

Risk Assessment Report

Title		Document Number	MHC-EHS-HIRA-25
Department	NA	Site Name	Leeper, Suffield Depot, Fleischmanns, Alanreed, Galeville, Rosewood, Bowers, Vinings, Weldona, Cowgill, Fort Myers Beach, Council Bluffs
Risk Assessment Type	Blasting	Status	Publish
Next Revision Date	NA	Revision Number	150.0
Created By	Renard Whatley	Created On	10-Mar-2026 02:40:12 PM
Modified On	10-Mar-2026 02:44:34 PM		

Sections

Activity: Blasting

Sub-Activity: Transport & Storage of Explosives

Hazard

Hazard	Unauthorized access / theft
Risk	Security threat, illegal use
Likelihood	3
Consequences	5
RR	15
Risk Level	High Risk

Control Measures

E - Elimination	Avoid storing explosives on-site if possible (use licensed third-party magazines/storage).
SB – Substitution	Where feasible, use non-explosive alternatives or inert training munitions for drills.
EC – Engineering Controls	Store in certified, purpose-built magazines compliant with local explosives regulations. Perimeter fencing, anti-climb measures, vehicle barriers and vehicle access gates. Intrusion detection systems (motion sensors, tamper alarms) and CCTV with off-site monitoring/recording. Controlled locks with tamper-evident seals and secure locks that meet regulation standards. Separate storage areas for different hazard classes and quantities; use approved segregation/barriers. Limited and hardened access routes with vehicle checkpoints.
AD – Administrative Controls	Strict access control list: only authorized, vetted, background-checked personnel with recorded access. Two-person rule for handling and access (no lone working for custody of explosives). Maintain up-to-date inventory (daily reconciliation) and serial number tracking. Immediate reporting procedure for discrepancies / missing items; routine audits. Security vetting & clearance, periodic rechecks. Security shift rosters, patrols and random checks. Liaison with local law enforcement; rapid-response contact list. Transport manifests, chain-of-custody documentation and sealed transfers.
PPE – Personal Protective Equipment	High-visibility uniforms for security staff. No special additional PPE reduces theft risk
New control measure	NA
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	2
Consequences	5
Residual RR	10
Risk level	Medium Risk

Hazard

Hazard	Testing
Risk	NA
Likelihood	4
Consequences	1
RR	4
Risk Level	Low Risk

Control Measures

E - Elimination	NA
SB – Substitution	NA
EC – Engineering Controls	NA
AD – Administrative Controls	NA
PPE – Personal Protective Equipment	NA
New control measure	NA

Residual Risk

Likelihood	2
Consequences	4
Residual RR	8
Risk level	Medium Risk

Hazard

Hazard	NA
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Hazard

Hazard	Improper storage (heat, sparks)
Risk	Fire, explosion
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Eliminate unnecessary quantities on site; only store minimum operational stock.
SB – Substitution	Use less sensitive formulations where technically possible; store lower-energy components separately.
EC – Engineering Controls	Store in climate-controlled, approved magazines with temperature monitoring and alarms. Natural or mechanical ventilation to prevent hot-spot build up; heat-proof insulation where needed. Non-sparking surfaces, explosion-proof electrical fittings, isolated lighting and intrinsically safe equipment. Bonding and grounding for transfer operations to prevent static build-up. Maintain minimum separation (distance) between explosive storage and other buildings/activities according to local QD (quantity-distance) rules. Fire detection (specialist detectors) and deluge or other approved fire suppression systems suitable for explosives. Provide blast walls / earth berms between magazines where required. Proper shelving, containment trays and secondary containment for incompatible materials.
AD – Administrative Controls	Strict segregation of incompatible materials (oxidizers, fuels, detonators), follow manufacturer storage instructions. Permit-to-work for hot work — no hot work near magazines. Implement hot-work exclusion zones. No smoking policy and clearly signed smoking buffers with enforcement. Routine inspection programme (daily/shift checks) for temperature, seals, ventilation, pest ingress, signs of deterioration. Scheduled maintenance of electrical equipment and testing of alarms/suppression. Training on safe storage, spill/fire response and handling — documented and recurrent. Limit transfer amounts (use small transfer containers) and plan transfers during low-risk times.

PPE – Personal Protective Equipment	Fire-resistant clothing for personnel working near storage; anti-static footwear and gloves where appropriate. Eye/face protection for transfer operations; hearing protection as required by work.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Mishandling during transport
Risk	Accidental detonation
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Reduce number of transport movements; consolidate with licensed carriers or use remote/specialist transfer services.
SB – Substitution	Transport less sensitive components separately (e.g., propellant vs detonators) or inert components when possible.
EC – Engineering Controls	Use certified transport vehicles with secure, locked compartments and appropriate signage/placarding only as per regulation. Vehicle restraint systems to prevent load shift; use shock-absorbing packaging and approved containers. Route planning to avoid populated areas where possible; approved emergency pull-off areas. Vehicle communication & tracking (GPS) monitored by control center. Provide blast/fragment containment packaging for sensitive items where available.
AD – Administrative Controls	Transport only by licensed, trained personnel with explosives transport endorsements. Pre-trip vehicle checks and loading/unloading checklists; document chain-of-custody. Two-person rule for loading/unloading; no smoking, no ignition sources, no mobile-phone use in immediate loading area if required by regs. Movement only during approved hours; notify local authorities where required. Escort vehicles/convoys for high-value or high-risk shipments. Emergency response plan for road incident or fire, including coordination with local emergency services and designated safe-standoff distances. Driver fatigue management and schedule control. Restricted parking and parking overnight only in approved secure locations.
PPE – Personal Protective Equipment	Flame-resistant clothing for drivers/handlers; anti-static footwear and gloves. High-visibility clothing and protective footwear for loading teams. Eye/face protection during transfer operations as required.

Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Sub-Activity: Drilling for Blasting Holes

Hazard

Hazard	Vehicle topple on uneven surface
Risk	Fatal accident

Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Move drilling location to more stable ground or redesign the drill pattern if possible. If part of the bench is too soft or broken, exclude that area from drilling until it's repaired or compacted.
SB – Substitution	Instead of a large wheeled rig, use a track-mounted drilling rig which has better traction and stability on uneven terrain.
EC – Engineering Controls	Grader or dozer levels and compacts the drill pad before rig setup. Drainage channels cut to prevent water accumulation and soft ground. Outriggers deployed on every drilling setup. Wheel chocks used on slight slopes. Machine safety features: Ensure ROPS/FOPS (Roll Over / Falling Object Protective Structures) installed. Functional tilt alarm fitted and tested before start. Daily pre-start check includes verifying hydraulic stabilizers.
AD – Administrative Controls	Conduct pre-start inspection and complete a Job Hazard Analysis (JHA) before drilling. Mark no-go zones around the rig. Assign a spotter to guide the rig on uneven ground. Stop work if ground becomes unstable (e.g., after rain). Ensure operators are trained and competent for sloped terrain operations. Communicate via radio — supervisor to monitor conditions continuously.
PPE – Personal Protective Equipment	Hard hat, safety glasses, gloves High-visibility vest Steel-toed boots Seat belt (mandatory while in cab)
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Burst of air compressor/air reservoir
Risk	Fatal injury
Likelihood	4
Consequences	5
RR	20
Risk Level	High Risk

Control Measures

E – Elimination	Use electric or hydraulic alternatives to air compressors when possible.
SB – Substitution	Use compressors with built-in pressure relief valves and auto cut-off systems
EC – Engineering Controls	Maintain proper pressure gauges and safety relief valves. Install protective barriers around compressors. Ensure compressors are in well-ventilated areas with rated hoses and fittings.
AD – Administrative Controls	Routine inspection and preventive maintenance schedule. Certification of air compressors and reservoirs. Only trained personnel operate compressors. Maintain exclusion zones around operating compressors.
PPE – Personal Protective Equipment	Helmet, face shield/goggles, hearing protection, gloves, safety shoes.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
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Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Failure of pneumatic hose
Risk	Struck-by injury, lacerations
Likelihood	4
Consequences	5
RR	20
Risk Level	High Risk

Control Measures

E – Elimination	Replace old or damaged hoses; avoid repairing compromised hoses.
SB – Substitution	Use reinforced, anti-whip pneumatic hoses with quick-disconnect fittings.
EC – Engineering Controls	Install whip-checks or clamps to secure hoses. Route hoses away from walking paths and work zones.
AD – Administrative Controls	Pre-use inspection of hoses before every shift. Tag damaged hoses and depressurize before disconnecting. Conduct toolbox talks on safe handling of pneumatic hoses.
PPE – Personal Protective Equipment	Goggles or face shield, gloves, long-sleeve coveralls, safety boots.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Sub-Activity: Charging the Holes

Hazard

Hazard	Mishandling of detonators / explosives
Risk	Premature explosion → Fatalities
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Minimize on-site handling of detonators; only bring in small quantities as needed.
SB – Substitution	Use electronic detonators instead of traditional blasting caps where possible, as they are safer and reduce the risk of premature initiation.
EC – Engineering Controls	Store detonators and explosives in separate, certified magazines near the blast site. Use insulated, non-sparking tools for handling explosives.
AD – Administrative Controls	Only trained and certified personnel handle explosives. Follow strict sequence for charging holes. Keep unauthorized personnel away from the charging area. Conduct toolbox talk on “Safe handling of explosives.” Maintain chain-of-custody documentation for all explosives and detonators.

PPE – Personal Protective Equipment	Flame-resistant clothing. Safety helmet with chin strap. Safety gloves, boots, and eye protection. Ear protection if near other blasting activities.
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Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Use of metal rods for stemming
Risk	Sparks → Explosion
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Avoid using metal rods or metallic tools for stemming holes.
SB – Substitution	Use wooden, plastic, or other non-sparking materials for stemming
EC – Engineering Controls	Design tools and equipment with non-sparking materials. Keep stemming materials and explosives separate from any metallic objects or surfaces.
AD – Administrative Controls	Toolbox talk on “Use of non-sparking tools only for charging.” Supervise charging to ensure correct materials are used. Prohibit unauthorized tools near the blast site.
PPE – Personal Protective Equipment	Flame-resistant clothing. Helmet, gloves, and safety boots. Eye protection.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Static electricity during charging
Risk	Premature detonation
Likelihood	3
Consequences	5
RR	15
Risk level	High Risk

Control Measures

E – Elimination	Avoid activities that generate static near explosives (e.g., synthetic clothing, plastic sheets).
SB – Substitution	Use antistatic mats, gloves, and clothing.
EC – Engineering Controls	Ensure grounding of charging equipment. Maintain humidity to reduce static buildup.
AD – Administrative Controls	Personnel training on static electricity hazards. No smoking or spark-producing activities near charging area. Use approved procedures for handling explosives.

PPE – Personal Protective Equipment	Antistatic gloves and clothing. Safety helmet with chin strap. Safety boots with proper grounding. Eye protection.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	2
Consequences	5
Residual RR	10
Risk level	Medium Risk

Sub-Activity: Blasting Operation

Hazard

Hazard	Fly rock
Risk	Fatal injury to workers/public, property damage
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measures

E – Elimination	Avoid blasting near areas with people, vehicles, or public access.
SB – Substitution	Use controlled blasting techniques such as deck blasting or electronic detonators to reduce fly rock.
EC – Engineering Controls	Construct blast mats or sandbags over blast holes. Use proper burden, spacing, and stemming to control rock ejection. Ensure blast design is approved by blasting engineer.
AD – Administrative Controls	Evacuate all personnel and public from danger zone before blasting. Establish exclusion zones with barricades and warning signs. Conduct toolbox talk on “Blast site safety and fly rock hazards.” Issue blasting schedule and communicate to all nearby stakeholders.
PPE – Personal Protective Equipment	Flame-resistant clothing. Helmet with face shield. Safety boots with good grip. Ear protection (for high-decibel blasts).
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	High Risk

Hazard

Hazard	Excessive vibration
Risk	Structural cracks in nearby buildings
Likelihood	4
Consequences	4
RR	16
Risk level	Medium Risk

Control Measures

E – Elimination	Avoid blasting close to sensitive structures if possible.
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SB – Substitution	Use smaller charges, electronic delay detonators, or pre-splitting techniques to reduce vibration.
EC – Engineering Controls	Monitor vibration levels using seismographs. Design blast to minimize overpressure and ground motion.
AD – Administrative Controls	Notify nearby residents and authorities before blasting. Keep records of vibrations and conduct post-blast inspections of nearby structures. Only trained blasting engineers to plan and execute blasts.
PPE – Personal Protective Equipment	Ear protection for workers in proximity. Helmet and safety boots.

Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	4
Residual RR	12
Risk level	Medium Risk

Hazard

Hazard	Noise above 120 dB
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Risk	Hearing loss, complaints
Likelihood	4
Consequences	3
RR	12
Risk level	High Risk

Control Measures

E – Elimination	Avoid unnecessary blasting near populated areas.
SB – Substitution	Use electronic detonators or delay blasting sequences to reduce peak noise levels.
EC – Engineering Controls	Blast mats, acoustic barriers, and proper timing of blasts.
AD – Administrative Controls	Restrict personnel in high-noise zones. Provide advance notice to nearby residents. Schedule blasts during times with minimal human exposure.
PPE – Personal Protective Equipment	Ear plugs or earmuffs rated for >120 dB. Helmet and eye protection.

Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	3
Residual RR	9
Risk level	High Risk

Hazard

Hazard	Incomplete evacuation of danger zone
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Risk	Multiple fatalities
Likelihood	4
Consequences	5
RR	20
Risk level	High Risk

Control Measure

E-Elimination	Plan blasting only when the area can be fully controlled and evacuated.
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SB – Substitution	Use controlled low-intensity blasts if full evacuation is difficult.
EC-Engineering Controls	Barricades, fencing, and clearly marked blast exclusion zones. Visual and audible alarms for blast warning.
AD-Administrative Controls	Pre-blast roll call and headcount of all workers. Assign trained blasting signalmen and spotters. Strict enforcement of “no entry” into danger zone. Emergency response plan in case someone enters the blast area
PPE-Safety helmet with chin strap.	Helmet, safety boots, and flame-resistant clothing for all authorized personnel.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk Level	High Risk

Sub-Activity: Post-Blast / Mucking

Hazard

Hazard	Misfire of explosive
Risk	Explosion during mucking → Fatalities
Likelihood	4
Consequences	5
RR	20
Risk Level	NA

Control Measures

E-Elimination	Avoid mucking operations until misfires have been declared safe and cleared.
SB – Substitution	Use electronic blasting systems with clear misfire signals to minimize risk.
EC – Engineering Controls	Establish safe misfire protocols, including designated wait times before mucking. Use remote mucking equipment where possible to reduce worker exposure. Clearly mark and isolate suspected misfire zones.
AD – Administrative Controls	Training on misfire recognition and response. Strict adherence to wait periods before re-entry. Communication of misfire status to all personnel. Emergency procedures for misfire situations.
PPE – Personal Protective Equipment	Flame-resistant clothing. Helmet with chin strap and face shield. Safety boots with good grip. Hearing protection.
Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk Level	High Risk

Hazard

Hazard	Fall of loose rock after blasting
Risk	Fatal crush injuries
Likelihood	4
Consequences	5

RR	20
Risk Level	High Risk

Control Measures

E - Elimination	Remove loose rock before mucking by pre-clearance or controlled loosening.
SB – Substitution	Use mechanical rock breakers or hydraulic tools to reduce manual clearing.
EC – Engineering Controls	Install rockfall barriers or catch fences in mucking areas. Use rock bolts or mesh for stabilization where necessary.
AD – Administrative Controls	Inspection of mucking area before work starts. Supervise mucking operations closely. Toolbox talks on rockfall hazards. Restrict access to danger zones.
PPE – Personal Protective Equipment	Helmet with chin strap. Safety boots with steel toes. Gloves and eye protection.

Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	5
Residual RR	15
Risk level	NA

Hazard

Hazard	Dust from mucking
Risk	Silica exposure → Lung disease
Likelihood	4
Consequences	4
RR	16
Risk Level	High Risk

Control Measures

E - Elimination	Use wet mucking methods to reduce dust generation
SB – Substitution	Substitute dry mucking with mechanical ventilation or dust extraction systems.
EC – Engineering Controls	Local exhaust ventilation or water sprays during mucking. Enclose dusty operations where possible
AD – Administrative Controls	Limit duration of exposure for workers. Conduct air quality monitoring. Provide training on silica hazards
PPE – Personal Protective Equipment	Respiratory protection (N95 or better). Safety goggles. Gloves and protective clothing.

Additional Control Measures	NA
Opportunities	NA

Residual Risk

Likelihood	3
Consequences	4
Residual RR	12
Risk level	Medium Risk

Created On	Created By	Comment	Attachments
10-Mar-2026 02:44:34 PM	Renard Whatley	Hira Status has been updated to 'Publish' Testing	
10-Mar-2026 02:40:12 PM	Renard Whatley	A new record was created: Hira Type set to 'Blasting' Hira Status set to 'Submitted' Revision Number set to '150'	