



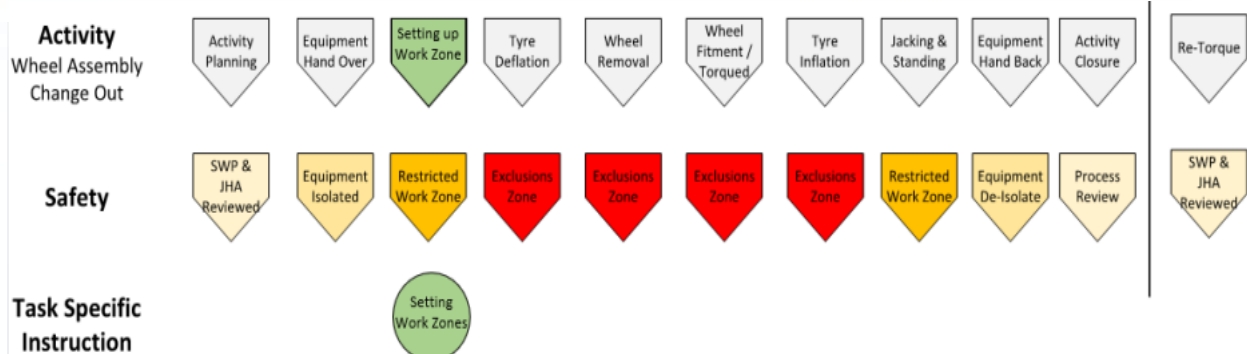
VUL-SWP-072a-004-Establishment of Work Zones

STANDARD WORK PROCEDURE (SWP)	
Description	Establishment of Work Zones
Site	Vulcan Mine
Department	Maintenance – Tyres
PPE Required	Job Step Analysis Reference
    	CTMS-ST-001 - Tyre, Wheel, and Rim Management Standard & CTMS-WI-GNC-001 Establish Work Zones. This integrated SWP forms part of VUL-SOP-072a-Tyres, Wheels & Rims Mgmt.
Task Specific PPE	Other Relevant Information ☐ Relevant OEM instructions & specification available
	ERT resources available on-site during operations. Personnel performing tyre fitting and maintenance tasks shall be assessed as competent in the specific units of competency according to the state OR national regulations • AURKTJ011 Remove, inspect, and fit earthmoving and off-the-road tyres. • AURKTJ012 Remove, inspect, and fit earthmoving and off-the-road wheel / rim assemblies. • RIIVEH307D Operate heavy rigid vehicle. • RIIHAN307D Operate a vehicle loading crane.
The purpose of this SWP is to provide a documented way of working to achieve an acceptable level of risk. The steps outlined pertain to the titled task only. All other SHMS requirements such as SOPs must be followed e.g., VUL-SOP-065-PPE, VUL-SOP-089-Dust etc.	Work Instruction is based on working in a controlled environment (Tyre Bay) on OEM standard Machine. If the environment, tools, equipment changes and or a deviation from this Work Instruction, a new JHA must be created and approved by all workers conducting the task.
Critical (Hazard) Risks	
Ensure controls are in place for critical risks associated with this task. These include:	    



1. Positioning of Machine & Establishing Work Zones OVERVIEW

1. Conduct a personal pre-task risk assessment to identify hazards and controls before commencing task.
2. Ensure that machines and in particular wheels/rims/tyres are clean with no hang-up or debris prior to jacking.
3. Tyre fitters are to identify the correct jacking point location prior to commencing to jack machine.
4. Jacking plates are to be used when the surface is sub-standard (refer to personal pre-task risk assessment).
5. Ensure that the Equipment is empty prior to jacking.
6. All jacking tools should be used on flat, stable concrete ground that can support the weight of the equipment.



2. Tyre Pad

The Tyre Pad should be a thick layer of levelled concrete ground, allowing it to support the machine's weight when it is being jacked. The Tyre Pad should have the following sets of requirements,

- Depending on the equipment model, select an appropriate tyre pad to accommodate the machine's size and weight. Ensure that the tyre pad is suitable for jacking the equipment.
- Check that the Tyre Pad is equipped with drainage and make sure that it is not clogged to prevent water accumulation (**Slip Hazard**).
- Demarcation – The Tyre Pad should be demarcated with lines to separate different work zones.
- The tyre pad's surroundings should be regularly maintained to ensure no undulations/soft spots and maintain a flat surface to conduct tyre bay activities.

3. Machine Positioning

1. Engage a spotter to guide the machine operator to position and park the machine on the designated location (pad / jacking slab etc.).

- a. Use two-way radios and hand signs/signals to establish positive communication.

NOTE: Stop all operation when losing sight or communication with the spotter.

- a. Ensure machine is parked on fundamentally stable ground or designated pad.
- b. Chock the wheels on the opposite wheel position of working zone (tyre / wheel position) of the machine.

2. Isolate machine and test for Dead.

- a. De-energise the machine by switching the “RED” battery isolation switch to the “OFF” position.
- b. Apply “Personal Danger” tag / lock and attach them onto the “RED” battery isolation switch.
- c. “Test for dead” – test machine is free from power and cannot be started (switch on machine with key and test for start).
- d. Ensure hydraulic pressure has been released by turning steering wheel.

NOTE: Test for dead required, if personnel not authorised, contact supervisor.

- a. Once the machine is parked and shutdown, connect to TPMS system (IF INSTALLED) to view/record tyre temperature and pressure, download TS data log, analyse battery voltage for spikes, RF conditions etc.

CAUTION: Uncontrolled movement of Heavy Moving Equipment (HME) can cause serious injury or fatality to personnel.



3. Conduct walk-around inspection (Visual) to identify hazards, including (but not limited to).

- a. Tyre specific (fractures / bubbles / leaks / body cords)
- b. Wheel / Rim (loose / damaged components / cracks / leaks)
- c. Material hang-up and overburden at the end of tray (tray hang up / material build up underside of tray)

NOTE: Any of above identified, notify supervisor.



4. Establish Work Zones

1. Demarcate Restricted Work Zone for the working location (wheel position) of the machine.

- a. Restricted Work Zone shall be centred from centreline of wheel position at distance 6m wide (3m each side of centre line of wheel position) x 18m long.
- b. Zone to be demarcated with High Visibility Barricades

NOTE: Refer to Figure 3 for setting up zones

All non-essential personnel and machinery must be positioned outside of this designated restricted work zone.

2. Maintaining Restricted Work Zone:

- a. The demarcated Restricted Work Zone must remain in place until completion of task.
- b. Restricted Work Zone must be re-established for each subsequent new task.

NOTE: Unauthorised personnel SHALL NOT enter a designated Restricted Work Zones.





5. Exclusion Zones

Before any work is done on Tyres Rims and Wheels, including fitting/removal of assemblies, an exclusion zone must be established.

The exclusion zone should consider that:

- a) Tyres can be dropped from Handlers/Manipulators; particularly when they are deflated.
- b) Components, such as a flange ring, can separate from the tyre.

During all Tyres, Rims, and Wheels activity (including inflation of tyres), the tyre bay will be restricted, and the access points closed by demarcation and signage. Where these types of activities occur outside the confines of the tyre bay, a risk assessment will be completed, and an exclusion zone established with appropriate demarcation/barricading as required by the task.

Whilst inflating tyres mounted on equipment, an exclusion zone will be enforced in front of the tyre, extending from the outside diameter of the tyre, and expanding at 45 degrees.

6. Location

Tyre and wheel changes must be done in an area isolated from traffic interaction. The dedicated Tyre Bay or Workshop, in conjunction with signage, are the preferred locations for Tyres, Rims and Wheels fitting/removal.

Vehicles with tyre defects must not be taken into the workshop or tyre bay area until the defect has been inspected by a competent person.

If a tyre or wheel change is undertaken in the field:

- a) A JHA is required to be completed when changing any wheel assemblies on site.
- b) The Open Cut Examiner must be consulted.
- c) A suitable location, clear of traffic and on level ground, should be selected.
- d) Traffic controls and exclusion zone demarcation must be put in place (e.g.) witches hats, signage etc. The control effectiveness of these will be monitored until the vehicle is again supported by its own wheels.
- e) Ground load bearing capacity must be assessed; a load spreading jacking plate may be required.
- f) If practical, payloads are to be removed.
- g) Adequate lighting shall be provided.

7. Restricted Work Zone

A visually demarcated area that includes:

- a) MUST be hard barricaded.
- b) The area between the tyre and machine whilst the tyre handler is moving into position to install the tyre on the hub.
- c) The area between or under the tyre handler attachment whilst handling of a tyre is in progress.
- d) The travel path in front of and behind the tyre handler.
- e) The line of fire if the tyre were to fall from the arrestor arm of the tyre handler.

The area span from the centreline of the wheel hub is 3m on either side and 18m long.

8. No Go Zone

A No-Go Zone must be in place when tyres and rims are removed, installed, and inflated to protect all personnel. The No-Go Zone will prevent any person from being in a direct line from the front of the tyre whilst this work is being undertaken.

- a) The No-Go Zone will be demarcated with signage and barricading.
- b) The No-Go Zone will contain, as part of its perimeter, a hard barrier such as a tyre handling equipment, forklift, or other mechanical barrier.
- c) Personnel directly involved in removal, installation and inflation will not cause their body to enter the No-Go



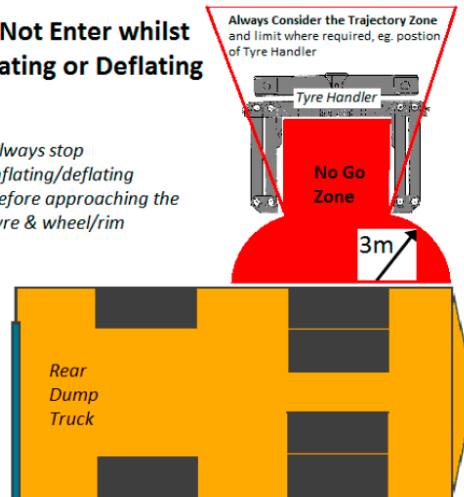
Zone whilst inflating tyres occurs. Air flow must be stopped before approaching the tyre.

- d) For any such task, tyre inflators will have suitable length hose to extend to outside of the No-Go Zone.

**Do Not Enter whilst
Inflating or Deflating**

*Always stop
inflating/deflating
before approaching the
tyre & wheel/rim*

*Always Consider the Trajectory Zone
and limit where required, eg. position
of Tyre Handler*



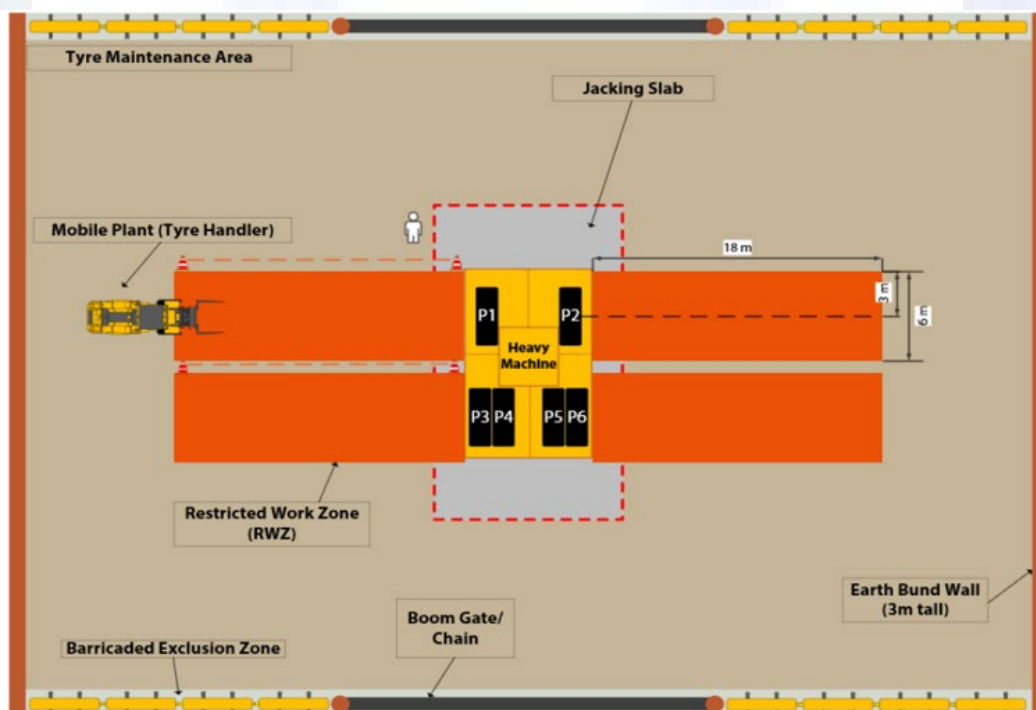
9. Demarcation – Working Zones and general layout

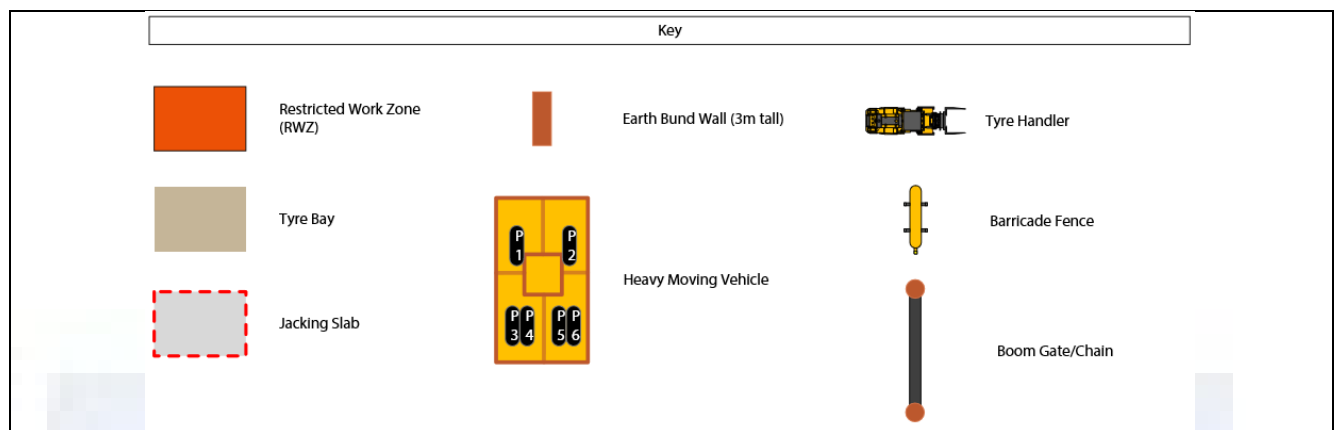
Demarcated tyre maintenance area where unauthorised personnel are prohibited within this area while mobile plants are in operation.

Restricted Working Zones (RWZ)

The RWZ must be barricaded without consulting the personnel in charge of the work area, as shown in the diagram below.

Engineered hard barriers should also be employed as a contingency measure, minimizing the chance of personnel getting injured in exploding tyres, falling wheel and risk of getting crushed by the tyre handler.





10. Tools and Equipment

The tools and equipment brought to the site or already on-site should be certified and fit-for-purpose.

The tyre bay should undergo a full inspection on each day shift to ensure that all items have been checked by crew members.

The minimum requirements in the following are but not limited to:

- Check that the jacking pads suitably rated.
- Check that the jacks and equipment stand are certified and fit-for-purpose.
- Workbenches are appropriate and filled with enough power and air outlets.
- Check that there is a designated area for the storage of consumables (nuts, bolts, and washers etc.) and tools.
- A display and noticeboard should be put in place to take notes or show relevant information.
- Check that there are tools to measure tolerances and dimensions of the wheel.
- Check that the jacking plates are present and fit-for-purpose.
- Check that there is a certified tyre inspection stand & it is secured.
- Check that the wheel or rim fitment stand are certified and fit-for-purpose.
- Ensure that the safety cage is certified and is able to suit assembly size & is secured correctly.
- There are sufficient tyre additives within the expiry date.
- Stands and dollies are certified and are in good working order.

11. Spotter

A spotter should be engaged to guide the operator if the operator cannot obtain a clear line of sight. The spotter is to visually direct the operator to ensure smooth operation and movement of the equipment. Use a two-way communication device and correct hand signals to maintain positive communication. A spotter must be engaged under these circumstances:

- Mobile equipment moving in, actively moving around the workshop compound area.
- Mobile equipment moving in the following areas.
 - Confined area
 - Congested area
 - Areas with electrical services
 - Areas near excavation
- Moving wheeled earthmoving equipment in the workshop area.
- Moving objects in a location with insufficient clearance (less than 3 metres clearance on both sides of the wheeled earthmoving equipment)
- Any situation in which the Job Hazard Analysis (JHA) specifies that a spotter is required.
- When the fork operator cannot see the line of path.

Spotter Rules

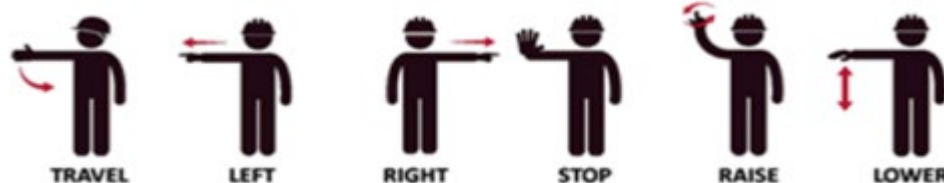
- The spotter must be familiar with the procedure.
- Notify the operator of the route to be taken and the destination.



- c) Use a torch if there is insufficient lighting, limiting visibility between operator and spotter.
- d) Spotters are expected to “walk-around” the equipment that is to be moved with the operator, visually inspecting the vehicle, and ensuring that there are no obstacles in the equipment’s pathway.
- e) Maintain full focus on the task, ensuring that there are no distractions from any source.
- f) Check for maintainers who may be working on the machine. They must be removed from the area and must remove their personal lock.
- g) To ensure the spotters’ health and safety, they are expected to be positioned in a safe location with an adequate distance from the wheeled earthmoving equipment whilst keeping a clear vision of the operator.
 - i. Always stay at least 5 metres away on the driver’s side of the vehicle.
 - ii. Spotters are not to be positioned directly in front of the forward-moving vehicle. Similarly, do not stand directly in the rear of a reversing vehicle.
 - iii. Not within the equipment’s pathway.
- h) If the spotter is spotted in the rear with inadequate distance (less than 5 metres to the driver’s side of the moving vehicle) from the moving truck, a second spotter is required.
- i) If there is insufficient clearance on both sides of the equipment (less than 3 metres), engage an assistant spotter.
- j) The main spotter is always in charge. He is responsible for giving clear directional signals to the operator. If the visibility between the operator and spotter is lost, all operation must be stopped.
- k) If there is any miscommunication and misunderstanding of directional signals, the spotter must stop the operation. Refer to Appendix A for Operator’s directional signals.

Operator Rules

- a) Operators must be familiar with the procedure.
- b) Operators are expected to “walk-around” the equipment that is to be moved with the spotter, visually inspecting the vehicle, and ensuring that there are no obstacles in the equipment’s pathway.
- c) Follow the spotter’s directional signals. If there are any miscommunication or confusion, stop all operation and clarify the confusion with the spotter.
- d) Do not move the vehicle unless the spotter is positioned:
 - i. Within line of sight.
 - ii. Adequately distanced from the outside of the moving equipment.
- e) Maintain full focus on the task, ensuring that there are no distractions from any source.
- f) If there is insufficient clearance on both sides of the equipment (3 metres), request an assistant spotter.



12. Communication

The spotter and the operator should agree on the communication method during an operation before commencing work. Only employ the use of two-way radio if there is a difficulty in maintaining visual contact with the operator.

13. Closed-Circuit Television (CCTV)

If a CCTV is fitted on the tyre handler to record the maintenance process, it can serve as evidence to prove that the maintenance job was carried out safely and properly.



14. Exclusion Zones

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