# Mineral exploration: Drilling and other field activities audit Site: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Date conducted:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| 1 Site preparation |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 1.1 | Tracks to the drill site are suitable for drilling, support and emergency vehicle access. |  |  |
| 1.2 | There are designated escape routes. |  |  |
| 1.3 | Access routes to the drill site are clearly marked. |  |  |
| 1.4 | A traffic management plan has been implemented, including the designation of parking areas. |  |  |
| 1.5 | The prepared ground and/or constructed drill pad are level and stable. |  |  |
| 1.6 | The drill site is clear. |  |  |
| 1.7 | Overhead powerlines, overhanging vegetation, underground services and other obstructions have been clearly identified. |  |  |
| 1.8 | The drill rig, service vehicles and plant are positioned to minimise exposure to hazards. |  |  |
| 1.9 | Where required, edge protection is in place for the drill site. |  |  |
| 1.10 | Sumps have been constructed to contain all drilling fluids. |  |  |
| 1.11 | Sumps are barricaded. |  |  |
| 1.12 | Safety and warning signs are present, clear, legible and suitably located. [see Part 2, 6.5] |  |  |

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| 2 Safety controls |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 2.1 | At least two emergency stops are installed for the drill rig, and there is a testing regime in place. |  |  |
| 2.2 | All sources of potential energy are identified and isolated when performing maintenance or repairs. |  |  |
| 2.3 | All sources of stored energy are identified and isolated when performing maintenance or repairs on pressurised systems. |  |  |
| 2.4 | Fire-fighting resources are readily accessible at work areas where there is a risk of fire. |  |  |
| 2.5 | Where practicable, an automatic fire suppression system is installed on each item of plant. |  |  |
| 2.6 | All vehicles at the site are parked in a fundamentally safe way. |  |  |

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| 3 Rotating and moving parts |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 3.1 | A risk assessment has been conducted to identify any hazards associated with rotating and moving parts, and assess the risks of an employee being exposed to those hazards. |  |  |
| 3.2 | An audit has been conducted to ensure all practical measures have been taken to control risks associated with rotating and moving parts. |  |  |
| 3.3 | Where required, an action plan with due dates and responsibilities has been developed for the installation, modification or replacement of guarding. |  |  |
| 3.4 | A competent person regularly reviews drilling operations to ensure the adequacy of guarding and systems of work for rotating and moving parts. |  |  |

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| 4 Compressed air systems |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 4.1 | Hoses, couplings, seals and air lines are appropriately rated for the compressed air system being used. |  |  |
| 4.2 | Where practicable, engineered systems with designated connection points are installed. |  |  |
| 4.3 | At least one emergency stop is installed for each auxiliary compressor unit, and there is a testing regime in place. |  |  |
| 4.4 | An air pressure relief system is installed for each compressed air line. |  |  |
| 4.5 | A competent person regularly inspects the compressed air system, and takes immediate corrective action where necessary. |  |  |
| 4.6 | Air receivers and pressure relief valves are regularly inspected, tested and certified by a competent person. |  |  |
| 4.7 | Fit-for-purpose restraining devices are installed on each compressed air hose. |  |  |
| 4.8 | The anchor points for restraining devices are appropriately rated and fit-for-purpose. |  |  |
| 4.9 | Blockages in compressed air systems are removed according to a safe system of work. |  |  |
| 4.10 | There is a preventative maintenance program in place for compressed air systems. |  |  |
| 4.11 | Access to high-risk areas associated with compressed air systems is restricted. |  |  |
| 4.12 | Compressed air is only used for appropriate purposes. |  |  |

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| 5 Hydraulic systems |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 5.1 | Pipework, hoses, couplings, seals and hydraulic lines are appropriately rated for the hydraulic system in use. |  |  |
| 5.2 | Where practicable, non-flammable and non-toxic hydraulic fluids are used. |  |  |
| 5.3 | Where practicable, engineered systems are installed and hydraulic hoses and lines are shielded against wear. |  |  |
| 5.4 | Where practicable, screens are installed or hoses and lines configured to minimise interaction with hot components or electrical sources. |  |  |
| 5.5 | A competent person regularly inspects the hydraulic system, and takes immediate corrective action where necessary. |  |  |
| 5.6 | There is a safe system of work to search for or confirm hydraulic leaks that does not involve the use of hands or fingers. |  |  |
| 5.7 | There is a preventative maintenance program in place for hydraulic systems. |  |  |
| 5.8 | Access is restricted to high-risk areas associated with hydraulic systems. |  |  |

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| 6 Hazardous substances and dangerous goods |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 6.1 | The hazardous substances and dangerous goods inventory is maintained and reviewed regularly, and reduced where practicable. |  |  |
| 6.2 | Current material safety data sheets (MSDSs) are available for all products used on site. |  |  |
| 6.3 | Control and response measures are in place to manage the uncontrolled release of hazardous substances and dangerous goods. |  |  |
| 6.4 | Containers, hoses, couplings, seals and lines are rated for the substance in use. |  |  |
| 6.5 | Hazardous substances and dangerous goods are stored and handled safely. |  |  |
| 6.6 | Screens are installed or hoses and lines configured to avoid interaction of flammable substances with hot components and ignition or electrical sources. |  |  |
| 6.7 | Where practicable, self-bunded containers, bunded pallets or portable bunds are used for hazardous substances or dangerous goods. |  |  |
| 6.8 | Appropriate fire-fighting equipment is available where flammable substances are used. |  |  |
| 6.9 | There is a preventative maintenance program in place for all flammable substance systems. |  |  |
| 6.10 | Sufficient spill response equipment is available to deal with a complete failure of the largest container of hazardous substances or dangerous goods. |  |  |
| 6.11 | All spills of hazardous substances or dangerous goods are cleaned up and cleaning aids disposed of appropriately. |  |  |
| 6.12 | Appropriate personal protective clothing and equipment (PPE) is provided to avoid contact when handling hazardous substances or dangerous goods. |  |  |

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| 7 Electricity |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 7.1 | Electrical work is undertaken by licensed electricians. |  |  |
| 7.2 | Electrical equipment and installations are correctly isolated before maintenance or repair work commences. |  |  |
| 7.3 | Safety switches and residual current devices (RCDs) are used. |  |  |
| 7.4 | Voltage reducing devices (VRDs) are used on welding equipment. |  |  |
| 7.5 | There is an electrical inspection, testing and tagging program in place to ensure electrical equipment and safety devices are maintained in good working order by a competent person. |  |  |
| 7.6 | Electrical equipment is rated for the expected working conditions. |  |  |
| 7.7 | The site plan allows for the appropriate placement of electrical equipment and cables. |  |  |
| 7.8 | There is a safe system of work for using electrical equipment and systems under all conditions likely to be encountered. |  |  |

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| 8 Manual tasks |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 8.1 | Where practicable, hazardous manual tasks are eliminated or mitigated through the use of engineering controls. |  |  |
| 8.2 | There is a safe system of work to reduce the risk of injury to personnel from hazardous manual tasks associated with drilling activities. |  |  |
| 8.3 | There is a safe system of work to reduce the risk of injury to personnel from hazardous manual tasks associated with handling loads. |  |  |
| 8.4 | There is a safe system of work to reduce the risk of injury to personnel from hazardous manual tasks associated with using hand tools, plant and equipment. |  |  |
| 8.5 | There is a safe system of work to reduce the risk of injury to personnel from hazardous manual tasks associated with tyre changing and repairs. |  |  |
| 8.6 | There is a safe system of work to reduce the risk where personnel are likely to be exposed to repetitive tasks or vibration. |  |  |
| 8.7 | Non-engineered, modified tooling is not used. |  |  |
| 8.8 | There is a safe system of work to ensure work at night can be performed safely. |  |  |

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| 9 Working at height |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 9.1 | Where practicable, working at height hazards are eliminated through the use of engineering controls. |  |  |
| 9.2 | There is a safe system of work for working at height, including rescue plans. |  |  |
| 9.3 | Where practicable, alternative means of access are provided rather than working at height. |  |  |
| 9.4 | Areas of fall risk are controlled with edge protection, handrails or other engineering controls. |  |  |
| 9.5 | There is a fall protection system in place for tasks that involve working at height. |  |  |

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| 10 Falling objects |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 10.1 | A competent person regularly inspects rig components, and takes immediate corrective action to eliminate the hazard of falling objects. |  |  |
| 10.2 | There is a preventative maintenance program in place for rig components. |  |  |
| 10.3 | Where practicable, components with high risk of falling are secured with a restraint. |  |  |
| 10.4 | There is a safe system of work for tasks that involve working at height. |  |  |
| 10.5 | Work tasks are planned and “working at height” toolkits used to minimise the requirement for tooling deployed at height. |  |  |
| 10.6 | Where practicable, attachment points are provided to secure tools with a lanyard. |  |  |
| 10.7 | Drop zones are adequately delineated to restrict access. |  |  |

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| 11 Working in hot environments |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 11.1 | There is a system in place to prevent heat-related illness. |  |  |
| 11.2 | All personnel are aware of the underlying causes of heat strain, recognise its symptoms and know how to respond. |  |  |
| 11.3 | Personnel at risk from heat stress are monitored for signs of heat strain. |  |  |
| 11.4 | Where practicable, weather protection and cool rest and recovery areas are provided. |  |  |
| 11.5 | There is a safe system of work for new employees and those returning to work after a break to acclimatise to working in hot environments. |  |  |
| 11.6 | Where practicable, hours of work are scheduled so that physically demanding work is done in cooler periods of the day. |  |  |
| 11.7 | All personnel are provided with clothing suitable for the environment. |  |  |

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| 12 Fatigue and mental wellbeing |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 12.1 | There is a safe system of work to prevent fatigue and support mental wellbeing at the workplace. |  |  |
| 12.2 | There is a fatigue management plan for exploration activities and all personnel are trained in its application. |  |  |
| 12.3 | All personnel are aware of the underlying causes of fatigue and stress, can recognise the symptoms and know how to respond. |  |  |

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| 13 Airborne contaminants and natural gases |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 13.1 | There is a general dust management plan and all personnel are trained in its application. |  |  |
| 13.2 | Where fibrous, radioactive or toxic minerals may be present, the dust management plan incorporates a management plan for them. |  |  |
| 13.3 | There is a safe system of work for monitoring and managing hazardous gases released during drilling, and personnel are trained in its application. |  |  |
| 13.4 | All personnel are aware of the likelihood of encountering fibrous, radioactive or toxic metal-bearing minerals, and hazardous gases and know how to respond. |  |  |
| 13.5 | Where practicable, wet drilling methods are used in areas identified as high-risk for fibrous minerals and other airborne contaminants. |  |  |
| 13.6 | Where practicable, dust produced by drilling is collected and contained. |  |  |
| 13.7 | Where dust collection and containment are not practicable, dust is directed away from areas where personnel may be present. |  |  |
| 13.8 | All personnel exposed to atmospheric contaminants are fit tested and trained in respirator use. |  |  |
| 13.9 | Disposable respirators are replaced regularly to prevent build-up of dust. |  |  |

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| 14 Noise |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 14.1 | There is a noise control plan. |  |  |
| 14.2 | New plant and equipment is engineered to maintain the lowest possible level of noise. |  |  |
| 14.3 | Noise suppression devices and techniques are used. |  |  |
| 14.4 | Where the noise exposure standard could be exceeded, hearing protection is provided to enable effective communication |  |  |
| 14.5 | Prominent signage delineates areas where hearing protection is required. |  |  |
| 14.6 | Noise labels are attached to items of fixed plant, where appropriate. |  |  |
| 14.7 | There is a hearing protection program in place and all personnel know when and where hearing protection is required and comply with the program. |  |  |
| 14.8 | All exposed personnel are fit tested and trained in hearing protection use. |  |  |

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| 15 Ionising radiation |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 15.1 | A radiation management plan approved by the State Mining Engineer and Radiological Council is in place for uranium, thorium or mineral sands exploration, or where a nuclear borehole logger is used. |  |  |

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| 16 Hot work |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 16.1 | There is a safe system of work for hot work. |  |  |
| 16.2 | Hot work is not undertaken when total fire ban conditions exist. |  |  |
| 16.3 | Hot work is restricted to specially designated areas that, where practicable, are within the line of sight of other crew members. |  |  |
| 16.4 | Fuel and ignition sources are minimised at the work area. |  |  |

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| 17 Extreme weather and bushfires |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 17.1 | Incident management and emergency response plans are in place to deal with severe weather events and bushfires, and all personnel know how to respond. |  |  |
| 17.2 | Severe weather events and bushfires are tracked and monitored. |  |  |
| 17.3 | All personnel are aware of the likelihood of flooding or flash flooding, and know how to respond. |  |  |
| 17.4 | There is a safe system of work so personnel are not exposed to lightning strikes. |  |  |
| 17.5 | If there are signs of suspected lightning strike, plant and equipment are checked for damage before use. |  |  |
| 17.6 | There is a safe system of work for crossing of watercourses. |  |  |
| 17.7 | There is a safe system of work to ensure loose objects are appropriately anchored or secured and do not become projectiles in high winds. |  |  |

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| 18 Light vehicle movement |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 18.1 | The original equipment manufacturer (OEM) recommendations for light vehicle inspection and maintenance are followed. |  |  |
| 18.2 | Light vehicle modifications and load configurations are assessed to determine their likely effect on stability and profile, and address risks. |  |  |
| 18.3 | There is a safe system of work to manage the ground, road and weather conditions likely to be encountered by light vehicles. |  |  |
| 18.4 | Changes to ground, road and weather conditions that may affect light vehicle movement are monitored. |  |  |

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| 19 Heavy vehicle movement |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 19.1 | The OEM recommendations for rig movement are followed. |  |  |
| 19.2 | Rig modifications are assessed to determine their likely effect on stability, design specifications and profile, and address risks. |  |  |
| 19.3 | There is a safe system of work to manage the ground, road and weather conditions likely to be encountered by heavy vehicles. |  |  |
| 19.4 | Changes to ground, road and weather conditions that may affect heavy vehicle movement are monitored. |  |  |
| 19.5 | There is a safe system of work for manoeuvring drill rigs and equipment, including identifying the roles and responsibilities of designated spotters. |  |  |
| 19.6 | There is a preventative maintenance program in place to avoid in-transit damage to heavy vehicles. |  |  |
| 19.7 | After rig movements, a pre-start check of the rig and its components is undertaken by a competent person. |  |  |

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| 20 Remoteness of exploration |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 20.1 | There is a safe system of work to plan and monitor travel to and from work in remote locations. |  |  |
| 20.2 | Communication, emergency response and incident management plans are in place that reflect the remote conditions and address operational needs, and ensure personnel are trained in their application and how to use the equipment. |  |  |
| 20.3 | There is a safe system of work for selecting fit-for-purpose modes of transport. |  |  |

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| 21 Housekeeping |
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| **Point** | **Standard** | **Standard met** | **Comments** |
| 21.1 | The site plan allows for the orderly movement of personnel, equipment and materials. |  |  |
| 21.2 | Tools and equipment are properly stored after use. |  |  |
| 21.3 | Daily inspections and clean-ups are undertaken. |  |  |
| 21.4 | There are designated areas for storage and rubbish disposal. |  |  |
| 21.5 | There are designated areas for eating and ablutions. |  |  |
| 21.6 | At the completion of drilling, drill holes are plugged and rehabilitated and sumps filled. |  |  |

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