

NSW DEPARTMENT OF EDUCATION

BUNGENDORE HIGH SCHOOL

Review of Environmental Factors

for

Hydraulic Services

Project No : 8332

Revision : 5 – Final Issue

REVISION SCHEDULE

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1 INTRODUCTION

This hydraulic services report has been prepared by DSC to support a Review of Environmental Factors (REF) for the NSW Department of Education (DoE) for the construction and operation of the new high school at Bungendore (the activity).

The purpose of the REF is to assess the potential environmental impacts of the activity prescribed by *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) as "development permitted without consent" on land carried out by or on behalf of a public authority under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The activity is to be undertaken pursuant to Chapter 3, Part 3.4, Section 3.37A of the T&I SEPP.

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI) as well as the *Addendum Division 5.1 guidelines for schools and Addendum October 2024 (Consideration of environmental factors for health services facilities and schools).*

The purpose of this report is to outline the hydraulic services required for the activity.

2 SITE DESCRIPTION

The current street address is part of 18 Harp Avenue, Bungendore, NSW, 2621 (the site), and is legally described as part of Lot 125 in Deposited Plan 1297613. As shown in Figure 1, the proposed school site forms part of a larger lot which is the subject of a proposed residential subdivision.

The site is located within the North Bungendore Precinct (Elm Grove Estate) in Bungendore. As a result of precinct wide rezonings, the surrounding locality is currently transitioning from a semi-rural residential area to an urbanised area with new low density residential development.

The site is zoned R2 Low Density Residential, with all adjoining land also zoned R2 Low Density Residential.

The site has three frontages:

- Approx 500m southern frontage to Birchfield Drive.
- Approx 500m northern frontage to Bridget Avenue.
- Approx 100m eastern frontage to Winyu Rise.

The site is currently cleared of all vegetation and consists of grassland, having been prepared for the purposes of future low density residential development.

An Aerial Photograph of the site below.



Figure 1 – Aerial Photograph of the Site

Source: Urbis, 2024

3 PROPOSED ACTIVITY DESCRIPTION

The proposed activity is for the construction and operation of a new high school in Bungendore at part 18 Harp Avenue, Bungendore (the site). The new high school will accommodate 600 students and 68 staff. The school will provide 26 general learning spaces, and three support learning spaces across two buildings. The buildings will be predominantly three-storeys in height and will include permanent and support teaching spaces, specialist learning hubs, a library, administrative areas and a staff hub.

Additional core facilities are also proposed including a standalone school hall with covered outdoor learning area (COLA), a car park, a kiss and drop zone along Birchfield Drive, sports courts and a sports field. The new school also features a single storey building with associated paddocks in the far western portion of the site designed for livestock management and hands-on agricultural learning. Specifically, the project involves the following:

- Building B, a part three/part four storey learning hub accommodating general learning spaces, specialist workshops for food, textile, wood and metal workshops, as well as visual arts studios, science labs and staff areas.
- Building C, a standalone school hall with COLA.
- Building D, a single-storey agricultural block comprising an animal storage space, a COLA and internal workshop.
- On-site staff car park with 50 spaces with access via Bridget Avenue.
- Kiss and drop zones and bus bays along Birchfield Drive.
- Open play space including a sports courts and sports field.
- Associated utilities and services including a 1000kv padmount substation.
- Main pedestrian entrance to be located off Birchfield Drive.
- Secondary pedestrian access from Bridget Avenue.
- Public domain/off-site works including the removal of street trees.

The design has been masterplanned to allow for an additional future stage.. The second stage does not form part of this proposal.

Figure 2 provides an extract of the proposed site plan.



Figure 2 – Proposed Site Plan

Source: NBRS, 2024

4 ASSESSMENT OF UTILITIES - WATER AND WASTEWATER

Requirement	Y	N	N/A	Comments
Utilities				
Does the REF broadly set out how the proposal will be serviced by necessary services and utilities?	\boxtimes			Sections 5 & 6
Does the REF assess any works required to provide necessary services and utilities and conclude that these would not have significant environmental affects?				QPRC will undertake an assessment of the water and sewer mains and provide the notice of requirements in the next phase of design.
If on site water treatment is required, does the REF include an on-site wastewater management plan / land capability assessment that concludes that the site would be capable of accommodating wastewater without significant affects on the environment?				Authority sewer mains are currently available at the site.

5 EXISTING SERVICES INFRASTRUCTURE

A desktop study of the detailed infrastructure design undertaken by FRAISH Consulting was conducted for the proposed Bungendore High School site and the surrounding area. The following outlines the existing services and infrastructure around the site, providing context for the proposed development's servicing strategy.

5.1 WATER

The detailed infrastructure design by FRAISH Consulting indicates that the 300 mm potable water main is located on the southern side of Birchfield Drive (Road 1) and is available for the site's potable and fire water connections. As shown in Figure 1.



Figure 1 – FRAISH Consulting - Water

5.2 SEWER

The detailed infrastructure design by FRAISH Consulting indicates that a 150 mm diameter sewer main is located on the northern side of Birchfield Drive (Road 1) and is available for the site sewer connection. An existing sewer connection is located at the site boundary for connection, as shown in Figure 2. The AG building will connect to the nearby 150mm sewer main, as shown in Figure 3.

The existing sewer mains running through the middle of the site (reticulating East and West) will become redundant and are proposed to be removed highlighted in green. Refer to the civil engineering report for stormwater.



Figure 2 – FRAISH Consulting – Sewer (Main Buildings)



Figure 3 – FRAISH Consulting – Sewer (Agricultural Building)

6 PROPOSED INFRASTRUCTURE

6.1 WATER

The current water mains in Birchfield Drive are expected to be able to support the water demand for the new High School. The next design phase will require a Section 68 application to QPRC.

The proposed water infrastructure consists of:

- Domestic cold water connection 100mm diameter pipe with an authority water meter.
- Fire hydrant system water connection 150mm diameter pipe.
- Domestic cold water pumps are used to boost the water pressure within the site.
- Rainwater tank with 100kL capacity with rainwater reuse pumps and filtration.
- Rainwater reuse system to supply irrigation and toilet flushing throughout the site.

Refer to Appendix A – Hydraulic site plan for the water connections and reticulation strategy.

6.2 SEWER

The current sewer mains in Birchfield Drive are expected to be able to support the sewer demand for the new High School. The next design phase will require a Section 68 application to QPRC.

The proposed sewer infrastructure consists of:

- Gravity sewer mains serving all buildings up to 150mm in diameter.
- Sewer access chambers located on main lines and at changes of direction.
- Trade waste grease arrestor serving trade waste drainage from kitchens.
- Dilutions pit serving science lab trade waste drainage.

Refer to Appendix A – Hydraulic site plan for the sewer connection and reticulation strategy.

7 ENVIRONMENTAL CONSIDERATIONS

Environmental impact considerations from hydraulic and fire services:

- Trenching for underground water and drainage services could disturb soil and vegetation.
- Noise from construction activities may temporarily affect surrounding areas.
- Visual impact from above-ground installations such as fire hydrant booster assembly, water meters and services plant rooms.

8 HYDRAULIC MITIGATION MEASURES

ID	Mitigation Measure	Timing	Reason for measure
HY1	To minimise soil disturbance during trenching, plan service routes efficiently, reuse excavated soil for backfilling, stabilise exposed areas with mulch or vegetation, and implement silt barriers to prevent erosion and runoff.	Construction	To minimise soil disturbance
HY2	To minimise noise disturbance, restrict noisy activities to standard working hours, use noise barriers near sensitive areas, maintain equipment with noise-dampening devices, and inform residents and businesses about high-noise activities in advance as per the traffic consultant's report.	Construction	To minimise noise during construction
HY3	To minimise visual impact from above-ground hydraulic services using neutral or natural-coloured materials for utility structures, positioned discreetly, landscaping for screening, and incorporating aesthetic design elements to blend with the surroundings as per the landscape architect's report.	Design	To minimise visual impact

9 COMPLIANCE WITH STANDARDS AND REGULATIONS

The design aligns with:

- NCC 2022 and relevant Australian Standards, including AS3500 & AS2419.1
- NSW Department of Education's EFSG 2.0 and Pattern Book
- Australian Standards
- QPRC Local Council Engineering Standards
- Fire and Rescue NSW Access for Fire Brigade Vehicles and Firefighters

10 STAKEHOLDER CONSULTATION

- BYDA enquiry for QPRC is complete.
- Liaison with QPRC regarding sewer connection and discharge requirements for the site.
- A Section 68 application will be submitted at the next design stage to QPRC to confirm the notice of requirements.
- Coordination of water connections and approvals will commence at the next design stage.

11 EVALUATION OF ENVIRONMENTAL IMPACTS

The extent and nature of potential impacts are low and will not have a significant impact on the locality, community and/or the environment.

Potential impacts can be appropriately mitigated or managed to ensure that there is minimal impact on the locality, community and/or the environment.

12 CONCLUSION

The hydraulic and fire services proposed for Bungendore High School have been assessed with careful consideration of environmental, regulatory, and operational factors. Existing infrastructure has been evaluated, and planned enhancements to water and sewer services will adequately support the proposed development while complying with QPRC standards and other regulatory requirements.

Potential environmental impacts, such as soil disturbance, noise, and visual effects, have been identified, and mitigation strategies have been outlined to address these issues effectively. The project aligns with relevant standards, including the NCC 2022, Australian Standards, and NSW Department of Education guidelines, ensuring sustainable and safe implementation.

Through diligent planning and stakeholder engagement, this development is well-positioned to meet the community's needs while minimising adverse environmental effects.

13 APPENDIX A – HYDRAULIC SERVICES SITE PLAN

BUNGENDORE HIGH SCHOOL BIRCHFIELD DRIVE, BUNGENDORE NSW 2621 HYDRAULIC SERVICES

LEGEND

ABBREVIATIONS

AAV	AIR ADMITTANCE VALVE	NG
AB		NPCW
		NPHW
ASM	AUTHORITY SEWER MAIN	N15 0/E
AWM	AUTHORITY WATER MAIN	OI F
AV	AIR RELEASE VALVE	ORG
AWC	ACCESSIBLE TOILET (WATER CLOSET)	Р
В	BASIN	PAA
B/CWU	BOILING/CHILLED WATER UNIT	PAT
BFW	BUNDED FLOOR WASTE	PCW
BG		PFS
BU BT		
BTFW	BUCKET TRAP FLOOR WASTE	PLRO
BTH	BATH	PLV
BV	BALANCING VALVE	PRO
BWU	BOILING WATER UNIT	PRV
CAC	CIRCULAR ACCESS CHAMBER	RC
CBO		RCP
CC	CIRCULAR COVER	RGB
CL		RL
CIC	CAST IN COLUMN	
CIS	CAST IN SLAB	RS
CO	CLEAR OUT	RST
CS	CLEANERS SINK	RTD
CSO	COMBI STEAMER OVEN	RV
СТ	COOK TOP	RW
Cu		RWH
		S
DCDV		SHR
DF	DRINKING FOUNTAIN	SK
DFH	DUAL FIRE HYDRANT	SL
DCW	DOMESTIC COLD WATER	SMH
DHWF	DOMESTIC HOT WATER FLOW	SMS
DI	DUCTILE IRON	SPR
DP	DOWN PIPE	SRA
		SRM
DTU	DRAINAGE TURN-UP	SRU SR7
DW	DISHWASHER	SSD
DWG	DRAWING	SST
е	EXISTING	ST
EJ	EXPANSION JOINT	SV
Ex	EXISTING	STW
FFL		SWDT
FH FHD	FIRE HYDRANT FIRE HOSE REEL	SWP
FW	FLOOR WASTE	
GAS	GAS SERVICE	TG
GBP	GAS BAYONET POINT	TMV
GD	GRATED DRAIN	ТОК
GDO	GRATED DRAIN OUTLET	TPZ
GFW	GARBAGE FLOOR WASTE	TTD
GMS		TRO
GW	GREASE WASTE	
GWM	GLASS WASHING MACHINE	TWCV
GWS	GREASE WASTE STACK	TWVP
HDC	HEAVY DUTY COVER	U.N.O.
HDG	HEAVY DUTY GRATE	uPVC
HDPE	HIGH DENSITY POLYETHYLENE	Ur
HL		UV
HPF		UW
HR	HALFROUND	
HT	HOSE TAP	VP
HW	HOT WATER	WC
HWF	HOT WATER FLOW	WM
HWR	HOT WATER RETURN	WP
HWU		WST
IL IM	INVERT LEVEL	WT
IPMF	INDUCT PIPE MICA FLAP	
KIP	KERB INLET PIT	
KFW	KITCHEN FLOOR WASTE	****
КО	KEY OPERATED	
KS	KITCHEN SINK	
LDC		DRAW
LDG		
LT	LAUNDRY TUB	

	NATURAL GAS
V	NON-POTABLE COLD WATER
V	NON-POTABLE HOT WATER
	OVERELOW
	OVERLAND FLOW
	OVERFLOW RELIEF GULLY
	PENETRATION
	PAN FLUSH SANITISER
	PLANTROOM FLOOR WASTE
	PLANTER HOSE TAP
	PLANTER RAINWATER OUTLET
	PRESSURE LIMITING VALVE
	PRESSURE REDUCING VALVE
	REFRIGERATION CABINET
	REINFORCED CONCRETE PIPE
	RECESS GAS BAYONET POINT
	RISING SHAFT
	RECESSED STOP TAP
	RECESSED TUNDISH
	RELIEF VENT
	SEWER/SANITARY
	SEWER DRAINAGE
	SHOWER
	SINK
	SEWER MANHOLE
	SPRINKLER SERVICE
	SPRAY RINSE ARM
	SEWER RISING MAIN
	SQUARE RAINWATER OUTLET
	SOIL STACK
	STOP TAP
	STOP VALVE (ISOLATION VALVE)
	STORWATER
U	STORMWATER DRAINAGE TURN-UP
M	STORMWATER RISING MAIN
	TUNDISH
	TRENCH GRATE
	THERMOSTATIC MIXING VALVE
	TERRACE RAINWATER OUTLET
	TEMPERING VALVE
/	TRADE WASTE CHAMBER VENT
	TRADE WASTE STACK
)	INIESS NOTED OTHERWISE
•	UNPLASTICISED POLYVINYL CHLORIDE
	URINAL
	ULTRAVIOLET
	UTENSIL WASHING MACHINE
	VENT PIPE
	TOILET SUITE (WATER CLOSET)
	WASHING MACHINE (CLOTHES)
	WASTE PIPE
	WARM WATER
	WARM WATER FLOW
	WARM WATER RETURN YG YARD GULLY

ABBREVIATIONS, SYMBOLS AND LINETYPES IN THE LEGEND MAY NOT APPEAR ELSEWHERE ON THE DRAWINGS. THIS LEGEND SHOULD BE USED AS A GUIDE ONLY

SYMBOLS

o	COLD WATER POINT
— •	HOT WATER POINT
	CONTINUATION SYMBOL (CONTINUATION OF SERVICE NOT SHOWN)
	CAPPED OFF SERVICE
ə	DROPPER
o	RISER
	DIRECTION OF FLOW IN PIPE
—	FLANGE CONNECTION
凶	BALANCING VALVE (STAD)
۵	TUNDISH
\bowtie	ISOLATION VALVE
м	FLEXIBLE CONNECTION
	PUMP
	METER
	EMS METER
T	TEMPERATURE GAUGE
P	PRESSURE GAUGE
TMV	THERMOSTATIC MIXING VALVE
TV	TEMPERING VALVE
22	DOUBLE CHECK VALVE
\sum	BACKFLOW PREVENTION DEVICE
A	TWO WAY VALVE
函	THREE WAY VALVE
R	FLOAT VALVE
	AIR RELEASE VALVE
Z	CHECK VALVE (WATER SERVICE) REFLUX VALVE (DRAINAGE) (RV)
\odot	REFLUX VALVE RISES TO SURFACE LEVEL
	FILTER
₩	VENTED GAS REGULATOR
\square	ELECTRICAL CONTROL PANEL
\boxtimes	OVERFLOW RELIEF GULLY/YARD GULLY
\boxtimes	SV IN PATH BOX
困	GAS REGULATOR
	PRESSURE REDUCING VALVE
	PRESSURE LIMITING VALVE
X N	SOLENOID VALVE
ŀ	STRAINER
	DIRECTIONAL ARROW
OF	OVERLAND FLOW PATH
)(PENETRATION
	- SERVICE - SIZE
НХ	CONTINUED ON DWG HX

LIQUIFIED PETROLEUM GAS

LPG

SYMBOLS

LINETYPES

- NPCW

Ø	FLOOR WASTE/RAINWATER OUTLET
Ø	GARBAGE FLOOR WASTE
	STORMWATER PIT (WITH COVER)
	STORMWATER PIT (WITH GRATE)
	SQUARE RAINWATER OUTLET
\bigcirc	SEWER MANHOLE (CAC)
	KERB INLET PIT (SINGLE GRATE)
	KERB INLET PIT (DOUBLE GRATE)
—(STORMWATER HEADWALL
шшо	SPREADER
¤	BOUNDARY TRAP
~	AIR ADMITTANCE VALVE
	FIRE HOSEREEL
Ø	FIRE HYDRANT
ø ∶ ø	STANDPIPE FIRE HYDRANT (DFH)
°₽₽ ₩₩₩₩₽₽₽	FIRE HYDRANT BOOSTER ASSEMBLY
	SHADED AREA INDICATES PIPEWORK CAST INTO SLAB

SEWER DRAINAGE/SANITARY PLUMBING VENT PIPE _____ SEWER RISING MAIN STORMWATER DRAINAGE RAIN WATER PIPE (RW) STORMWATER RISING MAIN STORMWATER OVERFLOW GREASE WASTE DRAINAGE — — — GWVP — — — GWVP — GREASE WASTE VENT PIPE TRADE WASTE DRAINAGE — TW — TW — TW — TRADE WASTE VENT PIPE TRADE WASTE CHAMBER VENT PIPE — — — TWCV — — — TWCV — SUBSOIL DRAINAGE _____ SUBSOIL RISING MAIN COLD WATER SERVICE HOT WATER FLOW _____. HOT WATER RETURN HEAT PUMP FLOW HEAT PUMP RETURN WARM WATER FLOW WARM WATER RETURN _____ _ _ _ _ _ _ ____ NON-POTABLE COLD WATER - NPCW-NON-POTABLE HOT WATER GAS SERVICE FIRE HOSE REEL SERVICE _____ FIRE HYDRANT SERVICE _____ FIRE SPRINKLER SERVICE _____ · · · · _ ____ · · · · _ ____ IRRIGATION SERVICE RECYCLED WATER **REVERSE OSMOSIS WATER** _____ EXHAUST ELECTRICAL CONDUIT — E — E — E — E — E EXISTING SERVICE _____ e _____ EXISTING SERVICE TO BE —<u>X</u> e <u>X</u> e <u>X</u> e <u>—</u> REDUNDANT

NOTES

- 1. DRAWINGS ARE DIAGRAMMATIC ONLY. FOR DIMENSIONS AND CONSTRUCTION DETAILS OF BUILDING REFER ARCHITECTURAL DRAWINGS AND SITE.
- 2. PIPEWORK SIZES ARE NOMINAL BORE FOR COPPER AND CAST IRON AND INTERNAL BORE FOR POLYMER BASED PIPEWORK. REFER SPECIFICATION FOR MATERIAL TYPE.
- 3. DRAWINGS ARE TO BE READ IN CONJUNCTIONS WITH HYDRAULIC SERVICES SPECIFICATION, ARCHITECTURAL, STRUCTURAL AND OTHER CONSULTANTS DOCUMENTATION.
- 4. ANY PENETRATIONS TO FIRE RATED ELEMENTS TO BE PROTECTED IN ACCORDANCE WITH AS1530.4-2014 AND AS4072.1-2005.

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