

APPENDIX J

Utilities Report





**Wagga Wagga Health Services
Redevelopment**

Phase 2 and 3

Acute Hospital and Associated Works

Hydraulic Engineering & Fire Protection Services

UTILITY SUPPLY REPORT

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Revision 4 (100% Schematic design issue)

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1.0 EXECUTIVE SUMMARY

The Wagga Wagga Base Health Services redevelopment Phase 2 and 3 Acute Hospital and Associated works project development will be provided with “fit for purpose” hydraulic services systems.

This report addresses authority utility supply services available for the proposed Phase 1, 2 and 3 redevelopment.

Scope of services covered within this report include:-

- Sewerage systems provided by Wagga City Council
- Potable and Fire Water supplies provided by Riverina Water County Council
- Natural gas supply provided by APA Group (Evenstra)

Authority supply services can be summarized as follows:-

ACOR have assessed and reported on the condition, capacity, compliance reliability and efficiency of the existing Wagga City Council sewerage infrastructure system and have found them to be adequate and suitable for connection.

ACOR have assessed and reported on the condition, capacity, compliance reliability and efficiency of the existing Riverina Water County Council water supply infrastructure system and have found them to be adequate and suitable for connection.

ACOR have assessed and reported on the condition, capacity, compliance reliability and efficiency of the existing APA Group (Evenstra) natural gas infrastructure system and have found them to be adequate and suitable for connection.

ACOR have received Riverina Water water quality test data on 17th July 2012, confirming compliance with Australian drinking water guidelines.

Hospital engineers advised on the 16th of August 2012, that independent water quality tests have been conducted by NATA accredited laboratory. Based on supplied results, centralized water filtration and water softening plant is recommended.

1.0 INTRODUCTION

Acor Consultants Pty Ltd has been engaged by Health Infrastructure to provide utility supply report for the proposed Wagga Wagga Health Service Phase 2 and 3 Redevelopment works.

The proposed expansion works comprise of:-

- New acute hospital
- New central building services plant (Separate REF application)
- New mortuary and Asset management building (Separate REF application)
- Refurbishment of existing clinical services building.
- Demolition of existing ward tower hospital building and mortuary upon completion of new facilities.

New building works is generally proposed to be serviced by the proposed “masterplan” site infrastructure.

This utility supply describes the existing hydraulic and Fire services utility supply capacity to service the proposed development sewage, water and natural gas loads.

Hydraulic and fire services include:

- Sewerage
- Domestic water supply.
- Fire protection water supply.
- Natural Gas supply systems.

This report does not consider stormwater or electrical supply, which are being reported by civil and electrical engineering consultant.

1.1 UTILITY SUPPLY DESCRIPTION

Authority services adequacy is summarized within the tables below

1.1.1 Sewerage

Item	Description
Supply Authority Name and Contact	<p>Wagga Wagga Council</p> <p>Jamie Harwood - Cadet Engineer</p> <p>Awaiting Council response for new contact person.</p> <p>Email :harwood.jamie@wagga.nsw.gov.au</p> <p>Ph: 02 69269531</p>
Sewerage Main Details	<p>The existing hospital campus has the following sewer mains available for connection.</p> <ul style="list-style-type: none"> ■ Council's 150mm sewer in Rawson Lane ■ Council's 150mm sewer in Edward Street / Sturt Highway. ■ Council's 150mm sewer in new Lewis Drive / Yabtree street. <p>The sanitary drainage for Wagga Wagga Base Hospital has three (3) main connections to the Councils sewer system. The connections are listed below;</p> <ul style="list-style-type: none"> ■ 150mm connection in Lewis / Yabtree Street ■ 150mm connection in old Lewis Street (New Phase 1 house drainage) ■ 150mm connection in Edward Street / Sturt Highway <p>Further investigations and survey required to validate sewage flows to each existing connection point.</p> <p>Refer Appendix A Sewer Diagram.</p>
Condition and Reliability	<p>No reports of major failures or surcharging of existing sewer mains</p> <p>Council sewerage system Infrastructure failure would not significantly impact the operation Wagga Wagga Base Hospital facility.</p> <p>Sewerage main surcharge or blockage would discharge via overflow relief gully. Council would implement emergency repairs and temporary measures to allow hospital to operate normally.</p>
Existing Sewage Loads	<p>Current (50 inpatient / hospital beds)</p> <p>Current Equivalent Tenements (ET) = $50 \times 1.43 = 71.5$</p> <p>Average Dry Weather Flow – 0.150l/sec</p> <p>ADWF = $ET \times 0.0021$</p> <p>Peak Dry Weather Flow – 0.751l/sec</p> <p>PDWF = $5 \times 0.0021 \times ET$</p> <p>Existing hospital tower to be demolished in phase 3 with patients relocated to the new facility.</p>
Proposed Additional Sewage Loads	<p>Proposed (55 beds inpatient / hospital beds)</p> <p>Proposed Equivalent Tenements (ET) = $55 \times 1.43 = 78.65$</p> <p>Average Dry Weather Flow – 0.165l/sec</p> <p>ADWF = $ET \times 0.0021$</p> <p>Peak Dry Weather Flow – 0.826l/sec</p> <p>PDWF = $5 \times 0.0021 \times ET$</p>
Capacity	<p>Based on increased loads and City of Wagga Council letter dated 17th February 2012 regarding sewerage contribution charges, it is the opinion of Acor Consultants Pty Ltd that the existing sewerage infrastructure can accommodate the proposed increased loads.</p>

1.1.2 Domestic Water

Item	Description
Supply Authority Name and Contact	<p>Riverina Water County Council</p> <p>Bill Webb: Acting Water Supply Development Manager</p> <p>Email: bwebb@rwcc.com.au</p> <p>Ph 69220608</p>
Water Main Details	<p>The existing hospital campus has the following water mains surrounding the site</p> <ul style="list-style-type: none"> ■ Riverina Water 100mm water main in New Lewis Drive ■ Riverina Water 150mm water main in Edward Street / Sturt Highway. ■ Riverina Water 250mm water main in new Docker street. <p>Wagga Wagga Base Hospital currently has five (5) metered water supplies and reticulates through the facility to the various buildings to serve the fixtures plant and equipment requiring potable water.</p> <p>The existing and proposed potable water connections are listed below;</p> <ul style="list-style-type: none"> ■ Existing 150mm connection to water main in Docker Street – main supply (to be made redundant upon completion of new main connection) ■ Existing 100mm connection to water main in Edward Street – serving the existing Multi-story building (To be retained) ■ Existing 80mm connection to water main in Docker Street – serving Lewis House/Community Health, Stores and engineering (to be made redundant upon completion of new main connection) ■ Existing 20mm connection to water main in Docker Street - serving the Dental Clinic (to be made redundant upon completion of new main connection) ■ Existing 20mm connection to water main in Lewis Street – serving Gissing house (to be made redundant upon completion of new main connection) ■ New 150mm main connection in Docker street extending to proposed 50kl emergency water storage / break tank and interconnection to phase 1 mental health unit, new phase 2 / 3 works and existing potable water reticulation. <p>Refer Appendix B – Water Main Diagram</p>
Existing Domestic Water Supply Loads	<p>Current (50 hospital beds)</p> <p>Equivalent Tenement (ET)= $50 \times 0.90 = 45\text{ET}$</p> <p>1ET = 0.73kl/day</p> <p>Total Load = $45\text{ET} \times 0.73\text{kl/day} = 32.85\text{kl/day}$</p> <p>Probable Maximum Simultaneous Flow – 10lsec</p> <p>Bed numbers to be confirmed by NSW Health.</p>
Proposed Additional Domestic Water Supply Loads	<p>Proposed (55 hospital beds)</p> <p>Equivalent Tenement (ET)= $55 \times 0.90 = 49.5\text{ET}$ (1 ET = 0.73KL/day)</p> <p>Total Load = $49.5\text{ET} \times 0.73\text{kl/day} = 36.14\text{kl/day}$</p> <p>Probable Maximum Simultaneous Flow – 13lsec</p> <p>Bed numbers to be confirmed by NSW Health.</p>
Condition and Reliability	<p>Good.</p> <p>No reports of major failures.</p> <p>Minimum 50kl emergency water storage to be constructed as part of the Phase 2 will interconnect with mental health facility and existing hospital supply.</p> <p>During water main failure, Riverina Water would implement emergency repairs and temporary measures to allow hospital to operate normally. Existing water main supply in Docker street is classified as a grade 2 water supply with</p>

	alternative arrangements for isolation and supply available.
Water Supply Available Flow and Pressure	Water supply flow and pressure test results at Docker Street validate that booster pumps are required.
Capacity	<p>Water supply flow test results provided by Riverina Water validate adequate flow capacity.</p> <p>Note: Riverina Water requirement to provide break tanks where site booster pumps are installed.</p> <p>Riverina Water County Council developer (DSP) charges based on Riverina Water County Council Water prices effective 1st July 2012 to 30th June 2013 are \$3800 per additional E.T</p> <p>Final determination of additional ET to be agreed between Health Infrastructure and Riverina Water.</p>
Water Quality	Water quality results have been received by Riverina Water to date and confirm water main supply complies with Australian Drinking Water Guidelines

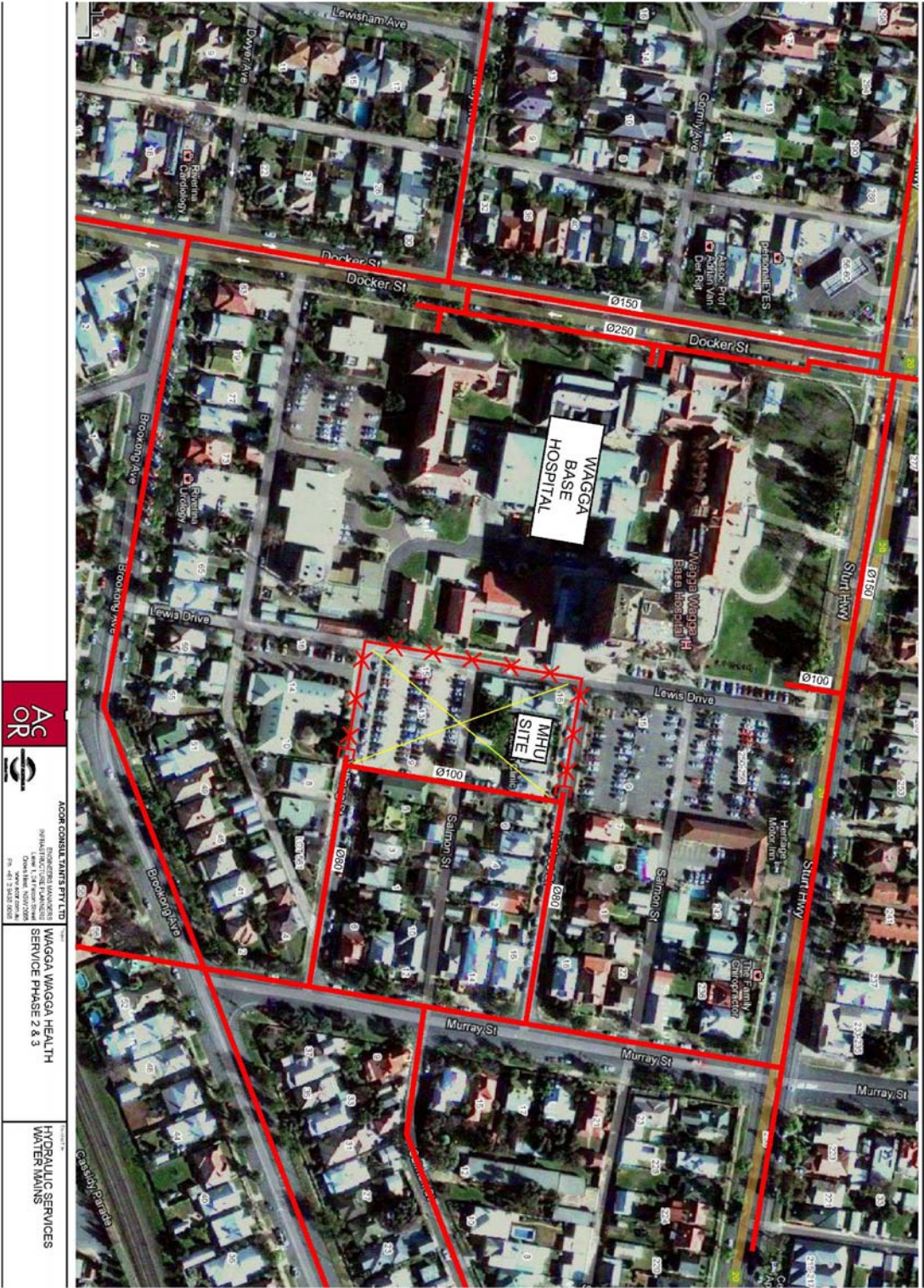
1.1.3 Fire Service Water Supply

Item	Description
Supply Authority Name and Contact	Riverina Water Bill Webb: Acting Water Supply Development Manager Email: bwebb@rwcc.com.au Ph 69220608
Water Main Details	<p>The existing Fire water connections are listed below;</p> <ul style="list-style-type: none"> ■ 150mm connection to water main in Docker Street – main supply (to be made redundant upon completion of new fire hydrant main connection) ■ 100mm connection to water main in Edward Street – serving the Multi-story building (To be retained) ■ 100mm connection to water main in Docker Street – serving Lewis House (To be made redundant) ■ 100mm connection to water main in Docker Street – serving “old” hospital building (To be made redundant) <p>Proposed fire hydrant and fire sprinkler water supply water for the proposed site to be fed through a new 250mm diameter water main connection in Docker street.</p> <p>Refer Appendix B – Water Main Diagram</p>
Existing Fire Water Supply Loads	Fire Hydrant 20l/sec
Proposed Fire Water Supply Loads	Fire Service = 30L/sec Fire Hydrant + 35l/sec Fire Sprinklers = 65l/sec.
Condition and Reliability	<p>Good.</p> <p>No reports of major failures.</p> <p>No emergency water storage for fire services is to be constructed as part of the Phase 2 project.</p> <p>During water main failure Riverina Water would implement emergency repairs and temporary measures to allow hospital to operate normally.</p> <p>Existing water main supply in Docker street is classified as a grade 2 water supply with alternative arrangements for isolation and supply available.</p>
Water Supply Available Flow and Pressure	<p>Water supply flow and pressure test results provided by Riverina Water validate booster pumps are required and as a consequence fire services break tanks also required.</p> <p>Refer appendix C Fire Flow Results</p>

1.1.4 Natural Gas

Item	Description
Supply Authority Name and Contact	<p>APA (Evenstra)</p> <p>Name :Phil Jenkins (Gas Engineering Officer)</p> <p>: Cliff Priest (Local area Customer Liaison officer)</p> <p>Local Area Representative</p> <p>Email : phil.jenkins@apa.com.au</p> <p>cliff.priest@apa.com.au</p> <p>Phone: 59330822</p>
Existing Natural Gas Details	<p>The site is currently supplied with high pressure gas main in Rawson lane to a main meter and regulator set.</p> <p>Numerous gas sub meters and regulators are located around the site servicing individual building areas.</p>
Existing Natural Gas Supply Loads	Refer appendix F
Proposed Natural Gas Supply Loads	<p>8000mj/hr - new central energy plant (future allowance)</p> <p>2260mj/hr – new domestic hot water plant</p> <p>1000mj/hr – Existing Mental Health Unit</p> <p>6211mj/hr – existing gas appliances to be retained.</p> <p>2620mj/hr – allowance for future expansion (15%)</p> <p>Total 20,091mj/hr say 21,000mj/hr.</p>
Condition and Reliability	<p>To be confirmed by supply authority</p> <p>No reports of major failures or delivery issues.</p> <p>If the gas authority was unable to supply gas to the site, gas fired plant for domestic hot water and mechanical heating would not be available until repaired.</p> <p>During gas main failure APA (Evenstra) would implement emergency repairs and temporary measures to allow hospital to operate normally as soon as possible.</p>
Capacity	<p>Gas authority has verbally advised gas supply for the phase 1, 2 and 3 works can be provided.</p> <p>Final determination of contribution charges and / or network augmentation to be confirmed by supply authority upon confirmation of final mechanical and hydraulic design loads.</p>
Proposed Works	Phase 2/3 works to connect

APPENDIX B – WATER SUPPLY DIAGRAM



APPENDIX D – WATER QUALITY RESULTS

Results Reporting by Analysis Type – All											
You have selected the following report –											
AHS – Greater Southern PHU Water Supply Authority – Riverina Water County (RV) Supply System – Wagga Waterworks (01)											
Date Range – From – 01 January 2012 To – 03 March 2012											
Sample Type/s – All											
Laboratory/s – All											
Barcode Count – These results represent 68 distinct samples.											
Summary Display											
Parameter	Guideline Value	Mean	Median	Standard deviation	Min.	Max.	Number of samples	Number of exceptions	95th percentile	5th percentile	% meeting guideline values
Total Coliforms	0.0000 cfu/100 mL	0.0308	0.0000	0.2481	0.0000	2.0000	65	1	0.4376	0.1000	98
E. coli	0.0000 cfu/100 mL	0.0000	0.0000	0.0000	0.0000	0.0000	65	0	0.0000	0.0000	100
pH	6.5 – 8.5	7.3313	7.3150	0.4924	6.3000	8.5400	62	3	8.1389	6.4120	95
Turbidity	5.0000 NTU	0.4740	0.4450	0.1852	0.2000	1.2800	62	0	0.7777	0.2540	100
Free Chlorine	5.0000 mg/L	0.5810	0.5350	0.3674	0.0500	2.2220	60	0	1.1836	0.1586	100
Total Chlorine	5.0000 mg/L	0.6810	0.6450	0.3773	0.0500	2.2220	60	0	1.2998	0.1586	100
Total Dissolved Solids (TDS)	600.0000 mg/L	90.5000	90.5000	24.7487	73.0000	108.0000	2	0	131.0879	74.7500	100
Aluminium	0.2000 mg/L	0.0150	0.0150	0.0071	0.0099	0.0200	2	0	0.0267	0.0104	100
Antimony	0.0030 mg/L	0.0010	0.0010	0.0000	0.0010	0.0010	2	0	0.0010	0.0010	100
Arsenic	0.0100 mg/L	0.0010	0.0010	0.0000	0.0010	0.0010	2	0	0.0010	0.0010	100
Barium	2.0000 mg/L	0.0120	0.0120	0.0026	0.0100	0.0140	2	0	0.0166	0.0102	100
Boron	4.0000 mg/L	0.0990	0.0990	0.0000	0.0990	0.0990	2	0	0.0990	0.0990	100
Cadmium	0.0020 mg/L	0.0005	0.0005	0.0000	0.0005	0.0005	2	0	0.0005	0.0005	100
Calcium	9999.0000 mg/L	12.7500	12.7500	0.0707	12.7000	12.8000	2	0	12.8660	12.7050	100

Results Reporting by Analysis Type – All

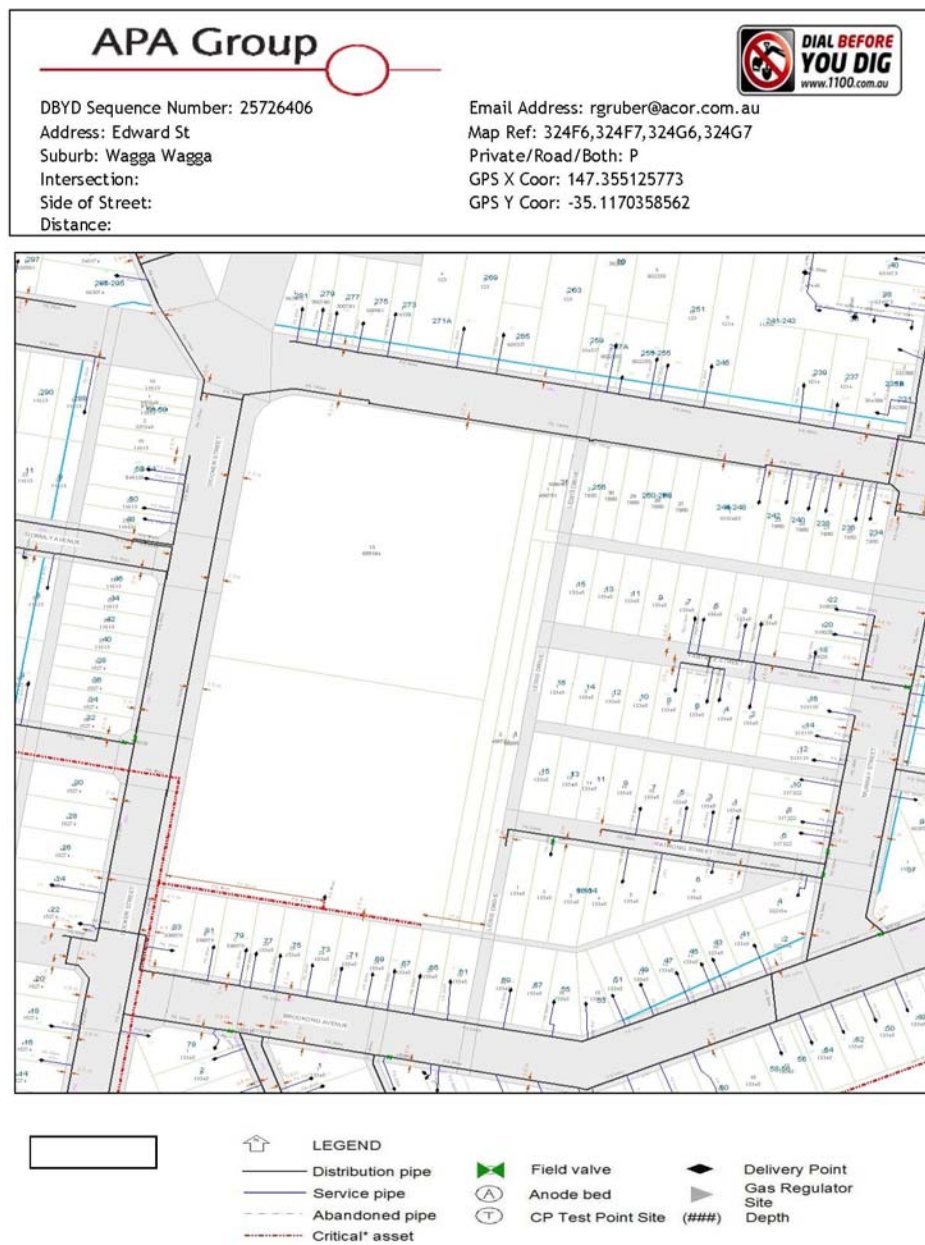
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Chloride	250.0000 mg/L	14.0000	14.0000	8.4853	8.0000	20.0000	2	0	27.9159	8.6000	100
Chromium	0.0500 mg/L	0.0050	0.0050	0.0000	0.0050	0.0050	2	0	0.0050	0.0050	100
Copper	2.0000 mg/L	0.0060	0.0060	0.0014	0.0050	0.0070	2	0	0.0063	0.0051	100
Fluoride	1.5000 mg/L	1.0800	1.0800	0.0283	1.0600	1.1000	2	0	1.1264	1.0620	100
Iodine	0.5000 mg/L	0.0199	0.0199	0.0001	0.0198	0.0200	2	0	0.0201	0.0198	100
Iron	0.3000 mg/L	0.0200	0.0200	0.0141	0.0100	0.0300	2	0	0.0432	0.0110	100
Lead	0.0100 mg/L	0.0020	0.0020	0.0000	0.0020	0.0020	2	0	0.0020	0.0020	100
Magnesium	9999.0000 mg/L	5.2350	5.2350	2.4254	3.5200	6.9500	2	0	9.2126	3.6915	100
Manganese	0.5000 mg/L	0.0050	0.0050	0.0000	0.0050	0.0050	2	0	0.0050	0.0050	100
Mercury	0.0010 mg/L	0.0001	0.0001	0.0000	0.0001	0.0001	2	0	0.0001	0.0001	100
Molybdenum	0.0500 mg/L	0.0050	0.0050	0.0000	0.0050	0.0050	2	0	0.0050	0.0050	100
Nickel	0.0200 mg/L	0.0099	0.0099	0.0000	0.0099	0.0099	2	0	0.0099	0.0099	100
Nitrate	50.0000 mg/L	1.0000	1.0000	0.0000	1.0000	1.0000	2	0	1.0000	1.0000	100
Nitrite	3.0000 mg/L	0.0990	0.0990	0.0000	0.0990	0.0990	2	0	0.0990	0.0990	100
Selenium	0.0100 mg/L	0.0025	0.0025	0.0007	0.0020	0.0030	2	0	0.0037	0.0021	100
Silver	0.1000 mg/L	0.0020	0.0020	0.0000	0.0020	0.0020	2	0	0.0020	0.0020	100
Sodium	180.0000 mg/L	11.0000	11.0000	5.6569	7.0000	15.0000	2	0	20.2772	7.4000	100
Sulfate	500.0000 mg/L	17.5000	17.5000	3.5355	15.0000	20.0000	2	0	23.2983	15.2500	100
Total Hardness as CaCO3	200.0000 mg/L	53.3500	53.3500	9.6874	46.5000	60.2000	2	0	69.2373	47.1850	100
True Colour	15.0000 Hazen Units (HU)	1.0000	1.0000	0.0000	1.0000	1.0000	2	0	1.0000	1.0000	100
Zinc	3.0000 mg/L	0.0150	0.0150	0.0071	0.0100	0.0200	2	0	0.0266	0.0105	100
Fluoride (field result WSA)	1.5000 mg/L	1.0000	1.0000	0.0283	0.9800	1.0200	2	0	1.0464	0.9820	100
Fluoride Ratio	0.8 – 1.2	0.9250	0.9250	0.0071	0.9200	0.9300	2	0	0.9366	0.9205	100
Fluoride (daily WSA)	0.9 – 1.5 mg/L	1.0286	1.0300	0.0568	0.9000	1.1600	63	0	1.1218	0.9130	100
Fluoride (weekly WSA)	0.9 – 1.5 mg/L	1.0178	1.0300	0.0491	0.9200	1.1000	18	0	1.0962	0.9290	100

Results Reporting by Analysis Type – All

2

APPENDIX E – GAS MAIN DIAGRAIM



APPENDIX F – EXISTING GAS LOADS

WWBH Boilers MJ and KW ratings

Location	Mega Joule	Kilowatt
Lewis Com Health,	870	193
Lewis Hot Water service,	200	43
Lewis Nurses,	277	61.5
Harvey House HWS,	50	11
CSB X 2 Hunt,	3600 each	814 each
CSB HWS X 10,	190 each	37each
Robinson House,	277	61.5
Robinson House HWS,	190	37
Old Hosp G floor Heating,	277	61.5
Old Hosp G floor HWS,	190	37
1 st floor Ed, Xray,	1719	382
7 th Floor Hot water MSB,	870	193
7 th Floor Exec Heating,	343	76
Hydro Pool,	278	62
Hydro Pool HWS,	190	37

EXISTING GAS LOADS CONTINUED

Ward 9,	278	62
Dental gas Ducted,	316.5	70.32
Dental Clinic HWS,	200	43
D Block Gas Ducted,	316.5	70.32
D Block HWS,	50	11
CSB Gas Fired Boiler,	2250	500

APPENDIX G – ATTENDANCE AND SITE OBSERVATIONS SCHEDULE

Attendance date	Inspections / Meeting outcomes / issues	Advice & Recommendations
09/07/12	<p>Rob Gruber and Ken Hickson – Site meeting with the HansenYuncken for an initial walk through of the existing campus and to gather as built information on the existing services within the proposed site and existing Campus.</p> <p>Meeting with Wagga Wagga City Council (Colin Fough) regarding sewer.</p> <p>Meeting with Riverina Water County Council (Peter Clifton) regarding water supply.</p>	<p>None.</p> <p>Colin Fough no longer employed by Wagga Council. Awaiting Council response for new contact person.</p> <p>Advised Bill Webb will be new point of contact as Acting Water Supply Infrastructure manager.</p>
25/07/12	<p>Rob Gruber – Site tour briefing with Health Infrastructure (Bruce Gould) and Phase 2 Architect for a walk through of the existing campus to gain understanding of future Phase 2 early works and phase 2 and 3 building works to understand interface with proposed MHU.</p>	<p>Phase 1 early works domestic and fire water works to be completed to allow connection to Phase 1 MHU.</p> <p>Redesign required to incorporate Riverina Water requirements and future phase 2 / 3 works.</p>
12/10/12	<p>Site investigations by Rob Gruber, Brian Phillips and Kevin Albertyn of Acor Consultants to review latent conditions.</p>	Nil
13/11/12	<p>Meeting with Riverina Water County Council (Bill Webb acting water supply infrastructure manager)</p>	Minutes issued.

12775sr009/MAC/mac

13.12.12

LFA (Pacific) Pty Ltd
SUITE 4, 2 NEW MCLEAN ST
Edgecliff, NSW 2027

Attention: Carla Mamaril

Dear Carla,

Services Statement – Response to DGR's – Portion B – Acute Hospital

This document provides a summary of the proposed electrical and mechanical design principles for the Acute Services Building of the Wagga Wagga Hospital Redevelopment. This summary provides a response to the Director General's Requirements.

ELECTRICAL SERVICES:

The following works will be carried out as part of the Portion B works:

11kV Supply

Three new 1500 kVA kiosk substations will be provided as part of a separate project, with sufficient capacity to serve the new Acute Services Building. All consultations with the utility company is being carried out as part of that project, therefore no specific consultations are required with the utility company for the Portion B works.

Low Voltage Services

Privately owned low voltage services will be taken from the new site substations (provided as part of a separate project) to the main switch room in the new Acute Services Building.

Standby Power

Generator backed power supplies will be provided in accordance with the relevant codes and standards, and is being provided as part of a separate project, with sufficient capacity to serve the new Acute Services Building.

TELECOMMUNICATIONS:

All communications reticulation on the Wagga Wagga site is being upgraded as part of a separate project and hence no consultation is required as part of this project. The network shall have sufficient capacity to support the new Acute Services Building as part of this portion of works, as the existing lead in services have the required capacity.

Steensen Varming has meet with the engineering and Local Health District ICT focus groups to discuss the general arrangement of engineering systems proposed for the Wagga Wagga Hospital redevelopment. These discussions obtained general acceptance from engineering and ICT for mechanical, electrical and communications systems.