory Protection For Work in an Environment Contaminated with H_2O_2 mist:	
1 -10 ppm	Supplied air respirator (SAR) or SCBA
10 - 50 ppm	SAR with full face piece, hood or helmet 
>50 ppm	Positive pressure SAR (see plant protection officer or hygienist)
Note: face sealing respirators must be fit-tested on issue and then yearly after that.	

METHANOL, WOOD ALCOHOL (CH_3OH)

* a clear, colourless highly polar liquid with an alcohol odour
* delivered to the mill as a liquid
* **FLAMMABLE.**

Use: used for chlorine dioxide generation
Location: Storage Tank, R8 Generator

HAZARDS of METHANOL

LIQUID

Skin contact -- prolonged skin contact can cause visual disturbances and blindness -- WCB *skin* notation below

Ingestion -- if ingested 2 - 8 oz. is FATAL -- most serious problem with ingestion is the belief that it is ethanol that is being consumed

VAPOUR or MIST

200 ppm (260 mg/m^3) *(skin)*	WCB 8 hour allowable time weighed average (TWA)
250 ppm (310 mg/m^3) *(skin)*	WCB 15 minute allowable short term exposure limit (STEL)
200 - 375 ppm	can cause headaches
800 - 1000 ppm	for 8 hours can seriously affect eyes
2000 - 5900 ppm	Odour Threshold -- poor odour warning quality
1200 - 8300 ppm	visual disturbances, dilated unreactive pupils and dim vision
3000 ppm	methanol accumulation in the body occurs
4000 - 13000 ppm	12 hours exposure caused DEATH
25000 ppm	Immediately Dangerous to Life and Health (IDLH NIOSH)
60,000 - 365,000 ppm	flammable

GENERAL

Keep heat and sparks away from spills -- VERY FLAMMABLE -- methanol burns with a clear flame --> very hard to see -- extinguish fires with CO_2, dry chemical, alcohol foam, or water mist

Inhalation of vapours can cause visual disturbances and blindness

Absorption rate is very high after ingestion or inhalation -- initial inebriation is mild and transient, with signs of poisoning occurring 6 - 30 hours after exposure

Methanol is slowly eliminated from the body, mainly through breathing -- repeated exposures results in an increasing concentration in blood and tissue

Chronic poisoning from repeated exposure can lead to symptoms such as: conjunctivitis, headache, giddiness, insomnia, gastric disturbances, bilateral blindness

PROTECTION and FIRST AID

Avoid eye and skin contact -- to avoid skin contact with methanol vapour, wear impervious coveralls, boots and gloves (neoprene unsupported or polyvinyl chloride PVC) -- wear chemical safety goggles and face sheild

Flush eyes immediately with lukewarm water for at least 15 minutes while holding eyelids open -- refer to Medical Aid

Remove contaminated clothing and wash skin immediately with warm water for 15 minutes -- apply skin lotions

If ingested refer to Medical Aid -- if conscious give water and induce vomiting -- administer 1 tsp. of baking soda in water

Avoid breathing vapours -- ensure adequate ventilation (minimum 100 L/min) to meet TWA requirements of 200 ppm -- evacuate to fresh air and prevent further exposure for 7 days -- refer to Medical Aid if victim is not fully normal within 10 minutes

Minimum Required Respiratory Protection For Work in an Environment Contaminated with Methanol mist:

200 - 2000 ppm	Supplied air respirator (SAR) or SCBA
2000 - 10000 ppm	SAR with a full face piece, helmet or hood -- or SCBA
>10000 ppm	Positive pressure SAR (see plant protection officer or hygienist)

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

NITROGEN (N_2)

* liquid nitrogen is colourless, odourless and similar in appearance to water
* nitrogen gas is inert, colourless and odourless
* nitrogen gas is non-combustible and non-explosive
* delivered by truck as a cryogenic liquid under pressure

Use: railcar padding for chemical unloading
Location: Chemical Unloading

HAZARDS of NITROGEN
LIQUID
Liquid nitrogen will cause rapid freezing of fingers or other tissues that come into contact.
GAS
Nitrogen gas is a simple asphyxiant - hazardous if it displaces oxygen to below 18% -- **confined spaces and enclosed areas low in oxygen are dangerous --** lack of oxygen may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, unconsciousness and DEATH.

GENERAL
The biggest problem with nitrogen is how reactive compounds are -- especially NO_x (i.e. NO_2, NO_3, etc.)
Liquid nitrogen cannot be handled in carbon or low alloy steels -- use 18-8 or 18-10 stainless steels -- see SDS for other acceptable metals
PROTECTION and FIRST AID
Avoid skin and eye contact with liquid form -- wear chemical safety goggles and loose-fitting insulated gloves -- wear cuffless pants outside high top shoes
Flush eyes with lukewarm water for 15 minutes
Clothing frozen to the skin should be thawed before removing -- thaw skin with warm water not hot -- keep victim warm and quiet -- seek Medical Aid
Avoid breathing high concentrations of nitrogen gas as oxygen will be displaced -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Wear a self-contained breathing apparatus (SCBA) for rescue

OXYGEN (O_2)

* a light blue, odourless cryogenic (low temperature) liquid
* generated on site in the PRAXAIR oxygen plant by the SET Plant

Use: used in bleaching
Location: Bleach Plant

HAZARDS of OXYGEN
LIQUID
Liquid oxygen can cause severe frostbite burns if splashed in eyes or on skin
Walking on liquid O_2 (spills) could cause explosion
Incompatible with flammable and combustible material, especially oils and grease
GAS
Breathing >80% O_2 may cause nasal stuffiness, cough, sore throat, chest pain, and breathing difficulty
Breathing pure O_2 under pressure may cause lung damage and central nervous system (CNS) effects resulting in dizziness, poor co-ordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions

GENERAL
NO smoking in O_2 enriched areas -- explosion hazard
NO contact between liquid oxygen and oily clothes or greasy tools -- fire hazard!
Oxygen aggressively supports combustion, which increases the risk of fire and / or explosion of substances from other sources.
PROTECTION and FIRST AID
Avoid eye and skin contact with liquid form -- wear chemical safety goggles and loose-fitting insulated gloves -- wear cuffless pants outside high top shoes
Flush eyes with lukewarm water for 15 minutes
Clothing frozen to the skin should be thawed before removing -- thaw skin with warm water ***not*** *hot water* -- keep victim warm and calm -- refer to Medical Aid
Avoid breathing high concentrations (>80%) of oxygen -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

PROPANE (C_3H_6)

* a colourless, odourless gas in its natural state
* commercial propane has an odorant added, ethyl mercaptan, which has an odour similar to boiling cabbage
* heavier than air
* delivered to the mill by truck
* very **FLAMMABLE**

Use: fuel
Location: Lime Plant/Recaust, Recovery, Yard, Mobile Equipment

HAZARDS of PROPANE
LIQUID
Eye contact -- may cause frostbite and permanent eye damage
Skin contact -- may cause frostbite
GAS
Propane is a simple asphyxiant - dangerous if it displaces oxygen to below 18% -- can become a problem in enclosed areas

GENERAL
Will explode spontaneously when mixed with chlorine dioxide (ClO_2)
NO smoking due to fire hazard -- extinguish fires with carbon dioxide or dry chemical
Hazardous combustion product: CO
Explosive air-vapour mixtures may form if allowed to leak to atmosphere
PROTECTION and FIRST AID
Avoid skin and eye contact with liquid form -- wear chemical safety goggles and insulated gloves
Flush eyes with lukewarm water for 15 minutes
Clothing frozen to the skin should be thawed before removing -- thaw skin with warm water not hot -- keep victim warm and quiet -- refer to Medical Aid
Avoid breathing high concentrations of propane as oxygen will be displaced -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

SODIUM CHLORATE ($NaClO_3$)

- clear, colourless, odourless, non-flammable solution -- but supports combustion with the release of oxygen
- delivered by railcar to the mill as a liquid solution
- pure $NaClO_3$ is a **very flammable** white deliquescent crystal that **can ignite with light friction or spark**

Use: used to generate chlorine dioxide for bleaching
Location: R8 Generator, Chem. Shed

HAZARDS of SODIUM CHLORATE
LIQUID
Eye contact -- irritant to eyes
Skin contact -- irritant to skin
Ingestion -- can cause abdominal pain, nausea, vomiting, cyanosis, collapse -- may cause kidney and liver damage -- May be FATAL at 10 to 30 g.
Strong oxidizing reaction on body tissues -- destructive action on red blood cells
VAPOUR or MIST
Irritant to eyes and skin
Irritant to upper respiratory tract

GENERAL
Primary Hazard: may ignite or explode when mixed with oxidizable materials (oils, grease, solvents)
Cannot let dry on clothes or other surfaces because of the extreme fire hazard -- flood with water only!
(Class ABC) Fire extinguishers are prohibited from use on chlorate fires
Contact with acids will release ClO_2 gas
Incompatible with metals, phosphorous, ammonia compounds, reducing agents -- may ignite
Hazardous decomposition products: oxygen, chlorine, chlorine dioxide, perchloric acid
PROTECTION and FIRST AID
Avoid skin and eye contact -- Note: contact lenses could hinder eye washing
Wear chemical safety goggles, rubber gloves and boots, washable, non-flammable synthetic (polypropylene) clothing with pants worn over boots -- NO leather, cotton or wool
Flush eyes immediately with large amounts of water for at least 30 minutes -- seek Medical Aid
Remove contaminated clothing and wash skin with soap and large amounts of water for 20 minutes -- do *not* use skin creams or greases -- seek Medical Aid
Avoid inhalation of mist or vapour -- evacuate to fresh air -- restore or support breathing as required -- **call 2400** for medical assistance
For clean-ups, wear complete covering protective clothing made of rubber or neoprene, which must be hosed down with water immediately after contact 

SULPHURIC ACID (H_2SO_4)

* a dense, oily, clear to light brown liquid with a biting acrid odour
* strongly corrosive -- non-flammable
* delivered by railcar (or truck) as a 93% solution and is diluted on site
* most widely used industrial chemical

Use: used in the generation of ClO_2 and also in the steam plant
Location: R8 Generator, Storage Tanks, Steam Plant

HAZARDS of SULFURIC ACID

LIQUID

Eye contact -- severe burns to eyes -- could result in <u>blindness !</u>

Skin contact -- dehydrates skin causing immediate and severe 2nd and 3rd degree burns -- reddening of skin which in severe cases turns black

Ingestion -- 135 mg/kg ingested - LETHAL dose (LDLo) oral (lowest recorded lethal dose)

VAPOUR or MIST

1 mg/m^3	WCB allowable 8 hour time weighted average (TWA)
> 1 mg/m^3	odour threshold -- level at which most people can begin to detect the odour
3 mg/m^3	WCB allowable 15 minute short term exposure limit (STEL)- this level is irritating to most people and will cause a choking sensation
0.35 - 5 mg/m^3	may cause increased pulmonary air flow resistance and subsequent shallower and more rapid breathing, also eye irritation
13 - 35 mg/m^3	erosion and discoloration of teeth
80 mg/m^3	Immediately Dangerous to Life and Health (NIOSH IDLH)

Hot concentrated mists may cause rapid loss of consciousness with possible damage to lungs

High vapour concentrations may produce bloody nasal secretions and sputum, vomiting of blood, gastritis, and pulmonary edema

GENERAL

***<u>Mist only</u>* - Group 1 carcinogen (IARC) -- confirmed human carcinogen**

Strong dehydrating agent, reacting violently and with evolution of heat when mixed with water or alcohol

When diluting ALWAYS add sulphuric acid to water NEVER water to acid

Sulphuric acid reacts violently with many substances: bases, metals, organics -- see MSDS

Liquid sulphuric acid attack some forms of plastics, rubber, and coatings

PROTECTION and FIRST AID

Avoid skin and eye contact -- wear chemical safety goggles and face sheild -- contact lenses could hinder eye washing -- wear appropriate protective clothing and gloves -- Viton (9mil) gloves

Flush eyes immediately with large amounts of fresh water for at least 15 minutes -- seek Medical Aid

Remove contaminated clothing and wash skin with soap and lots of water for 15 minutes -- seek Medical Aid

Avoid inhalation of fumes -- evacuate to fresh air immediately if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

Minimum Required Respiratory Protection For Work in an Environment Containing H_2SO_4 Mist:

1 -50 mg/m^3	Gas mask with an acid gas canister and a high efficiency particulate (HEPA) filter
>50 mg/m^3	Positive pressure supplied air respirator (SAR) or SCBA (see plant protection officer or hygienist)

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

WEAK WASH

* a slippery, golden coloured liquid with a slight odour of sulphides -- pH 8-10 up to 13
* the clear liquor produced from washing the green liquor dregs and white liquor mud

Use: used in kraft pulping process, to control and minimize the dilution of the green liquor in the dissolving tank

Location: Recaust, Recovery, R8

HAZARDS of WEAK WASH
LIQUID
Eye contact -- corneal scaring and possible blindness
Skin contact -- thermal and chemical burns -- soapy feeling
Ingestion -- serious damage to mouth, throat and stomach
VAPOUR or MIST
Inhalation of vapours -- nose, throat and lung irritation

GENERAL
Weak wash is typically very hot -- thermal and chemical burns
If in contact with acids can release H_2S gas -- see hazards of Hydrogen Sulphide (H_2S)
Hazardous ingredient to be aware of: NaOH -- see hazards of Caustic (NaOH)
Hazardous combustion products: H_2(gas), H_2S(gas), Na_2O(gas)
Incompatible with aluminum, tin, zinc and brass
PROTECTION and FIRST AID
Avoid eye and skin contact -- contact lenses could hinder eye washing
Wear chemical safety goggles
Wear butyl rubber or neoprene gloves
Flush eyes immediately with plenty of fresh water for at least 15 minutes -- refer to Medical Aid
Wash skin with plenty of warm water until the slippery feeling is gone
Avoid breathing vapour -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR) (AR) -- refer to Medical Aid

WHITE LIQUOR

* a white to gold coloured solution
* pH 13-14 -- very corrosive
* produced on site by reacting green liquor with slaked lime in the causticizing process
* not flammable under normal conditions

Use: digestion of wood chips in the kraft pulping process
Location: Recaust, Batch Digesters, Kamyr and M&D Digesters, Bleach Plant, R8

HAZARDS of WHITE LIQUOR
LIQUID
Eye contact -- corneal scaring and possible blindness
Skin contact -- thermal and chemical burns -- soapy feeling
Ingestion -- serious damage to mouth, throat and stomach
VAPOUR or MIST
Breathing mist or vapour will irritate upper respiratory tract

GENERAL
White liquor is typically very hot -- thermal and chemical burns
If in contact with acids can release H_2S gas -- see hazards of Hydrogen Sulphide (H_2S)
Hazardous ingredient to be aware of: NaOH -- see hazards of Caustic (NaOH)
Spills can be very slippery
Corrosive to brass (due to NaOH content)
Corrosive to aluminum, zinc or tin and contact may produce explosive H_2 gas
PROTECTION and FIRST AID
Avoid eye and skin contact. Note: contact lenses may hinder eye washing
Wear chemical safety goggles and alkaline resistant rubber gloves
Flush eyes immediately with fresh water for at least 15 minutes while holding eyelids open -- seek Medical Aid
Wash skin immediately with fresh water until the slippery feeling is gone
Avoid breathing mist or vapour -- evacuate to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

HAZARDOUS DUSTS

LIME, QUICK LIME, CALCIUM OXIDE (CaO)

* lime dust is a white-greyish, odourless solid powder
* lime is naturally derived from limestone which is primarily calcium oxide (CaO), but also contains magnesium oxide (MgO), and quartz (SiO_2)
* supplemental limestone is added to the lime kiln
* limestone is delivered as crushed lime rock by truck

Use: react with green liquor to form sodium hydroxide (NaOH) in white liquor for kraft pulping
Location: Lime Plant, Recaust

HAZARDS of LIME DUST	
2 mg/m^3	WCB 8 hour allowable time weighted average (TWA)
250 mg/m^3	Immediately Dangerous to Life and Health
Eye contact -- severe burns, possible permanent injury or blindness	
Skin contact -- irritant, dermatitis	
Inhalation -- may cause irritation to upper respiratory tract - bronchitis, pneumonia -- silicosis if silica is present	
Ingestion -- corrosive -- serious damage to mouth, throat and stomach	
GENERAL	
Hazardous ingredient in limestone: silica (SiO_2) -- crystalline silica is classified as a Group 2 (a) probable human carcinogen (IARC) -- WCB 8 hour TWA for SiO_2 is 0.1 mg/m^3 respirable dust	
Incompatible with boric oxide, acids, fluorine, steam -- contact with water causes violent spattering and heat	

PROTECTION and FIRST AID
Avoid eye and skin contact -- contact lenses may hinder eye washing and trap caustic lime dust underneath
Wear safety glasses and gloves -- wear long sleeves and pants worn outside boots -- wear impervious clothing for clean-ups 
Flush eyes immediately with fresh water for at least 15 minutes while holding lids apart -- refer to Medical Aid
Administer large quantities of water if lime is ingested and victim is conscious
Remove contaminated clothing and wash skin with water for several minutes, then with vinegar to remove all the lime
Avoid breathing high concentrations of lime dust -- wear a dust mask -- move to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)
Minimum Required Respiratory Protection For Work in a Lime Dust Contaminated Environment:

2 - 10 mg/m^3	Dust and mist respirator
10 - 20 mg/m^3	Dust and mist respirator, except single use or quarter-mask respirator
20 - 100 mg/m^3	**Fit-tested** full face piece respirator with a high efficiency particulate (HEPA) filter
>100 mg/m^3	Positive pressure supplied air respirator (SAR) or SCBA (see plant protection officer or hygienist)

Note: face sealing respirators must be fit-tested on issue and then yearly after that.

LIME MUD, CALCIUM CARBONATE ($CaCO_3$)

* an odourless, tasteless, powder or crystal
* product of the causticizing process resulting from the reaction of slaked lime (calcium hydroxide) with sodium carbonate
* it is subsequently separated, filtered and washed, and then passed to the lime kiln

Use: heated in the lime kiln to produce calcium oxide (lime)
Location: Lime Plant, Recaust

HAZARDS of LIME MUD	
10 mg/m^3 $CaCO_3$	WCB 8 hour allowable time weighted average (TWA)
20 mg/m^3 $CaCO_3$	WCB 15 minute short term exposure limit (STEL)
Eye contact -- mildly irritating	
Skin contact -- mildly irritating	
Inhalation -- mild irritation to the upper respiratory tract -- may cause silicosis if silica is present	
Ingestion -- 5000 mg/kg $CaCO_3$ lethal dose low (LDLo)	

GENERAL
Hazardous ingredient in lime mud: silica (SiO_2) -- crystalline silica is classified as a Group 2 (a) probable human carcinogen (IARC) -- WCB 8 hour TWA for SiO_2 is 0.1 mg/m^3 respirable dust
Spills of slurry can make floors very slippery
Incompatible with acids, alum, ammonium salts, fluorine
PROTECTION and FIRST AID
Avoid eye contact -- wear safety glasses -- contact lenses could trap dust underneath and hinder eye washing
Flush eyes immediately with fresh water for at least 15 minutes while holding lids apart -- seek Medical Aid
Remove contaminated clothing and wash skin with water for several minutes
Avoid breathing high concentrations of lime dust -- wear a dust mask -- move to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

WOOD DUST

* particles < 50 microns, generally 6-10 microns
* **FLAMMABLE** in high concentrations and in the presence of oxygen and a spark
*

Location: mill wide but higher concentrations around sawdust, hog, and chip storage piles, Screen Rooms, Steam Plant, chip conveyors, Carpenter Shop

Source: generated by any manual or mechanical cutting or abrasion performed on wood

HAZARDS of WOOD DUST	
1.0 mg/m^3	WCB 8 hour allowable time weighted average (TWA) for allergenic wood dusts (i.e. western red cedar)
2.5 mg/m^3	WCB 8 hour allowable time weighted average (TWA) for non-allergenic wood dusts
40,000 mg/m^3	lower explosive limit (LEL)

PROTECTION and FIRST AID
Fire hazard -- no smoking around wood dust
Avoid eye and skin contact -- wear safety glasses and gloves
Flush eyes immediately with fresh water for at least 15 minutes while holding lids apart -- seek Medical Aid
Wash skin with soap and water for several minutes
Avoid breathing high concentrations of wood dust -- wear a dust mask -- move to fresh air -- if breathing has stopped **call 2400** for medical assistance, begin artificial respiration (AR)

GENERAL
Eye contact -- conjunctivitis
Skin contact -- dermatitis
Inhalation -- irritation to respiratory tract and lungs -- may cause sneezing, bronchitis, nasal discharge, irritating cough and nasal cancer if exposure is prolonged (average of 40 years since first exposure)
Group 1 human carcinogen (IARC) -- there is no evidence of an excess risk of nasal cancer for pulp and paper mill workers
WCB "Z" designation for allergenic wood -- potential sensitizing agent
Incompatible with strong oxidizing agents (i.e. nitric acid) strong acids (i.e. sulphuric acid) and drying oils (i.e. linseed oil) -- can ignite

NOISE

* Sound waves are produced by vibrations from equipment, work processes, and other sources.
* Short term exposure to high levels of noise can temporarily effect hearing, often leaving ears ringing (tinnitus) or feeling 'stuffed up'
* Prolonged exposure to excessive noise causes damage to eardrums, which can cause permanent hearing loss.

Location: mill wide but noise levels will be higher near running machines and processes.
Source: generated by most activities including but not limited to running machines, processes, and alarm horns.

HAZARDS of NOISE	
85 dBA	WSBC 8 hour regulated limit for noise exposure. Grade 1 (Class C) or higher hearing protection must be worn for prolonged work.
83.5 dBA	Calculated exposure limit for a 12 hour work period. Grade 1 (Class C) or higher hearing protection must be worn.
100 dBA	Approximate exposure limit for a 15 minute work period. At this noise level Grade 3 (Class A) hearing protection must be worn.
140 dBC	Peak noise level not to be exceeded at any time. Impact noises such as hammering should also not exceed this limit. Prolonged exposure at this level will quickly cause damage to the eardrum. Dual hearing protection is required for prolonged work around this noise level.

GENERAL
The risk of hearing loss depends on the loudness of the noise, as well as how long workers are exposed to the noise.
Noise exposure levels are averaged across an 8 hour period. Exposure levels can be calculated for different time periods and shift lengths.
As a rule of thumb, if you have to raise your voice in the workplace to carry on a conversation, noise levels are likely around or above 84 dBA.
Hearing loss can be caused by a single extreme noise event, such as an expolosion.
Hearing loss caused by noise is permanent, and irreversible.
Annual hearing tests are necessary for pulp & paper workers. Workers must participate in hearing tests yearly as outlined by WSBC OH&S Regulation, Part 7.8

PROTECTION and FIRST AID
Hearing protection devices (earplugs / earmuffs) must be worn in areas exceeding 84 dBA.
Dual hearing protection (muffs AND plugs) is required if 8 hour exposure levels reach over 105 dBA.
Hearing protection devices are available from the Stores Counter.
Ensure hearing protection devices are maintained / cleaned / replaced as per the manufacturer's instructions.
Hearing protection devices must conform to CSA Standard Z94.2-02.
Choose hearing protection that offers enough protection for your work environment.
Ensure that hearing protection fit correctly and makes a proper seal. Hearing protection that does not fit correctly may be uncomfortable, and may offer inadequate protection.
Consider your work environment. Earplugs are often favoured over earmuffs for hot or humid areas.

HEAT (HEAT STRESS, HEAT STROKE)

* Temperature differences are common between different areas of the mill.
* Wet gloves or clothing can heat up in the presence of heat. These wet articles hold heat for longer, and as a result, may cause burns to the worker rather than radiating the heat to the air.

Location: mill wide in various process areas including but not limited to boiler areas, machine room dryer areas and presses area, top of M&D, top of Kamyr.

Source: generated by processes and equipment that use steam or chemical reactions that produce heat.

HAZARDS of HEAT	
38° Celsius Core Body Temp.	Thermal stress occurs when a worker's core body temperature rises above 38° Celsius.
Thermal stress can occur at lower temperatures if workers are acclimatized (not used to the ambient temperatures), are not properly hydrated, overdressed, or taking certain medications.	
40° Celsius Core Body Temp.	Heat stroke sets in risking damage to the brain, heart, kidneys and muscles. Heat stroke is the most severe form of thermal strain or injury.
Confusion, agitation, slurred speech, irritability, delirium, seizures and coma can all result from heatstroke.	
Heat stroke cases brought on by ambient temperatures will most likely leave the skin feeling dry and hot.	
Heat stroke cases brought on by intense activity will likely leave skin feeling moist and flushed.	

GENERAL
The worker's activity level has a direct and major effect on body temperature.
High humidity and / or low air movement will increase the rate at which body temperature rises.
Heat stress causes rapid breathing, flushed skin, and increased / racing heart rate as the body's systems struggle to lower the body's temperature.
Heat exhaustion and fainting can be caused by exposure to heat. While not fatal, these are temporarily debilitating. Fainting workers may also sustain additional injuries due to falling.

PROTECTION and FIRST AID
If you start to experience light-headedness, or dizziness leave the hot area, take a short break, and rehydrate.
If symptoms persist, seek First Aid at the Protection Office. If symptoms worsen, seek medical attention from a Physician.
Cool vests may be available to wear for hot tasks in your department. Inquire to your Supervisor to see if you have access to thermal protective equipment.
Heat stroke can be fatal. Every year workers perish from occupational heat stroke.
Workers with heat stroke require immediate medical attention. Damage from heat stroke gets worse the longer treatment is delayed.
Make immediate attempts to cool workers with heat stroke. Immediately remove from hot area, remove excess clothing, and use water, ice packs, cool air, cool mist, or cool wet towels to the worker's head, neck, armpits, and groin to cool the worker down. A cool bath or shower may quickly assist in lowering body temperature.

COLD (COLD STRESS, HYPOTHERMIA)

* Temperature differences are common between different areas of the mill, as well as outside the mill.
* Wet gloves or clothing increase the risk of hypothermia and frostbite.

Location: warehouses, chip system, hog system, outside buildings, mill grounds, and various exposed areas on site.

Source: natural and artificial cold sources, wet conditions, wet clothing, cold weather, wind.

HAZARDS of COLD	
37°-38° Celsius Core Body Temp.	The body produces heat to maintain a temperature between these points.
Early Warning:	Feeling cold means that the body is losing heat faster than it is producing it. Taking corrective to preserve body heat at this stage will prevent the onset of hypothermia.
Mild Hypothermia:	Shivering, grogginess, poor judgement or confusion. Normal breathing and pulse.
Moderate Hypothermia:	Violent shivering or shivering may stop altogether. Impaired ability to think, pay attention, and understand. Victims may not understand what is being said to them. Slow, shallow breathing, slurred speech, poor co-ordination. Slow, weak pulse.
Severe Hypothermia:	Shivering stops. Unconsciousness. Little or no breathing. Weak, irregular, or non-existent pulse. Dilated (wide open) pupils, victims may appear dead even when still alive.

GENERAL
Hypothermia can happen even on mild winter days, or damp days in fall or spring.
The worker's activity level has a direct and major effect on body temperature.
The onset of hypothermia can be gradual and delayed, even becoming noticeable after leaving work.
It is important to treat hypothermia early to prevent victim condition from worsening to moderate or severe.
Frostbite can occur in minutes if workers are not properly protected.
Cold water immersion cools the body 25 times faster than cold air.

PROTECTION and FIRST AID
Fatigue makes it difficult for the body to produce heat and increases the rate at which cold stress and hypothermia set in. Work well rested.
Wearing a hat contains a lot of body heat, as heat quickly escapes through the top of the head.
Protect yourself from loss of body heat with layered clothing. The inner layer of clothing should be breathable. The second layer should be insulating, and have the ability to absorb moisture away from the body. The outer layer should trap heat and keep dampness out.
Keep hands and feet dry and warm. Spare socks and replacement gloves should be available to replace wet articles.
Heated, non-alcoholic drinks help maintain the body's ability to produce heat adequately. Caffeinated beverages such as tea or coffee are less effective.
Keep bare hands away from wet and / or metal objects in cold environments. Workers can be affected by frostbite from something as simple as working with wet gloves or removing gloves to put chains on tires.

RADIATION

* Radioactive devices are used for measurement and monitoring certain processes and equipment.

Location: throughout the mill in various areas including LF Chip Bin, M&D Kone Bin, White Liquor Clarifiers, Lime Mud Washer and Bleach Plant Mixer & Ground Floors. See ***RSPM-29.00***.

Source: Generated by radioactive measuring devices

HAZARDS of RADIATION	
1 – 10 Sieverts (Whole Body)	Observable health effects are not expected at these levels. There could be a slight increase in the risk of cancer.
10 – 100 Sieverts (Whole Body)	Receiving this level within a short period of time can cause observable health effects, often in blood cells. The body will likely recover from these effects. Risk of cancer also increases.
100 – 200 Sieverts (Whole Body)	Receiving this level within a short period of time will cause nausea and fatigue, and will increase the risk of cancer.
200-300 Sieverts (Whole Body)	Receiving this level within a short period of time will cause nausea and vomiting within 24-48 hours, and will increase the risk of cancer.
300-500 Sieverts (Whole Body)	Receiving this level within a short period of time will cause nausea and vomiting within 24-48 hours, loss of hair within a week, and will increase the risk of cancer.
500-1200 Sieverts (Whole Body)	Receiving this level within a short period of time will likely result in death within a few days.
>10,000 Sieverts (Whole Body)	Receiving this level within a short period of time will likely result in death within a few hours.

GENERAL
Radiation dose levels are measured in Sieverts.
A radiation dose could span several years, compounding over time.
Radiation exposure drops off rapidly as distance from the source increases. Workers should maintain as much distance from sources as realistically possible.
Radiation causes damage by affecting the DNA of individual cells. These effects can be temporary or permanent, for example, causing cancer.
The risk of cancer is influenced by age, sex, and other factors such as tobacco use.
Internal exposure is when radioactive material enters the body by eating, drinking, breathing, or injection. Alpha and beta particles pose a serious health threat if a significant amount enters the body.
Gamma and X-ray particles can pass through skin and clothing into the body, depositing energy as they do.

PROTECTION and FIRST AID
Workers suffering symptoms from radiation exposure ***MUST*** seek medical attention. Report ***immediately*** to protection and seek attention from a health care professional, for example, a Doctor.
Higher level radiation exposures left untreated will continue to damage the worker, even leading to death hours, days or even weeks after exposure.
Be familiar with the locations of radioactive sources. See ***RSPM-29.00*** for a map of locations.

BLOOD BORNE PATHOGENS

* Blood borne pathogens are generally opportunistic viruses that pose significant health risks.

Location: Potentially any location where people are, or have been present.
Source: Spread by human bodily fluids and domestic sewer waste.

HAZARDS of BLOOD BOURN PATHOGENS
Common blood borne pathogens include Hepatitis B (HBV), Hepatitis C (HCV), and Human Immunodeficiency Virus (HIV).
A single exposure from a contaminated needle stick or cut has a 6% - 30% chance of infecting an unvaccinated person with Hepatitis B.
A single exposure from a contaminated needle stick or cut has approximately a 3% chance of infecting the person with Hepatitis C.
Hepatitis viruses attack and damage ***only*** the liver. Hepatitis B can cause flu-like symptoms including fever, exhaustion, nausea, stomach pain, and loss of appetite. HBV can also cause jaundice after a few weeks.
A single exposure of infected blood to the eye, nose, or mouth has approximately a 0.1% chance of causing HIV infection.
The risk after exposure to the skin with infected blood is approximately 0.1%. This risk can increase with the quantity of infected blood and larger exposed surface area.
Open sores or cuts increase the risk of infection via skin exposure.

GENERAL
Blood borne pathogens can be carried and spread by any bodily fluid excepting sweat.
Hand washing is the simplest form of prevention for infectious pathogens.
Workers should keep vaccinations up to date to maximize protection against infectious pathogens.
Safe work procedures must be developed and used for jobs which present specific risk of blood borne pathogen exposure.
Contaminated coveralls and clothing must be placed into proper laundry bins so that the dry cleaning service can clean and sterilize them.

PROTECTION and FIRST AID
Contaminated or potentially contaminated articles, materials, and substances should only be handled by protected individuals who are familiar with the risks, and how to control them.
Workers handling contaminated or potentially contaminated items must wear latex or nitrile gloves, masks, protective eyewear with side-shields, and protective gowns when dealing with contamination.
Workers must take care to ensure that bodily fluids are contained as much as possible. Saliva bearing items such as sunflower seeds should also be disposed of safely.
ALL occupational exposures must be evaluated by a health care professional, i.e. a doctor. Simple blood testing can determine if an infection has occurred.
An N95 particulate respirator will reduce the risk of infection by preventing infected droplets or particles from being inhaled.
Respirators and filters must meet ***CSA Standard CAN/CSA-Z94.4-93.***

MILL HAZARDS BY AREA

Power & Recovery	
Hazard	***Areas***
Carbon Monoxide (CO)	Forklift Corridors, Recovery Area
Dimethyl Sulphide (DMS)	Boiler Areas,
Hydrogen Sulphide (H_2S)	Boiler Areas, Hog System, Evaporator Area, Sewer Systems
Methyl Mercaptan	Recovery Building, Seal Tanks, Sewer Systems
Wood Dust	Hog System
Natural Gas	Power Boiler Area, Recovery Boiler Area, Natural Gas Station, Natural Gas Pipeline
Propane	Spout Area, Mobile Equipment
Green Liquor	Ground Floor – 2nd Floor, Evaporator Area, Storage Tank
Black Liquor	Ground Floor – 2nd Floor, Evaporator Area, Storage Tanks
Caustic Soda	Caustic Heater (Ground Floor), K+B Room, Anion Regen Area, Organic Trap Area, Piping from Chem. Shed
Sulphuric Acid	Acid Skid Area, Cation Regen Area
Weak Wash	Recovery Area, Dissolving Tank
Fuel Oil ("Bunker C")	Power Boiler Guns, Storage Tank Near Chip Dump
Welding Fumes	Field Hot Work Locations
Compressed Air	Air Lances & Hoses,
Heat	Boiler Areas, Evaporator Areas,
Cold	Hog System, Roofs, Cell Basins
Noise	Potentially All Areas Containing Equipment or Processes, Sirens & Horns
Blood Borne Pathogens	Domestic Sewer System

Bleach Plant	
Hazard	***Areas***
Chlorine Dioxide (ClO_2)	R8 Generator Area, Operating Floor, Mixing Floor, Ground Floor, Sewer Systems
Carbon Monoxide (CO)	Mobile Equipment
Nitrogen	Chem. Unloading
Oxygen	Ground Floor, Oxygen Reactors Area, Praxair Tanks
Airborne Contaminants	Potentially All Areas
Propane	Mobile Equipment
Caustic Soda	R8 Generator, Chem. Shed., Piping From Chem. Shed.
Sodium Chlorate	R8 Generator Area, Chem. Shed, Piping From Chem. Shed
Methanol	R8 Generator Area, Chem. Shed
Sulphuric Acid	R8 Generator Area, Chem. Shed
Hydrogen Peroxide (H_2O_2)	Chem. Shed, Bleaching Areas,
Welding Fumes	Field Hot Work Locations
Compressed Air	Air Lances & Hoses
Heat	Operating Floor, Mixer Floor,
Noise	Potentially All Areas Containing Equipment or Processes, Sirens & Horns
Radiation	Mixer Floor, Ground Floor
Blood Borne Pathogens	Domestic Sewer System

Digesters	
Hazard	***Areas***
Carbon Monoxide (CO)	Mobile Equipment Areas
Dimethyl Sulphide (DMS)	Chip Bin, Kone Bin, Accepts Floor, Sewer Systems
Hydrogen Sulphide (H_2S)	Kamyr Areas, M&D Areas, Brown Stock Washer Area, Blow Tanks, Seal Tanks, Sewer Systems
Methyl Mercaptan	Kamyr Areas, M&D Areas, Brown Stock Washer Area, Blow Tanks, Seal Tanks, Sewer Systems
Propane	Mobile Equipment
White Liquor	Kamyr Areas, M&D Areas, Brown Stock Area, Level Tank, Seal Tanks, Blow Tanks
Black Liquor	Kamyr Areas, M&D Areas, Brown Stock Area, Seal Tanks, Blow Tanks
Caustic Soda	Kamyr Areas, M&D Areas
Wood Dust	LF Chip System, SF Chip System, Chip & Sawdust Piles, Chip Screen Areas
Welding Fumes	Field Hot Work Locations
Compressed Air	Air Lances & Hoses
Heat	Kamyr Areas, M&D Areas
Cold	Chip System, Roofs
Noise	Potentially All Areas Containing Equipment or Processes, Sirens & Horns
Radiation	Chip Bin Area, Kone Bin Area, Brownstock Area
Blood Borne Pathogens	Domestic Sewer System

Recaust / Kiln	
Hazard	***Areas***
Carbon Monoxide (CO)	Mobile Equipment
Dimethyl Sulphide (DMS)	Slaker Area, Liquor Clarifier Areas, Seal Tanks, Sewer Systems
Hydrogen Sulphide (H_2S)	Slaker Area, Liquor Clarifier Areas, Seal Tanks, Sewer Systems
Methyl Mercaptan	Slaker Area, Liquor Clarifier Areas, Seal Tanks, Sewer Systems
Natural Gas	Kiln Area, Natural Gas Piping
Propane	Kiln Auxiliary Drives, Mobile Equipment
White Liquor	White Liquor Clarifiers, Slaker Area
Green Liquor	Green Liquor Clarifier, Green Liquor Storage Tank, Slaker Area,
Caustic Soda	Recaust Area
Weak Wash	Dregs Area, Mud Washer Area
Lime Dust	Kiln Area, Slaker Area
Lime Mud	Kiln Area, Lime Mud Washer, Mud Storage, Slaker Area
Welding Fumes	Field Hot Work Locations
Compressed Air	Air Lances & Hoses
Heat	Kiln Area, Recaust Area
Noise	Potentially All Areas Containing Equipment or Processes, Sirens & Horns
Radiation	White Liquor Clarifiers
Blood Borne Pathogens	Domestic Sewer System

Machine Room	
Hazard	***Areas***
Chlorine Dioxide (ClO_2)	Process Tanks, HID Storage Tank Area,\
Carbon Monoxide (CO)	Warehouse, Dry End, Mobile Equipment
Dimethyl Sulphide (DMS)	Process Tanks, Sewer Systems
Hydrogen Sulphide (H_2S)	Process Tanks, Sewer Systems
Methyl Mercaptan	Process Tanks, Sewer Systems
Airborne Contaminants	Warehouse, Dry End
Natural Gas	Natural Gas Piping
Propane	Propane Station, Mobile Equipment
Caustic Soda	Wet End Caustic Tank, Wet End Felts
Sulphuric Acid	Wet End At Headbox
Welding Fumes	Field Hot Work Locations
Compressed Air	Air Lances & Hoses, Baling Line Equipment, Layboy
Heat	Dry End, Wet End, Flakt Dryer, Sheet Cooler, Press Sections
Cold	Warehouse
Noise	Potentially All Areas Containing Equipment or Processes, Sirens & Horns
Blood Borne Pathogens	Domestic Sewer System

Protection Department	
Hazard	***Areas***
Chlorine (Cl_2)	Calibration Gasses in Bay
Carbon Monoxide (CO)	Calibration Gasses in Bay
Hydrogen Sulphide (H_2S)	Calibration Gasses in Bay
Methane	Calibration Gasses in Bay
Oxygen	First Aid Room, Bay
Compressed Air	SCBA Compressor & Lines, Cylinders
Cold	Bay
Blood Borne Pathogens	First Aid Room, Domestic Sewer System
Unknown Contaminants	The Protection Department has patients from various areas within the mill. This poses extra risk of cross contamination from outside sources and locations to enter the Protection Department.

MACKENZIE PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

CONTRACTOR CREW LIST | **TRAC-22.00**

This document is the current revision and has been reviewed and approved for adequacy.
*Printed copy is valid for 24 hours from **24 October 2016 1:22 PM** unless stamped "MPMC Controlled Copy" in red.*

COMPLETE IN FULL

COMPANY:		**DATE:**	
SUPERVISOR:		**CELL:**	
JOB LOCATION:			
SHIFT	☐ **DAYS** ☐ **NIGHTS**	**SHIFT START TIME:**	
		SHIFT END TIME:	

Print Names Clearly			
1.		**16.**	
2.		**17.**	
3.		**18.**	
4.		**19.**	
5.		**20.**	
6.		**21**	
7.		**22.**	
8.		**23.**	
9.		**24.**	
10.		**25.**	
11.		**26.**	
12.		**27.**	
13.		**28.**	
14.		**29.**	
15.		**30.**	

Phone List

	Office	Cell
Protection Emergency	250-997-2400	RADIO Channel 1
Protection- non Emergency	250-997-2409	250-997-2911
General manager	250-997-2432	250-421-7709
Production Manager	250-997-2405	306-314-1167
Management Administrative Assistant	250-997-2411	
Loss Prevention Supervisor	250-997-1189	250-997-2429
Safety Co-ordinator	250-997-2474	250-997-1037
Loss Prevention Manager	250-997-7843	250-997-2429
Power & Recovery Manager	250-997-2435	250-997-8177
Power & Recovery Steam Chief	250-997-2448	250-997-7737
Human Resources Manager	250-997-2451	250-

NAME: ***(Please Print)***_____ **DATE:** _____

COMPANY: ***(if applicable)***_____ **MILL REPRESENTATIVE:** _____

1. ***You may park on the mill site:***
   - **a)** If you have obtained a parking permit issued by the Supervisor
   - **b)** If your mill representative says it's okay
   - **c)** If you find a good parking spot

2. ***Vehicle speed limit on site is:***
   - **a)** 20 km/h
   - **b)** varied – watch for signs
   - **c)** 15 km/h

3. ***What are the items of personal protective equipment required when you are working in the mill?***
   - **a)** hard hat and safety boots
   - **b)** safety glasses and hearing protection
   - **c)** bite block respirator
   - **d)** hi-viz vest
   - **e)** all of the above

4. ***Name two possible hazards you may encounter in the mill:***
   - **a)** Gases
   - **b)** Noise

5. ***Smoking is allowed:***
   - **a)** in designated areas only
   - **b)** in lunchrooms and control rooms
   - **c)** anywhere as long as you don't get caught

6. ***The First Aid Station is located:***
   - **a)** in Maintenance
   - **b)** by Shipping and Receiving
   - **c)** at the Protection Office

7. ***What is the mill emergency telephone number?***
   - 250-997-2911
   - local - 2400

8. ***Emergency alarms are used in the mill to signal evacuations of:***
   - **a)** Bleach & Digester Area
   - **b)** Power & Recovery Area
   - **c)** Total Mill
   - **d)** All of the above

9. ***In case of any emergency the elevators should be used as they are a quick way to exit:***
   - **a)** Yes
   - **b)** Never
   - **c)** Sometimes

10. ***When the Total Mill Evacuation alarm is activated you must proceed to the Muster Station located:***
    - **a)** at the Protection Office
    - **b)** across the tracks towards the parking lot
    - **c)** south of the mill near shipping & receiving

11. ***During a mill evacuation who is responsible to account for your presence?***
    - **a)** Protection Officer
    - **b)** Your Supervisor
    - **c)** The Muster Station Coordinator

12. ***Contractor locks for Lock Out purposes are:***
    - **a)** gold
    - **b)** green
    - **c)** black
    - **d)** white

13. ***Fall protection must be used if you are working at a height of more than:***
    - **a)** 6 feet (1.8 meters)
    - **b)** 10 feet (3.0 meters)
    - **c)** 15 feet (4.5 meters)

14. Mackenzie Pulp's Fall Protection Rescue Plan is mandatory for any work over 25'

a) True
b) False

15. Danger do not Enter tag is _____.

a) Red
b) Green
c) Yellow

16. Metal Waste Disposal bins are_____.

a) Red
b) Green
c) Yellow

17. **Mackenzie Pulp may have wildlife present on site. It is mandatory people do not approach, feed or block the animals path. According to the wildlife act 33.1 you may receive up to $25,000 fine and or jail time is you intentionally feed or attempt to feed wildlife.**

a) True
b) False

18. Compressed air is the last resort for cleaning combustible dust.

a) True
b) False

19. Two examples of a nip point

_Gears_____ _____conveyors_____

20. All Locks and keys will be maintained and controlled by the _____.

a) Maintenance Department
b) Operating Department
c) Protection Department
d) Stores Department

21._____ is allowed to work under another person's lock.

a) A person of the same trade
b) A Supervisor
c) No one

21. It is of the utmost importance that the equipment I will be working is locked out properly before any work is started. Therefore this final responsibility lies with:

a) management
b) operations
c) me
d) my foreman

22. The Locks used to protect individuals are the:

a) Department Locks
b) Multi-Point Locks
c) Personal Locks

23. To Confirm a piece of Equipment we use

a) LA #'s (Location Assignment number)
b) EI #'s (Equipment Identifiers)
c) PN #'s (Part Numbers)

24. **Notifying Operations and Immediate Supervisor when work is complete or if leaving the job not completed _____.**

a) Is a good idea
b) Is known already
c) Is Mandatory

25. Department Isolation Locks can be used as personal Locks.

a) true
b) false

26. Multi Point Locks used by qualified Supervisors or their delegates are:

a) Brass
b) Green
c) Red

27. A Supervisor's Hold Lock is put on by _____ to allow a Personal Lock to be removed.

a) any Supervisor
b) Department Heads
c) Supervisor of the crew performing the work

RETURN TO SAFETY COORDINATOR
EMPLOYEES – TO BE FILED IN HUMAN RESOURCES TRAINING FILE

MACKENZIE
PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

SAFETY ORIENTATION QUIZ - NEW EMPLOYEE/VISITORS/CONTRACTORS **SPPM-12.05.1a**
NO LOCKS REQUIRED

This document is the current revision and has been reviewed and approved for adequacy.
*Printed copy is valid for 24 hours from **10 November 2016 8:27 AM** unless stamped "MPMC Controlled Copy" in red.*

NAME: ***(Please Print)***_____ **DATE:** _____

COMPANY: ***(if applicable)***_____ **MILL REPRESENTATIVE:** _____

1. ***You may park on the mill site:***
   a) If you have obtained a parking permit issued by the Supervisor
   b) If your mill representative says it's okay
   c) If you find a good parking spot

2. ***Vehicle speed limit on site is:***
   a) 20 km/h
   b) varied – watch for signs
   c) 15 km/h

3. ***What are the items of personal protective equipment required when you are working in the mill?***
   a) hard hat and safety boots
   b) safety glasses and hearing protection
   c) bite block respirator
   d) hi-viz vest
   e) all of the above

4. ***Name two possible hazards you may encounter in the mill:***

   a) GASES
   b) NOISE

5. ***Smoking is allowed:***
   a) in designated areas only
   b) in lunchrooms and control rooms
   c) anywhere as long as you don't get caught

6. ***The First Aid Station is located:***
   a) in Maintenance
   b) by Shipping and Receiving
   c) at the Protection Office

7. ***What is the mill emergency telephone number?***
   2400 / 250-997-2911 OR CHANNEL 1

8. ***Emergency alarms are used in the mill to signal evacuations of:***
   a) Bleach & Digester Area
   b) Power & Recovery Area
   c) Total Mill
   d) All of the above

9. ***In case of any emergency the elevators should be used as they are a quick way to exit:***
   a) Yes
   b) Never
   c) Sometimes

10. ***When the Total Mill Evacuation alarm is activated you must proceed to the Muster Station located:***
    a) at the Protection Office
    b) across the tracks towards the parking lot
    c) south of the mill near shipping & receiving

11. ***During a mill evacuation who is responsible to account for your presence?***
    a) Protection Officer
    b) Your Supervisor
    c) The Muster Station Coordinator

13. ***Fall protection must be used if you are working at a height of more than:***
    a) 6 feet (1.8 meters)
    b) 10 feet (3.0 meters)
    c) 15 feet (4.5 meters)

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EMPLOYEES – TO BE FILED IN HUMAN RESOURCES TRAINING FILE

CONFIDENTIAL ANSWER KEY

MACKENZIE PULP MILL CORPORATION
A PAPER EXCELLENCE COMPANY

LOSS PREVENTION FORM

SAFETY ORIENTATION QUIZ – Fibre Truck Operators **SPPM-12.06A**

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NAME: _____ **SIGNATURE:** _____
(Please Print)
COMPANY: _____ **DATE:** _____

1. Vehicle speed limit on site is:

a) 20 kph

b) varied – watch for signs

c) 15 kph

2. The First Aid Station is located:

a) At the Chip Truck Dump

b) In the Protection Office

c) In Mill Stores

3. What should you do if the Total Mill Evacuation Horn is sounding and you are on the mill site?

a) Leave your truck and go to the muster station

b) Park your truck and stay in it

c) Leave the mill site by the nearest and safest route

4. Where must you de-tarp?

a) At the Weigh Scale

b) At the Chip or Sawdust dump

c) Close to overhead power lines

5. *Which Mill radio channel must you use to report your location?*

a) Channel 2

b) Channel 1

c) Channel 6

6. *What is the external emergency telephone number you must call if you want to report an emergency to a Protection Officer?*

a) 2400

b) 911

c) 250 997 2911

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