

MEMO / TECHNICAL NOTE

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cc: Jacob Sickinger, GeoLINK Consulting Pty Ltd

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Job: J-000684 – Dangerous Goods Screening Study for Warrawong Community centre

Document: J-000684-HINSW-TN-02-Rev 1

Subject: **Dangerous Goods Screening Study for Warrawong Community Health Centre**

1 INTRODUCTION

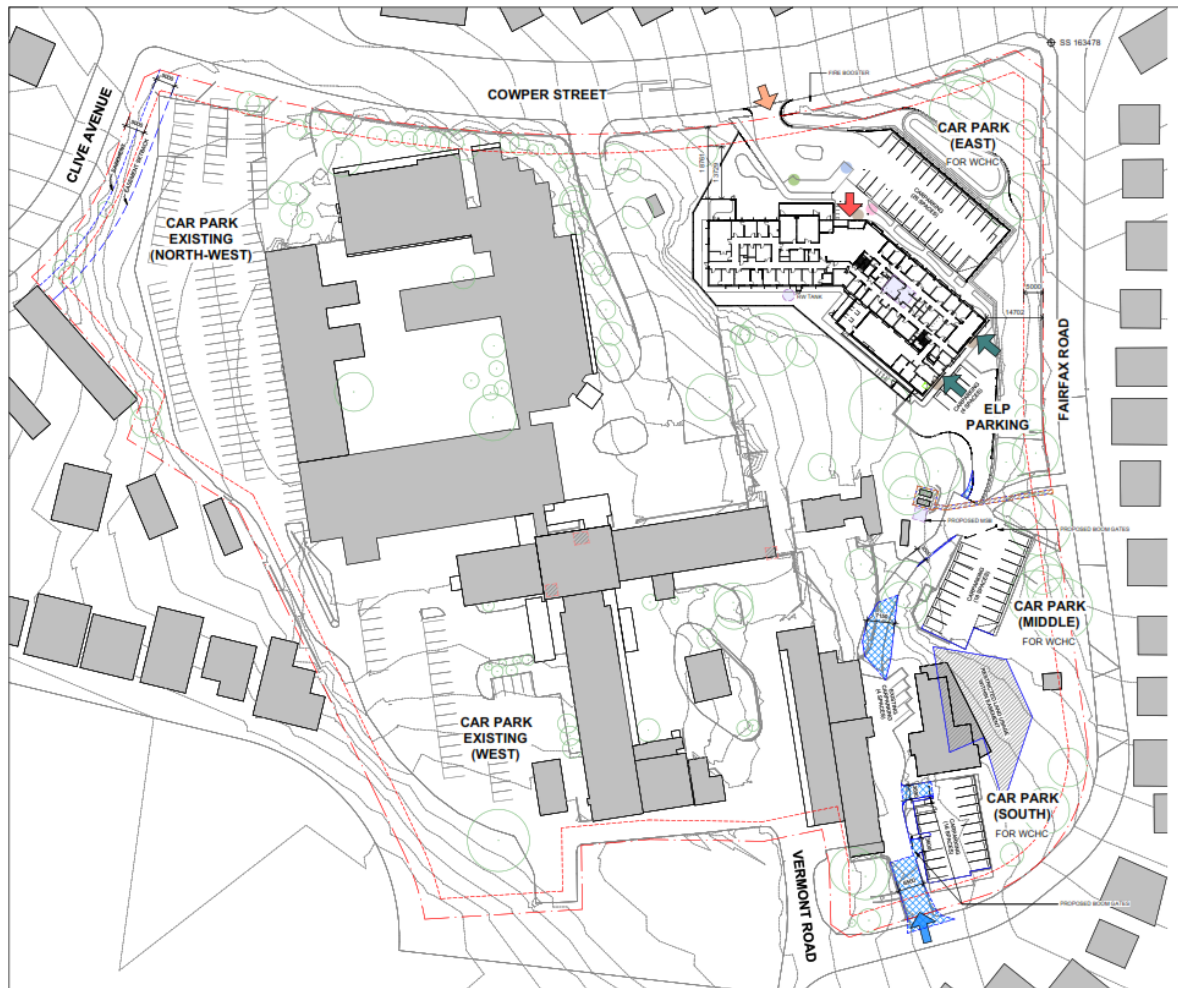
NSW Health Infrastructure (HINSW) is proposing to construct a new Warrawong Community Health Centre at 85-91 Cowper Street, Warrawong, NSW. The site location is shown in Figure 1 [1].

The community health centre will contain small quantities of chemicals storage for laboratory analysis related to health checks.

Arriscar was commissioned to review the chemicals storage, screen the storage for applicability of State Environmental Planning Policy (Resilience and hazards) [2] (SEPP), conduct a safety assessment of chemicals storage and assess compliance with relevant Australian Standards.

This technical note summarises the review and findings.

Figure 1: Warrawong Community Health Centre Site Location



2 NOTATION

Abbreviation	Description
AS	Australian Standard
DG	Dangerous Good
HINSW	Health Infrastructure NSW
L	Litres
n.o.s.	Not otherwise specified
PG	Packing Group
PPE	Personal Protection Equipment
SEPP	State Environmental Planning Policy
UN	United Nations
v:v	Volumetric ratio

3 PROPOSED CHEMICAL STORAGE

The Sexual Health Service in the Warrawong Community Health Centre will have a chemical storage cabinet in the Laboratory Room. It is used for storage of Gram stain chemicals, the quantity of chemicals may have to be confirmed [3].

The Gram stain is a laboratory technique used to differentiate bacterial species into two large groups: gram-positive bacteria and gram-negative bacteria. Gram staining aids in the diagnosis of a disease or a pathologic condition.

3.1 Chemicals Stored

Gram staining procedure uses four chemicals [4]:

- Crystal violet (primary stain). Gives all bacteria a purple colour.
- Gram's iodine solution (the mordant)
- Acetone alcohol (50:50 v:v of acetone and ethanol or isopropanol) (the decolouriser). Removes the crystal violet from the gram-negative cells, but not from the gram-positive cells.
- 0.1% basic fuchsin solution (the counterstain). Stains the gram-negative cells pink or red.

The quantities stored are laboratory quantities, constituting "Minor Storage."

3.2 Properties of Chemicals

The properties of the four chemicals listed above are summarised in Table 1.

Table 1: Properties of Gram Stain Chemicals

Parameter	Crystal violet [5]	Gram's Iodine [6]	Acetone alcohol [7]	Fuchsin 0.1% [8]
State	Solid, green in colour	Liquid	Liquid. 50:50 mixture of acetone and alcohol (ethanol or isopropanol)	Liquid (Red violet colour)
DG Class	9	Not classified as a DG	3	Not classified as a DG
UN No.	3077	-	1993	-
Packing Group (PG)	III	-	II	-
Product category	Environmentally hazardous substances, n.o.s., solid	-	Flammable liquid	-
Water soluble	Yes	Yes	Yes	Yes
Flammability	Not flammable. Melting point 215°C	Non-combustible	Flammable, Flash point -18°C	Not flammable. Boiling point, similar to water.
Hazard	Harmful if swallowed or on eye contact. Toxic to aquatic environment	No data. Not considered hazardous.	Fire if ignited. Toxic smoke in unventilated areas.	Not considered hazardous. Need to avoid skin and eye contact during handling (PPE required)
Purpose	Reagent for analysis (dye)	Strengthens the reaction with crystal violet	Gram Decolorizer	Staining the gram-negative bacteria in the Gram stain process

3.3 Quantity of Storage

The precise quantity of storage is not known at this stage, but HINSW expects this to be in minor quantities for laboratory use [3].

The chemicals will be stored in a SafeWork approved DG cabinet such as the one shown in Figure 2.

Figure 2: Chemical Storage Cabinet



Since Acetone alcohol (Class 3 liquid) is flammable, it needs to be kept in a fire safe cabinet, fully banded to contain any spills from containers. The Gram stain chemicals are compatible (i.e. no reaction among them) and hence they can be stored in the same cabinet.

The location of the cabinet is yet to be determined.

4 REGULATORY COMPLIANCE

4.1 SEPP (Resilience and Hazards)

The only chemical of significance is Class 3 liquid (Acetone alcohol), listed in “Applying SEPP 33” [9]. The minimum threshold value at which the SEPP would apply is 2 tonnes.

The proposed quantity of storage significantly less than the threshold quantity and therefore SEPP (Resilience and Hazards) does not apply to the DG storage in the proposed development.

4.2 AS 1940-2017

The applicable Australian standard for the storage of Class 3 liquids is AS 1940-2017 [10]. The proposed storage quantity falls under “Minor Storage”.

For storage of less than 1000L, which is the case at Warrawong Community health centre, the separation distance between flammables storage and other operating areas is 3m.

The chemicals will be stored in fire safe cabinet, approved by SafeWork NSW. Spill containment is provided within the cabinet as part of construction.

If the cabinet is located on a floor other than the ground, its capacity shall not exceed 250L.

At least one portable fire extinguisher (dry chemical type) is to be kept within reach from the storage cabinet.

5 RECOMMENDATIONS

1. The chemicals storage cabinet must be of the SafeWork approved type for Class 3 PG II flammable liquids.
2. The cabinet location and associated equipment (spill cleanup, fire extinguisher) must comply with AS 1940-2017 , Minor Storage requirements.
3. Adequate personal protection equipment (PPE) must be kept in the laboratory for chemicals handling and spills cleanup.
4. A spill response and cleanup procedure must be developed and personnel trained in the procedure.

6 REFERENCES

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