MontanaTech
ENVIRONMENTAL HEALTH & SAFETY

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Fire Protection and Prevention Plan

I. Purpose

The purpose of the Montana Tech Fire Protection and Prevention Plan is to provide faculty, staff and students with information and guidelines to assist them in recognizing, reporting and controlling fire hazards. The plan helps eliminate the causes of fire and helps prevent loss of life and property. Reference 29 CFR 1910.38

II. Responsibilities

Deans, Department Heads, Directors, and Program Managers

1. Ensure faculty, staff, and students are trained on procedures, evacuation routes and assembly areas.
2. Ensure that fire doors are closed at all times in their buildings unless they are on a magnetic system.
3. Closely monitor the use and storage of flammable materials and liquids in the department.
4. Ensure flammable material storage areas are properly maintained.

Physical Facilities Director

1. Ensure fire suppression systems are inspected and maintained to a high degree of working order according NFPA 25, Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.
2. Ensure fire alarm systems are inspected and maintained to a high degree of working order according to NFPA 72, the National Fire Alarm and Signaling Code.
3. Ensure exit signs and emergency lights are periodically inspected and operating properly.
4. Ensure fire extinguishers are inspected monthly by Facilities' personnel and inspected annually by a certified inspector according to NFPA 10, Standard for Portable Fire Extinguishers.

Montana Tech Employees and Students

1. Use, store and transfer flammable materials in accordance with provided training.
2. Control accumulation of flammable and combustible materials in offices, labs and storage areas through proper housekeeping.
3. Know how to report fires, hazardous chemical spills and other emergencies.
4. Know evacuation routes, assembly areas, and procedures.

III. Potential Fire Hazards

Most fires are preventable if proper precautions are followed. See Appendix A for the most common causes of fire and their associated hazard prevention methods.

IV. Control of Flammable or Combustible Waste Materials

The two basic types of waste generated on the Montana Tech campus include ordinary trash and hazardous waste.

Montana Tech's Custodial Services is responsible for collecting ordinary combustibles such as paper, cardboard, plastic, etc. on a daily basis. Recycling is collected in each department and is picked up weekly by an off-campus vendor. This includes shredded material.

The Office of Environmental Health and Safety is responsible for collecting and disposing of hazardous waste. Hazardous waste disposal is done on an as-needed basis. Call 496-4463 if you have any questions regarding hazardous waste disposal.

V. Notification and Evacuation Procedures

In the event of a fire, explosion, or other emergency, call 911 from a safe location, evacuate the building if necessary by pulling the fire alarm, and call Campus Security at 496-4357 and Environmental Health & Safety at 496-4463. Others will be notified as needed according to the flow chart in Appendix B.

All occupants must evacuate a building when the fire alarm goes off and proceed to the assigned assembly area for that building. In an emergency situation, protection of people is a priority. All Emergency Response Assistants in buildings should sweep the building on their way out and direct people to the nearest exits and assembly locations. The ***Emergency Response Assistants*** should:

- Never put their own life in danger
- Check normally unoccupied rooms (meeting rooms, restrooms, etc.). Use the evacuation map as a checklist.
- Carefully check all closed doors for the presence of heat and smoke before opening (check door with back of hand).
- Close all open doors in areas they have searched.
- Inform all personnel they come in contact with to evacuate immediately.
- Exit the building and proceed to assigned assembly point.
- Bring an Emergency Evacuation Sign-In Sheet to have those at the assembly point sign in so they are accounted for.

In the event of a fire or drill, everyone must evacuate the building immediately.

- Close doors behind you to prevent the spread of fire.
- Place your hand on any closed door. If it is cool, exit through the door. If it is hot, leave by another route.
- DO NOT attempt to use an elevator.
- Alert others to the emergency on your way out.
- Leave the building and move to your assigned assembly area and sign in.
- Do not re-enter the building until the all-clear is given.

Every effort should be made to account for students and employees in an emergency situation, so everyone must go first to the assembly area and sign in. If the primary area is not accessible, go to the alternate assembly location. See Appendix C for the list of Assembly Areas.

VI. Fire Extinguishing Systems

Portable fire extinguishers are located in every building on campus for use by those who are trained in their use. Most extinguishers on campus are Class ABC, which can be used on fires involving normal combustibles (paper, wood, garbage), flammable liquids, and electrical fires. Some computer areas have a Class BC with carbon dioxide. The kitchen areas in the Student Union Building and Highlands College are equipped with built-in fire suppression systems for the griddles.

Extinguishers are placed such that no one should have to travel more than 50 to 75 feet to reach a fire extinguisher.

- Refer to Appendix D for procedures on how to use a fire extinguisher.
- Refer to Appendix E for a fire extinguisher selection guide.

Automatic fire sprinkler systems must be properly maintained according to the manufacturers' instructions. See Appendix F for the requirements.

VII. Maintenance

Physical Facilities is responsible for monthly inspections of fire extinguishers, and annual inspections of fire extinguishers are contracted out to a certified contractor. If an extinguisher needs service, it is sent to a contractor for repair or refilling. Extinguishers are also on a schedule for hydrostatic testing.

Physical Facilities contracts out the annual maintenance on the fire suppression and fire alarm systems; the emergency lights and exit signs are inspected and maintained by Facilities personnel.

VIII. Flammable Material Handling and Storage

All flammable and combustible materials must be handled and stored in a safe manner. Refer to Appendix G for definitions on flammable and combustible materials. Minimize the amount of flammable liquids in your lab or shop. Buy only what you will use in the immediate future, and buy the smallest size that you need. Excess flammable solvents increase the risk of a fire or dangerous spills.

Store flammables in a UL-approved flammable storage cabinet. Flammables must be stored away from strong oxidizers, such as most strong acids. On your benchtop, limit flammable liquids to only those for immediate use.

Always bond metal containers to metal receivers when transferring large volumes of flammable liquids or gases.

Areas that contain flammable materials must follow the guidelines for storage amounts. See Appendix H for storage of flammable materials.

IX. Housekeeping

All employees are responsible for routine clean-up of work areas.

- Corridors, aisles, and stairwells must be kept clear at all times.
- The minimum clear corridor width in all teaching areas is six feet unless the building was designed with narrower corridors.
- No building equipment, fixtures or furnishings can violate the designed or required width. The extension of departmental activities or equipment from adjoining spaces into the corridor is prohibited, regardless of corridor width, e.g., freezers, file cabinets, incubators, display cases, etc. This includes all buildings on the Montana Tech campus.

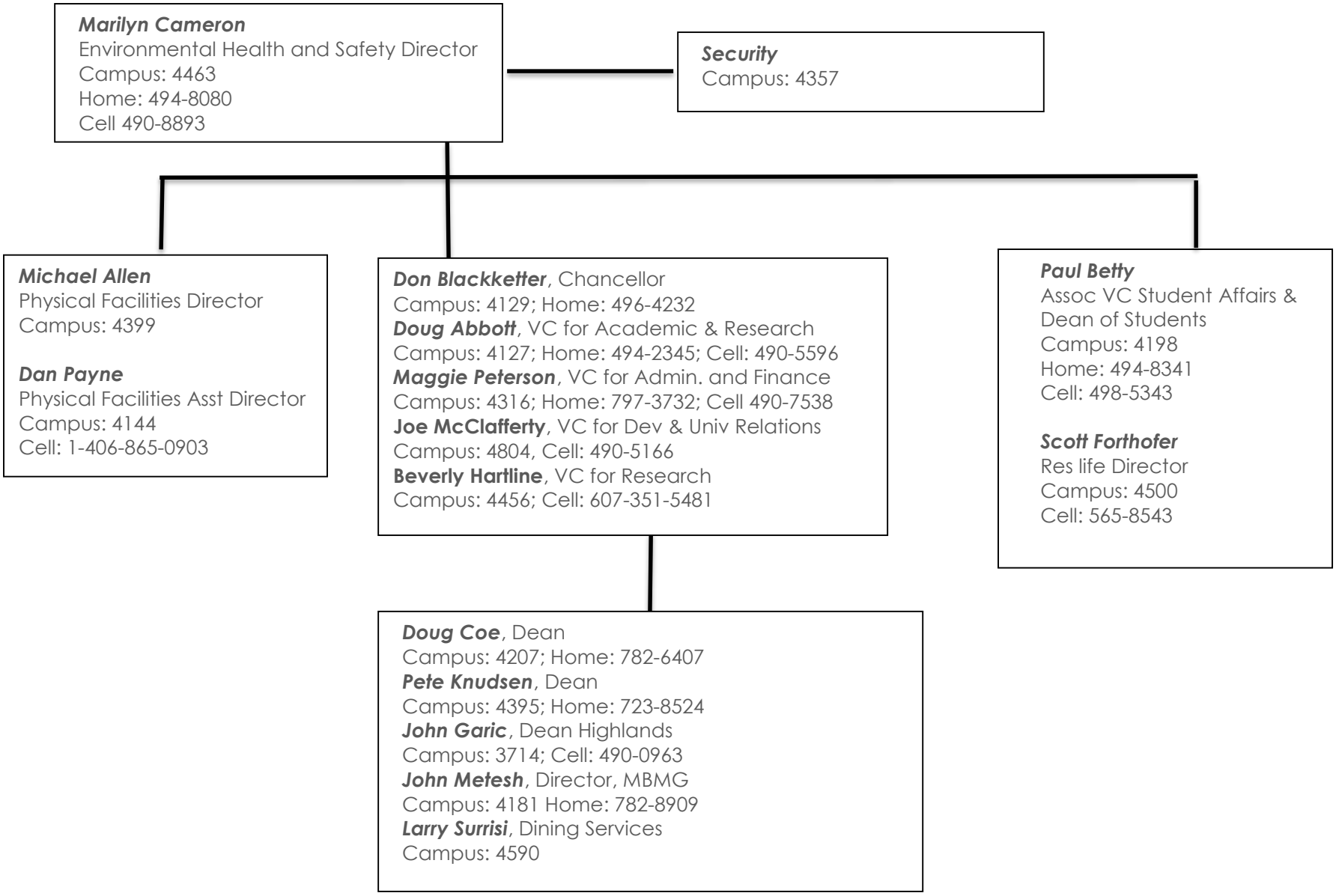
X. Training

Each new employee must receive training regarding the fire hazards of materials and processes to which they are exposed. Employees must also be trained in procedures to protect themselves in the event of an emergency. Although each new employee attends a New Employee Safety Orientation, the specific training on the departmental hazards is the responsibility of the department.

Appendix A- Potential Hazards and Prevention Methods

Hazard	*Precautions*
Overloaded electrical circuits, unsafe wiring and defective extension cords – all buildings	• Plug extenders are not allowed on campus. Power strips with fuses are allowed, but don't overload the circuits. • Extension cords can only be used for temporary setups. They cannot be used as a permanent means of wiring. Check extension cords before each use for frays and cuts. Replace if defective.
Appliances such as coffee makers, hot plates and other heating devices when left on when not in use – Residence Life, all buildings	• Make sure all appliances are shut off at the end of the day. Consider putting coffee pots on timers.
Unattended cooking and open coil appliances – Residence Life	• In areas that have cooking facilities, remain in the area until your food is cooked. Turn off all appliances. • Cooking is restricted in all areas other than designated kitchen areas. Hot plates, crock-pots, electrical frying pans and other open coil appliances are prohibited in dorms and other kitchen areas on campus. Electric coffee pots, microwaves and popcorn poppers are allowed.
Improper use of space heaters – all buildings	• According to the Butte-Silver Bow Fire Marshall, the only allowable space heaters in public buildings are those without heating elements such as ones that are oil-filled. • Keep all combustible materials away from space heaters • Space heaters must be turned off and UNPLUGGED anytime the area/office is unoccupied.
Improper disposal of smoking materials.	• Montana Tech is now a tobacco-free campus. Smoking is no longer permitted anywhere on campus.
Improper use, storage and handling of flammable materials such as gasoline, solvents, flammable chemicals, flammable gases, and paints – Laboratories, Facilities shops and garages	• Any flammable materials should be properly stored in a UL-approved flammable cabinet • Make sure items you are storing together are compatible. Refer to the Montana Tech Chemical Hygiene Plan for information on compatible storage.
Improper use of Christmas tree lights and decorations and associated electrical cords – all buildings	• Only artificial trees are allowed. • All lights must be UL-approved. • Unplug all lights at the end of the day. • If an extension cord must be used, make sure it doesn't present a tripping hazard, and unplug it when no one is around.
Use of candles, incense or other burning materials on campus – all buildings	• They are not allowed in any building on campus.
Poor housekeeping which results in accumulation of combustible materials such as paper, boxes, oil-soaked rags, and flammable liquids – all buildings	• Keep all combustibles away from heat sources. • Recycle or throw away empty boxes, packing material and papers that are no longer needed. • Place rags in a metal container and empty it every night.
Improper use of welding torches and equipment – Facilities & welding programs	• Anyone on campus using equipment that produces heat or sparks must follow the Montana Tech Hot Works Plan or provide a copy of their own plan that meets all requirements.
Gas Cylinders – Laboratories, welding shops and labs	• Must be stored upright and secured with chains or straps. • Caps must be replaced when gauges are removed. • Keep away from heat and direct sunlight.

Appendix B: Internal Notification Flow Chart



Appendix C- Assembly Areas

North Campus Buildings

ASSEMBLY AREA 1 - South Side of Park Street near Leonard Field by handrail
Engineering Hall
Main Hall
Mill Building
S&E (Science & Engineering Building)

ASSEMBLY AREA 2 - South Side of Park Street by stadium fence
HSB (Health Sciences Building)
SUB (Student Union Building)
Heating Plant
Greenhouse
Physical Plant building

ASSEMBLY AREA 3 – Grassy area west of ELC
ELC (Engineering, Lab & Classroom Building)
Library and Auditorium
NRB (Natural Resources Building)

ASSEMBLY AREA 4 – Middle of mall area
CBB (Chemistry/Biology Building)
Museum Building

ASSEMBLY AREA 5 – Prospector lawn by flag poles
MG (Mining Geology Building)

ASSEMBLY AREA 6 – Bottom of stairs on east side of HPER
HPER – east exits

ASSEMBLY AREA 7 – Grassy area west of HPER
HPER – west exits

ASSEMBLY AREAS 8 & 9 - Prospector and Centennial Halls –
Prospector evacuates to Centennial
Centennial evacuates to Prospector
If both halls are involved, they evacuate to Leonard Field

ASSEMBLY AREA 10 – Parking area north on Ophir Street on right
URC (University Relations Center)

Highlands College

South end of parking lot for south end of building
North end of parking lot for north end of building

Montana Tech Research Center

Far end of the parking lot

Appendix D- How to use a Fire Extinguisher

In the event of a small fire, if you are trained to use a fire extinguisher, follow these procedures:

- Always position yourself with an exit or means of escape to your back.
- Use the PASS method:
  - Pull the pin and stand back 8-10 feet
  - Aim at the base of the fire (not the flames)
  - Squeeze the handle
  - Sweep back and forth at the base of the fire. Remember, most extinguishers will last between 8 and 10 seconds.
- If the fire isn't out at this point, evacuate and call 911 if it hasn't already been called.
- 911 should be called immediately even for a small fire as the fire can quickly get out of hand.

Do **not** attempt to use a fire extinguisher if:

- You are not trained
- You would have no escape route – Call for help!
- You don't know what is burning
- The fire is spreading rapidly
- You don't have the appropriate equipment
- The extinguisher is ineffective
- You might inhale toxic smoke
- If drums, cylinders or chemicals are involved
- Your instincts tell you not to

Appendix E: Fire Extinguisher Selection Guide

		Water		Dry Chemical	
Type of Extinguisher		**Stored Pressure**	**Carbon Dioxide**	**Multi-Purpose ABC** Stored Pressure	**Halogenated Agents**
Sizes commonly in use (normal capacity)		2.5 gallons	2.5 to 20 gallons	2 to 30 lbs	2.5 to 5 lbs
Classification of Fires	**A**	Yes	No	Yes	No
	B	No	Yes	Yes	Yes
	C	No	Yes	Yes	Yes
	D	No	No	No	No
Extinguishing Agent		Carbon Dioxide	Sodium Bicarbonate Base	Ammonium phosphate base	Halon 1301 and/or 1211
Method of Operation		Pull pin, squeeze handle, sweep at base of fire			
Range		30-40 ft	3-8 ft	5-20 ft	4-8 ft
Approximate Discharge Time		1 minute	8-30 seconds	8-25 seconds	8-10 seconds

Appendix F: Maintenance of Automatic Fire Sprinkling Systems

Montana Tech has ten locations where automatic sprinkler systems exist and must be maintained.

1. Highlands College
2. Mill Building
3. Auditorium stage area
4. Engineering, Lab and Classroom Building (ELC)
5. Natural Resources Building (NRB)
6. Prospector Hall
7. Centennial Hall
8. Family Housing Units x 3

Monthly Inspection – Boilermen will:

1. Verify all controls are in the following position:
    a. Normally open valves are in the open position
    b. Normally closed valves are in the closed position
2. Verify all control valves in open position are either:
    a. Locked open
    b. Sealed open
    c. Equipped with operable tamper switch
3. Check pressure gauges for similarity in pressure/check antifreeze temperature – 45 degrees below.

Annual Maintenance is contracted out.

Emergency Procedures

1. In the event of a fire with activation of the sprinkling system, 911 is always called first.
2. The maintenance engineers and/or the boilermen are called.
3. The shut off zone control valve affected after fire department has determined that the fire has been extinguished.
4. Zone drain valve to be opened after #3 has been accomplished.
5. Call our licensed sprinkler contractor for repair of the sprinkler system.

Appendix G: Definitions

Flammable liquid or Class I liquid: A liquid having a flashpoint below 100 degrees Fahrenheit and having a vapor pressure not exceeding 40 pounds per square inch at 100° F. Class I liquids are sub-divided as follows:

Class IA includes liquids having flashpoints below 73° F and boiling points below 100° F.

Class IB includes liquids having flashpoints below 73° F and boiling points above 100 ° F.

Class IC includes liquids having flashpoints at or above 73° F and boiling points below 100° F.

Combustible liquid: A liquid having a flashpoint at or above 100 degrees Fahrenheit. Combustible liquids are sub-divided as follows:

Class II includes liquids with flashpoints at or above 100 ° F and below 140 ° F.

Class IIIA includes liquids with flashpoints at or above 140 degrees F and below 200 ° F.

Class IIIB includes liquids with flashpoints above 200 ° F.

Appendix H: Storage of Flammable Materials

It is important to be aware of maximum allowable container size and maximum quantities for storage in cabinets based on the class of the flammable. The class of a flammable or combustible is determined by its flash point and boiling point. See Appendix E for definitions of classes of flammables.

	Maximum Allowable Size of Containers and Portable Tanks				
Container Type	**Flammable Liquids**			**Combustible Liquids**	
	Class IA	Class IB	Class IC	Class II	Class III
Glass or approved plastic	1 pint	1 quart	1 gallon	1 gallon	1 gallon
Metal (other than DOT drums)	1 gallon	5 gallons	5 gallons	5 gallons	5 gallons
Safety Cans	2 gallons	5 gallons	5 gallons	5 gallons	5 gallons
Metal drums (DOT specifications)	60 gallons	60 gallons	60 gallons	60 gallons	60 gallons
Approved portable tanks	660 gallons	660 gallons	660 gallons	660 gallons	660 gallons

The following chart lists the maximum volume of flammables and combustibles that can be stored in a single flammable storage cabinet.

Maximum Storage Quantities for Cabinets	
Liquid Class	**Maximum Storage Capacity**
Flammable/Class I	60 gallons
Combustible/Class II	60 gallons
Combustible/Class III	120 gallons
Combination of classes	120 gallons*

**Not more than 60 gallons may be Class I and Class II liquids. No more than 120 gallons of Class III liquids may be stored in a storage cabinet, according to OSHA 29 CFR 1910.106(d)(3) and NFPA 30 Section 4-3.1.*
NOTE: *Not more than three such cabinets may be located in a single fire area, according to NFPA 30 Section 4-3.1.*

29 CFR 1910.106 also limits the total amount of a liquid kept outside of a cabinet or storage room. The quantity of liquid that may be stored outside of an inside storage room or a cabinet in any one fire area of a building cannot exceed:

- 25 gallons of Class IA liquids in containers
- 120 gallons of Class IB, IC, II or III liquids in containers
- 660 gallons of Class IB, IC, II or III liquids in a single portable tank