1 LEGISLATION & CODES

A Risk Assessment is aimed at complying with the Risk Management requirements of the following legislation and codes of practice: -

- Health and Safety at Work Act 2015 (R2018) [HSWA]
- Health and Safety at Work (General Risk & Workplace Management) Regulations 2016 [GRWM Regs]
- Health and Safety at Work (Hazardous Substances) Regulations 2017 Part 3 *General Duties Relating to Risk Management* [Haz Subs Regs]
- Health and Safety in Employment (Pressure Equipment, Cranes and Passenger Ropeways) Regulations 1999 (R2017) [PECPR Regs]
- Industry Codes of Practice: e.g. WorkSafe NZ Good Practice Guide *BEST PRACTICE GUIDELINE FOR THE SAFE USE OF TIMBER PRESERVATIVES & ANTISAPSTAIN CHEMICALS* [Timber Treatment Code]

2 RISK ASSESSMENT METHODOLOGY

A Risk Assessment should follow industry best practice and national/international guidelines. Hazcom uses the following guidelines when conducting and presenting a Risk Assessment: -

- AS/NZS ISO 31000: 2009 *Risk Management – Guidelines*
- AS/NZS HB 436: 2013 *Risk Management Guidelines – Companion to AS/NZS ISO 31000: 2009*
- Worksafe NZ. Good Practice Guide *Health and Safety by Design 2018*

3 RISK ASSESSMENT PROCESS

The main outcome from a Risk Assessment is a Risk Register (see Figure 2 below).

A Preliminary Risk Assessment can be compiled by an experienced practitioner following a site inspection and discussions with management and operations staff. However, a full risk assessment cannot be done adequately by just one person working in isolation.

A Detailed Risk Assessment needs to include a Risk Workshop which involves a group of people with a variety of skills and experience to discuss and agree on the data entered into the Risk Register.

A risk assessment comprises the following steps: -

3.1 Risk Matrix

Risk is defined as the combination of CONSEQUENCE and LIKELIHOOD of a hazardous event. Risks are described as one of the following: LOW, MODERATE, HIGH, EXTREME as defined the example Risk Matrix shown in Figure 1 below

This risk matrix follows the example given in Table 6.6 of AS/NZS HB 436: 2013 *Risk Management Guidelines*

3.2 Hazard Identification

Hazard is defined as "source of potential harm" e.g. flammable-toxic-corrosive substances, overpressure etc. A Hazardous Event is an event that creates exposure to a hazard e.g. a loss of containment of a hazardous substance, fire leading to overpressure etc.

3.3 Cause & Effect Description (of hazardous event)

A description of possible hazardous effects is given, and their causes noted.

3.4 Unmitigated Risk

Using the Risk Matrix, a consequence and likelihood value are entered for the "worst case scenario" assuming that no risk control measures are in place and an Unmitigated Risk score is determined.

3.5 Risk Controls

A description of existing and proposed risk controls (risk mitigation measures) are presented to minimise the risk. Risk controls include a wide range of physical items, procedures and PPE.

3.6 Mitigated Risk

A mitigated risk consequence and likelihood values are entered, and a Mitigated Risk (aka Residual Risk) score is determined.

3.7 Actions

Any actions required to implement the risk controls are noted in the "Action" "Resp." and "Due Date" columns

4 RISK EVALUATION

The final step is Risk Evaluation. Risks are evaluated as NEGLIGIBLE, ACCEPATABLE, UNDESIRABLE, or INTOLERABLE

The Risk Assessment considers whether it is possible : -

a) to eliminate risks to health and safety, so far as is reasonably practicable; and

b) if not, to minimise those risks so far as is reasonably practicable.

5 RISK MONITORING AND IMPLEMENTATION

Preparing a Risk Register is not an end in itself. Rather the Risk Register should be a tool to inform the business and help to set priorities of improvements. The Risk Register should be kept up to date with periodic reviews. It should also be updated when there is any significant change to the operation

Figure 1 Example Risk Matrix

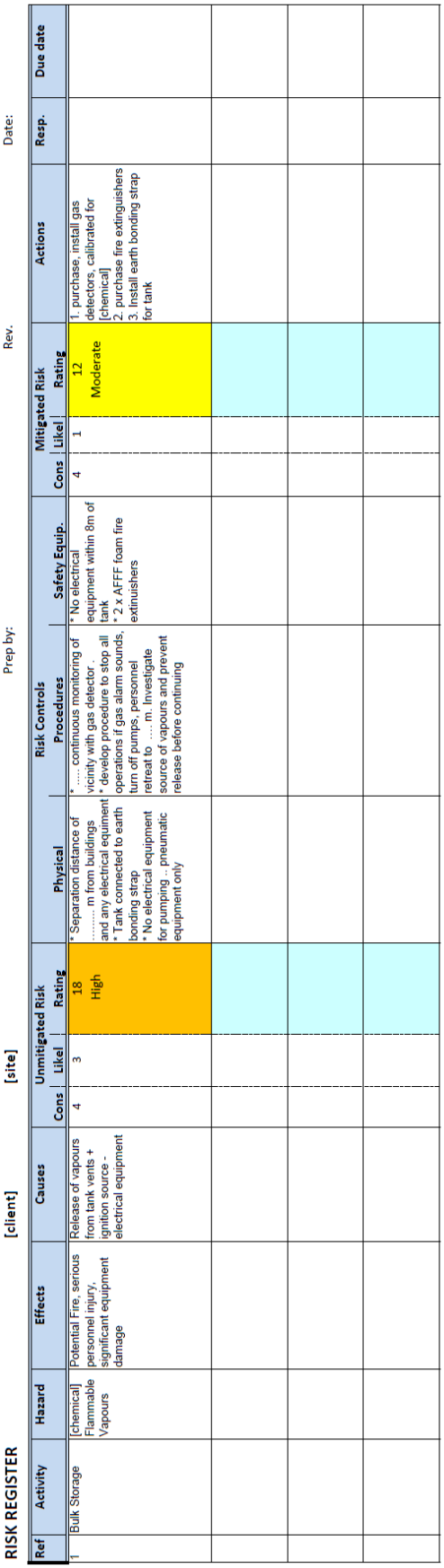
[client] **RISK MATRIX**

CONSEQUENCE	Hazard Effect / Consequence				
	Very Low 1	Low 2	Moderate 3	High 4	Very High 5
H&S - Harm to People	First aid case / Exposure to minor health risk	Medical treatment case / Exposure to major health risk	Lost time injury / Reversible impact on health	Single fatality or loss of quality of life / Irreversible impact on health	Multiple fatalities / Impact on health ultimately fatal
Environmental	Insignificant environmental harm	Minor environmental harm	Moderate environmental harm	Serious environmental harm	Major environmental harm
Vehicle /Property Damage	< $50K	$50K - $125K	$125K - $250K	$250K - $500K	> $500K
Business Interruption	No disruption to operation < $50K Profit	Brief disruption to operation <$100K Profit	Partial shutdown <$250K Profit	Partial loss of operation < $500K Profit	Substantial or total loss of operation > $500K Profit
Legal & Regulatory	Low level legal issue	Minor legal issue; non compliance and breaches of the law	Serious breach of law; investigation/report to authority, prosecution, moderate penalties	Major breach of the law; considerable prosecution and penalties	Very considerable penalties & prosecutions. Multiple law suits & jail terms
Impact on Reputation / Social / Community	Slight impact - public awareness may exist but no public concern	Limited impact - local public concern	Considerable impact - regional public concern	National impact - national public concern	International impact - international public attention

LIKELIHOOD	Description	Probability					
Almost Certain 5	Has occurred frequently; occurs in the order of one or more times per year & is likely to	>75% - 100%	7	14	17	23	25
Likely 4	Has occurred infrequently; occurs in the order of less than once per year & is likely to	>50%-<75%	6	9	16	19	24
Possible 3	Has happened in the business at some time; or could happen within 10 years	>20%-<50%	3	8	15	18	22
Unlikely 2	Has happened in the business at some time; or could happen within 20 years	>5%-<20%	2	5	11	13	21
Rare 1	Has never been known to occur in the business; or it is highly unlikely that it will occur within	< 5%	1	4	10	12	20

RISK EVALUATION & TREATMENT	EVALUATION	TREATMENT
LOW	NEGLIGIBLE	Monitor Hazard/Risk during operations and ensure that Risk scor does not increase
MODERATE	ACCEPTABLE	Monitor Hazard/Risk and actively take steps to minimise likelihood
HIGH	UNDESIRABLE	Modify facility/procedures to reduce risk to Moderate
EXTREME	INTOLERABLE	Cease Operations ... cannot proceed with an extreme risk threat

Figure 2 Example Risk Register



RISK REGISTER [client] [site] Prep by: Rev. Date:

Ref	Activity	Hazard	Effects	Causes	Unmitigated Risk			Risk Controls			Mitigated Risk			Actions	Resp.	Due date
					Cons	Likel	Rating	Physical	Procedures	Safety Equip.	Cons	Likel	Rating			
1	Bulk Storage	[chemical] Flammable Vapours	Potential Fire, serious personnel injury, significant equipment damage	Release of vapours from tank vents + ignition source - electrical equipment	4	3	18 High	* Separation distance of ..... m from buildings and any electrical equipment * Tank connected to earth bonding strap * No electrical equipment for pumping - pneumatic equipment only	* ..... continuous monitoring of vicinity with gas detector . * develop procedure to stop all operations if gas alarm sounds, turn off pumps, personnel retreat to .... m. Investigate source of vapours and prevent release before continuing	* No electrical equipment within 8m of tank * 2 x AFFF foam fire extinuishers	4	1	12 Moderate	1. purchase, install gas detectors, calibrated for [chemical] 2. purchase fire extinguishers 3. Install earth bonding strap for tank		

For more information and assistance with running a successful Risk Assessment and Risk Workshops contact:

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