HAZARD IDENTIFICATION

Gather and analyze job-specific safety information.key details to include:

- □ Site location & layout
- □ Scope of work
- □ Client & contract requirements
- Regulatory permits & requirements

RISK ASSESSMENT

Assess hazards based on consequences and probability.

Consequence categories:

- I Catastrophic: Death or total loss
- II Critical: Severe injury/illness, major damage
- III Minor: Mild injury/illness, minor damage
- IV Low: Violation of standards

Probability rankings:

- A Likely (Immediate or soon)
- B Probable (Will happen over time)
- C Possible (May happen)
- D Unlikely (Rare occurrence)

Risk Matrix:

Balances consequences and probability to determine overall risk. Example: Poor housekeeping = moderate risk, fuel tank explosion = moderate risk (unlikely but severe).

HAZARD CONTROL

Prioritize hazard mitigation based on risk level:

- Eliminate catastrophic hazards.
- Minimize critical or serious hazards.
- □ Address moderate, minor, and negligible hazards.
- □ Control methods (in order of preference):
 - 1. Engineering Controls Eliminate or reducing hazards (e.g., guards, isolation).
 - 2. Administrative Controls Training, procedures, signage, rotation.
 - 3. PPE Controls Protection from hazards, used for minor risks.

PREPARING A SITE SAFETY PLAN

- □ Also called ES&H (Environmental Safety & Health) or SH&E (Safety, Health & Environment) Plan.
- Uses data, pre-bid checklists, safety programs & scheduling software.
- □ Assistance available from professional safety firms & OSHA resources

KEY COMPONENTS:

- □ Site information (security, layout)
- □ Scope of work
- Key contacts
- On-site & adjacent hazards
- Standard & additional safety procedures
- □ Emergency response & muster points
- □ Training verification (e.g., confined space, HAZWOPER)

SITE SAFETY PLAN REQUIREMENTS

Varies by project size & scope, must include:

- □ Safety responsibilities & emergency procedures
- □ Hazard communication & incident prevention
- □ Inspections, record-keeping, PPE, housekeeping
- □ Operation-specific procedures (e.g., hoisting, rigging, demolition)

COORDINATION

All project groups (client, subcontractors, workers) must align on safety roles & procedures.

Federal/state/local agencies must be informed if emergency response is required.

Oversight & review:

Regular inspections, audits, and reporting to ensure safety compliance throughout the project.

RISK EQUALS

Probability/Likelihood – The chance that a given event will occur

Consequences – The results of an action, condition, or event

Exposure – The amount of time and the degree to which someone or something is exposed to an unsafe condition, material, or environment

This formula helps prioritize risks:

Probability + Consequences + Exposure = Risk

LEVELS OF SEVERITY

 Negligible – An injury is not likely.
 Marginal – Minor illness, injury, or property damage are likely.

3. Critical – Severe illness, injury, or property damage are likely.

4. Catastrophic – Death or permanent disability are likely.

Risk = Probability x severity

Risk = Probability + severity + exposure

Probability = Likelihood if an event happening

Severity = Consequence or impact

SAMPLE

		SEVERITY				
		Negligible (1)	Marginal (2)	Serious (3)	Very Serious (4)	Critical (5)
ГІКЕГІНООД	Unlikely (1)	1 Risk acceptable	2 Risk acceptable	3 Risk acceptable	4 Risk acceptable	5 Risk acceptable
	Remote (2)	2 Risk acceptable	4 Risk acceptable	6 Risk acceptable	8 Review at appropriate time	10 Review at appropriate time
	Occasional (3)	3 Risk acceptable	6 Risk acceptable	9 Review at appropriate time	12 High priority	15 High priority
	Moderate (4)	4 Risk acceptable	8 Review at appropriate time	12 High priority	16 High Risk	20 High Risk
	Frequent (5)	5 Risk acceptable	10 Review at appropriate time	15 High priority	20 High Risk	25 High Risk

SAMPLE



CHAIN OF COMMAND

- □ Emergency Response Coordinator Leads emergency efforts, ensures outside aid is contacted
- □ Plant/Facility Coordinator Manages overall site response, public relations, and external aid
- □ Backups Assigned Ensure trained personnel are always available when needed
- Construction Manager (CM) / General Contractor (GC) Oversees multi-employer sites, coordinates response

EMERGENCY COMMUNICATIONS

- Backup Communication Plan Alternate location for coordination if power/phones fail
- Communication Devices Radios, cell phones, explosion-proof devices for emergency use
- $\hfill\square$ Emergency Alarms Audible/visible alarms with auxiliary power
- Emergency Contact List On-site and off-site storage of key personnel details
- □ Emergency Reporting Clear procedure for employees to report incidents immediately

PERSONNEL ACCOUNTABILITY

- Designated Check-In Leader Responsible for verifying all employees are accounted for
- □ Tracking Systems Use electronic timekeeping or daily safety rosters to easily and quickly account for employees on site

EMERGENCY ACTION PLAN (EAP) ELEMENTS

- □ Escape Procedures & Routes Clearly defined evacuation routes
- Shutdown Procedures Steps for employees handling critical operations before evacuating
- □ Employee Accountability Method for tracking all personnel postevacuation to assure no one is missing or injured
- □ Rescue & Medical Duties Assigned roles for trained personnel
- Emergency Reporting Preferred method for reporting fires/emergencies
- □ Contact List Key personnel or departments for EAP inquiries
- Hazard Assessment Identify workplace-specific emergencies during pre-job planning
- Evacuation Plans Maps or floor plans that provide information for emergency routes and safe zones
- □ Ongoing Updates Regularly revise based on site changes

ADDITIONAL EAP COMPONENTS

- □ Chain of Command Provides a defined leadership hierarchy for decision-making
- □ **Communications** Provide reliable methods for emergency alerts and coordination
- Personnel Accounting Systems to track all workers in an emergency.
- □ Emergency Response Teams Trained employees for first aid, fire response, and rescue
- □ Training & Drills Regular instruction and practice for all employees
- Medical Assistance On-site first aid and coordination with local medical services
- $\hfill\square$ Security Measures to control site access and emergency responses
- □ **Record Keeping** Documentation of plans, training, and emergency incidents that can be maintained orderly and accessed when needed

COMPLIANCE STANDARDS

OSHA, ANSI, MSHA, NIOSH – Follow regulations for equipment use.

Manufacturer Guidelines – Consult with safety professionals before selecting PPE.

Emergency Drills & Plan Review

Conduct Drills Annually – Include fire, rescue, medical scenarios.

Evaluate Performance – Immediate feedback from employees & management.

Multi-Contractor Sites – General contractor must coordinate emergency plans.

Plan Updates - Review & revise annually to maintain efficiency.

PERSONAL PROTECTION & RESPIRATOR SAFETY PROTECTIVE GEAR FOR EMERGENCY SITUATIONS

- □ Eye Protection –Safety glasses, goggles, face shields
- □ Head & Foot Protection Hard hats, safety shoes
- Respiratory Protection NIOSH-approved respirators for toxic gases, mists, or low oxygen levels
- □ Chemical Protection Suits, gloves, hoods, boots for hazardous exposure
- Environmental Protection Extreme temperature gear
- □ Fall Protection Personal fall-arrest systems
- Respirator Safety:
- □ Proper Fit Testing Ensure a secure seal for effective use.
- □ **Training & Maintenance** Employees must be trained in proper use, storage, and cleaning.
- Emergency Use SCBA required for rescue teams in oxygendeficient or toxic environments.

EMERGENCY RESPONSE TEAMS TRAINING

- □ Fire extinguisher use
- □ First aid, CPR, AED
- □ Confined-space rescues
- Evacuation & chemical spill response
- □ SCBA (Self-Contained Breathing Apparatus) use
- □ Rescue from trenches/elevated locations

ALL EMPLOYEES SHOULD BE TRAINED IN

- □ Evacuation plans & alarms
- □ Fire & electrical hazards
- Reporting & shutdown procedures
- □ Types of potential emergencies

TRAINING FREQUENCY

- Initial employee onboarding
- □ When new equipment, materials, or procedures change
- Post-exercise evaluations & annual drills

FIRE EMERGENCIES

- □ Fire Protection Plan Required for all construction phases (new, repair, alteration, demolition).
- Firefighting Equipment Portable extinguishers required; fire hoses permitted with trained personnel.
- Equipment Access & Maintenance Firefighting tools must be accessible, inspected, and functional.
- □ **Trained Fire Brigade** May be required for large projects.
- □ Water Supply Must be available early, sufficient in volume, duration, and pressure.
- □ Underground Water Mains Install as soon as possible.

FIRE EXTINGUISHER REQUIREMENTS

- **2A extinguisher** per 3,000 sq. ft., max 100 ft. travel distance.
- □ 2A extinguisher per floor, placed near stairways in multistory buildings.
- **10B extinguisher** within 50 ft. of flammable liquids/gases.
- **Regular Inspections** Must follow NFPA No. 10-2013 standards.
- Demolition Fire Safety Charged hose lines, water tank trucks, or equivalent required.
- □ Sprinkler System Installed and activated as early as possible per legal requirements.
- □ Standpipes Maintain, install, and keep functional with fire department connections at street level.
- □ Alarm System Required for alerts.
- □ Emergency Instructions Alarm codes and reporting details must be posted throughout the site.

DEALING WITH THE MEDIA

Know Company Policy

 $\hfill\square$ Only authorized personnel should speak to the media.

Key Questions from Media

- □ What happened?
- U Were there injuries?
- U Why did it happen?
- Community impact?
- □ How will it be fixed?

Best Practices

- Express concern for injured personnel.
- Be prepared, factual, and honest—don't speculate.
- Say "I don't know" if unsure.
- Be polite, professional, and avoid humor.
- Do not make off-the-record comments or admit liability.
- Avoid discussing legal matters.
- □ Stress the company's commitment to safety.
- □ Keep media out of hazardous areas.
- $\hfill\square$ Track media interactions and end interviews when complete.

Social Media Policy

- Employees should not post about incidents.
- □ Establish and enforce a written policy.
- □ Ensure only authorized personnel communicate externally.
- Some situations may be part of a criminal investigation coordinate with legal teams as necessary.

TRAFFIC PATTERNS

Site Layout & Traffic Control – Key for safety; prevent vehiclerelated hazards. One-Way Traffic Flow – Reduces collision risks.

Site Access Considerations

Urban vs. rural hazards. Public road/sidewalk closures may require permits. Private property restrictions must be followed.

PEDESTRIAN SAFETY

Designate safe walking routes. Place field offices and break areas away from high-traffic zones.

ADJACENT HAZARDS

Natural & Man-Made Hazards – Slopes, water bodies, excavation risks.

Utility Safety – Locate and mark: Water Electricity Gas Sewer Telecom/Fiber-optic lines

Operational Interactions – Consider how construction impacts nearby activities (noise, pollution).

ENVIRONMENTAL CONCERNS

Protect waterways. Check for required **NPDES permits**. Assess risks to legally protected wildlife/habitats.

SCOPE OF WORK

Phase-Specific Safety Planning - Different risks for each phase.

High-Hazard Work:

- Blasting
 Excavation
- Demolition
- Extreme heights
- Confined spaces
- Work over water

□ Handling hazardous materials (asbestos, chemicals, waste) Scheduling Considerations – High-risk operations require extra planning in the site safety plan.

EPA LAWS & DEFINITIONS

CAA Clean Air Act regulates all sources of air emissions. The 1970 CAA authorized the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment

CWA Clean Water Act establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters

RCRA Resource Conservation and Recovery Act governs the disposal of solid waste and hazardous waste

CERCLA Comprehensive Environmental Response, Compensation & Liability Act gives the EPA the ability to intervene in managing land contaminated with high levels of hazardous materials. And penalize \$ the polluting companies

NPDES National Pollutant Discharge Elimination System The CWA prohibits anybody from discharging "pollutants" through a "point source" into the "water of the USA" unless they have an NPDES permit. The permit contains limits on what you can discharge, monitoring & reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health

POLLUTANTS CAN INCLUDE dredged soil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste

SUPERFUND program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills and natural disasters. To protect public health and the environment, the Superfund program focuses on making a visible and lasting difference

VAPOR INTRUSION

occurs when there is a migration of vapor-forming chemicals from any subsurface source into an overlying building.

VAPOR FORMING CHEMICALS INCLUDE

VOLATILE ORGANIC COMPOUNDS (VOCS)

 Trichloroethylene, Benzene, Naphthalene, Mercury, Pesticides and PCBs

PCBs

- · PCBs primarily cause Cancer
- PCBs were often used in dielectric gel in old electrical transformers & fluorescent light ballasts.
- The reason PCBs were banned is that they are highly toxic, cancerous & do not easily degrade.
- PCBs can lay dormant in the soil for several years/decades and affect the health of workers, children playing & pets

POLLUTION PREVENTION ACT

- Pollution prevented or reduced at the source when feasible
- Pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner when feasible
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner

REDUCING POLLUTION & GREENHOUSE GASES

SUSTAINABILITY RECOMMENDED PRACTICES INCLUDE:

- Procurement of sustainable products and services and helping to create a more sustainable marketplace for all
- Encouraging chemical technologies to incorporate principles of green chemistry into chemical design, manufacture & use
- Safer Choices of products that perform & contain ingredients that are safer for human health and the environment

ADDITIONAL EPA TERMS AND ENVIRONMENTAL DEFINITIONS

EPA & CHEMICAL MANAGEMENT

- □ **Potential Responsible Party**: An individual or company that may be liable for environmental contamination cleanup.
- □ EPA Waste Generator: Any business or individual that produces hazardous waste, regulated by the EPA.
- □ **Hazardous Materials**: Substances that can harm humans, animals, or the environment when improperly handled.
- □ Hazardous Waste: Waste that poses risks to health or the environment due to its toxic, corrosive, or reactive nature.
- Secondary Containment: A backup system to contain spills or leaks from primary containment.
- □ Storm Water Run-off: Rainwater that flows over land, potentially carrying pollutants into water bodies.
- □ Swales: Shallow, vegetated ditches designed to capture and filter stormwater.
- □ Wetlands: Ecosystems saturated with water, supporting unique plants and wildlife, and important for biodiversity and flood control.

EPA LEGAL

- □ **Superfund**: A federal program for cleaning up hazardous waste sites in the U.S.
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act, a law addressing hazardous waste cleanup.
- □ NPDES (National Pollutant Discharge Elimination System): A U.S. federal program that regulates the discharge of pollutants into surface waters, requiring facilities to obtain permits to control water pollution.

WORKER HEALTH TERMS

- Baseline: Initial health status used for comparison in medical monitoring.
- □ **Bioaccumulate**: The process by which substances (ex., chemical, biological, radiation) build up in an organism over time.
- **Target Organ**: Primary organ affected by a specific chemical or toxin.

WORKER MEDICAL SURVEILLANCE PROGRAMS INCLUDE:

- □ Pre-employment medical screening, annual screenings
- Exposure related testing
- Termination testing
- □ Emergency and non-emergency medical treatment
- □ Employee and potential exposure recordkeeping
- □ Program review and improvement.

ASBESTOS

- □ Asbestos: A fibrous mineral once widely used for insulation and fireproofing, now known to cause respiratory diseases.
- ACM (Asbestos-Containing Material): Any material with more than 1% asbestos, posing health risks when disturbed.
- □ Asbestosis: A chronic lung condition caused by inhaling asbestos fibers.
- □ **Mesothelioma**: Cancer of the lung lining from asbestos exposure.

SILICA

- □ Silica: A natural mineral found in sand and rock, hazardous when inhaled as fine dust.
- □ Silicosis: A lung disease caused by inhaling silica dust over time.

ELECTRICAL PCB

- Dielectric: A material that does not conduct electricity, used as an insulator such as PCBs (previously used) and Mineral Oil blend (now used).
- □ PCBs (Polychlorinated Biphenyls): Toxic industrial chemicals formerly used in electrical equipment, now banned due to health risks.
- Light Ballast: A device that regulates the current in fluorescent lights, sometimes containing PCBs

Construction General Permit (CGP) compliance under the **Clean Water Act (CWA) stormwater management**

Develop & Implement a Stormwater Pollution Prevention Plan A comprehensive **SWPPP** will be developed, detailing measures to minimize pollution from construction activities.

Install and Maintain Erosion and Sediment Controls: Erosion and sediment controls, such as silt fences, wattles, and sediment basins, will be installed and maintained to prevent soil from washing into storm drains and water bodies.

Stabilize Exposed Soil: Exposed soils will be stabilized with mulch, hydroseeding, or other methods to prevent erosion.

Minimize Disturbed Areas: Disturbed areas will be minimized to reduce soil exposure and the potential for erosion and sedimentation.

Protect Storm Drains: Storm drains will be protected with inlet protection devices to prevent sediment and pollutants from entering the stormwater system.

Manage Waste and Materials: Construction materials, chemicals, and waste will be managed properly to prevent them from contaminating stormwater runoff.

Use Perimeter Controls: Perimeter controls, such as berms and buffer zones, will be established to contain construction site runoff and prevent pollutants from leaving the site.

Inspect Controls Regularly: Erosion and sediment controls will be inspected regularly, especially after rain events, to ensure they are functioning properly and repaired as needed.

Train Employees on Best Management Practices (BMPs): All employees will be trained on stormwater management BMPs and the importance of pollution prevention.

Reduce Vehicle Tracking of Sediment: Vehicle access points will be stabilized, and track-out controls like wheel wash stations or rock entrances will be used to reduce sediment tracking onto public roads.

Maintain Good Housekeeping Practices: Good housekeeping practices will be maintained on-site, including regular cleanup of debris and proper storage of materials.

Handle and Dispose of Concrete Washout Properly: Concrete washout will be handled in designated areas and disposed of properly to prevent contamination of stormwater.

Monitor Weather Conditions: Weather conditions will be monitored, and additional controls will be deployed before forecasted storms to prevent runoff pollution.

Control Dust: Dust control measures, such as water spraying or covering materials, will be implemented to prevent airborne particles from settling into stormwater.

Manage Stockpiles: Stockpiles will be covered or stabilized to prevent erosion and sediment runoff during storm events.

Ensure Proper Chemical Storage: Chemicals and hazardous materials will be stored in covered, contained areas to prevent spills and leaks into stormwater systems.

Contain and Clean Up Spills Immediately: Any spills or leaks will be contained and cleaned up immediately to prevent pollutants from entering the stormwater system.

Document Inspections and Maintenance: All inspections, maintenance activities, and corrective actions taken will be documented to ensure compliance with stormwater regulations.

Comply with Local Regulations: All stormwater management practices will comply with local, state, and federal regulations to ensure environmental protection.

Minimize Soil Compaction: Soil compaction will be minimized in areas where stormwater infiltration is necessary to reduce runoff and enhance natural filtration.

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