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## Confined Space Policy

### I. Purpose and Scope

This policy provides minimum safety requirements to be followed while entering, exiting and working in confined spaces. The purpose of this policy is to establish procedures for the safety and health of employees, contractors, and visitors, who work in, and in connection with, confined spaces and ensure the Escanaba mill complies with MIOSHA Part 90 (permit required confined spaces).

### II. Definitions

Additional Attendant: When determined necessary through the pre-job huddle, this individual would be assigned outside the space as well as the Authorized Attendant to call for help in case of an emergency.

Authorized Attendant: A person assigned outside the space as standby to monitor a confined space process or operation, and provide support or react as required. The authorized attendant is responsible for determining if entry conditions are acceptable, completing all entry documentation and signing under **Pre-Entry Sign Off** on Permit. Additionally, this person is responsible for assuring additional entrants receive a pre-entry briefing and are signed in on the permit.

**Note**: Never attempt to enter a confined space to rescue an Entrant; you may also be overcome by hazardous conditions. Call for help, your job at this point is to provide non-entry rescue with the equipment available and assist when help arrives (more deaths occur from rescue attempts than the actual incident).

Confined Space: An enclosed area that has the following characteristics:

- Its primary function is something other than human occupancy; **and**
- Has restricted entry and exit; **and**
- Is large enough and so configured that an employee may bodily enter and perform assigned work.

Engulfment: The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entrant: A person that will enter a space that is qualified in confined space entry.

Entry: The action of any person breaking the plane of the confined space entrance with any part of his/her body.

Hazard Evaluation: A process to assess the severity of known, real, or potential hazards, or all three, at or in the confined space.



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Hazardous Atmosphere: An atmosphere that may be or is harmful to occupants by reason of oxygen deficiency or enrichment, flammability, explosivity or toxicity.

Hazardous Materials: Any substance or mixture of substances having properties capable of producing hazardous effects on the health or safety of a human. Typical hazardous materials include:

- toxic materials (Cl<sub>2</sub>, ClO<sub>2</sub> gas, biocide)
- corrosive liquids (acid, caustic, white and black liquor, peroxide)
- flammable materials (High Volume, Low Concentration (HVLC) gases, Low Volume, High Concentration (LVHC) gases, methanol, foul methanol (contaminated condensate) and steam.
- This list is not all inclusive.

Hot Work: Work within a confined space that produces arcs, sparks, flames, heat or other sources of ignition.

Immediately Dangerous to Life or Health (IDLH): means any condition which poses an immediate or delayed threat of loss of life; may result in irreversible immediate/severe health effects, eye damage, irritation, or other conditions which could impair escape from the permit space.

Isolation: Is the process by which a space is removed from service and completely protected against the release of energy and/or potentially hazardous material/chemical into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes or ducts; a double block and bleed system; lockout all energy sources, for flowable materials a minimum of two lockouts such that if one lockout fails there is a redundancy within the system to prevent the hazardous material from entering the space; or blocking or disconnecting all mechanical linkages.

Lock Out/Tag Out: The placement of a lock/tag on the energy isolating device in accordance with the mill's lockout/tag out policy/procedure, indicating that the energy isolating device(s) shall not be operated until removal of the lock/tag in accordance with this lockout procedure.

Lower Explosive Limit or Lower Flammable Limit (LEL/LFL): Lower explosive (flammable) limit in air, %by volume at room temperature.

Oxygen Deficient Atmosphere: An atmosphere containing less than 19.5% oxygen by volume.

Oxygen Enriched Atmosphere: An atmosphere containing more than 23.5% oxygen by volume.

Permissible Exposure Limit (PEL): which is the allowable "safe" air contaminant level established by OSHA.



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Permit-Required Confined Space: A confined space which after evaluation has actual or the potential to contain a hazardous atmosphere, engulfment hazards, inwardly converging walls or floors which taper to a smaller cross-section, or any other recognized serious safety or health hazard.

Qualified Person: A person who has been trained in confined space entry, is knowledgeable in the operation to be performed and is competent to judge the hazards involved.

Retrieval System/Rescue Equipment: The equipment (including a lifeline, full-body harness, and lifting device) used for non-entry rescue of persons from permit spaces.

Toxic Atmosphere: An atmosphere containing a concentration of a substance above the published or otherwise known safe levels.

Upper Explosive Limit or Upper Flammable Limit (UEL/UFL): Upper explosive (flammable) limit in air at room temperature.

### III. Confined Space Classification

All confined spaces within the Escanaba Mill will be classified as “permit-required confined space”.

Examples of confined spaces include:

- Vats, tanks or process vessels
- Digesters
- Underground utility vaults/pits/sewers/trenches
- Boilers
- Silos
- Precipitators
- Cyclones
- Chip bins

### IV. Hazard Evaluation:

The Safety Department will conduct all initial hazard assessments for confined spaces. Every effort has been made to evaluate and classify all confined spaces, with appropriate signage. All confined spaces must be labeled “*Danger Confined Space Enter by Permit Only.*”

All associated individuals shall examine each hazard with respect to:



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- Scope of hazard exposure.
- Magnitude of the hazard.
- Likelihood of hazard occurrence.
- Potential for changing conditions/activities. Examples:
  - introduction of cleaning agents into the confined space
  - welding/torch cutting

Reevaluation - Any changes in the space that introduce new hazards to the space shall require immediate reevaluation of the space before entry.

### V. Hazard Controls

Hazards associated with confined space entry must be identified prior to entering the space. The requirements for each confined space will be spelled out in the confined space inventory and depending upon the hazards present may include one of the methods in the definition's sections for Isolation. Products that require these procedures include but are not limited to: all hazardous materials/chemicals, stock, water, steam/condensates, coating materials, and any material that could pose an engulfment hazard.

**Note: Isolation may only be achieved through blinding or blanking, misalignment or removing a section of pipe, or the double block and bleed system, for the following chemicals: chlorine dioxide (including dilute); ammonia; chlorine; foul condensate/hot well condensates; sodium hydroxide (caustic); hydrogen peroxide; sulfuric acid; white liquor; sulfur dioxide, biocides, and methanol.**

1. Mandatory controls:
  - a. Lock out energy sources.
  - b. All safe-working practices that are required outside of a confined space must be followed inside a confined space including barriers and warning signs if required. (i.e. fall protection, trip hazards, guardrails, etc.)
  - c. All electrically powered tools or equipment used in a confined space where electrical shock hazards exist (i.e. steel tanks or wet conditions, etc.) must be either a low voltage type or be powered through a Ground Fault Circuit Interrupter (GFCI).
  - d. Lock out chemical and/or hazardous process sources:
  - e. Decontamination of vessel tanks (e.g., follow specific procedure, rinse tank, etc.). Decontamination may not be necessary for dry product storage tanks or non-hazardous tanks, such as water.
  - f. Shoring trenches
  - g. Flag off area in high traffic areas.
  
2. Non-Mandatory controls include:



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- a. Ventilation, natural and mechanical
- b. Personal Protection Equipment

### VI. Confined Space Permit

Where indicated by signage or by hazard evaluation a qualified entry team shall complete a Confined Space Entry Permit prior to entry into the confined space. (See "Confined Space Entry Permit" Appendix A)

1. Duration of a permit (the permit becomes invalid if the following occurs):
  - a. Shift change
  - b. Conditions change from those shown on the permit (such as alarms)
  - c. Permit exceeds 12 hours
  - d. If work is not started within 30 minutes of the air monitoring, retesting of the atmosphere must be performed.
  - e. Different purpose/new group of entry personnel
2. All permits must be reviewed and signed within 24 hours of the completion of the job, by an area foreman/supervisor before being forwarded to the Safety Department.

### VII. Atmospheric Testing/Air Monitoring

Atmospheric Testing/Air Monitoring is required for all confined spaces:

1. Testing of the atmosphere in the confined space must take place immediately prior to entry
2. Testing of the atmosphere must take place at 4 foot intervals, for 40 seconds at each interval, until the bottom has been reached
3. Continuous atmospheric monitoring must be conducted at all times while an entrant(s) is in the confined space.
4. If test results indicate the existence of a hazardous condition, entry cannot be made until the condition is eliminated.
5. If the testing device goes into alarm, or the if the entrants become suspicious of a hazardous atmosphere, all employees must immediately exit the space and assess from outside the space.
6. "Periodic Tests" must be recorded on the permit at least every 2 hours.
7. The initials of the person(s) performing the test must be documented on the permit.
8. IDLH entries require the use of an auxiliary air supply, harness and lifeline, and other safety equipment as hazards dictate. This entry also requires a second attendant (standby) prepared for entering with duplicate safety equipment. A continuous air monitor is also required.



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### VIII. Ventilation

Forced air ventilation is encouraged for all permit entries. When utilizing a ventilation blower, most often it is better to blow air into the space as it creates greater turbulence and provides more efficient mixing, than exhausting the air.

1. A blower must be used for the confined space if the monitor alarm sounds and entrants must leave the space.
2. A blower must be used for the confined space if initial monitoring reveals the following readings:
  - %Oxygen - 19.5% or less, or 23.5% or greater
  - %Combustibles - 2% or greater of the LEL
  - Hydrogen Sulfide - 2 ppm or greater
  - Carbon Monoxide - 2 ppm or greater
  - Chlorine Dioxide - 0.2 ppm or greater
  - Combustible dust present and visibility less than five feet

### IX. Confined Space Kit

The entry team shall ensure that a Confined Space Entry Kit is moved near the location of the confined space to be entered.

### X. Personal Protective Equipment (PPE)

Body Harness, Lifeline and Rescue Equipment are required for all confined spaces unless this equipment will create an additional hazard to the employee(s). If you need assistance in making this determination, contact the Safety Department.

If the space has a top entry or an opening greater than five feet above either or both the inside and outside working surfaces, retrieval system/rescue equipment must be in-place before entry into the space can be permitted. All equipment must be setup according to manufacturer's instructions.

All equipment to be used during an entry and for rescue purposes must be readily available, properly inspected and be in proper operating condition before entry is made.



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Employees shall wear PPE selected in accordance with the requirement of the job to be performed and potential hazards. All personal protective equipment used in a confined space entry must be documented on the entry permit.

### XI. Communication

Prior to entering a Confined Space, the entrants must have some means of communication with the attendant for contact and emergency purposes:

1. two-way radio
2. hand signals (must maintain line of sight at all times)
3. voice (if the area requires hearing protection, voice is not an option)
4. tether line (this is not the lifeline that is connected to the full body harness, but rather a small rope or string attached to the arm or belt for communications).

Prior to entering all confined spaces, all effected individuals shall participate in a pre-entry huddle to discuss potential hazards, emergencies, operational procedures, and any other relevant topics.

### XII. Cleaning/Decontamination

Confined spaces shall be cleaned/decontaminated of hazardous material to the extent feasible before entry. Check with area supervision for required procedures on specific equipment.

Caution must be used whenever cleaning a tank with mill water as the mill water may contain elevated residuals of chlorine dioxide for microorganism control. If the tank or vessel is believed to contain chlorine or chlorine dioxide, a Cl<sub>2</sub>/ClO<sub>2</sub> monitoring must be used.

Lines that carry any hazardous materials such as toxics, corrosive liquids, flammables or steam can be isolated by disconnecting or blanking the lines, or by closing two valves and draining the line segment between them (double block and bleed). Please refer to Line Breaking Policy.

### XIII. Responsibilities

Personnel responsible for supervising, planning, entering, or participating in confined space entry shall be adequately trained in their functional duties prior to any confined space entry. Within MIOSHA's Permit-Required Confined Space Entry standard the term "Entry Supervisor" is used to describe the employee authorized to approve entry, all those responsibilities under our program are performed by the "Authorized Attendant."



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### Responsibilities for the Authorized Attendants:

- Complete permit and conduct pre-entry sign-off before anyone can enter confined space.
- Monitor confined space for potential hazards and determine if conditions are acceptable.
- Review, through the pre-entry huddle, all potential hazards that the entry team may encounter.
- Notify Front gate of a confined space entry, provide front gate with a contact information in case of need for front gate to stop confined space entry, closest confined space kit number and closest column number.
- Approve entry.
- Oversee entry.
- Monitor activities of entrants.
- Maintain constant communication with entrants.
- Observe entrants for signs and symptoms of exposure to airborne chemicals.
- Maintain entry and exit log on permit to keep an accurate count of entrants inside confined space.
- Perform any non-entry rescue if required.
- Terminate entry if required.
- Maintain at post at all times, unless relieved by another attendant.
- No use of cell phones, unless for emergency situations.

**PLEASE REMEMBER: THE AUTHORIZED ATTENDANT MAY NEVER LEAVE HIS/HER POST FOR ANY REASON! YOU MUST MAKE PROVISIONS TO MAKE THE EMERGENCY CALL, WITHOUT LEAVING THE ENTRANCE, BEFORE THE ENTRY BEGINS. NO NON-WORK-RELATED CELL PHONE USE IS PERMITTED.**

### Responsibility of Front Gate/Loss Prevention Officers:

- Immediately notify the Emergency Response Team if a confined space rescue is needed.
- Immediately cancel all other confined space entries if a confined space rescue is in process.
- Maintain a log of confined space entries at the Front Gate.

### Responsibilities of the Entrants:

- Be aware of the potential hazards within the space.
- Use PPE and other equipment required.
- Be in constant communication with attendant.
- Exit space if necessary.
- Terminate entry if required.



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Responsibilities of Area Supervisor/Foreman for Permit Review Sign-Off:

- Once the confined space work is completed and the entry terminated, an Area Supervisor/Foreman must review the permit for accuracy and completeness and sign permit within 24 hours of work completion.
- Any area supervisor or foreman from maintenance or operations having responsibility for the area where the work was conducted, including Tour Maintenance, must sign their name on the line **Area Supervisor/Foreman** under **Permit Review Sign-Off**.
- After the permit has been signed, completed/expired permits shall be returned to the operating department where issued, and a debriefing conducted. After, it must be forwarded to the Safety Department at mailbox 51.

### XIV. Training Courses

Training may consist of video, PowerPoint presentations and classroom lectures, along with hands on training on the mill's training vessel, allowing employees to simulate a confined space entry.

All appropriate documentation is maintained by the Training Department.

### XV. Confined Space Rescues

- Mill Rescue Team (Emergency Response Team, Rope Rescue Team, and/or Medical First Responders can be mobilized by calling 2911).
- Tripods and retrieval systems must be in place for top entries.
- Radios are available at the front gate for confined space entry use.

**PLEASE REMEMBER: RESCUE, OTHER THAN NON-ENTRY RESCUE, IS FOR RESCUE TRAINED PERSONNEL ONLY!**



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**Confined Space Policy**

*Appendix A*



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### Confined Space Entry Permit

Date \_\_\_\_\_

Permit # \_\_\_\_\_

Confined Space Kit # \_\_\_\_\_

#### Michigan Operations

(Call 2676)

Building \_\_\_\_\_ Floor \_\_\_\_\_  
 Column # (if available) \_\_\_\_\_ Shift \_\_\_\_\_  
 Equipment Name \_\_\_\_\_  
 Reason For Entry \_\_\_\_\_  
 Authorized Attendant(s) \_\_\_\_\_  
 Authorized Entrant(s) \_\_\_\_\_  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out  
 \_\_\_\_\_ Time In \_\_\_\_\_ Time Out

**More Entrant spaces on back of form**

**PERIODIC TEST RESULTS MUST BE RECORDED EVERY TWO HOURS**

<b>Periodic Test 1</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Readings</b> _____ _____ _____ _____ _____	<b>Periodic Test 2</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Reading</b> _____ _____ _____ _____ _____
<b>Periodic Test 3</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Readings</b> _____ _____ _____ _____ _____	<b>Periodic Test 4</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Readings</b> _____ _____ _____ _____ _____
<b>Periodic Test 5</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Readings</b> _____ _____ _____ _____ _____	<b>Periodic Test 6</b> Time _____ O <sub>2</sub> <19.5% or >23.5% CO > 18 PPM H <sub>2</sub> S > 10 PPM Flam Vap > 10% LEL Other _____	<b>Readings</b> _____ _____ _____ _____ _____

**PRE ENTRY HUDDLE**

1. Confined Space Hazards (Examples on back)

YES	NO	Controls	PPE
<input type="checkbox"/>	<input type="checkbox"/>	Chemical - SDS _____	_____
<input type="checkbox"/>	<input type="checkbox"/>	Physical _____	_____
<input type="checkbox"/>	<input type="checkbox"/>	Mechanical _____	_____
<input type="checkbox"/>	<input type="checkbox"/>	Hot Work Permit _____	_____
<input type="checkbox"/>	<input type="checkbox"/>	Special Hazards _____	_____

2. Lockout

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	Multiple Lockout – If yes, write title of Lockout Procedure Used _____

3. Ventilation (Check one)

Airhorn  Blower  N/A

**Review Atmosphere Testing Requirements**

**ATMOSPHERE TESTING EQUIPMENT (CONTINUOUS MONITORING REQUIRED)**

<input type="checkbox"/> MSA Altair 5X	<input type="checkbox"/> MSA Altair 2X (SO <sub>2</sub> )
<input type="checkbox"/> MSA Altair 2X (ClO <sub>2</sub> , Cl <sub>2</sub> )	<input type="checkbox"/> Other _____

**ATMOSPHERE TEST RESULTS**

**IF ANY READINGS ARE AT ALARM LEVELS DO NOT ENTER CONFINED SPACE**

Oxygen (O <sub>2</sub> ) < 19.5% or >23.5%	Reading _____
Carbon Monoxide (CO) more than 18 PPM	Reading _____
Hydrogen Sulfide (H <sub>2</sub> S) more than 10 PPM	Reading _____
Flammable Vapors more than 10% LEL	Reading _____
Other _____	Reading _____

**INITIAL TEST RESULTS**

Initials of Tester \_\_\_\_\_

**If initial readings are above 2 for CO, H<sub>2</sub>S And Flammable Vapors, Ventilation is required.**

**COMMUNICATION**

1. Between Attendant and Entrant(s) (Check all that apply)

Visual  Radio  Voice  Tether line

2. Between Attendant and LPO/ Control Room (Check One)

Radio to LPO  Telephone to 2911 or (906) 233-2911

Radio to Control Room  Additional Attendant

**IF AN EMERGENCY DEVELOPS, SOUND ALARM AND CALL 2911 OR (906) 233-2911**

**PRE-ENTRY SIGN OFF:**

To be signed by the authorized attendant, after all required information has been completed, and before anyone can enter the confined space.

Authorized Attendant: \_\_\_\_\_ Time: \_\_\_\_\_

**POST-ENTRY SIGN OFF:**

To be signed upon completion of entry to close out permit, after all entrants have exited the confined space.

Authorized Attendant: \_\_\_\_\_ Time: \_\_\_\_\_

**RETURN PERMIT TO AREA SUPERVISOR/FOREMAN FOR REVIEW UPON COMPLETION OF ENTRY**

**IF AN EMERGENCY DEVELOPS, SOUND ALARM AND CALL 2911 OR (906) 233-2911**

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Authorized Entrants		
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
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Authorized Entrants		
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____
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_____	Time In _____	Time Out _____
_____	Time In _____	Time Out _____

### EXAMPLES OF CONFINED SPACE HAZARDS FOR COMPLETING PERMIT

	HAZARD EXAMPLES	PROBABLE CONTROL METHODS
<b>Chemical</b>	ClO <sub>2</sub> from stock	Lock-out and ventilate
	H <sub>2</sub> S from fuel condensate	Double block & bleed
	White liquor to digester	Lock-out
<b>Physical</b>	Steam	Lock-out and ventilate
	Blades on agitator	PPE (Gloves)
	White liquor to digester	Lock-out
	Digester	Temporary Flooring
	Boiler	Scaffold
	Agitator (Trip hazard)	Cover/flag off
<b>Mechanical</b>	Motor	Lock-out
	Electrical	Lock-out
	Drag chains	Lock-out
	Conveyor	Lock-out
<b>Special Hazards</b>	Nuclear Gauge	Lock-out
	Work in trench	Slope/shoring

**PERMIT REVIEW SIGN OFF:**  
 After entry has been completed, forward permits to your supervisor for their review. Permit must be reviewed and signed within 24 hours of completion of work/permit removal. A debriefing must be conducted if there are any findings during the permit review. Once signed, permit must be sent to the safety department at **MB51**.

Area Supervisor/Foreman: \_\_\_\_\_ Date: \_\_\_\_\_



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