



MINERALS EXPLORATION



Issued by: Global Operations Manager	Variations, which may have regional or locational significance, are contained in SOP Documents as specific appendices.		
HSEC	Pages 1 of 27	Issue No. 002 Date May 2003	Global SOP BHPB Exploration



Standard Operating Procedure for Field Work

Standard Operating Procedures for Field Work

<p>1. DEFINITIONS AND INTRODUCTION</p> <p>Risks to Health, Safety, Environment, or Community Relations may arise whenever there is exposure to activities in the field. Controls may depend upon a number of options, and references should be made to specific SOP's where these exist.</p> <p>Staff are not to work alone when undertaking fieldwork!</p> <p>BHP Billiton Minerals Exploration requires that risk assessments are carried out prior to the commencement of field activities, and this assessment should be as broad as necessary to encompass all likely risks associated with any particular project.</p> <p>The application of BHPB Standards and procedures is required on activities that are owned /operated by BHPB, and are to be made available in joint venture and contract situations which may not be under direct BHPB control.</p>	<p>Project: <input type="text"/></p> <p>Location: <input type="text"/></p> <p>Date: <input type="text"/></p> <p>Reviewer: <input type="text"/></p> <p style="text-align: center;">Comments</p> <p><input type="checkbox"/></p>
---	---

2. SUPERVISION	Comments
<p>All work must be supervised by a person competent to give assurance that correct procedures are being followed, and that there is compliance with the requirements of this SOP. The on-site supervisor must be able to provide clear communication in the required language(s), with site personnel.</p>	<p><input type="checkbox"/></p>
<p>Non-compliance with HSEC requirements shall be regarded as serious, and any such events reviewed to establish the reasons. Where no valid reason exists then the matter may be treated as a disciplinary matter.</p>	<p><input type="checkbox"/></p>



Standard Operating Procedure for Field Work

3. TRAINING	Comments
Medical conditions, which may affect a person's ability to perform work contemplated, shall be reported to the appropriate manager prior to commencement of work.	<input type="checkbox"/>
All persons on a project shall receive induction to enable them to work safely and responsibly, and must be trained in safe and responsible work procedures for their job. There should be evidence of periodic refresher training.	<input type="checkbox"/>
Contractors must demonstrate employee competency to fulfill the assigned tasks. Contractors should hold records on employees' work experience and training courses.	<input type="checkbox"/>
In locations where trained contractors' employees are unavailable, BHP Billiton will assist in providing appropriate training and expect these employees to follow the BHP Billiton standard operating procedures.	<input type="checkbox"/>

4. CAMP AND FIELD EQUIPMENT SAFETY	Comments
4.1 Tools	
<ul style="list-style-type: none"> ▪ Use the correct hand tool or power tool for the job; never use defective or worn tools. Seek instruction if you are unsure about the correct use of tools and equipment. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Securely store all hand tools and power tools. Keep each item in its designated storage place when not in use. Never leave tools where they might fall or be knocked down. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep tools in good repair and free of dirt and grease. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Avoid using a "cheater" pipe to gain extra leverage while using a pipe wrench. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Before use, check the handles of tools such as axes, hammers, machetes, etc., to make sure they are sound and securely attached to the head of the tool. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Report all equipment breakages or malfunctions to supervisors so they can be repaired or replaced. Using worn or damaged tools, etc., may result in injury if the tool fails during use. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never use electrical tools in wet conditions or near flammable liquids or gases where a spark may ignite fumes/vapours. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Operate compressed air tools only through a pressure regulator. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Follow the manufacturer's instructions for the use, maintenance and storage of welding equipment. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ When using electrical tools a trip switch or Residual Current Device (RCD) must be used. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ All electrical equipment should be inspected and tagged prior to use by qualified person. 	<input type="checkbox"/>
4.1.1 Axes	Comments
Clear the work area of branches, etc., before you begin working with an axe. If you are clearing a path with an axe, beware of branches that will interfere with your axe strokes.	<input type="checkbox"/>
Only use axes that are in good condition, properly sharpened and fitted with good handles.	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Exercise caution when using an axe. Maintain your body in a position so the blade will hit the ground if you miss your target. 	<input type="checkbox"/>
A long-handled axe is safer to use than a short-handled axe. It is less likely to hit your leg if you miss your target.	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep axes well sharpened and wear leather gloves when sharpening them. Use an axe file or sharpening stone to sharpen the axe. Dull axes require more effort to use and they can glance off wet wood more easily than a sharp axe. 	<input type="checkbox"/>

Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Keep the axe in a sheath when it is not in use. Insert the axe into a magazine or wrap the axe in paper if no sheath is available. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Carry an unsheathed axe safely. Hold it by the handle close to the axe head. Point the blade down and away from your body. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never carry an unsheathed axe over your shoulder. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never use an axe to pull over a log or push over a standing tree. 	<input type="checkbox"/>
4.1.2 Machetes (Pangas)	Comments
<ul style="list-style-type: none"> ▪ Carry a machete or panga in a scabbard attached to your belt. Do not grip the side of the scabbard that houses the cutting edge of the machete. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Wear cut resistant protective leggings. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use a wrist loop when using a machete. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep well away from others when using a machete. Never swing it in the direct path of someone in case you lose your grip. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ If you are working with an unsheathed machete in steep terrain, try to carry it on the downhill side of your body. Then, your uphill hand is free to stabilise yourself if you lose your footing. 	<input type="checkbox"/>
4.1.3 Rock (geology) Hammers and Chisels	Comments
<ul style="list-style-type: none"> ▪ Always wear eye protection when you chip rock samples or are near other employees doing so. Make sure flying rock or metal fragments, due to your actions, will not injure members of your party. Flying slivers can cause eye injuries. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ When using hammers and chisels, beware of flying splinters of steel that may spall off the hammer. Never use another hammer in place of a chisel as the hardened steel of the hammer may splinter. Wear appropriate eye protection when using chisels and hammers. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use the largest chisel suitable for the job. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ File off any rough edges or "mushrooms" that develop on rock hammers or chisels. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make sure no vegetation will obstruct your swing. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Carry a rock hammer carefully. Falling on the sharp end has injured people. 	<input type="checkbox"/>
4.1.4 Ice Augers	Comments
Maintain ice augers in good working condition. Ensure the clutch works properly before use.	
<ul style="list-style-type: none"> ▪ Two people should handle an ice auger, as it is easy to lose control if only one person is operating the machine. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use ice augers that have a "safety arm", as it will stop the rotation if you lose control of the auger. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Always stand on the ice when operating the auger. Never stand on an oil drum, etc., to gain height. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Drill the length of the auger and then place another piece of auger on the machine. Do not join two lengths of auger together before you commence drilling. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Join each length of auger with the correct cotter pin. Do not use substitutes. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

4.1.5 Wrenches, Tongs and Spanners	Comments
These tools are essential at drill sites for handling pipes, tubing, etc. They can be dangerous if used incorrectly or if they are not kept in good condition.	
<ul style="list-style-type: none"> ▪ Use the correct tool for the job. Make sure the fit is correct. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep tools clean, well lubricated and in their designated storage place when not in use. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Replace gripping parts (jaws) when the teeth are worn on tools with replaceable parts. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Pull the spanner toward you; never push. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never use a hammer on a wrench or spanner, except on a striking spanner that is designed for the hammer strike. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never allow any part of you to come between wrenches, tongs, or break out spanners, and the mast or drill frame. You may be severely injured or killed. 	<input type="checkbox"/>
4.1.6 Power Tools	Comments
<ul style="list-style-type: none"> ▪ Always use three-wire core extension cords (leads) for connecting power tools unless you are using a double insulated power tool. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Double insulated power tools should be labelled as such. Do not ground (earth) the casing of these tools. These tools require only a two-wire power cord. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep electric tools away from water, chemicals, gasoline, diesel, oil, etc., and hot surfaces. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use a power cord that is as short as possible for the job. Keep the power cord out of the way while you work. It should never be near your feet. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Plugs and socket connections must be weather proof for use in camps and drill sites. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Keep power tools clean. They must be kept free of grease and dirt, especially near the tool ventilation openings. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Never use a tool that is overheating. Follow Lock-out/Tag-out procedures and have it repaired by a qualified person. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Do not leave power tools overhead where they may fall if the cord is pulled. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Use Ground Fault Circuit Interrupter (GFCI) or Residual Current Device (RCD) when using power tools. 	<input type="checkbox"/>	
4.1.7 Chainsaws		Comments
Employees must be authorised and trained prior to using a chainsaw.		
Chainsaws are dangerous. All BHP Billiton employees who are authorised to use chainsaws must be thoroughly trained to handle them safely. Supervisors must check out new employees before permitting the authorised use of chainsaws. Even if you have used chainsaws before, read the instruction manual for the particular model (or consult your supervisor or a trained technician) to determine if there are any special features that you should know about before you operate it the first time.	<input type="checkbox"/>	
Chainsaw "kickback" can cause severe injury. Kickback occurs when the blade suddenly jams or catches wood so the momentum of the chain causes the blade to spring back toward the operator (the saw bucks up). All chainsaws must have a chain brake that immediately stops the chain if kickback occurs. Learn the correct use of the chain brake.	<input type="checkbox"/>	

Standard Operating Procedure for Field Work

To avoid kickback:	Comments
<ul style="list-style-type: none"> ▪ Inspect the chain to make sure it is in acceptable working condition. Ensure that the cutting teeth of the chainsaw are properly sharpened. Dull chainsaws will kickback more frequently and with greater force. Wear leather gloves when you sharpen or manually move the chain. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Ensure that the depth gauges are correctly set. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make sure that all parts are tight and the chain is at the proper tension. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Adjust the idle correctly. The blade must stop when you release your fingers from the trigger. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ <u>NEVER</u> CUT WITH THE TIP OF THE BLADE. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never cut with the upper side of the blade unless it is absolutely necessary (e.g., when making an undercut on a limb to relieve tension or rarely, when making a back cut). 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make sure your footing is stable and that you will not slip while cutting. Clear debris or deep snow away from your work area before using a chainsaw. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never straddle the saw or stand directly behind the saw while cutting. Stand slightly to the side to reduce the chance of injury due to kickback. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Maintain full control over the saw at all times. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ When limbing, make sure the saw tip does not touch another branch. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never cut above chest height. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

These additional guidelines will help you work safely with chainsaws.	Comments
<ul style="list-style-type: none"> ▪ Start the chainsaw on the ground or on a stump with the chain break applied – not on your knee. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Never use a chainsaw to cut brush or strip bark. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Carry the saw with the motor stopped (or chain brake applied) and the blade pointed to the rear. Carry it with the sheath on the saw, whenever possible. Never walk with the saw motor running. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Always keep a first aid kit nearby. This kit should include a large pressure bandage. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Keep a fire extinguisher nearby if there is a fire hazard. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Beware of branches and limbs that are bent or "pre-stressed", as they may spring back or break. 	<input type="checkbox"/>
Refuelling a chainsaw	Comments
<ul style="list-style-type: none"> ▪ Do not smoke while refuelling. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Do not refuel a hot chainsaw; let it cool a while. Clear the organic material away from the immediate area. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use the correct oil and gas ratio for the chainsaw. Mix and keep the fuel in an accurately labeled container. Use a funnel and filter. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use oil of the correct viscosity for the season of the year. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Set the chainsaw onto non-flammable material to refill the gas tank. 	<input type="checkbox"/>

Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Do not refuel a chainsaw on a vinyl truck bed liner. Refuel the chainsaw on the ground. Vinyl bed liners prevent the grounding (earthing) of the chainsaw so static builds up when the fuel flows from a container through a hose or nozzle. A spark may occur as the nozzle is withdrawn and cause vapours to ignite. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Clean any spilled fuel from the machine after refuelling. Make sure there is no gas left on the muffler. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Move the chainsaw at least 3 metres (10 feet) from the refuelling site before you start the motor again. 	<input type="checkbox"/>
<p>When using a chainsaw, it is mandatory to use and wear the following equipment.</p>	<p>Comments</p>
<ul style="list-style-type: none"> ▪ Safety boots 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Cut-resistant gloves 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Hard hat, with face screen (shield) 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Eye and hearing protection 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Chainsaw pants or "chaps" made of kevlar or other equivalent safety material. 	<input type="checkbox"/>
<p>Felling Trees</p>	<p>Comments</p>
<p>If you are felling a tree for the first time, have someone with experience demonstrate the proper notching techniques.</p>	
<ul style="list-style-type: none"> ▪ Wear safety boots. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Do not fell or blaze trees unless it is necessary. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Do not fell trees when the wind is strong enough to make them sway. Only experienced employees may fell large trees. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Keep your cutting equipment sharp. Sharpen your axe as needed. Use a saw file regularly to keep the chainsaw blade cutting cleanly. A sharp chain is less likely to become embedded in the tree or to "kickback". 	<input type="checkbox"/>
<p>Before you begin felling:</p>	<p>Comments</p>
<ul style="list-style-type: none"> ▪ Check aloft for dead branches, snags, dead treetops or chicots (dead trees). 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Check aloft for other hazards that might fall when the tree is felled. Remove all hazards before you begin felling a tree. Changes in wind or even the vibrations of a saw may cause dead branches or trees to suddenly fall. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Determine the direction of the lean of the tree so you can plan the direction of fall. Make sure the tree does not lean in a direction opposed to the direction of your planned cut. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Before cutting, plan your path of retreat. The path of retreat is usually 45° to the rear of the planned direction of fall. Clear any obstructions from the area and from your path of retreat. Make sure no branches or objects will impede your movements. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make certain no one is in the area when you are felling. If anyone is present, make certain they know your plans. Keep people at least 60 metres (200 feet) from the tree being felled. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ If it is necessary to fell a tree across a road, post people on the road to issue warnings. Remember you cannot hear anyone approaching once your chainsaw motor starts. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make deep notches – one-third the diameter of the tree. Place the felling cut 5 cm (2 inches) above the bottom of the notch. Do not cut right through to the notch; a tree must have some wood to hinge on or it will kick back when it falls. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Just before the tree begins to fall shout "TIMBER". When the tree begins to topple, remove your saw and place it at the base of the stump directly behind the line of fall of the tree. You are then free to move rapidly away. Watch out for objects that might be knocked down by the falling tree. 	<input type="checkbox"/>
4.1.8 Firearms	Comments
<p>There are very limited circumstances where the need may exist to use firearms to protect employees from wild animal attacks while they are conducting BHP Billiton business. If it is deemed necessary to keep firearms in camp and to carry a firearm in the field (i.e., on traverse), the situation must be reviewed by the appropriate ELT manager and written approval received.</p>	
<ul style="list-style-type: none"> ▪ The carrying and use of weapons must be done in accordance with the BHP Billiton Minerals Exploration Firearms Policy. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ All employees required to use firearms must have appropriate training and a license in accordance with the codes, statutes or laws of the local jurisdiction (e.g., Firearms Acquisition Certificate). 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ BHP Billiton employees and contractors may not possess, carry or use personal firearms on Company premises or while on Company business except with the express written approval of their appropriate ELT manager. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Firearms must never be used for sport or hunting while in or around BHP Billiton camps or field operations. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Firearms must only be used for the protection of life. They must not be drawn or discharged to defend BHP Billiton Minerals Exploration property. If property destruction is a problem or threat, engage the help of the government wildlife officials in the region. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Contractors must follow the BHP Billiton Firearms Policy and rules when employed by BHP Billiton. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Violation of the Firearms Policy may result in Company disciplinary actions up to and including dismissal. 	<input type="checkbox"/>	
4.2 Camp Lanterns and Heating Stoves		Comments
<p>Most camps contain a variety of lanterns and heaters. Each type has different controls and idiosyncrasies. If you have not used a particular type before, read the instructions and ask questions of someone experienced with its use. Propane or battery-powered lanterns are safest. Lanterns that run on flammable liquid can be knocked over and spill fuel that may result in a rapidly spreading fire. Hang lanterns from the ceiling. They are more easily overturned if they are placed on a table.</p>		
Follow these precautions when using lanterns:		
<ul style="list-style-type: none"> ▪ Use the correct fuel. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Light your lantern outside the tent. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Light your match before turning on the fuel. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Do not pump the lantern too hard at first. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Pump a lantern carefully once the flame is going smoothly. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Never smoke while lighting lanterns and stoves. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Place lanterns far enough away from the walls and ceiling so the heat radiating from them does not set the tent on fire. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Keep burning lanterns away from fuel drums, cans or tanks that contain (or have contained) flammable liquids. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Be careful when you take down a hanging lantern. Use a glove or stick, as the handle may be very hot. 	<input type="checkbox"/>	



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> If a lantern runs dry, let it cool off and make sure it is out before you open and refuel it. Fuel will vapourise when poured into a hot lamp and an explosion may result. 	<input type="checkbox"/>
<ul style="list-style-type: none"> When lighting a new mantle let it burn in the open air for 15 minutes. This will allow toxic amounts of beryllium and thorium to dissipate. 	<input type="checkbox"/>
Heating stoves in tents	Comments
<ul style="list-style-type: none"> New stoves and pipes will smoke as the protective coating burns off. Make sure there is good ventilation as this smoke may be toxic. 	<input type="checkbox"/>
<ul style="list-style-type: none"> When you use any heaters, always check that your tent is well ventilated but where there are no drafts. Carbon monoxide and toxic fumes are significant hazards. 	<input type="checkbox"/>
<ul style="list-style-type: none"> Place oil and wood stoves at least 1 metre from any flammable material (e.g., tents, beds and clothes). 	<input type="checkbox"/>
<ul style="list-style-type: none"> Place a heat resistant barrier on the walls nearest the stove. Use aluminium foil, which will also reflect heat around the tent. 	<input type="checkbox"/>
<ul style="list-style-type: none"> Place insulation between the chimney and the support pole whenever an outside chimney needs a support pole. Brace and wire all pipes until they are solid enough to withstand a windstorm. Make sure the chimney does not touch the tent and that the chimney vent that passes through the tent is made of adequate insulating material. 	<input type="checkbox"/>
<ul style="list-style-type: none"> Use a heat-resistant spark arrester on oil and wood stoves. 	<input type="checkbox"/>
<ul style="list-style-type: none"> If an oil stove is HOT, turn off the oil and do not light it again until the fire pot cools. Oil evaporates when it seeps into a hot fire pot and this may cause an explosion. 	<input type="checkbox"/>
<ul style="list-style-type: none"> Do not move kerosene heaters when lit. 	<input type="checkbox"/>
<ul style="list-style-type: none"> Clean oil stove filters regularly. Use a soot remover and vacuum at least once a week when stoves are frequently used. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Frequently inspect all fuel lines (hoses). 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Remember to turn stoves down or off when the tent or camp is not occupied. 	<input type="checkbox"/>
Meltdowns have occurred from the misuse of heaters when:	Comments
<ul style="list-style-type: none"> ▪ The wrong type of fuel was used. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ The operator was smoking while fuelling up. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Insufficient care was taken when lighting them. 	<input type="checkbox"/>
4.3 Fuel Handling	Comments
Camps often require a variety of fuels. These are commonly stored in 45-gallon (200 litre) fuel drums or in smaller drums and jerry cans. Some fuels are compressed gases and are stored in cylinders that require special handling (e.g., propane).	
<ul style="list-style-type: none"> ▪ Fuel storage areas must be at least 100 metres away from the camp. Clear vegetation to reduce the risk of fire and create a berm around the area, if necessary. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Store each type of fuel in a separate pile. It is important not to mix them up. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Most drums are clearly marked but occasionally markings are erased. If in doubt about the identity of a fuel – DO NOT USE IT. Report it to your camp manager. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Drums should be stored lying down with both bungs horizontal when not in use. This prevents air and moisture from entering. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ When a drum is in use, store it with the bung elevated by raising one side of the base (use a rock, piece of wood). Then, any water that falls cannot run into the fuel through the bung. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Do not expect pilots to use fuel that is more than two years old or if the bung seals are damaged. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ When transferring fuel to smaller containers, label each container clearly. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use hand or power pumps to empty the drums into jerry cans. Use a flash or spark arrester when transferring fuel between containers to prevent a static spark from occurring. Try to use metal fuel containers; avoid the use of plastic fuel containers whenever possible. Never use your mouth to siphon fuel. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ If you must use the same pump for various fuels, make sure you flush it out first and empty the waste into a bucket – never onto the ground. Label the waste fuel container. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Smoking is never permitted around fuel storage areas. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Know the correct fuel for each piece of mechanical equipment. Check the manual or ask someone who knows. All fuel required for machinery must be properly filtered. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Refrain from refilling drums. If refilling a drum is unavoidable, do the following: 	<input type="checkbox"/>
<ul style="list-style-type: none"> a. Use the same type of drum. 	<input type="checkbox"/>
<ul style="list-style-type: none"> b. Closely inspect the drum for cleanliness inside and out and ensure it is not damaged. 	<input type="checkbox"/>
<ul style="list-style-type: none"> c. Thoroughly rinse the drum with the fuel that will fill the drum. This avoids contamination. 	<input type="checkbox"/>
<ul style="list-style-type: none"> d. Label the contents on the outside of the drum with indelible markings. 	<input type="checkbox"/>
<ul style="list-style-type: none"> e. Properly dispose of the fuel used to rinse the drum. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Transport fuel drums and gas cylinders upright in the back of pickup trucks – never in the cab. Carefully secure all drums and tanks so they cannot shift while underway. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Ensure that the drums or any fuel storage area are banded (dyked) to catch any spills. 	<input type="checkbox"/>	
Propane (liquefied petroleum gas – LPG)		Comments
Propane gas is compressed into liquid and stored in special cylinders.		
<ul style="list-style-type: none"> ▪ Handle propane tanks carefully. Propane cylinders must be used, transported and stored in an upright position. Place cylinders on a solid base and secure them so they cannot tip over. Place protecting collars on cylinders. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ As propane gas is heavier than air, escaping gas will accumulate in low areas. It is essential to have proper ventilation around all equipment that burns propane. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ The pressure of the propane varies with the temperature of the liquid propane, not with the amount of propane in the cylinder. Never heat up a propane tank (using a torch, etc.) to try to increase the flow of gas from the tank. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Use only the correct installation methods, the correct tools and the proper fittings (regulators, hoses, etc.) when you connect propane cylinders to fuel lines. 	<input type="checkbox"/>	
a. Secure the propane cylinder upright against the outside wall of the building, tent or drill shack, etc.	<input type="checkbox"/>	
b. Connect the feed hose (from the stove, refrigerator, torch, etc.) to the regulator of the cylinder.	<input type="checkbox"/>	
c. Open the shut-off valve on the propane cylinder.	<input type="checkbox"/>	
d. Use soapy water to check for leaks at the joints and fittings. Never use a flame to check for leaks.	<input type="checkbox"/>	
e. Turn the shut-off valve a quarter turn to light the pilot light of the heater, stove, refrigerator or the torch, etc.	<input type="checkbox"/>	



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Ensure the safety shut-off valve works properly. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Shield propane tanks from radiant or blower heat sources, and shield hoses from excessive heat and traffic. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Store full and empty gas cylinders separately outdoors. Never store propane tanks inside living or working quarters. Protect tanks from weather and heat, including direct sunlight. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Propane tanks have a limited life span. Do not use corroded or rusty tanks or those with expired dates. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Propane tiger torches are useful to heat drilling equipment in very cold weather. Use them carefully as it is easy to start a fire. 	<input type="checkbox"/>	
<p>NOTE: If in doubt about the identity of a fuel – DO NOT USE IT. Report it to your camp manager.</p>		
<p>4.4 Generators and Electrical Equipment</p>		<p>Comments</p>
<p>Exploration field camps and geophysical ground surveys use a wide variety of generators in exploration activities. Small camps usually use small gasoline powered generators with a generating capacity of 300-2000 Watts (W). Permanent camps commonly use larger diesel powered generators with capacities of 2-50 kW.</p>		
<p>Follow these guidelines to ensure safe operation of generators.</p>		
<ul style="list-style-type: none"> ▪ When you use generators in the field, make certain they do not rest on any organic material or vegetation that might ignite and start a bush fire. 	<input type="checkbox"/>	
<ul style="list-style-type: none"> ▪ Place the generator at least 1 metre (3 feet) away from any tent, building or other equipment when the generator is operating. 	<input type="checkbox"/>	



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Place large generators further away from the camp and in an insulated housing to reduce noise. Whenever possible, locate them downwind from camp to reduce noise and emission pollution. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Exhaust emissions contain poisonous carbon monoxide. Never run a generator in an enclosed area unless the exhaust pipe discharges outside the area so those fumes cannot re-enter the enclosure. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Carry out regular maintenance and repairs. This includes regular oil changes and coolant level checks. Shut off the engine before you perform any maintenance. Keep a written log of maintenance and servicing. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Operate the generator on a level surface. Otherwise, as the generator is filled, fuel and oil spillages may result. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Small generators should be placed in and operated within a metal pan. This container will catch spills that frequently occur during refuelling. Larger generators should be placed in a bunded (dyked) area. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Know how to stop the generator quickly. Label the emergency shut-off and understand the operation of all the controls. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ A generator is a potential source of electrical shock should you misuse it. Do not use a generator if your hands are wet. Do not allow the generator to get wet. Cover it to protect it from rain or snow. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ To prevent damage to the generator, make certain that the generator is grounded. Connect a length of heavy wire from the ground terminal to the ground spike. Grounding protects the generator from damage due to lightning, etc. Be aware, however, that grounding the generator may increase the danger of shock to a person standing near the generator if the soil or flooring beneath the generator is very wet. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Install a Ground Fault Circuit Interrupter (GFCI) / Residual Current Device (RCD) at the generator and plug all cords into it. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

Refuelling procedures for generators	Comments
<ul style="list-style-type: none"> ▪ Refuel generators during daylight hours. Never allow a generator to run dry of fuel (unless you intend to do so). Each evening there should be enough fuel present to last until morning. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ If refuelling must be done in darkness (e.g., Arctic winter), ensure there is adequate lighting to do the job safely. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Gasoline is extremely flammable and explosive. Refuel only in a well-ventilated area with the generator engine stopped. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Do not smoke or allow flames or sparks in the area where the generator is being refuelled. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Take care not to overfill the fuel tank and cause spillage. Replace the filler cap tightly after refuelling. Clean up any spillage. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ If diesel generators are fed directly from 45-gallon drums, ensure that you have an appropriate emergency spill clean-up kit available nearby. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use only well filtered fuel. 	<input type="checkbox"/>
Follow these guidelines for safe operation of electrical equipment.	Comments
<ul style="list-style-type: none"> ▪ Treat every wire as if it were energised or "live" until you confirm that it is not. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Ensure all electrical systems are correctly grounded. All circuits must be equipped with Ground Fault Circuit Interrupters (GFCIs) or Residual current device (RCD). GFCIs/ RCDs protect people from electrical shock, as they will trip and interrupt the circuit before a fuse in a circuit breaker panel will trigger. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Electrical cords should contain inline GFCIs/ RCD and must have no taped splices. To use electrical cords that lack GFCIs/ RCDs may require a documented inspection program; it is cheaper and safer to purchase and use cords with inline GFCIs/ RCDs. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Use electrical cords with ratings that are appropriate for the job. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Electrical cords must be free of breaks in the insulation. Inspect them frequently. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Minimise the hazards caused by electrical cabling (i.e., bury, elevate or barricade exposed cables). Protect cords from damage when they must cross roads or passageways. Secure or suspend electrical cords with non-conducting materials. Ensure that cables do not get wet. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ All electrical and repair work must be carried out by authorised personnel only. Do not attempt to repair electrical equipment. Tag out defective tools and bring them to the attention of your supervisor for repair work. 	<input type="checkbox"/>
<p>Camp procedures must comply with BHP Billiton Lock-out/Tag-out standard procedures when circuits are de-energised for maintenance, repair or other activity.</p>	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use extreme caution when handling aluminium ladders or other conductive materials near any electrical source. You must prevent them from touching exposed overhead electrical wires, light bulbs or other electrical conductors. 	<input type="checkbox"/>
<p>As core saws operate with water, operators must be especially careful to guard against electrocution. The electrical circuit containing the core saw must contain a GFCI / RCD and be grounded (earthed). Operators must use all required PPE, which may include a full face shield, complete hearing protection, a waterproof apron, gloves and steel-toed rubber work boots.</p>	<input type="checkbox"/>

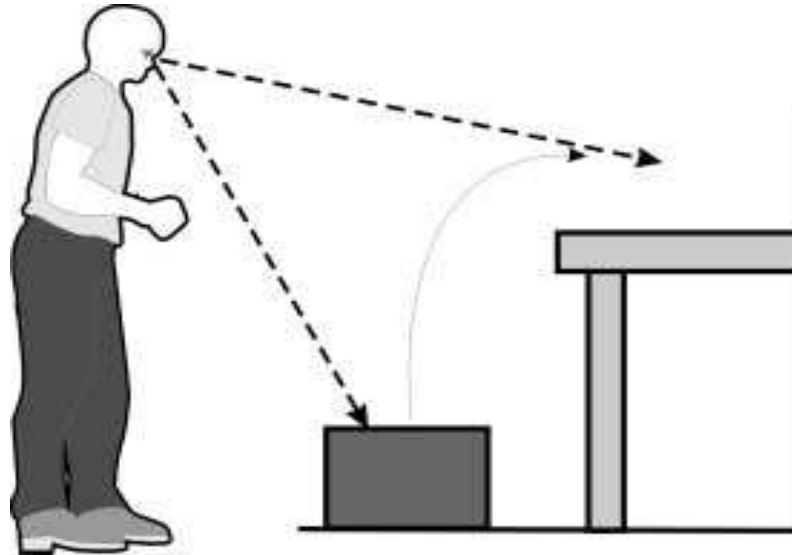
5. PERSONAL CONSIDERATIONS	Comments
Before you begin fieldwork:	
<ul style="list-style-type: none"> ▪ Have a general medical checkup if it has been a year or more since you had one. This may be a mandatory procedure depending on where you work. Your immunisations should be up-to-date. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Make note of any specific conditions which will apply, and inform your (travel) medical advisor of these –i.e. high altitude working. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Have a dental checkup if you will be working in a remote area for a long time. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Inform your supervisor and co-workers about all allergies, medication requirements or adverse reactions and special dietary requirements. Occasionally, allergies to certain foods, insect bites, or medications can cause fatal reactions. If you have a special medical condition or allergy, teach co-workers to recognise symptoms of an impending attack. Get their consent for you to know how to administer medication (e.g., insulin) because they may be unable to administer medication to themselves. A stressful situation can trigger symptoms of some disorders such as diabetes or asthma. If you require such medical provisions, keep them on your person at all times. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Make sure you have an adequate supply of any required medication. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Learn to swim if you will be working on or near water. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Do some physical training to strengthen weak muscles. 	<input type="checkbox"/>
5.1 Correct Lifting Procedures	Comments
<p>BHP Billiton provides training for employees in correct lifting procedures. Employees must know how to avoid unnecessary physical stress and strain and how to recognise factors that might contribute to an accident.</p>	<input type="checkbox"/>

Standard Operating Procedure for Field Work



Follow these correct lifting procedures when you lift any object, especially a heavy one.

<p>a. Plan the lift before you begin. Make sure your footing is secure and the route is clear if you must carry the object.</p>	<input type="checkbox"/>
<p>b. The best stance is to position your legs shoulder-width apart with one foot slightly ahead of the other. This position forces you to bend the knees rather than the back.</p>	<input type="checkbox"/>
<p>c. Bend your knees and get a good grip. Use gloves if your hands are sweaty or if the object is slippery.</p>	<input type="checkbox"/>
<p>d. Lift with your legs, not with your back. Keep your back straight, avoid twisting and never jerk when you lift. Cradle heavy objects close to your body when carrying them.</p>	<input type="checkbox"/>

Standard Operating Procedure for Field Work

e. Lift within your ability. Try not to exceed 50 pounds (22 kg) per lift. Get assistance if there is any possibility that you might injure yourself if you do the job alone. Don't "show off" by doing the job alone.	<input type="checkbox"/>
f. When you lift with a team, make sure you plan the lift together and execute the lift according to your plan.	<input type="checkbox"/>



Lift with your legs, not with your back. Cradle heavy objects.

6. GROUND SURVEY SAFETY	Comments
Geophysical and geochemical surveys have special hazards.	
<ul style="list-style-type: none"> ▪ Follow all BHP Billiton Mineral Exploration safety rules and guidelines for the various transportation methods you employ. 	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none">▪ Be fully prepared for the weather/climate with an appropriate survival kit, clothing, extra water, etc.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ The heavy equipment you carry hinders good balance. Be very cautious when you traverse along cut lines. Take care to keep your footing secure and be vigilant when you climb over logs or debris. If you fall, “pungies” or stubs may impale you.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ When you work in insect infested areas and must use insect repellent, take care not to apply it to your eyes and mouth. Do not overuse repellent as it is absorbed through your skin. Be vigilant if you use head nets as they restrict your visibility.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ Take care of your feet by wearing good quality boots appropriate for the terrain where you work. Use leather boots with good ankle support or waterproof boots if you work in wet areas.	<input type="checkbox"/>
6.1 Ground Geophysical Survey Field Safety	
<ul style="list-style-type: none">▪ Be sure all personnel who operate geophysical transmitters are fully aware of the hazards associated with high voltage equipment.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ Place High Voltage signs on any unsupervised geophysical electrode sites that carry high voltage or currents exceeding the milliampere range. Place them in populated areas where electrodes are out of sight.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ Be sure the transmitter power is off at all times except when actual measurements are being made. Always verify that the power is off before you remove or connect electrodes, change personnel on a task, or attempt any field repairs.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ Never apply electrical current to grounded wires or ungrounded loops of wire unless you notify the rest of the crew and receive confirmation that they know the system will be energised.	<input type="checkbox"/>
<ul style="list-style-type: none">▪ When pulling electrical cables across terrain, use a 4-wheel ATV rather than a motorbike. Before pulling, carefully check the cable to ensure it has no kinks or knots and very few splices as these may catch on roots, etc. If the cable breaks while being pulled, it will stretch first and then whip back at the driver when it breaks.	<input type="checkbox"/>



Standard Operating Procedure for Field Work

<ul style="list-style-type: none"> ▪ Take extreme fire precautions as the equipment used in geophysical surveys can cause a fire if the equipment malfunctions or overheats. Wires may become hot due to poor contact with the electrode or if they become detached and lie in direct contact with the ground. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Take extreme precautions if a lightning storm approaches. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Take care of your back, as geophysical equipment is very heavy. Remember to use correct lifting procedures. 	<input type="checkbox"/>
6.2 Ground Geochemical Survey Field Safety	Comments
<ul style="list-style-type: none"> ▪ Take care of your back. Backpacks become very heavy when laden with samples. Use correct lifting procedures and do not overload your pack. Keep samples to a weight that can be easily lifted. Use team lifting if required. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Use your shovels, picks, etc., correctly and use caution when you traverse so you do not fall on them and injure yourself. 	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ When doing soil /gas work, it is important to treat gas canisters carefully. Do not allow them to overheat. Follow transportation requirements for "dangerous goods". 	<input type="checkbox"/>