# Port Macquarie Base Hospital

## Fourth Pod Expansion Project

## Hydraulic Engineering & Fire Services Engineering

# UTILITY SUPPLY REPORT

**Acor Consultants Pty Limited**
**Level 1, 24 Falcon Street,**
**Crows Nest, NSW. 2065**
**Tel: 02 94385098**
**Fax: 02 9438539**
Date: 21st December 2011

Revision 4

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## 1.0 INTRODUCTION

Acor Consultants Pty Ltd has been engaged by Health Infrastructure to provide utility supply report for the proposed Port Macquarie Base Hospital Campus expansion works.

The proposed expansion works comprise of construction 3 clinical levels (approximately 14,000m2) + one level of plant + planning for future helipad some internal refurbishment within the existing building.

New building works is generally proposed to be serviced by the existing internal site infrastructure connecting.

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

Hydraulic and fire services include:

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

This report does not consider stormwater or electrical supply, which are being reported by other consultants.

## 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** | Port Macquarie-Hastings Council<br>Tom Angus - Sewerage Investigations Engineer<br>Email :Tom.Angus@pmhc.nsw.gov.au<br>Katrina Mesher & Deanne Gooch<br>Administration Officer (Sewerage)<br>Ph: 02 6581 8111 |
| **Sewerage Main Details** | The existing house sanitary drainage systems for the site connect to a 225mm (material?) diameter sewer connection to the Port Macquarie / Hastings Shire Council sewer main located towards the north of the site. Refer Appendix A Sewer Diagram. |
| **Condition and Reliability** | Good.<br>No reports of major failures. |
| **Existing Sewage Loads** | Current (200 hospital beds)<br>Current Equivalent Population (EP) = 200 X 3.4 = 680<br>Average Dry Weather Flow – **1.428lsec**<br>ADWF = EP X 0.0021<br><br>Peak Dry Weather Flow – **7.14l/sec**<br>PDWF = 5 X 0.0021 X EP |
| **Proposed Additional Sewage Loads** | Proposed (341 beds)<br>Proposed Equivalent Population (EP) = 341 X 3.4 = 1,160<br>Average Dry Weather Flow – **2.436l/sec**<br>ADWF = EP X 0.0021<br><br>Peak Dry Weather Flow – **12.18l/sec**<br>PDWF = 5 X 0.0021 X EP |
| **Capacity** | Not Adequate<br>Authority have advised that upgrade works of the existing main infrastructure pipes and pumping plant is required to accommodate increased loads.<br>Council Infrastructure upgrade cost may be included in the development consent conditions.<br>Refer Appendix B – Tom Angus Email dated 5th April 2011 |

### 1.1.2 Domestic Water

| Item | Description |
|---|---|
| **Supply Authority Name and Contact** | Port Macquarie-Hastings Council<br><br>JN (Nick) Houston<br>Water Supply Development Engineer<br>Port Macquarie-Hastings Council<br><br>Email: nickh@pmhc.nsw.gov.au<br>Ph (02) 6581 8640 |
| **Water Main Details** | Domestic water for the existing site is fed through a 200mm diameter water main extending west along Wrights Road from the Oxley Highway water main to the West. The site is fed by a 150mm diameter council water meter. The council water main is protected by the site containment reduced pressure zone device (RPZD) located immediately downstream of the meter.<br><br>An alternate water supply to the site is fed along the road reserve (undeveloped) section of the Wrights Road alignment from the main within Merrigal Street to the east of the site. The main is a 150mm diameter PVC main and is normally valved in the off condition. The valve is operated only by council in case of emergency or loss of supply from the Oxley Highway main fed to the site from the west.<br><br>Domestic potable water supplies within the hospital are fed by a 50,000 litre domestic water storage tank that provides approximately8 hours of emergency storage based on the current bed population and usage.<br>Maximum flow from water main to storage tank, due to existing tank fill servo valves= 9 litres/second.<br><br>Refer Appendix C – Water Main Diagram |
| **Existing Domestic Water Supply Loads** | Current (200 hospital beds) X 0.92ET<br>Equivalent Tenement (ET)= 0.73kl/day<br>Total Load = 134kl/day<br>Probable Maximum Simultaneous Flow – 9lsec |
| **Proposed Domestic Water Supply Loads** | Proposed (341 beds) x 0.92ET<br>Equivalent Tenement (ET)= 0.73kl/day<br>Total Load = 230kl/day<br>Probable Maximum Simultaneous Flow – 14lsec based on proposed additional 50,000litre storage for new building and incoming additional supply limited to 5litres per second by tank fill servo valves |
| **Condition and Reliability** | Good.<br>No reports of major failures. |
| **Water Supply Available Flow and Pressure** | Water supply flow and pressure test results provided by Council dated 13th October 2011 indicate adequate flow and pressure for fire fighting purposes |
| **Capacity** | Adequate .<br><br>The existing water meter connection has sufficient capacity for the future development without the need for on-site storage.<br><br>Note: PMHC had indicated that an upgrade of 60m of water main within Wrights road from the hospital site could be considered, however due to the proposed design to incorporate an emergency water storage tank further assessment would be required to determine if the main upgrade were necessary. |
| **Water Quality** | Water quality results dated 25th March 2011, received 11th November 2011, from council confirm water main supply complies with Australian Drinking Water |

| | |
|---|---|
| | Guidelines |

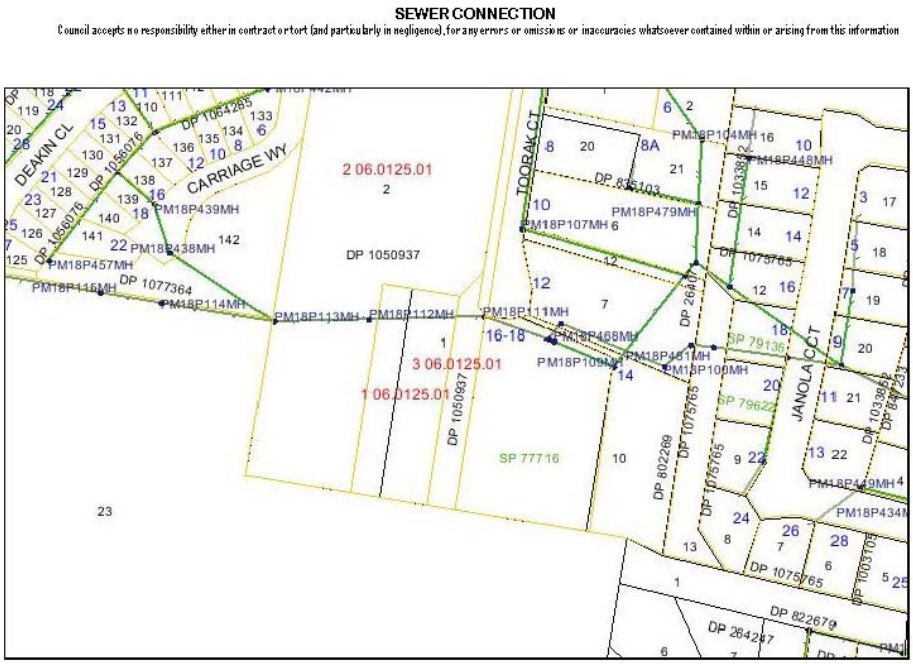
### 1.1.3 Fire Service Water Supply

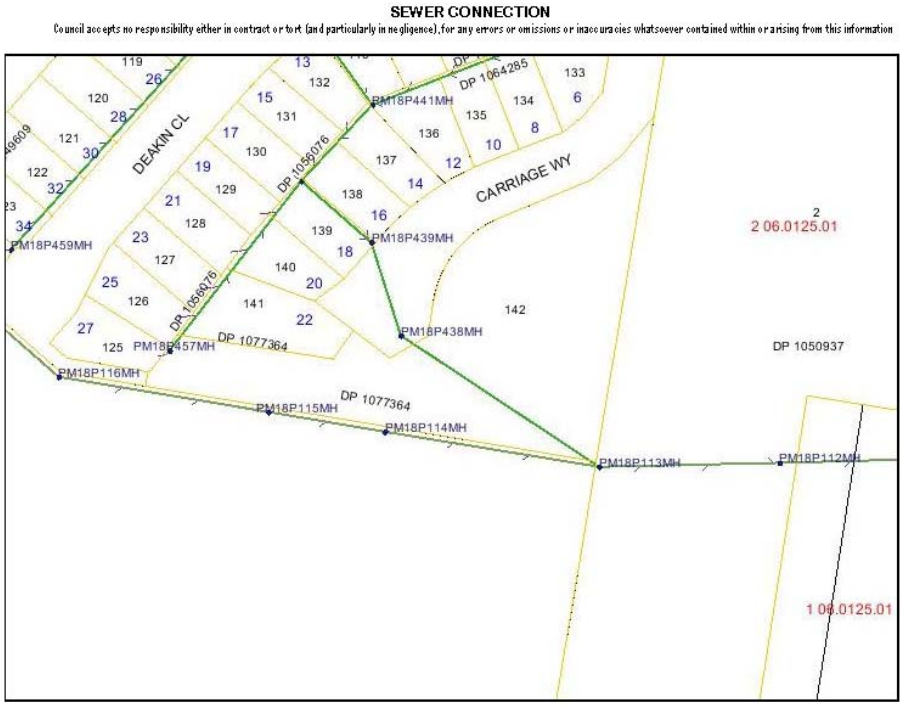
| Item | Description |
|---|---|
| **Supply Authority Name and Contact** | Port Macquarie-Hastings Council<br><br>JN (Nick) Houston<br>Water Supply Development Engineer<br>Port Macquarie-Hastings Council<br>Ph (02) 6581 8640 |
| **Water Main Details** | Fire protection water supply for the existing site is fed through a 200mm diameter water main extending west along Wrights Road from the Oxley Highway water main to the West. The site fire water supply is fed through a 100mm diameter fire brigade booster valve assembly. The council water main is protected by a double check valve located on the fire brigade booster assembly.<br><br>An alternate water supply to the site is fed along the road reserve (undeveloped) section of the Wrights Road alignment from the main within Merrigal Street to the east of the site. The main is a 150mm diameter PVC main and is normally valved in the off condition. The valve is operated only by council in case of emergency or loss of supply from the Oxley Highway main fed to the site from the west.<br><br>The site fire hydrant system is pressurized by a superseded / non complying fire hydrant pump set (Southern Cross Model ASE A18) located within the services area. |
| **Existing Fire Water Supply Loads** | Fire Hydrant 20l/sec |
| **Proposed Fire Water Supply Loads** | Fire Hydrant 20/l/sec<br>Automatic Fire Sprinklers Ordinary Hazard Group 1 9l/sec |
| **Condition and Reliability** | Good.<br>No reports of major failures. |
| **Water Supply Available Flow and Pressure** | Water supply flow and pressure test results provided by Council dated 13th October 2011 indicate satisfactory available water supply flow and pressure for fire fighting purposes.<br>Refer Appendix D – Fire Flow Results |
| **Capacity** | Adequate.<br><br>The existing water meter connection has sufficient capacity for the future development without the need for on-site storage. |

### 1.1.4 LP Gas

| Item | Description |
|---|---|
| **Supply Authority Name and Contact** | ELGAS<br>Ram Ramjas<br>Laurie Bombardiere<br>NSW Technical Manager Elgas<br>Ph: (02) 96720777<br>Anthony Patrick<br>Local Area Representative<br>Email : anthony.patrick@elgas.com.au<br>Mobile: 0401987542 |
| **Existing LP Gas Details** | The site is currently supplied with 4 x 7500 litre LPG bulk storage cylinders that are filled on a weekly basis. The tanks are manifolded to supply gas at medium pressure (100 kPa) through a 65mm diameter copper gas main to the building.<br><br>On entering the building at the services area the gas is reduced in pressure to 7 kPa and fed through to the plant room appliances.<br><br>A 32mm diameter copper service also extends as a medium pressure service to the kitchen area where gas pressures are reduced by a 2nd stage regulator for kitchen gas appliances.<br><br>The North Coast Cancer Institute (NCCI) is fed completely independently off a 4500 litre LPG bulk storage tank located to the NE of the building.<br><br>Natural gas is not available at the site |
| **Existing LP Gas Supply Loads** | Average 1136litres per day as provided by ELGAS gas usage data provided. |
| **Proposed LP Gas Supply Loads** | Average 2150 litres per day based on additional hot water plant, heating hot water plant and steam plant total maximum 12,000mj/hr. |
| **Condition and Reliability** | Good.<br>No reports of major failures or delivery issues.<br>Tanks are generally “topped up” on a fortnightly basis. |
| **Capacity** | To be confirmed by ELGAS |
| **Proposed Works** | Due to the location of the proposed expansion works it is proposed to relocate the existing LP Gas fuel farm within the proposed new eastern car parking area.<br><br>The new tanks and associated piping will be constructed as an early works package to allow continual operation of the existing hospital during the construction of the new building. |

## APPENDIX A – SEWER DIAGRAM




SEWER CONNECTION
Council accepts no responsibility either in contract or tort (and particularly in negligence), for any errors or omissions or inaccuracies whatsoever contained within or arising from this information
DEAKIN CL
CARRIAGE WY
DP 1064285
DP 1056076
DP 1077364
DP 1050937
PM18P459MH
PM18P457MH
PM18P116MH
PM18P115MH
PM18P114MH
PM18P113MH
PM18P112MH
PM18P441MH
PM18P439MH
PM18P438MH
2 06.0125.01
1 06.0125.01

## APPENDIX B – SEWER UPGRADE EMAIL

From: Tom.Angus@pmhc.nsw.gov.au [mailto:Tom.Angus@pmhc.nsw.gov.au]
Sent: Tuesday, 5 April 2011 2:39 PM
To: Potter, Grant - ACOR
Cc: Jeffery.Sharp@pmhc.nsw.gov.au
Subject: PMBH POD 4 & POD 5 expected sewer flow increase

Grant,

I refer your email of 4 April 2011 and your subsequent conversation with Clayton Miechel.

In order to accommodate the increased sewage flows as a result of the redevelopment of PMBH & as provided by Acor, downstream augmentation of the sewerage system is required to the amount of $540,000.

Augmentation involves:-
upgrading of the sewer rising main from 250mm to 375mm
augmentation of the sewage pumping station
upsizing of critical components within the reticulation system

Regards,
Tom Angus - Sewerage Investigations Engineer
Port Macquarie-Hastings Council
Ph. 02 6581 8672
Fax 02 6581 8735
tom.angus@pmhc.nsw.gov.au

## APPENDIX C – WATER SUPPLY DIAGRAM

## APPENDIX D – FIRE FLOW RESULTS

PORT MACQUARIE-
HASTINGS COUNCIL

PO Box 84
Port Macquarie
NSW Australia 2444
DX 7415

council@pmhc.nsw.gov.au
www.pmhc.nsw.gov.au

ABN 11 236 901 601

RECEIVED
19 OCT 2011
ACOR CONSULTANTS

PORT MACQUARIE
HASTINGS

13 October 2011

Pin: 49703

ACOR Consultants
Level 1/24 Falcon Street
CROWS NEST NSW 2065

Dear Robert Gruber

**Re: Your Pressure Enquiry Dated: 5/10/2011**
**Property Address: Wrights Road Port Macquarie**

The expected maximum and minimum pressure available in the watermain given below are in accordance with current Australian Standards where applicable:

**Approximate Ground Level (AHD):** 22 metres

**Nominal Size of Watermain (DN):** 200 mm

**Available Pressures**

1. **Maximum Pressure:** (AS 3500 -2003, Zero demand) 35 m head

   **Minimum Pressure:** (AS 3500 -2003, Peak demand) 26.5 m head

2. **Fire Hydrant Installations:**

   (AS 2419.1-1991, Clause 4.5.3.3. Minimum pressures are based on the design pressure expected to be maintained for 95% of the time)

| Flow Rate l/s | 10 | 20 | 30 |
|---|---|---|---|
| Pressure (m.head) | 27 | 26.5 | 25 |

PORT MACQUARIE OFFICE
Corner Lord & Burrawan Streets
Telephone (02) 6581 8111
Facsimile (02) 6581 8123

WAUCHOPE OFFICE
High Street
Telephone (02) 6589 6500

LAURIETON OFFICE
9 Laurie Street
Telephone (02) 6559 9958

**3. Fire Sprinkler and Wall Wetting Sprinkler (Drencher) Installations:**

(AS 2118-1982, Clause 4.10.1. Minimum Pressure is based on the sprinkler flows combined with the peak demands in Council's main.)

| Flow Rate l/s | 10 | 20 | 30 |
|---|---|---|---|
| Pressure (m.head) | 25.5 | 24 | 22.5 |

**NOTES:**

The applicant acknowledges that the information supplied in relation to the expected maximum and minimum pressures in the watermain is determined from computer modelling and that no actual test of the main has been conducted by an Officer of Port Macquarie-Hastings Council.

The computer model used by Port Macquarie-Hastings Council provides an estimate of pressures and flow after taking into account variables within the water supply system and factoring in peak loads on the system. Peak demand is the maximum theoretical hourly flow rate in the watermain based on conditions previously experienced or expected to occur in the water supply system.

The minimum pressures quoted may not always be available during times of abnormal system operation such as a main break or during system maintenance such as reservoir cleaning. The property owner is responsible for ensuring that fire fighting installations can be adequately operated under all mains pressure and flow conditions.

The computer model simulates conditions in existing watermains at the time of the enquiry. The design of water supply and fire hydrant/sprinkler installations should give consideration to a condition of development consent that may require augmentation of existing watermains. It is recommended that contact be made with Council's water supply section on telephone 02 6581 8667 to establish any augmentation that may be required to service individual developments.

Should you require further information please do not hesitate to contact Allan Barlin on telephone number 02 6581 8667.

Yours faithfully

A Doig
Acting Manager Water Supply Services

## APPENDIX E – WATER QUALITY RESULTS

### Detailed Reporting by Analysis Type - All

You have selected the following report -

AHS - **North Coast PHU**
Water Suppy Authority - **Port Macquarie-Hastings Council (HA)**
Supply System - **Port Macquarie (01)**
Sample Site Number - **73**

Sample Site Details - **The Point drive , Port Macquarie**
Sample Site Description - **SPS 77**

Date Range -
From - **21 March 2011**
To - **25 March 2011**

Sample Type/s - **All**

Laboratory/s - **All**

**Detailed Display**

| Barcode | Parameter | Guideline Value | Units | Value | Sample Site | Lab Name | Date Sampled | Date Received | Date Entered | Comments |
|---|---|---|---|---|---|---|---|---|---|---|
| 111HA0129379 | Total Coliforms | 0.0000 | cfu/100 mL | <1 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 111HA0129379 | E. coli | 0.0000 | cfu/100 mL | <1 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 711HA0130743 | pH | 6.5 - 8.5 | | 8.2 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 111HA0129379 | pH | 6.5 - 8.5 | | 8.50 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 711HA0130743 | Turbidity | 5.0000 | NTU | 1.4 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 111HA0129379 | Turbidity | 5.0000 | NTU | 1.67 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 111HA0129379 | Free Chlorine | 5.0000 | mg/L | 0.08 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 111HA0129379 | Total Chlorine | 5.0000 | mg/L | 0.18 | HA01073 | Hastings Council Laboratory | 22/03/2011 | 22/03/2011 | 27/04/2011 | |
| 711HA0130743 | Total Dissolved Solids (TDS) | 500.0000 | mg/L | 104 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Aluminium | 0.2000 | mg/L | 0.03 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Antimony | 0.0030 | mg/L | <0.001 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Arsenic | 0.0070 | mg/L | 0.001 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Barium | 0.7000 | mg/L | 0.012 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Boron | 4.0000 | mg/L | <0.1 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Cadmium | 0.0020 | mg/L | <0.0005 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Calcium | 9999.0000 | mg/L | 16.3 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Chloride | 250.0000 | mg/L | 24 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Chromium | 0.0500 | mg/L | <0.005 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Copper | 2.0000 | mg/L | 0.014 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Fluoride | 1.5000 | mg/L | <0.10 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Iodine | 0.1000 | mg/L | 0.03 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Iron | 0.3000 | mg/L | 0.18 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Lead | 0.0100 | mg/L | 0.003 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Magnesium | 9999.0000 | mg/L | 4.44 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Manganese | 0.5000 | mg/L | 0.026 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Mercury | 0.0010 | mg/L | <0.0001 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Molybdenum | 0.0500 | mg/L | <0.005 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Nickel | 0.0200 | mg/L | <0.01 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Nitrate | 50.0000 | mg/L | <1 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Nitrite | 3.0000 | mg/L | <0.1 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Selenium | 0.0100 | mg/L | <0.002 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Silver | 0.1000 | mg/L | <0.002 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Sodium | 180.0000 | mg/L | 18 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Sulfate | 500.0000 | mg/L | 3 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Total Hardness as CaCO3 | 200.0000 | mg/L | 59.0 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | True Colour | 15.0000 | Hazen Units (HU) | 2 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |
| 711HA0130743 | Zinc | 3.0000 | mg/L | 0.01 | HA01073 | ICPMR-DAL Laboratory | 22/03/2011 | 23/03/2011 | 30/03/2011 | |

Excel Report PDF Report

## APPENDIX F – EXISTING LPG LOAD PROFILE

| PORT MACQUARIE HOSPITAL LPG USAGE FROM ELGAS DELIVERY DATA | | | |
|---|---|---|---|
| **Ref No.** | **Delivery Date/Time** | **Quantity in Litres** | **Litres Per Day** |
| 111063123 | 7-Jan-10 | 10,500 | |
| 111073125 | 21-Jan-10 | 11,112 | 794 |
| 111083197 | 4-Feb-10 | 11,400 | 814 |
| 111092314 | 18-Feb-10 | 11,510 | 822 |
| 111103793 | 4-Mar-10 | 11,733 | 838 |
| 111113588 | 18-Mar-10 | 11,864 | 847 |
| 111123904 | 31-Mar-10 | 11,001 | 846 |
| 111133693 | 15-Apr-10 | 11,803 | 787 |
| 111144357 | 28-Apr-10 | 12,203 | 939 |
| 111155118 | 13-May-10 | 12,411 | 827 |
| 111164817 | 20-May-10 | 8,000 | 1143 |
| 111168326 | 27-May-10 | 8,301 | 1186 |
| 111173353 | 3-Jun-10 | 7,301 | 1043 |
| 111178741 | 10-Jun-10 | 7,801 | 1114 |
| 111185519 | 17-Jun-10 | 8,835 | 1262 |
| 111192128 | 24-Jun-10 | 8,551 | 1222 |
| 111199207 | 2-Jul-10 | 11,001 | 1375 |
| 111207383 | 8-Jul-10 | 7,651 | 1275 |
| 111215506 | 15-Jul-10 | 7,604 | 1086 |
| 111222755 | 22-Jul-10 | 9,502 | 1357 |
| 111230109 | 29-Jul-10 | 8,100 | 1157 |
| 111236888 | 5-Aug-10 | 8,300 | 1186 |
| 111242756 | 12-Aug-10 | 8,101 | 1157 |
| 111248755 | 19-Aug-10 | 8,002 | 1143 |
| 111254033 | 26-Aug-10 | 8,601 | 1229 |
| 111261981 | 2-Sep-10 | 8,002 | 1143 |
| 111267593 | 9-Sep-10 | 6,969 | 996 |
| 111273142 | 16-Sep-10 | 6,901 | 986 |
| 111285591 | 23-Sep-10 | 6,901 | 986 |
| 111282751 | 30-Sep-10 | 6,596 | 942 |
| 111289435 | 7-Oct-10 | 5,776 | 825 |
| 111299721 | 14-Oct-10 | 5,602 | 800 |
| 111297516 | 21-Oct-10 | 7,403 | 1058 |
| 111308323 | 4-Nov-10 | 12,072 | 862 |
| 111324507 | 18-Nov-10 | 1,501 | |
| 111317018 | 18-Nov-10 | 12,227 | 873 |
| 111331765 | 1-Dec-10 | 2,509 | 193 |
| 111326218 | 2-Dec-10 | 9,802 | 9802 |
| 111334792 | 16-Dec-10 | 11,000 | 786 |
| 111347149 | 30-Dec-10 | 10,002 | 714 |
| 111357414 | 13-Jan-11 | 10,200 | 729 |
| 111367212 | 27-Jan-11 | 11,422 | 816 |
| 111375295 | 10-Feb-11 | 10,311 | 737 |
| 111384563 | 24-Feb-11 | 9,113 | 651 |
| 111394218 | 3-Mar-11 | 7,600 | 1086 |
| 111395413 | 10-Mar-11 | 5,802 | 829 |
| 111399829 | 17-Mar-11 | 6,521 | 932 |
| 111404577 | 24-Mar-11 | 4,801 | 686 |

## APPENDIX G – SITE PHOTOS

Existing Site Water Meter to be Retained

Existing Fire Hydrant Booster Valve Assembly to be upgraded


Existing LP Gas fuel farm to be relocated as early works.