



Essential guide: our Critical Risk expectations

Chemicals and hazardous substances

The word **MUST** means it is a mandatory requirement. Where you see the words **YOUR CALL** it means you are strongly advised to do this, but you can use your judgement.



Why do you need to know about chemicals/hazardous substances?

When undertaking work on our sites, you **MUST** be aware of the hazardous substances in your work area and the dangers that they pose.

You **MUST** have the appropriate knowledge and experience to operate and work safely. Where you do not have the appropriate knowledge and experience, you **MUST** have access to someone who does or can provide supervision.

When working with hazardous substances you **MUST** know what to do in an emergency involving these substances. Some roles will require a person to work with hazardous substances in the performance of their duties.

The main hazardous substances that you may come at Contact are:

- Flammable gas or aerosol (class 2), liquid (class 3)
- Corrosive (class 8): (e.g., acids, caustic, bleach)
- Ecotoxic (class 9): (e.g., cooling water biocides)

What is a hazardous substance?

A hazardous substance is any substance that has one or more of the following hazardous properties:

- Explosive (Class 1) – not normally present at Contact sites
- Flammable (Class 2 for Gas/Aerosol, Class 3 for liquid, Class 4 for solid)
- Oxidising, i.e., accelerate a fire (Class 5)
- Toxic to humans (Class 6)
- Corrosive to human tissue or metal (Class 8)
- Ecotoxic, i.e., toxic to the environment (Class 9)

Exposure to a hazardous substance may also be created through our operations. e.g., from geothermal fluid.

The operations that we undertake at Contact may also require the purchase of hazardous substance e.g., chemicals.

Many of the commonly used hazardous substance can be found in our mechanical workshops or out on our plant. These items are often purchased from a local hardware store but you must still treat them like any other hazardous substance and read the warning labels so you can control their use accordingly, e.g., Loctite LB 771 anti-seize is carcinogenic and a skin sensitiser ("allergic" or overly sensitive after repeated exposure).



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What do you need to know?

Anyone who is about to undertake work that involves the use of, or potential exposure to, a hazardous substance **MUST**:

- be aware of the potential harm that the hazardous substance used at work can cause
- know which substances are incompatible and need to be stored separately
- know how to undertake the job safely when using hazardous substances
- understand the control measures that need to be used to reduce potential exposure
- have correct PPE for the hazardous substance being used and know how to use it
- be aware of the safety data sheets, know how to access them and understand how to use them
- know what to do in emergencies involving the hazardous substances
- be aware of any special first aid equipment needed to deal with incidents involving hazardous substances
- have practical experience using hazardous substances or are working under the supervision of someone who does
- know where to obtain help to safely use, store or dispose of hazardous substances
- have written records of worker training, instruction, and supervision.

Common hazardous substance labels you might see

Flammables: substances that ignite easily and burn rapidly.



Corrosives (e.g., acids, caustic)



Acutely toxic: may cause death if ingested, inhaled or from skin contact



Less severe acute health effects: e.g., skin sensitisation, skin and eye irritation, respiratory irritation, drowsiness, or dizziness



Chronic (long term) health hazards: e.g., cancer, mutations, affect fertility, damage to unborn child, allergies, asthma, respiratory sensitisation





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Hazardous substances and geothermal fluids and deposits

Naturally occurring hazardous substances are present within geothermal fluid. They are mainly toxic either through skin absorption or inhalation. They include:

- mercury, stibnite, arsenic, antimony, silica
- gases: hydrogen sulphide (H₂S), carbon dioxide (CO₂)
- colourful orange deposits may contain antimony (e.g., in the mineral form of stibnite) which can release highly toxic gas when mixed with acid
- dark deposits may also be harmful
- steam condensate and cooling water is the least contaminated, but system deposits can concentrate hazardous substances
- brine (separated geothermal water SGW) will contain most of the non-gas hazardous substances and scales/deposits on surfaces can concentrate these.

PPE

Hazardous substances PPE may include:

- overalls
- aprons
- footwear
- gloves
- chemical resistant glasses
- face shields and respirators.

Refer to the current hazardous substances safety data sheets (SDS) via Chemwatch to ensure that you are using the correct PPE for the substance that you are using.

For all PPE you **MUST** understand the limitations of the selected PPE.

Remember PPE **MUST** only be used to supplement or support higher level controls that have been established.



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Regulations

The regulation of hazardous substances that affect human health and safety in the workplace now sits under WorkSafe, the regulations listed below **MUST** be followed when working with hazardous substances:

- [Health and Safety at Work \(Hazardous Substances\) Regulations 2017](#)
- [Health and Safety at Work \(Major Hazard Facilities\) Regulations 2016](#) (for geothermal binary plants)

Emergency response plan

The goal of an emergency response plan is to minimise the impact of the event on people, property, and the environment.

You **MUST** be aware of the emergency response plan developed specifically for the hazardous substance you are working with.

The emergency response plan **MUST** provide information about any special training that any person identified needs to have in order to respond to emergencies.

The emergency response plan **MUST** detail how to find information on the properties of hazardous substances involved and about how to control those substances in the event of an emergency.

Remember an emergency response plan is there to help you respond to an unexpected or dangerous occurrence and enable you to manage the situation without harm to yourself or others.