Job Safety Analysis (JSA) – Guideline

A job safety analysis (JSA) is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job operation. In a JSA, potential hazards are identified for each step of the task and controls recommended for the safest way to do the job.

A JSA risk assessment must be developed when:

- the work activity involves a number of different tasks and hazards for which risk controls need to be planned, communicated and implemented
- changes at the workplace occur that may impact on the effectiveness of control measures
- a Permit to Work is required
- developing SOPs

A Take 5 risk assessment can be used instead of a JSA when the work activity involves a simple task with a limited number of low risk hazards and there is good understanding about how the hazards should be controlled to ensure the task is completed safely. For example doing a visual inspection of a worksite, or closing off a valve, or investigating a tripped switch.

Developing a JSA

The person leading the work is responsible for developing the JSA. This is typically the:

- Person doing the work for single person tasks
- Person supervising the work for team tasks
- Person in charge of designing new work or equipment.

One method of doing a JSA is to have a group of experienced workers complete the analysis through discussion. An advantage of this method is that more people are involved in a wider base of experience and promoting a more ready acceptance of the resulting work procedure. This method is most suitable for infrequently performed or new jobs; or situations where observation may not be practical.

When leading JSA discussions ask:

1. What are we doing?
2. What could go wrong?
3. What do we need to do to make it safe?

These three prompt questions will provide you with the basic information needed to build your JSA. Once you have your JSA framework built, use available guidance to ensure the risk control measured selected are sufficient to reduce the risk so far as reasonably practicable i.e. standards, best practice guidelines, WSL Key Requirements and risks assessments. Include diagrams and photos where needed.

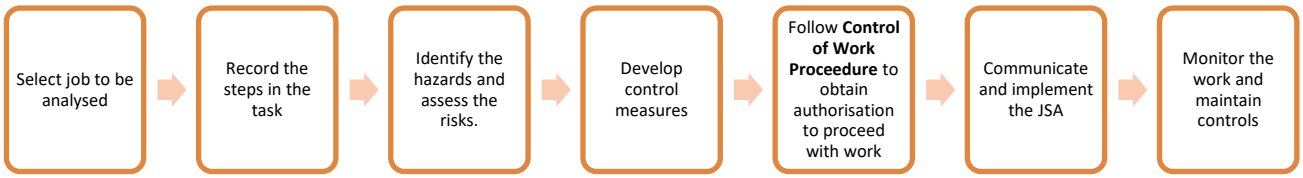
Benefits of doing a JSA

The JSA process helps identify hazards and increase the job knowledge of those participating. Safety and health awareness is raised, communication between workers and supervisors is improved, and acceptance of safe work procedures is promoted.

Instructions

JSA Process

There are seven basic steps to follow:



Step 1: **Select job to be analysed.** When writing the description of the works, clearly define the activities for which the JSA applies. Complex jobs, or jobs that last several weeks, it's often more effective to break the job analysis into specific work packs each with an individual JSA.

When selecting a job to be analysed, consider the following:

- The scope of the work.
- When and where is the job performed?
- Who has to do it and how often?
- The activities involved and how are they done?
- What equipment or procedures are needed to perform the job safely?

Step 2: Record the steps in the task. Examine a specific job by breaking it down into a series of steps or tasks. This will enable you to discover potential hazards you and the Work Team may encounter. Each job or operation will consist of a set of steps or tasks. Be sure to list all the steps needed to perform the job. Some steps may not be performed each time, i.e. setting up the work area, however, if that step is generally part of the job, it should be listed.

Example:

6. Steps taken to complete the job

	Hazards *(one per line)*		Hazard controls – what do we need to do to make it safe?			
What are we doing? *(step by step)*	**What could cause harm?**	Existing risk level *(use risk matrix)*	**Can we eliminate the risk?** *List how below*	If elimination is not possible, can we: - **substitute** and/or - **isolate** and/or - use **engineering controls**	If any risk still remains: - use **admin controls** and/or **PPE** *(PPE is the least effective and should not be first or the only control measure)*	Residual risk level
Establish general locations for boreholes during initial site walkabout						
Take samples for contaminants at 6 proposed borehole locations						
Locate underground utilities						
Set up drill rig at borehole locations						

Step 3: **Identify the hazards and assess the risks.** A hazard is a potential danger. The purpose of the Job Safety Analysis is to identify ALL hazards, both those produced by the environment or conditions and those connected with the work activities. Compiling an accurate and complete list of potential hazards will allow you to develop the recommended controls to ensure that work proceeds safely.

Example:

6. Steps taken to complete the job

	Hazards *(one per line)*		Hazard controls – what do we need to do to make it safe?			
What are we doing? *(step by step)*	**What could cause harm?**	Existing risk level *(use risk matrix)*	**Can we eliminate the risk?** *List how below*	If elimination is not possible, can we: - **substitute** and/or - **isolate** and/or - use **engineering controls**	If any risk still remains: - use **admin controls** and/or **PPE** *(PPE is the least effective and should not be first or the only control measure)*	Residual risk level
Establish general locations for boreholes during initial site walkabout	Spray paint or other chemical marking products					
	Electrical Environment					
	Personnel contacting live electrical apparatus					
	Moving vehicles in the area					
Take samples for contaminants at 6 proposed borehole locations	Contact with underground electrical					
	Pinches, cuts, strains					

Tip: Insert a new row for each hazard identified.

How to Assess the Risk

When we refer to risk in relation to occupational safety and health the most commonly used definition is 'risk is the likelihood that a person may be harmed or suffers adverse health effects if exposed to a hazard.'

Once you have identified the hazards involved in the task, estimate what realistic **severity** of harm that may occur, and the **likelihood** of that occurring. A risk matrix tool provides a numerical score for the risk assessment.

Firstly assess the Existing Risk by:

1. Identifying the hazard; take into consideration who may be harmed and how that harm may occur
2. Identifying existing controls that will remain active during the work
3. Using the risk matrix determine the LIKELIHOOD and SEVERITY of harm

			CONSEQUENCE / POTENTIAL SEVERITY				
			MINIMAL Non-injury or first aid injury (FAI)	**MINOR** Medical Treatment Injury	**MODERATE** Medical Treatment Injury, with lost time (LTI)	**MAJOR** Injury requiring hospitalisation/notifiable event	**CATASTROPHIC** Fatality or Multiple Fatalities
LIKELIHOOD	**Very high**	**Almost certain:** Commonly Occurs	3: Medium	4: High	4: High	5: Very high	5: Very high
	High	**Likely:** Could easily happen	2: Low	3: Medium	4: High	4: High	5: Very high
	Medium	**Possible:** Could happen or has been known to happen	2: Low	2: Low	3: Medium	4: High	4: High
	Low	**Unlikely:** Hasn't happened yet but could happen	1: Very Low	2: Low	3: Medium	3: Medium	4: High
	Very low	**Rare:** Very unlikely but could happen in exceptional circumstances	1: Very Low	2: Low	2: Low	3: Medium	4: High

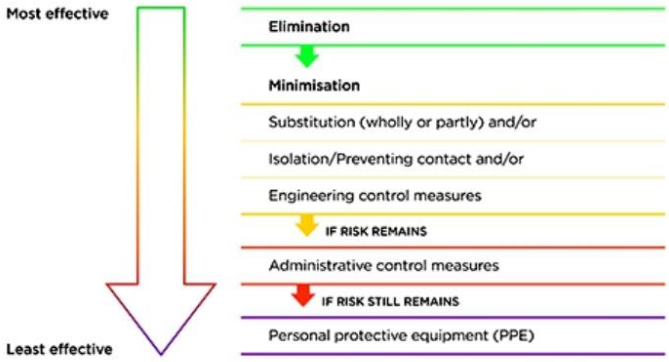
Example:

6. Steps taken to complete the job

	Hazards *(one per line)*		Hazard controls – what do we need to do to make it safe?			
What are we doing? *(step by step)*	**What could cause harm?**	Existing risk level *(use risk matrix)*	**Can we eliminate the risk?** *List how below*	If elimination is not possible, can we: - **substitute** and/or - **isolate** and/or - use **engineering controls**	If any risk still remains: - use **admin controls** and/or **PPE** *(PPE is the least effective and should not be first or the only control measure)*	Residual risk level
Establish general locations for boreholes during initial site walkabout	Spray paint or other chemical marking products	3				
	Electrical Environment	4				
	Personnel contacting live electrical apparatus	5				
	Moving vehicles in the area	5				
Take samples for contaminants at 6 proposed borehole locations	Contact with underground electrical	4				
	Pinches, cuts, strains	3				

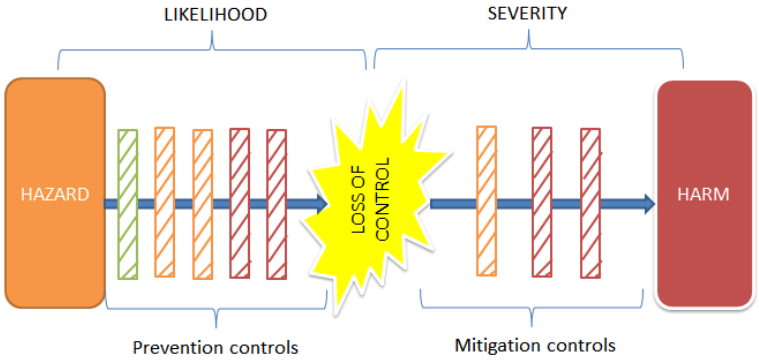
Step 4: **Develop control measures.**

Hierarchy of Control



Reduce the LIKELIHOOD of harm occurring by adding **Prevention Controls**. These are controls which are designed to prevent an event occurring (the point where control is lost). For example: a guard isolates moving machinery from body parts, isolations prevent energy from harming humans, training enables workers to work safely, and signage informs others. All of these are Prevention Controls.

Reduce the SEVERITY of potential harm by adding **Mitigation Controls**. These controls acknowledge that sometimes prevention controls fail and when this happens, mitigation controls can reduce the severity of the harm. For example; seat belts and airbags in vehicles minimise the severity of harm in a crash, a harness will catch you if you fall and a rescue plan will enable the team to get you down safely. When a hazard comes into direct contact with a human, PPE can minimise the harm it causes and decontamination, evacuation and emergency plans all work to mitigate the severity of harm.



Once you have planned your risk controls and added them to the JSA, assess the Residual Risk by taking into account the extra prevention and mitigation controls to work out the Residual Risk score.

Example:

6. Steps taken to complete the job

	Hazards *(one per line)*		Hazard controls – what do we need to do to make it safe?			
What are we doing? *(step by step)*	**What could cause harm?**	Existing risk level *(use risk matrix)*	**Can we eliminate the risk?** *List how below*	If elimination is not possible, can we: - **substitute** and/or - **isolate** and/or - use **engineering controls**	If any risk still remains: - use **admin controls** and/or **PPE** *(PPE is the least effective and should not be first or the only control measure)*	Residual risk level
Establish general locations for boreholes during initial site walkabout	Spray paint or other chemical marking products	3	SDS sheet or consumer product label. Wear gloves, safety glasses and appropriate mask during use.			1
	Electrical Environment	4	Have owner / authorised person accompany. Wear approved electrical resistant footwear.			3
	Personnel contacting live electrical apparatus	5	Set up safe limits of approach around apparatus.			3
	Moving vehicles in the area	5	Establish safety barriers around work areas. Wear high vis clothing.			3
Take samples for contaminants at 6 proposed borehole locations	Contact with underground electrical	4	Refer to the "Before U Dig" plans for locations of utilities. Mark out the utilities in the area. Excavate by hand only.			1
	Pinches, cuts, strains	3	Personnel to wear approved work wear (long longs) including gloves, eye protection and hard hats.			2

IF THE RISK RATING IS IN THE RED (4 or 5) AFTER YOUR PLANNED CONTROLS, WORK CANNOT PROCEED. The JSA needs to be reviewed by subject matter expert(s).

Permit to Work

Once you have completed the task analysis section you may need to apply for a Permit to Work.

1. Use the Permit to Work Decision trees (**appendix A**) to work out whether a permit is required.
2. A Permit to Work is mandatory where a "Y" has been listed in the "PTW required" column.
3. Where a Y/N is indicated the = Permit Receiver and Permit Issuer must discuss planned controls to determine if a permit is required.
4. The Permit Receiver must fill in the permit certificates – obtain PTW forms from your Watercare Representative
5. The Permit Receiver must seek authorisation from the Duty Permit Issuer
6. Where multiple permit certificates are required under a single JSA, the activity will be assigned a Permit Issuer to authorise the works.

The chart below outlines the work supervision and permit authorisation requirements based on the residual risk assessment score.

Residual risk assessment score	High (4-5)	Medium (3)	Low (1-2)
Required controls	• PI to authorise permits. • Site/Asset manager to authorise JSA • PI must view the site and verify controls with the PR prior to work starting.	• PI to authorise permits	• PI to authorise permits
Supervision required by Permit Receiver	• PR must be at the job at all times.	• Absences from the job site of 1–2 hours acceptable at the PI's discretion. Must be contactable at all times.	• Absences from the job site of 2–4 hours acceptable at the PI's discretion. Must be contactable at all times.
Simultaneous permits	• PR cannot be responsible for any other permits.	• PR can be responsible for one orange-level permit and one green-level permit.	• PR can be responsible for up to three green-level permits.

Step 5: Follow **Control of Work Procedure** (appendix B) to obtain Watercare authorisation to proceed with work. The Person in Charge of the Work is responsible for all aspects of the implementation and adherence to the JSA.

Step 6: Communicate and implement the JSA

Make sure that the JSAs are easy to read and understand. Communicate the JSA to all personnel and have the documents available onsite to read, sign-on and update.

Step 7: Monitor the work and maintain controls

During the work an appropriate level of supervision must be provided to ensure that the controls are maintained.

Whenever a variation from the JSA occurs, for example a new task, change of risk, unexpected event; the variation must be clearly identified, hazards identified and risk controls planned. The variation must be authorised by your Watercare Representative before work can continue.

7. Changes and updates to the JSA

	New hazards *(one per line)*		Hazard controls – what do we need to do to make it safe?			
List any changes or modifications to the job below, in order	**What could cause harm?**	Existing risk level *(use risk matrix)*	**Can we eliminate the risk?** *List how below*	If elimination is not possible, can we: - **substitute** and/or - **isolate** and/or - use **engineering controls**	If any risk still remains: - use **admin controls** and/or **PPE** *(PPE is the least effective and should not be first or the only control measure)*	Residual risk level
Buried asbestos discovered at drill hole 4	Asbestos particles becoming airborne	4	Move the proposed site of drill hole 10m up-line of original proposed site.			

Any variations to the JSA need to be reviewed by your Watercare Representative(s).

Appendix A: Permit to Work Decision Trees

Use the **Permit to Work Decision Tree** to help identify any risks associated with your activities and whether a permit is required. A **Permit to Work** is mandatory where a "YES" column has been listed in the PTW column. Where a Y/N is indicated the Permit Receiver and Permit Issuer must discuss controls to determine if a permit is required.

The Permit Receiver must fill in the permit forms – *obtain PTW forms from your Watercare Representative.*

Hazardous Energy Permit Containing mechanical, chemical, electrical, thermal gravitational, potential, pneumatic or hydraulic energy. **Note:** The Watercare Isolation Procedure & Isolation Form still applies. **Note:** Work Type Competency (WTC) must be held if working on or near Electrical Energy Areas i.e. Motor Control Centre (MCC), Switch Rooms, Transformers, Earthing and Ring Main Unit (RMU)	PTW Req?
Will it work involve working on High Voltage equipment?	YES
Will it involve live product work including all work either inside or on live wastewater or water pipes where either product or vapours may still be present?	YES
Will it involve working in a HV room or within 2 metres of HV equipment? (Excludes routine activities undertaken by WTC trained personnel, with a Watercare approved SOP).	YES
Will it involve working on live equipment, electrical circuits, energised pipes or pressure vehicles?	YES
Does the work require any remote isolation(s)?	YES
Does the work require energising during testing or commissioning?	YES
All other isolation of hazardous energy; the Watercare Isolation Procedure applies	NO

Confined Space Work in an enclosed or partially enclose space. **Note:** The Watercare Confined Space Entry Certificate and Confined Space Risk Decision Tree must be completed for ALL Confined Space entries.	PTW Req?
Is the residual risk score 2 or above on the Confined Space Decision Tree?	YES
Is the residual risk score 1 on the confined space decision tree?	NO

Explosive Atmosphere Areas These are areas that encompass explosive atmosphere zones, refer: *AS/NZS 60079.10.1:2009 Classification of areas – Explosive atmospheres*	PTW Req?
Is any of the work in a designated **explosive atmosphere zone**?	YES
Is any of the work undertaken in a designated **hazardous area** that is covered by an approved SOP?	Y/N

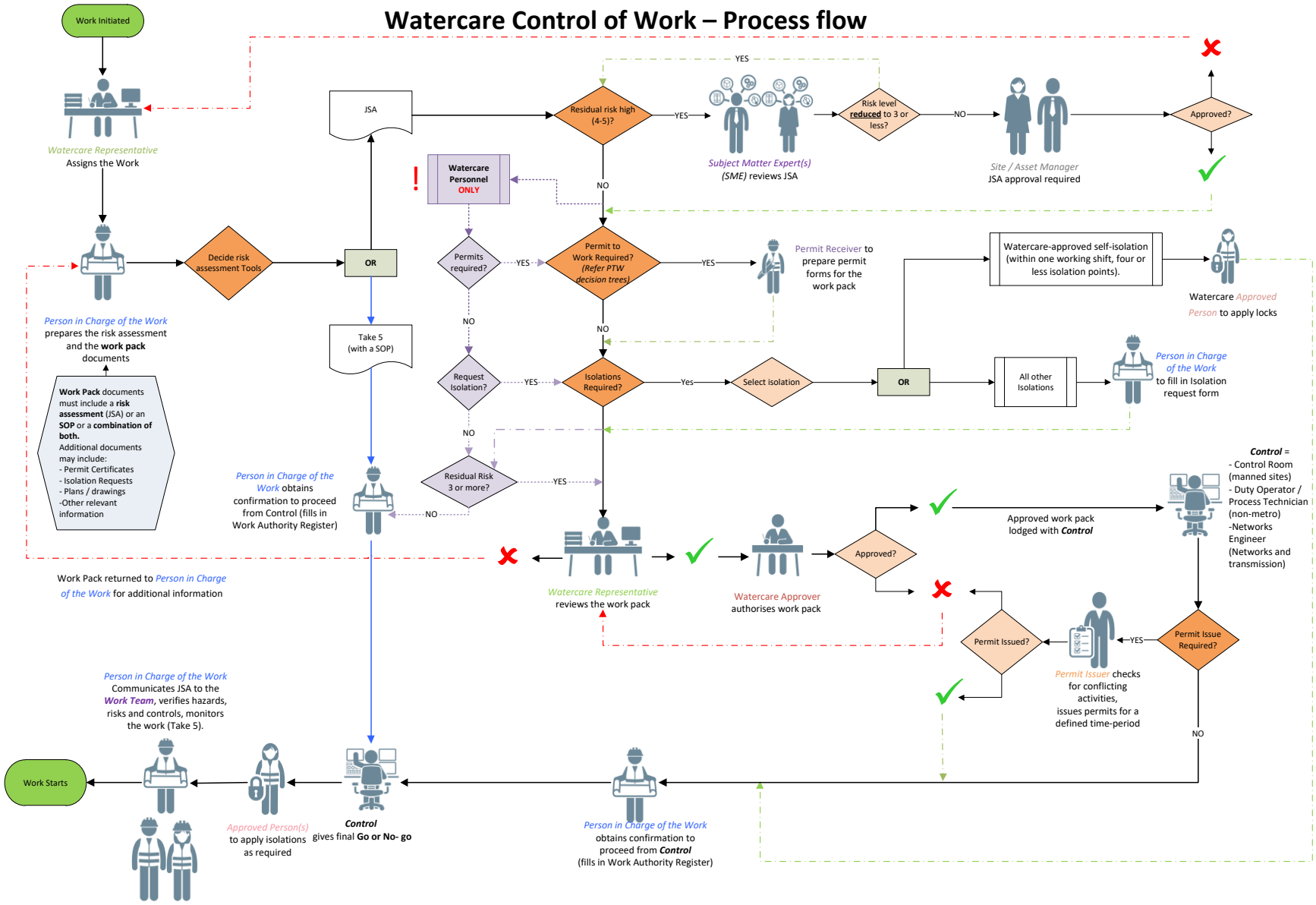
Working at Heights Working in place where a person could be injured if they fell from one level to another. 	PTW Req?
Will it involve working at a height of 5 metres or higher? (Notification to Worksafe?)	YES
Will it involve working at a height between 2 metres and 5 metres? **Excludes:** Under 5 metres when working from a scaffold erected by a competent person or from a scissor lift, a boom lift or a permanent ladder where the fall protection is permanently engineered into the plant or equipment.	YES

Hot Work Where a source of ignition is introduced to a work environment 	PTW Req?
Does it involve any non-intrinsically safe activity within a confined space or designated explosive atmosphere zone?	YES
Will there be any hot work on equipment or pipes?	YES
Will there be any hot work in an operational plant, offices or admin areas?	Y/N
Will the hot work be undertaken outdoors, when a fire ban is in place and/or within 3 metres of a structure?	Y/N

Excavation Work involving the removal of soil or rock from a site to form an open face trench, hole or cavity. 	PTW Req?
Will the excavation be deeper than 1.5metres?	YES
Is there a risk of atmospheric contamination or build-up of gases or fumes within the excavation?	YES
Is de-watering required?	YES
Will the excavation contain contaminated soil?	YES

Safety Device Impairment Where the work will disable or affect emergency systems (emergency monitoring systems, fire fighting, escape or rescue systems) or safety critical elements on a Major Hazard Facility.	PTW Req?
Will the work disable or affect emergency systems, including leaving a site operating with a disabled emergency alert system or safety device?	YES
Will the work disable or affect a MHF safety critical element as specified in the site MHF Safety Case (applies to Ardmore WTP only)	YES

Appendix B



V2.1 (*w. MD exception*)