Greater Hume Shire

simply greater

Greater Hume Drought Management & Emergency Response Plan

Document Control	Drought Management & Emergency Response Plan

Document Register Number: GHSC.WS.STRAT.0006.003

Rev No	Date	Revision Details	Author	Reviewer	Approver
1		First Edition	Manager Water and Sewer	Director Engineering	General Manager
2	6/03/2014	Add map, flowchart & water supply route plan, content changes	Manager Water and Sewer	Director Engineering	General Manager
3	6/05/2014	Final – SES comments incorporated	Manager Water and Sewer	Director Engineering	General Manager

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Document Status and Release Information

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Client:	Greater Hume Shire Council
Project No:	1057/13B
Document Title:	Drought Management & Emergency Response Plan

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Document Status

Rev No.	Prepared By		Approved for issue	
	Name	Date	Signature	Date
0 - Draft	D. McGregor	30/10/13		31/10/13
1 – Amended Draft	D. McGregor	11/03/14		11/03/14
2 - Final (SES comments incorporated)	D. McGregor	7/05/14		7/05/14

Executive Summary

This Drought Management and Emergency Response Plan (DMERP) describes and details how Greater Hume Shire Council (GHSC) will manage its water supply during periods of drought and emergencies.

The Plan will apply to all water supply service areas administered by Council.

Plan Objectives

1. Strategic Objectives

To ensure a systematic, timely, effective and efficient response to drought and emergencies which minimises disruption and adverse impact on customers by:

- Ensuring timely warning of any potential water shortages or supply disruptions and having in place ready response strategies.
- Identifying and responding to long term planning issues to ensure financial capacity to implement necessary infrastructure installation.

2. Planning Objectives

To ensure that in the short term:

- Consumers are made aware of the development of the Response Plan to ensure all stakeholders have an understanding and an ownership of the Plan.
- The Plan identifies all the necessary steps that need to be taken throughout a drought or emergency, including identification of triggers which instigate implementation of management actions.
- The Plan is subject to monitoring and regular review as the system develops.
- The Plan is monitored and reviewed throughout the course of a drought or emergency and adjusted where necessary.

To ensure that in the long term:

- The agreed level of service, including security of supply satisfies the requirements of GHSC and its customers at an acceptable cost.
- All feasible options for achieving a balance between supply and demand are evaluated in terms of impact on customers.

3. Operational Objectives

To ensure that in the short term**:**

- In all droughts a **minimum** residential supply of at least 100 litres per person per day is provided to accommodate the basic requirements for health and sanitary purposes. This would apply to critical, emergency situations under Level 6 restrictions. Council has adopted a range of target residential supply levels under drought conditions, commencing at 163 litres per person per day under Level 1 restrictions.
- The most efficient use is made of water resources during periods of water shortage.
- A reliable assessment of drought or emergency status is made so that GHSC is aware of what stage of a drought applies and/or how severe the emergency is.

To ensure that in the long term:

- GHSC is kept informed of demand patterns and customer expectations in relation to desirable levels of services, so that assessments can be made of system reliability during future droughts/emergencies.
- **Emergency measures** caused by supply shortfalls beyond Level 6 restrictions are not required more often than in 2% of years; that the duration of restrictions (during drought) not exceed 3 months; that the duration of interruption to supply during an extreme emergency not exceed 4 weeks and that the portability of restrictions in any year is, on average, no greater than 10%.

Trigger Points and Levels of Restrictions

Council has decided to implement a consistent set of water restriction triggers across its supply systems. The Southern System of Triggers adopted by Riverina Water will apply to both the Culcairn and Villages schemes.

The Trigger Points adopted are set out in Table 8 and shown below:

Water Restriction Triggers	Level of Restriction Applied	Target Residential Consumption (L/person/day)
Water supply available is greater than or equal to 85% of the total extraction Limits	Voluntary water saving measures only	In accordance with Demand Management Plan scenario targets.
Water supply available is less than 85% of the total extraction Limits	Level 1	163
Water supply available less than 80% of the total extraction Limits	Level 2	159
Water supply available less than 75% of the total extraction Limits	Level 3	152
Water supply available less than 70% of the total extraction Limits	Level 4	131
Water supply available less than 60% of the total extraction Limits	Level 5	123
Critical deterioration in water source capacity – below 50 % of the total extraction Limits	Level 6	<100

The Levels of Restrictions to be imposed by Council are set out in Table 9.

The Levels of Restrictions adopted by Council are in line with regional restrictions adopted by a number of other Councils in NSW. This regional approach will provide a level of uniformity and consistency for these communities and provide a high degree of flexibility in implementation.

Council is implementing a number of demand management initiatives, as outlined in Section 5.

Council will also progressively implement the following additional initiatives, as required:

- Achieve demand reduction by the implementation, monitoring, and policing of water restrictions at the appropriate level.
- Review water conservation programmes regularly.
- Consider the merits of installation of AAA water saving devices on existing developments subject to compliance of backflow and cross connection prevention requirements.

Supply side drought measures that will provide drought security for GHSC are being investigated, implemented and developed by Council. These include:

- Conservation Pricing for Residential Users
- Residential Washing Machine Rebate
- Residential Shower Retrofit
- Continuing the National Water Efficiency Labelling Scheme (WELS) Program
- Community Education
- BASIX - Fixture Efficiency with Rainwater Use

A range of other options is also being investigated as part of the development of Council's Integrated Water Cycle Management Plan Evaluation Study.

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1.0 Introduction

1.1 General

The preparation of a Drought Management and Emergency Response Plan for a water supply authority needs to be based on a thorough assessment of the regional and local factors which affect planning and management.

There are two primary components involved in securing an adequate water supply in times of drought and during emergency situations. These are:

a. the provision of an adequate supply system to satisfy current and future demands over a range of climatic conditions (including drought conditions) and emergency situations.
b. the definitions of actions required when shortfalls in water available for supply occur and when supply is interrupted under emergency conditions.

The first component represents the long term planning actions which result in a satisfactory level of infrastructure development and the investment required to secure supply under a range of adverse conditions.

The second component relates to management actions which are required to be implemented to minimise the adverse impacts of a shortfall in supply. These actions complement the long term planning process.

An acceptable Drought Management and Emergency Response Plan involves an appropriate combination of long term and short term management actions.

This document is a Drought Management and Emergency Response Plan for GHSC's water supply district.

The Greater Hume Shire Local Government Area is shown in Figure 1

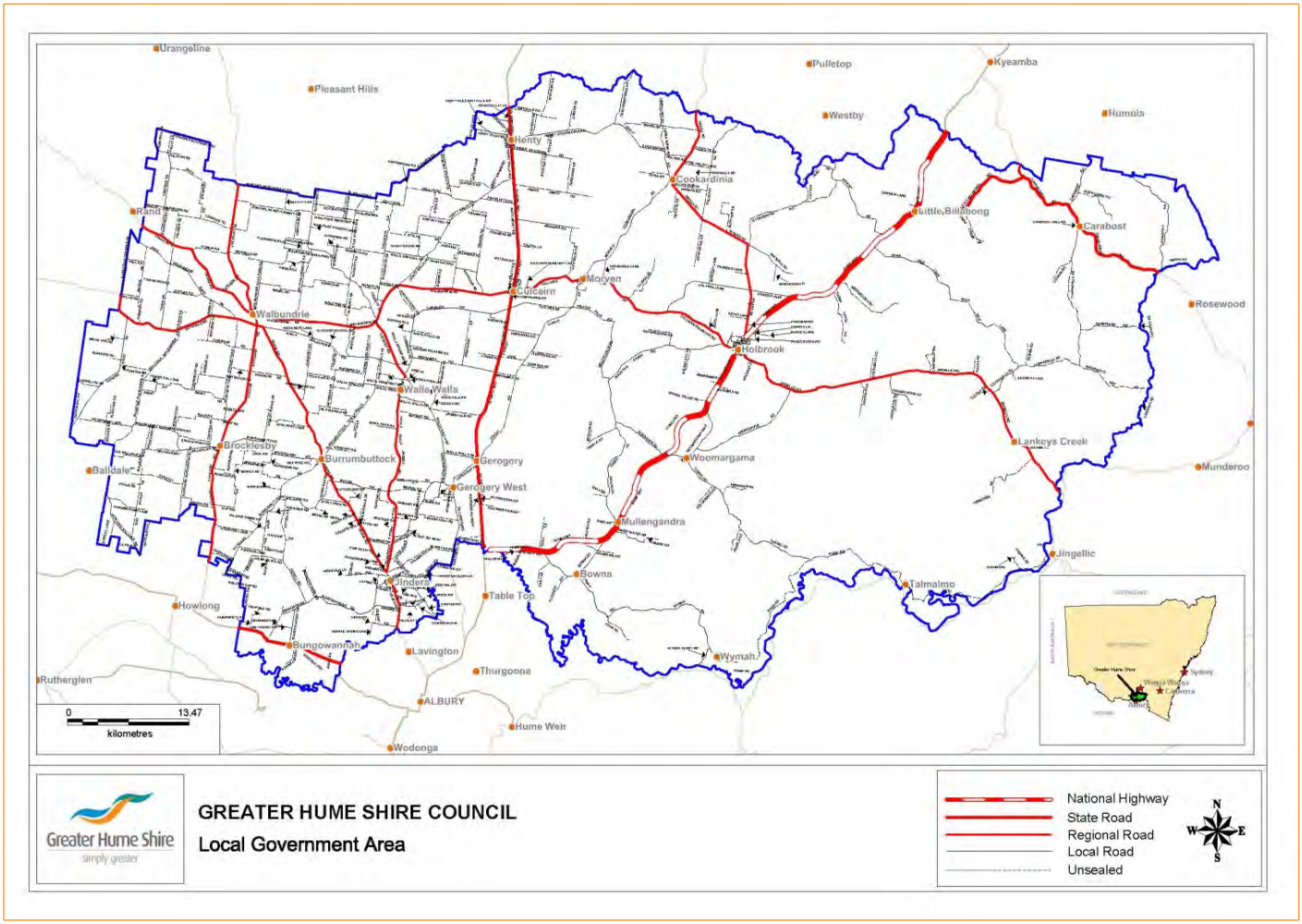

Figure 1 - Greater Hume Shire Local Government Area

1.2 Purpose

This Plan outlines the various demand and supply side drought response actions that should be employed at various stages during an extended drought period.

The fundamental objective of the Plan is to minimise the risk of the community running out of water, and to ensure that there is always sufficient water available to satisfy the basic needs of the community.

These objectives will be enhanced by the effective implementation of demand management initiatives.

It is important to consider this Plan in conjunction with both Council's Demand Management Strategy and Integrated Water Cycle Management Plan.

Drought management planning is an essential component of the NSW Government's Best Practice Management Guidelines for local water utilities (LWUs).

1.3 GHSC's Powers & Responsibilities

Under Section 5, Part 2 of the Local Government (Water Services) Regulation 1998, Council is empowered to restrict water supply (by public notice published in a newspaper circulating within the Council's area).

Under Section 637 of the Local Government Act 1993, the Penalty which can apply for non-compliance is a maximum of $2,200 as follows:

Maximum penalty:	20 penalty units
Current Penalty Unit:	$110

Restrictions will be enforced by Council's Ordinance Officers who are empowered under the Local Government Act (1993) to issue such infringement notices.

Council may also choose to prosecute offenders under Section 637 of the Local Government Act (as detailed above - maximum penalty: $2,200).

This plan is administered by GHSC. During drought and emergency supply situations this plan will be covered by the Council's Drought Committee which will be appointed by Council's General Manager and Councillors. The implementation of this Plan will be the responsibility of the Council staff.

1.4 Role of NSW Office of Water

The NSW Office of Water works with partner agencies and with the community to provide a reliable, sustainable supply of water for households, irrigators, farmers, industry and the environment.

State Water operates the major rural dams across NSW.

Water supplies to households are the responsibility of local water utilities across most of NSW and State-owned Corporations in the major metropolitan centres.

For non-metropolitan areas, the Office of Water provides managerial, technical and financial support under the Country Towns Water Supply and Sewerage Program.

Available Water Determinations (AWDs) are made for each water source generally at the start of a water year. The licensed volume or the percentage of the share component is defined by NSW Office of Water. (Source: NSW Office of Water website).

1.5 Emergency Response Issues

Apart from drought, the issues that could trigger an emergency response and introduction of restricted supplies are:

- Contamination of supply, either at the source or within the supply system;
- Concentrations of algae, suspended material or other contaminants in the raw water supply causing substantial loss of filtration capacity;
- Widespread power failure affecting transmission of raw and/or filtered water;
- Major system failure, including failure of major distribution mains, or service reservoir(s).

The response would largely depend on the magnitude and/or duration of any of the above emergencies and the ability of the system to supply water to consumers.

2.0 Plan Objectives

2.1 General

A set of objectives is required for a Drought Management and Emergency Response Plan in order to give the Plan direction and purpose. Also, the effectiveness of drought assessment and response activities will be difficult to monitor and evaluate without a clear set of objectives.

There are essentially three types of goals to be considered, namely:

a) Strategic:
- To address overall objectives for drought and emergency response which are linked to other strategic objectives of Council.

b) Planning:
- To address future infrastructure and supply needs are linked to the overall planning objectives of Council.

c) Operational:
- To translate the strategic objectives into specific responses and management actions.

2.2 Strategic Objectives

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- All feasible options for achieving a balance between supply and demand are evaluated in terms of impact on customers.

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To ensure that in the short term**:**

- In all droughts a minimum residential supply of at least 100 litres per person per day is provided to accommodate the basic requirements for health and sanitary purposes. This would apply to Level 6 restrictions. Council has adopted a range of target residential supply levels under drought conditions, commencing at 163 litres per person per day under Level 1 restrictions.
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To ensure that in the long term:

- Council is kept informed of demand patterns and customer expectations in relation to desirable levels of services, so that assessments can be made of system reliability during future droughts/emergencies.
- **Emergency measures** caused by supply shortfalls beyond Level 6 restrictions are not required more often than in 2% of years; that the duration of restrictions (during drought) not exceed 3 months; that the duration of interruption to supply during an extreme emergency not exceed 4 weeks and that the portability of restrictions in any year is, on average, no greater than 10%.

3.0 Background Information

3.1 Existing Water Scheme Description

GHSC is responsible for two water supply schemes:

- Culcairn Water Supply.
- Villages Water Supply (Jindera, Burrumbuttock, Brocklesby, Gerogery, Gerogery West, and connected rural areas).

The water supply for Culcairn is sourced from groundwater by means of two bores fitted with submersible pumps. Council also has a bore at Holbrook's 10 Mile Creek Gardens and one at the Holbrook Sportsground, which are used for irrigation purposes as well as 3 wells in Culcairn that are not used due to water quality issues.

The townships/villages of Jindera, Burrumbuttock, Brocklesby, Gerogery and Gerogery West are supplied with filtered water from Albury City.

Water Supply for the townships of Henty, Holbrook, Morven, Walla Walla, Walbundrie, and Woomargama is supplied, operated and managed by Riverina Water.

Culcairn Water Supply System

Water Treatment Plant

The Culcairn Water Treatment Plant is owned and operated by GHSC. It is located in Water Works Road Culcairn and supplies drinking water to 1300 residents in the Culcairn township urban area. Water is sourced from two ground water bores. The aquifer is located at approximately 80 metres below ground level and is considered to be a secure supply.

The current plant operates 7 days a week and can process up to 2.5 ML/d peak production capacity. Average daily demand is 0.45 ML/d and the historical peak daily demand between 2003 and 2008 was 1.4 ML/d. The plant does not run continuously; it runs for anywhere between 3 and 12 hours a day depending on demand.

The capacity of Culcairn water treatment plant and its current water allocation of 450 ML/y are sufficient to supply water in the foreseeable future (Source: GHSC Demand Management Plan 2012).

The Treatment Process

Ground (untreated) water is pumped from one of two bores located approximately 120 metres south of the water treatment plant. Water is transferred at 30 l/sec to the water treatment plant forced draft, totally enclosed segregated aeration tower. This process improves the pH and reduces levels of iron and carbon dioxide and thus stabilises the water.

Following aeration, Chlorine (Sodium Hypochlorite) is added to the water for disinfection prior to its discharge to the treated water storage (100 kL) tank. The water treatment plant is attended every day to conduct maintenance and operational water quality monitoring for pH, turbidity, free and total chlorine residuals.

Water Distribution System

The Culcairn Water Supply distribution system consists of 4km of trunk rising mains, 17km reticulation mains and two reservoirs, Gordon Street reservoir (378 kL) and Black Street reservoir (1000 kL)

Treated water is transferred by the relift pump from the water treatment plant storage tank, north into Culcairn township reticulation and reservoirs via a 200mm x 4km trunk rising main.

The reticulation system in Culcairn is a ring main system with 17km pipeline. Water is stored in the Gordon Street reservoir while the Black Street reservoir is filled indirectly through the town's reticulation. Both reservoirs are roofed and bird-proofed. They are inspected periodically and are maintained at full level.

Every 3 years the reservoirs are cleaned, inspected and reported upon by a diving crew company (Aqua Lift). Any repairs are budgeted for and carried out promptly.

The Gordon Street reservoir has point to point telemetry with the water treatment plant which controls the relift pump to transfer water to the Culcairn township. A data logger is located at the water treatment plant to continuously monitor flows, power failures, pump faults, high and low level alarms. The data logger has backup batteries in case of power failure.

A Flow Diagram for the Culcairn Water Supply Distribution System is shown in Figure 2

A Plan of the Culcairn Water Supply system schematic is attached in Appendix B.

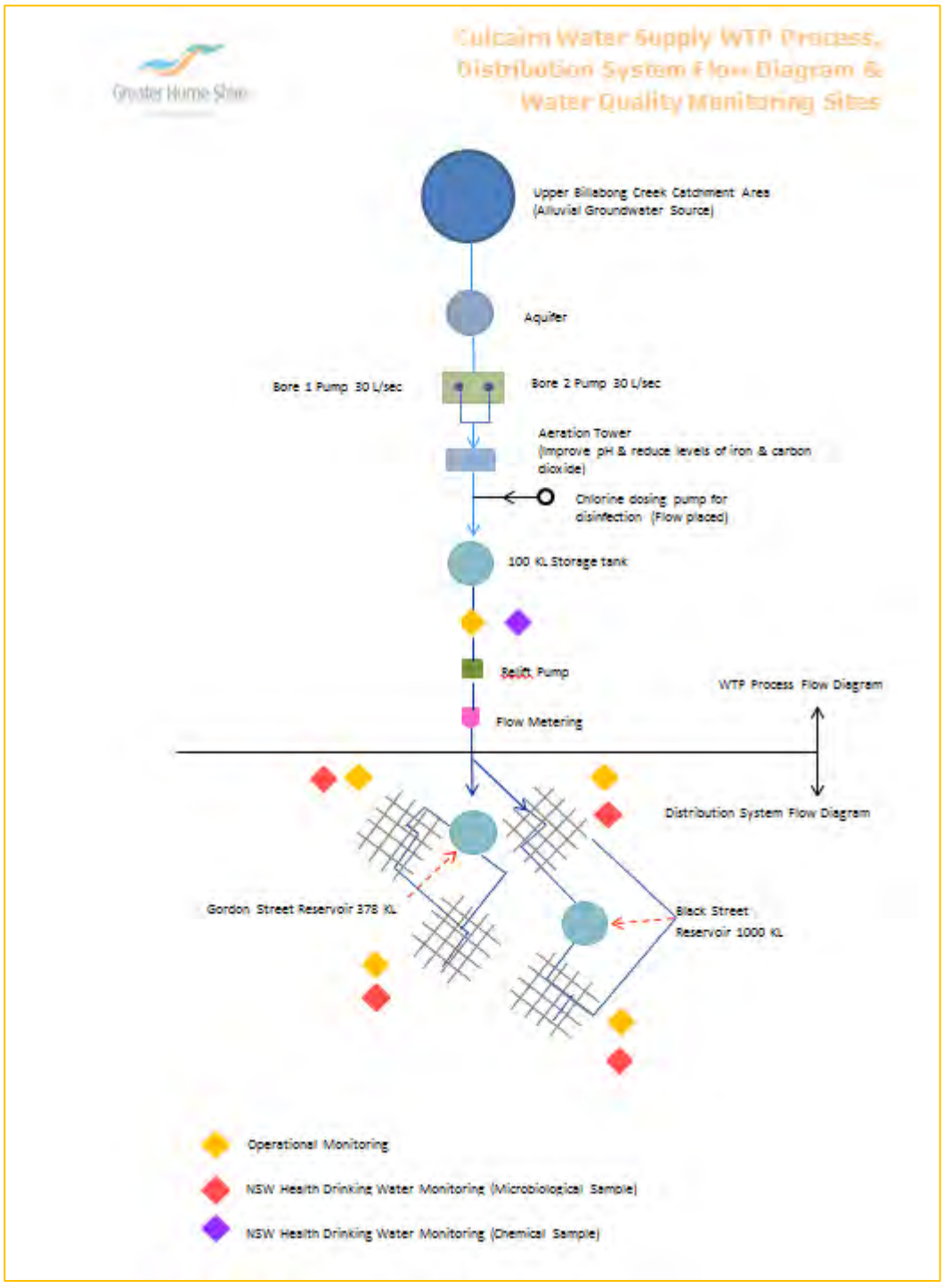


Figure 2 - Culcairn Water Supply WTP Process, Distribution System Flow Diagram & Water Quality Monitoring Sites

Villages Water Supply System

Filtration and Treatment

The filtration and treatment process is owned and operated by Albury City Council. The filtration plant is located in Water Works and Boundary Roads East Albury. The plant operates 24 hours a day, 7 days a week and can process 140 ML of water per day, which is the equivalent of 56 Olympic-sized swimming pools.

When the raw water arrives at the plant, it goes through the various treatment processes. Specific chemicals are added to improve water quality. For example:

- Powdered activated carbon is added to remove algal toxins and control the smell of the water by reducing the levels of Methylisoborneol (commonly known as MIB) and Geosmin.
- Alum (aluminium sulphate) and polyelectrolyte (a non-ionic polymer) are added to assist with the coagulation and flocculation process. Essentially, these chemicals cause the dirt particles to stick together so that it is easier to filter them out.
- Lime is added to remove the acidity caused by the alum.
- Fluoride is added to improve the health of teeth.
- Chlorine gas is used as a disinfectant to kill any micro-organisms.

The water is then passed through a filter medium consisting of layers of gravel and sand, topped with a layer of anthracite (a hard filter coal), to remove dirt particles.

Water Distribution System

The Village Water System, owned and operated by GHSC is a series of trunk mains, reticulation mains and service reservoirs that supply the southern township/villages of GHSC Local Government Area (LGA)

Filtered water is supplied to approximately 3200 people within the township and villages of Jindera, Burrumbuttock, Brocklesby, Gerogery, Gerogery West and many rural properties in between.

Filtered water is sourced via the Albury City Council (ACC) supply system at two locations – Jindera Gap Water Supply Pump Station (WSPS) and the point at which the two LGA boundaries meet on Dights Forest Road, where Albury City Council Table Top Water Supply Scheme and GHSC Village Water Supply Scheme trunk mains link together.

The Village Water Supply (VWS) and Table Top Water Supply Scheme (TTWS) were originally owned and operated by the previous Hume Shire Council. These two schemes were linked together to balance the system as the Jindera Gap and Table Top reservoir top water level are the same. When the new Council (GHSC) was formed in 2004 it took over the VWS and ACC took ownership of the TTWS. A meter was installed at the new LGA boundary by ACC to measure the flow of water in both directions

The Jindera Gap WSPS, owned and operated by GHSC, is located along Urana Road, Lavington and is GHSC's main source of water from ACC.

Filtered water gravitates from ACC Kemp Street high level reservoir to Jindera Gap WSPS. Two 90kw pumps transfer the water at 60 l/sec along a rising trunk main (2.2km x 250mm dia), to the Jindera Gap 2.85 ML concrete reservoir.

GHSC supplies water to 10 ACC residents whose properties are connected to the rising trunk main. These residents are rated by ACC.

The water is then transferred by gravity trunk mains from the Jindera Gap reservoir to each of the townships/villages through a network of trunk mains (71km), reticulation mains (54km) and four other reservoirs. The other reservoirs are situated along the main trunk lines and are located on the downstream side of each village. These are Burrumbuttock reservoir (600kL), Big Brock reservoir (600kL), Little Brock reservoir (100kL) and Gerogery reservoir (600kL).

All reservoirs are roofed and bird-proofed and are inspected and monitored twice weekly. Depending on chlorine demand, Calcium Hypochlorite tablets are added to each reservoir for disinfection. Every three years the reservoirs are cleaned, inspected and reported upon by a diving crew company (Aqua Lift). Any repairs are budgeted for and carried out promptly.

The Jindera Gap reservoir has telemetry which controls the Jindera Gap WSPS and also continuously monitors high and low level alarms. This reservoir also has a backup dialler to monitor any telemetry failure.

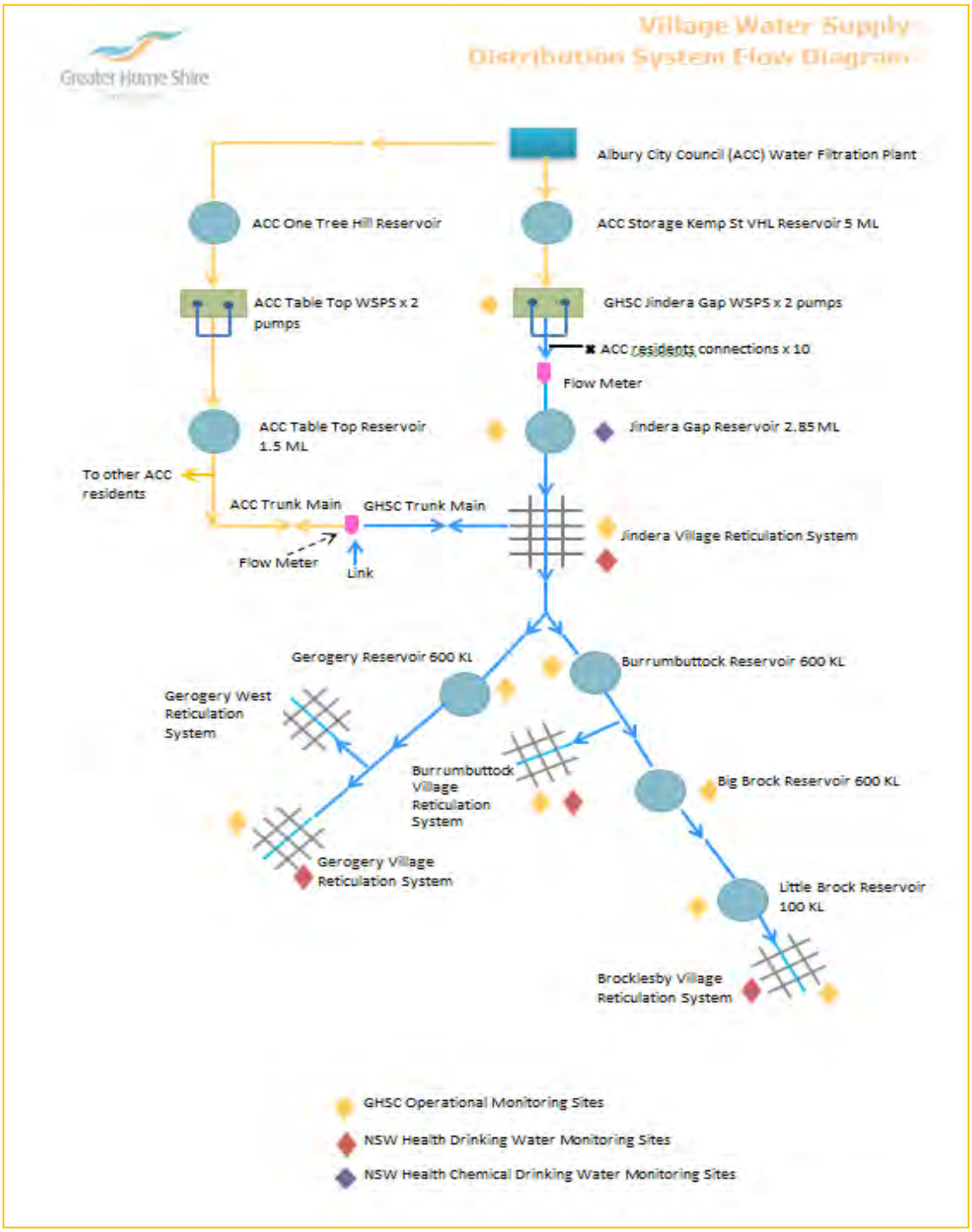


Figure 3 - Village Water Supply Distribution System

A Plan of the Village Water Supply System schematics is attached in Appendix B

For operational monitoring the Village Water Supply Scheme is divided into four zones (Shown in– Figure 4):

- Zone 1 – From Jindera Gap WSPS, Jindera Gap Reservoir, Jindera Village and to Burrumbuttock and Gerogery inlet side of reservoir.
- Zone 2 – From and including Burrumbuttock Reservoir, Burrumbuttock Village, Big Brocklesby Reservoir and to the inlet side of Little Brocklesby Reservoir.
- Zone 3 – From and including Little Brocklesby Reservoir and to Brocklesby Village.
- Zone 4 – From and including Gerogery Reservoir, Gerogery West and to Gerogery Village.

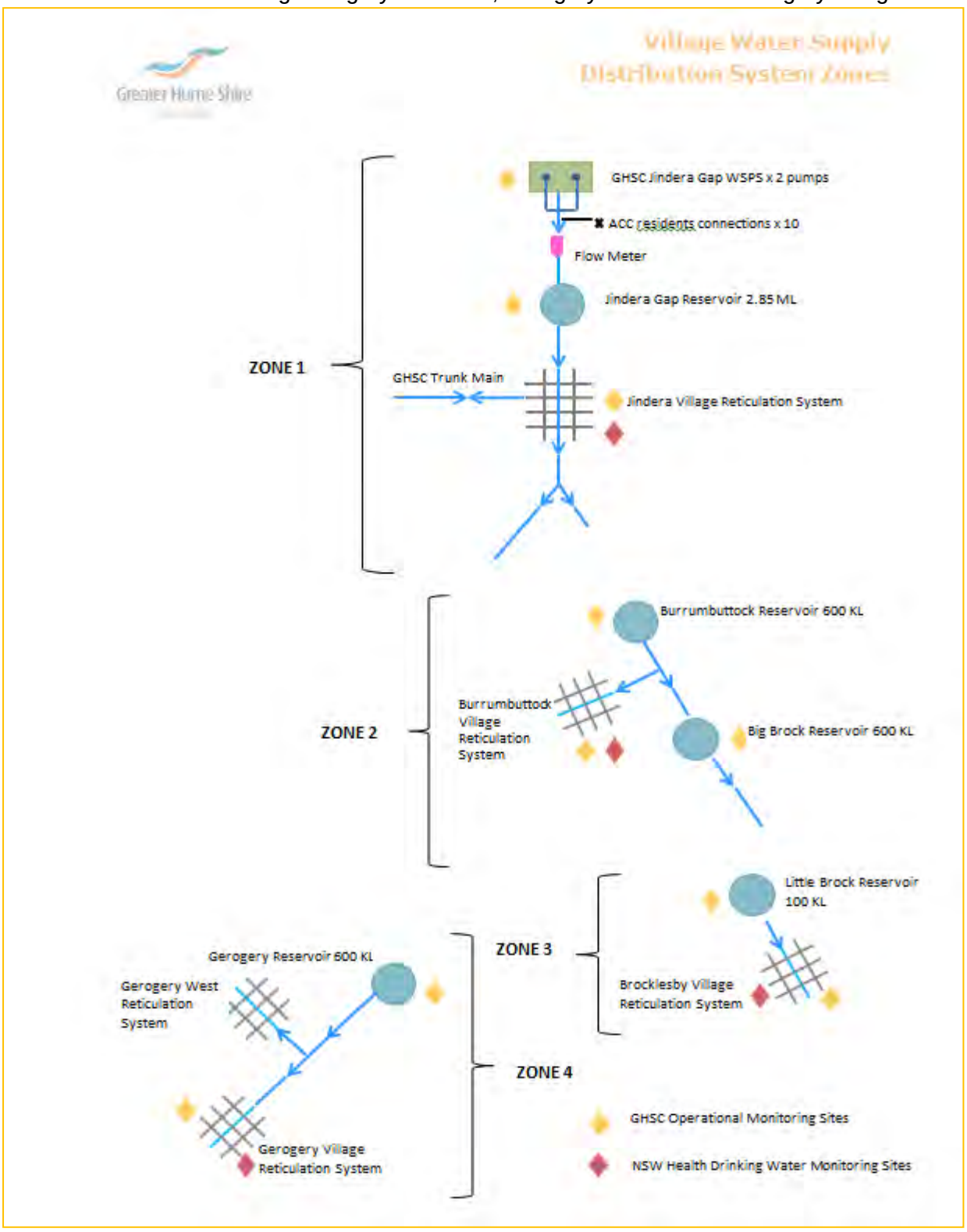


Figure 4 - Village Water Supply Distribution System Zones

3.2 Population & Growth

Greater Hume Shire covers an area of 5929 km^2 and is situated in southern New South Wales between the two major centres of Albury and Wagga Wagga.

The current population of the Shire (Australian Bureau of Statistics March 2012) is 10,423 people.

The populations of the centres provided with water supply by Council are shown in Table 1 (Australian Bureau of Statistics March 2011):

Township	Population
Brocklesby	150
Burrumbuttock	170
Culcairn	1,121
Gerogery	80
Gerogery West	120
Jindera	1,048
Rural areas	1,270 (estimated)
Total	**3,959**

Table 1 - Township Populations

The number of properties connected to the water supply systems is 1,810 (Triple Bottom Line Water Supply Performance Report, 2011/12).

The region is characterised by relatively low population growth. The Shire growth rate is approximately 1.5%. The future growth rate for the Shire is predicated at 12% over the 18 years from 2013 to 2031 (*Source: NSW Planning & Infrastructure, 2013*).

3.3 Human Resources

Council considers that, overall, there are adequate staff numbers to operate and maintain the water supply systems. Management during drought periods involves most of the staff employed at Council and in recent years drought periods and resulting water restrictions have been managed very well.

There is a total of 6 staff employed directly in the Water and Sewerage Section, as shown in Figure 5:

Figure 5 - Water and Sewerage Organisational Chart

3.4 Water Pricing

Water Charges for 2013/14 incorporate an access and usage component. The access or base charge has been calculated to cover the fixed costs of the water reticulation scheme.

Council's pricing structure for both the Culcairn supply and the Villages supply is shown in Table 2:

PRICING STRUCTURE	
COMPONENT	**CHARGES**
Water Access Charge Residential	
20 mm	$280.00
Non-residential	
20mm	$280.00
25mm	$310.00
32mm	$351.00
40mm	$407.00
50mm	$475.00
80mm	$655.00
Usage Charge per kL $	
<200kL/annum	$1.40
>200kL/annum	$2.20

Table 2 - Water Pricing - Greater Hume Shire

Properties with more than one connection will be charged for each additional meter according to size, as per the above Schedule.

The actual water used, as recorded by the Council-installed water meter, is charged to each property on a quarterly basis.

3.5 Drought History

Compulsory water restrictions were introduced to Greater Hume Shire in 2007. Since that time, there have been a number of restriction periods, as shown in Table 3:

Culcairn		Villages	
Month / Year	**Restriction Level**	**Month / Year**	**Restriction Level**
Jul '07 – Oct '07	Level 4 water restrictions	Jul '07 – Oct '07	Level 4 water restrictions
Nov '07 – Jan '07	Level 3a water restrictions	Nov '07 – Jan '08	Level 3a water restrictions
Feb '08 – Oct '08	Level 3 water restrictions	Feb '08 – Oct '08	Level 3 water restrictions
Nov '08 – Jun '09	Level 2a water restrictions	Nov '08 – Jun '09	Level 2a water restrictions
Jul '09 – Oct '13	Level 1 "permanent" water restrictions	July '09	Level 4 water restrictions
		Aug '09 – Oct '09	Level 3 water restrictions
		Nov '09 – Apr '10	Level 2 water restrictions
		May '10 – Oct '13	Level 1 "permanent" water restrictions

Table 3 - Restrictions Imposed Since 2007

3.6 Consumption

Details of historical water consumption are summarised in the following tables and figures:

Year	Consumption (ML)
1995/96	309.59
1996/97	436.32
1997/98	552.47
1998/99	446.55
1999/00	425.91
2000/01	486.79
2001/02	495.23
2002/03	**569.39 (peak consumption)**
2003/04	467.75
2004/05	416.40
2005/06	400.81
2006/07	403.91
2007/08	274.49
2008/09	352.42
2009/10	314.14
2010/11	**255.49 (min consumption)**
2011/12	270.63
2012/13	379.51

Table 4 - Consumption - Villages Water Supply

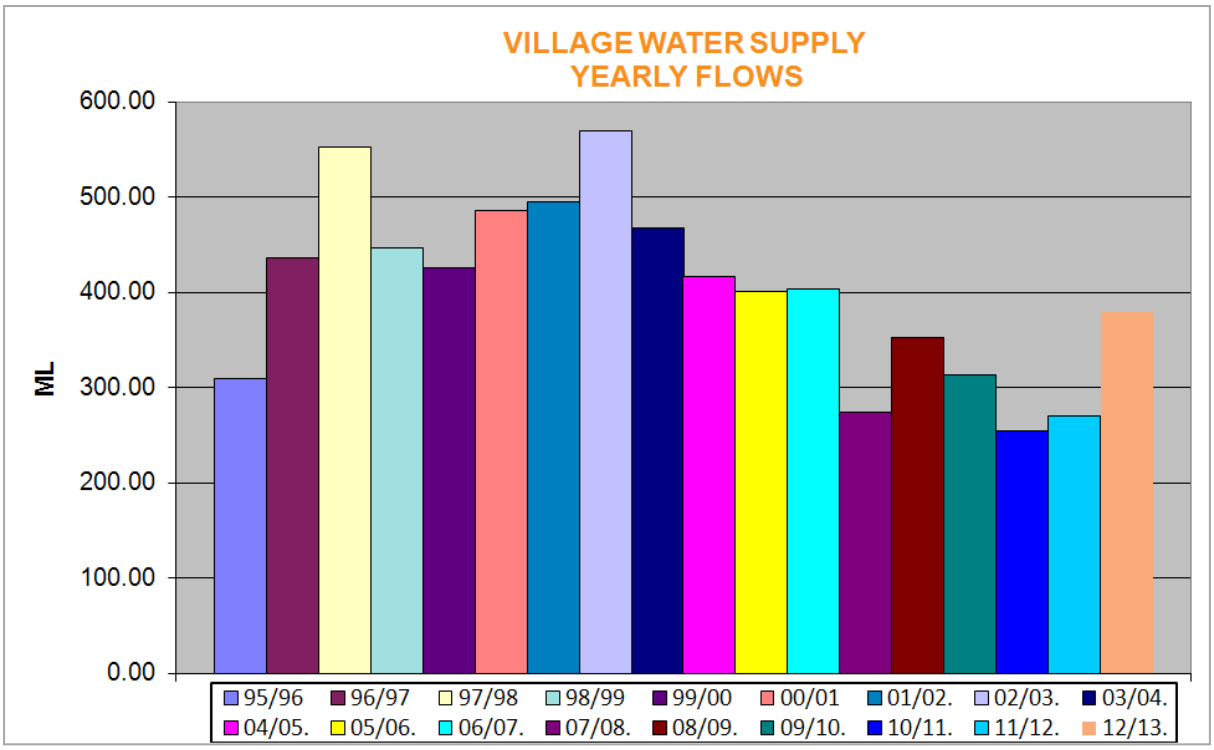


Figure 6 - Villages Water Supply Consumption

Year	Consumption (ML)
2006/07	**180.72 (peak consumption)**
2007/08	122.02
2008/09	140.80
2009/10	135.73
2010/11	**95.32 (min consumption**
2011/12	107.03
2012/13	134.92

Table 5 - Consumption - Culcairn Water Supply

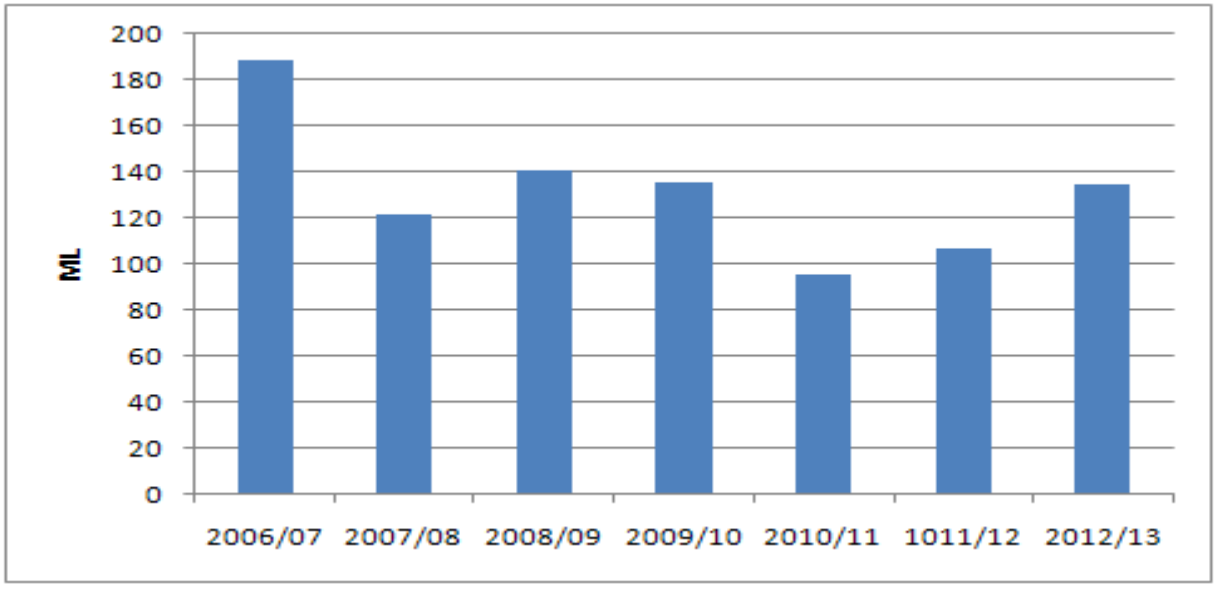


Figure 7 - Culcairn Water Supply Consumption

3.7 Water Dependant Industries/Businesses

Industrial water consumption in Greater Hume Shire represents less than 2% of the total consumption.

The water dependant businesses and industries are:

	2011/12 Consumption (kL)	2012/13 Consumption (kL)
Billabong High School	2,292	2,331
Culcairn Hospital/Aged Care	1,457	1,767
Jindera Galvanising	1,236	1,027
Jindera Aged Care	1,217	886
Lutheran School, Jindera	893	887

3.8 Communities without Reticulated Supply

There are approximately 200 properties within the Greater Hume Shire not served by reticulated water schemes. They live predominantly on small rural properties.

There are three (3) very small villages which are not currently supplied with town water – Mullengandra, Bungowannah and Cookardinia. Council has no plans to supply these very small communities with water.

Residents without reticulation supply may seek assistance during a drought. It has not been Council's experience in past droughts that these householders seek assistance (other than financial assistance). There is a well-established system of residents privately arranging water cartage when required, without intervention from Council.

Council has a number of filling stations which would be made available to people suffering from extreme water shortages. These filling stations are located as shown in Table 6:

Availability	Location	Agent
Closed	Jindera Industrial Estate	Emergency use only
Open	Cnr Walla Walla Jindera Rod & Urana Rd	GHSC – Auto filling station
Closed	Glenellen Rd	Emergency use only
Closed	Gerogery West – CnrGlenellen Rd & Gerogery West Rd	Emergency use only
Open	Gerogery – Coach Rd	GHSC – Auto filling station
Open	Culcairn – Gamble St	GHSC – Auto filling station
Open	Burrumbuttock – Urana Rd	GHSC – Auto filling station
Open	Brocklesby – Main St	GHSC – Auto filling station
Open	Walla Walla – Railway St	Agent – Landmark 62 Commercial St
Open	Walbundrie – Billabong St	Agent – Walbundrie Hotel
Closed	Woomargama – Murray St	Emergency use only
Open	Henty – Olympic Way – between Third & Fourth Sts	Riverina Water - Auto filling station
Open	Holbrook – Millswood Rd	Riverina Water - Auto filling station

Table 6 - Location of Filling Stations

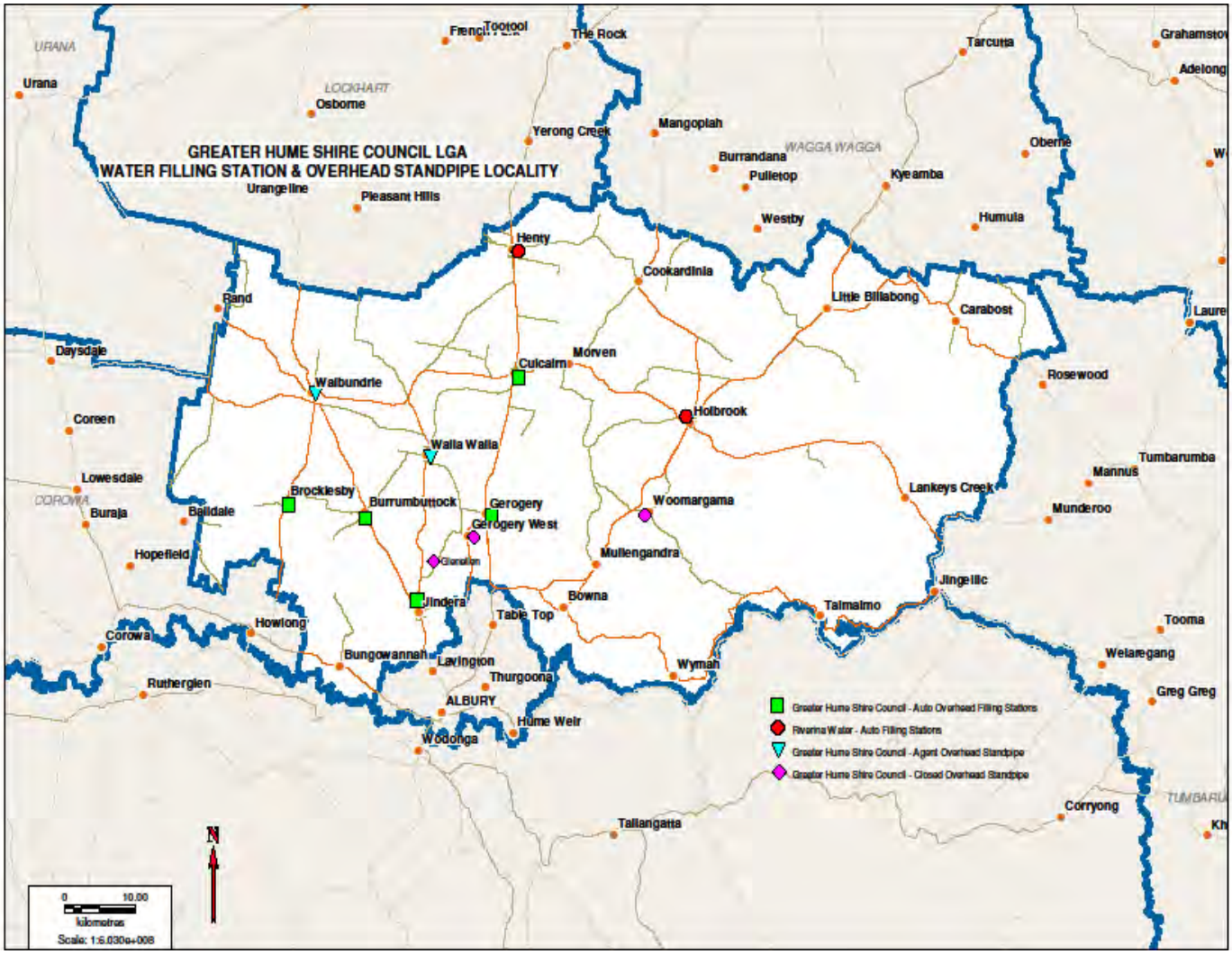


Figure 8 - Location of Water Filling Stations - GHSC

3.9 Fire Fighting Considerations

Provision of water supply for fire fighting purposes is a critical issue to consider during periods of restrictions. The water supply scheme in the Council area has fire fighting capabilities to AS 2419.1 and complies with the Building Code of Australia and NSW Fire Brigade requirements (for all residential, commercial and industrial areas).

Under high level water restrictions there are alternative water sources for use in fire fighting (farm dams, pools, creeks and storages).

Under all demand reduction restriction options, preference will be given to accommodating fire fighting requirements.

The bottom 10% of all water stored in the service reservoirs is reserved for fire fighting requirements.

Should an emergency last for more than 2 days, Fire Services will be directed to alternative supply sources or to secure groundwater sources.

3.10 Water Entitlements

Greater Hume Shire has a current groundwater entitlement of 450 ML/annum shared between 5 bores (for the Culcairn bore supply).

The Holbrook Showgrounds and the Culcairn Showgrounds have groundwater entitlements respectively of 60 ML/annum and 5 ML/annum and the Brocklesby Recreation Ground has a groundwater entitlement of 15 ML/annum.

The Villages scheme does not have an entitlement, being supplied directly from the Albury City supply system.

Albury has an entitlement from the Murray River (Town supply) of 12,274 ML/annum.

The former Department of Land and Water Conservation "assigned" a "reasonable annual entitlement" of 461 ML/annum to the Villages scheme.

The consumption by the Villages scheme peaked at 569 ML in 2002/03; but is now at 380 ML (2012/13).

Details of the Licences held by GHSC are presented in Table 7.

Scheme	Bore Licence Number	Purpose	Description	In Use	Water Source	WAL Number
Culcairn Water Supply	50BL105726	TWS	Well	Standby	Billabong Creek Alluvial Groundwater source	32718
	50BL120874	TWS	Bore 1	Yes		
	50BL120875	TWS	Well	Standby		
	50BL120876	TWS	Well	Standby		
	50BL199101	TWS	Bore 2	Yes		
Holbrook Show Grounds	50BL104998	Recreation	Well	Yes	Billabong Creek Alluvial Groundwater source	32707
	50BL198775	Recreation	Well	Standby		
	50BL199224	Recreation	Bore	Yes		
Village Water Supply	N/A	TWS	River	Yes		
Brocklesby Recreation Ground	50AL509497D	Recreation	Aquifer			

Table 7 - Town Water Supply (Bore) Licences held by Greater Hume Shire

3.11 Demand Management

Demand management, or implementation of water conservation initiatives, is a different process entirely to drought management. Whereas, demand management seeks to bring about an overall, on-going, reduction in water use, drought and emergency response management seeks to enforce restrictions on use; to ensure that a safe, potable supply of water is maintained during droughts and/or periods of supply interruption.

This Drought Management and Emergency Response Plan, whilst a stand-alone document, should also be read in conjunction with Council's Demand Management Plan to ensure there is no conflict. (Refer to 5.0 - Demand Management Options).

4.0 Climate, Climate Change & Water Security

4.1 Climate Details

Long term average rainfall across the Greater Hume Shire varies from 830 mm/year at Holbrook to 685 mm/year at Culcairn. Henty's long term annual rainfall is 700 mm/year.

Average maximum temperatures range from 20.9^0 C to 21.5^0 C with an area evaporation rate of approximately 1200 mm/year.

A 2008 report on NSW climate change impacts, *Future Climate and Runoff Projections (to 2030) for New South Wales and Australian Capital Territory,* provides the first detailed projections of the impacts of climate change on runoff and water availability across New South Wales.

The report concludes:

- There is considerable uncertainty in the modelling of rainfall response to global warming in NSW and ACT.
- 9 out of 15 of the Global Climate Models (GCM's) show a decrease in the mean annual rainfall.
- Winter rainfalls are likely to be lower across the entire state.
- There is less likelihood of reductions in future summer rainfalls (only 5 out of 15 GCM's indicate a reduction).
- The median (or best) estimate indicates that mean future rainfall in NSW in 2030 relative to 1990 will be lower by 0 to 20% in the southern parts.
- Averaged across all regions, the median estimate is a 5% decrease in mean annual rainfall.

The results of this study/report will be used in NSW to look at the impacts of future flows and river health, aquatic ecosystems and water availability for towns, irrigation and industry.

For GHSC, although the science and modelling are by no means conclusive, the potential impacts of climate change include:

- Reduced rainfall and runoff
- Increasing rainfall variability
- Increased maximum temperatures
- Increasing evaporation
- Possible increase in damage to underground infrastructure, particularly pipelines
- Increases in water usage and demand
- The need for water conservation and reuse initiatives (like grey water reuse, effluent reuse etc)
- Population changes as a result of migration away from rural and particularly irrigation areas.

4.2 Climate Change Impacts

The Key Findings of the CSIRO Murray-Darling Basin Sustainable Yields Project Water Availability in the Murray (July 2008) are:

- Average surface water availability for the MDB aggregated to Wentworth under the **historical climate** is 14,493 GL/year. For the Murray region, average surface water availability is 11,162 GL/year. Under **current development**, surface water use across the MDB aggregated to Wentworth (including downstream use) is extremely high with 56% of the average available water used. Average surface water use within the Murray region aggregated to Wentworth is 4045 GL/year or a high 36% of the average surface water available in the region. Current groundwater use within the region is about 233 GL/year or 5% of total water use in the region.

- If the **recent (1997 to 2006) climate** were to persist, average surface water availability for the Murray region would fall by 30%, average diversions in the Murray region would fall by 13% and end-of-system flows would fall by 50%. The relative level of surface water use across the MDB would be 66%.

  The best estimate (median) of **climate change by 2030** is less severe than the recent past. Under this climate, average surface water availability for the Murray region would fall by 14%, average diversions in the Murray region would fall by 4% and end-of-system flows would fall by 24%.

- **Future development** of farm dams by 2030 is expected to reduce total runoff across the region by less than 1%. Although likely commercial plantation forestry expansion by 2030 would have significant local effects on runoff, the impact on average annual runoff for the entire Murray region would be negligible. Groundwater use in the region is expected to treble by 2030 to be 701 GL/year or 15% of total average water use.

  At predicted future extraction levels and under the best estimate 2030 climate, extraction would be less than half of rainfall recharge in the Hume Shire aquifer region.

4.3 Water Security

GHSC's Integrated Water Cycle Management Plan ("Joint Integrated Water Cycle Management Evaluation Study", Hydroscience Consulting, March 2010) notes (in the section on Water Security) that:

"GHSC staff advised that Culcairn aquifer is considered to be a secure supply within its existing licence allocation. A letter from the Department of Infrastructure, Planning and Natural Resources to Albury Water (Aug 2005) states that the security of supply for high security entitlements in the NSW Murray Valley is very high".

5.0 Demand Management Options

5.1 Introduction

Demand management, or implementation of water conservation initiatives, is a different process entirely to drought management. Whereas, demand management seeks to bring about an overall, on-going, reduction in water use, drought and emergency response management seeks to enforce restrictions on use; to ensure that a safe, potable supply of water is maintained during droughts and/or periods of supply interruption.

Response options can be generally classified under two broad categories:

- Demand Management
- Supply Management.

In this section of the Plan, demand management options applied by GHSC are outlined.

5.2 Water Conservation & Demand Management Initiatives

Council has completed a Demand Management Plan (Hydroscience Consulting, May 2012).

The Demand Management Plan recommended that the same demand management initiatives be implemented across the Villages scheme and the Culcairn supply.

Current Demand Management Measures

This section provides a list of all water demand management measures that are currently implemented by Council.

Pricing

The NSW Government Best-Practice Management of Water Supply and Sewerage Guidelines (Aug 2007) require LWUs under 4,000 connections to have:

- Residential water usage charges set to recover at least 50% of residential revenue
- Customer water consumption billed at least three times a year (and preferably quarterly)
- A two-part tariff with an appropriate water usage charge/kL based on the long-run marginal cost. High water consuming residential customers should be subjected to a step price increase of at least 50% for incremental usage above a specified threshold.

GHSC has a 2 tier water pricing structure. The current (2013/14) residential usage charges are set out in Table 2.

Albury City Council Bulk Pricing Increases

Albury City Council supplies bulk water to the Villages Water Supply System. There has been a significant water pricing increase in Albury City Council in the past two financial years (2010/11 and 2011/12). Weekly flow data indicates that the total weekly consumption in 2010/11 and the first half of 2011/12 was in general lower than that of previous years. This appears to demonstrate that the cost of water has affected customer water usage. However the impact of the pricing versus weather (wet years) is not as yet certain.

System Water Loss Management Program

GHSC initiated water loss investigations in September 2010. The potential water savings results of the water loss management program are:

- Water savings in the Villages system = negligible
- Water savings in the Culcairn system = 9 ML/year (Source: GHSC Water Loss Management Program, Sep 2010)

Council intends to repair leakage and replace water mains in Culcairn and the Villages Systems in the next few years.

This water savings demand measure is a powerful water conservation measure that Council should continue implementing.

Potential Demand Management Measures

The following is a list of potential water demand management measures that Council will implement through its Management Planning process.

- Conservation Pricing for Residential Users
- Residential Washing Machine Rebate
- Residential Shower Retrofit
- Continuing the National Water Efficiency Labelling Scheme (WELS) Program
- Community Education
- BASIX - Fixture Efficiency with Rainwater Use

The Demand Management Plan also considered the benefits of rainwater tank installations throughout the two supply areas but resolved that since the cost to consumers would be 83% more expensive than the current usage charge, this is probably not an appropriate water demand management measure.

Council has also adopted the **permanent water conservation measure of limiting the use of fixed sprinklers** between the hours of 10am and 5pm. This voluntary measure aims to increase water use efficiency, reduce water wastage and reduce evaporation losses.

TARGETS for maximum water consumption in the Greater Hume Shire service area **(outside restriction periods)** will be:-

- Annual Consumption: Villages Maximum: 450 ML/year

  Culcairn Maximum: 150 ML/year

- Annual Residential Consumption: Maximum of 163 kilolitres per household per year

5.3 Demand Reduction during Drought

The stages of water restriction that will be applied by GHSC under declared drought conditions in the future are outlined in Sections 6 and 7. (Note: restrictions will be imposed on water dependant industries under Levels 4, 5 and 6 and under all Emergency Conditions).

Notes:

- Seasonal variations to watering times
- For all restriction levels, summer means the following months: October, November, December, January, February, March and April
- For all restriction levels, winter means the following months: May, June, July, August, and September.

5.4 Alternate Water Sources

Council is currently planning to further develop the bore supply at Culcairn by increasing bore depth.

Pump-testing of the production bore (Bureau of Rural Sciences) demonstrated that it is capable of sustaining a groundwater yield of at least 2.25 ML/day. Over the four stages of the test, the bore was pumped at rates of 0.76, 1.025, 1.510 and 2.25 ML/day, with each pumping rate sustained for six hours. The final drawdown in the observation bores was just over 3.5 metres at the end of the 24 hour test, and water levels recovered rapidly (more than 85% recovery, 3¼ hours after pumping ceased).

Council will also investigate bore supplies for the Villages, although the supply from Albury City is considered to be very secure (being sourced from the Murray River just downstream of Lake Hume).

The Albury allocation from the river was reduced to 50% of entitlement in July 2008 (for 2 years during the height of the drought), but the system was still able to supply sufficient water to Albury and the Villages in Greater Hume Shire, albeit under Level 4 (Albury City) restrictions.

This reduction in entitlement has been assessed by the Office of Water as having a recurrence interval in excess of 120 years.

6.0 Trigger Points

6.1 Supply Triggers

Council has decided to implement a consistent set of water restriction triggers across its supply systems. The Southern System of Triggers adopted by Riverina Water will apply to both the Culcairn and Villages schemes and the same restrictions will also apply across both schemes. This will ensure a level of consistency across the whole Shire.

Water Restriction Triggers	Level of Restriction Applied	Target Residential Consumption (L/person/day)
Water supply available is greater than or equal to 85% of the total extraction Limits	Voluntary water saving measures only	In accordance with Demand Management Plan scenario targets.
Water supply available is less than 85% of the total extraction Limits	Level 1	163
Water supply available less than 80% of the total extraction Limits	Level 2	159
Water supply available less than 75% of the total extraction Limits	Level 3	152
Water supply available less than 70% of the total extraction Limits	Level 4	131
Water supply available less than 60% of the total extraction Limits	Level 5	123
Critical deterioration in water source capacity – below 50 % of the total extraction Limits	Level 6	<100

Table 8 - Trigger Points - GHSC

6.2 Emergency Response Triggers

Stage 1 Emergency Response: Local Area Interruption to Supply

Triggers:

- A burst water main
- Local area power failure affecting a supply zone pumping facility
- Mechanical or electrical failure at a supply zone pumping facility
- Necessary maintenance works such as mains flushing, disinfection and repairs
- Planned water supply works requiring mains supply to be turned off.

Procedure:

- Where possible, affected residents are to be notified of the interruption and advised of the likely time to rectify the fault. Council's after-hours telephone service is to be kept informed and will be able to provide updated advice to callers.
- Alternative supply options within the system are to be investigated and actioned if possible.
- If the interruption is expected to last longer than 12 hours, alternative supply sources are to be initiated.
- Level 4 water restrictions are to be implemented.

Stage 2 Emergency Response: Widespread Interruption to Supply

Triggers:

- Major, system wide, power failure
- Failure of the Culcairn water treatment plant
- Failure of a major pumping station
- Burst of a major distribution pipeline
- Failure of a service reservoir.

The following procedures shall apply in such an emergency.

Procedure:

- The Greater Hume Shire Local Emergency Management Officer (LEMO) and Police are to be informed of the situation.
- All affected residents are to be notified of the interruption and advised of the likely time to rectify the fault. This may be done via local radio. Council's after hours telephone service is to be kept informed and will be able to provide updated advice to callers.
- Alternative supply options within the system are investigated and actioned if practicable.
- If the interruption is expected to last longer than 12 hours, alternative supply sources are initiated.
- Level 5 water restrictions are to be implemented until the emergency has passed or the fault is rectified.

Stage 3 Emergency Response: Extreme Emergency

Triggers:

- Projected long term interruption to supply caused by contamination of supply
- Prolonged outage at the water filtration plants
- Severe power failure
- Major system failure.

This is typically an event which will require more than 1 day and less than 3 days to rectify.

Procedure:

- The Greater Hume Shire Local Emergency Management Officer (LEMO) and Police are to be informed of the situation.
- Immediate implementation of Level 6 water restrictions (supply for household use only).
- Implementation of a widespread awareness campaign to alert the community, to advise them of Stage 6 restrictions and to encourage conservative domestic usage.
- Negotiate with bulk and industrial water users to implement emergency water use provisions.
- Careful monitoring of water use throughout the supply area.
- Use of trucks to import water from outside the Greater Hume LGA to service reservoirs is to be initiated, if required. This would be an extreme event and would require mobilisation of a number of suitable tankers and pumping equipment. It would need to be coordinated with the Local Emergency Management Committee (LEMC).
- Advise industries and commercial premises of the emergency and seek cooperation with the implementation of drastic water reduction measures.

7.0 Response Options – Levels of Restrictions

The levels of restrictions to be imposed by Council are set out in the following Tables.

These should be read and considered in conjunction with Sections 5 and 6.

The levels of restrictions adopted by Council are in line with Riverina Water County Council. This also applies to Hay, Upper Hunter, Muswellbrook, Murray Shire, Dubbo, Wellington, Narromine, Warren, Bogan, Bourke, Cobar, Brewarrina, and Singleton Councils as well as the Water Utilities within the Centroc Alliance (namely; Orange, Bathurst, Blayney, Boorowa, Cabonne, Central Tablelands, Cowra, Forbes, Harden, Lachlan, Lithgow, Oberon, Parkes, Upper Lachlan, Weddin and Young).

The regional approach provides a level of uniformity and consistency for communities and provides a high degree of flexibility in implementation.

Water Restrictions Applied During Drought

When the water restriction trigger level is reached, immediate notice will be provided that water restrictions are in force, by advertising in the media. This procedure will normally be applied without officers first obtaining a resolution of Council.

Any decision to remove water restrictions, or reduce the level of water restrictions, will normally be made by resolution of Council, bearing in mind factors such as water percentage capacity available, seasonal factors and weather outlook.

Water Restrictions Applied During Emergencies

Decisions to implement and remove water restrictions during emergencies will be made by the General Manager.

Table 9 - GHSC Water Restriction Policy

Restrictions on the Use of Water from the Water Supply System

Regional System of Water Restrictions						
Activity	**Water Restrictions**					
	Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**
	Low	**Moderate**	**High**	**Very High**	**Extreme**	**Critical**
Target Water Consumption	**163 L/Person/Day**	**159 L/Person/Day**	**152 L/Person/Day**	**131 L/Person/Day**	**123 L/Person/Day**	**100 L/Person/Day**
Residential Water Use						
Watering of Lawns ***Note:*** *Subject to varying* ***Summer*** *and* ***Winter Times***	Watering systems, microsprays, drip systems, soaker hoses, non-fixed sprinklers hand held hoses only. **Summer Time** between 1800-0900 hrs only daily. **Winter Time** 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Not permitted	Not permitted	Not permitted

Residential Water Use Continued.						
Watering of Residential Gardens ***Note:*** *Subject to varying* ***Summer*** *and* ***Winter times***	Watering systems, microsprays, drip systems, soaker hoses, non-fixed sprinklers hand held hoses only. **Summer Time** between 1800-0900 hrs only daily. **Winter Time** 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 1800-2000 hrs only on each Wednesday and Sunday. **Winter Time** 1600-1800 hrs on each Wednesday and Sunday.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, not permitted at any time. Bucket / watering can only. **Summer Time** between 1800-2000 hrs on Sunday only. **Winter Time** between 1300-1500 hrs on Sunday only.	Not permitted
Topping up, filling garden water features	Permitted	Permitted	Permitted	Permitted	Not to be topped up or filled.	Not to be topped up or filled.
Irrigation of new turf	Permitted for one week after laying after which level 1 restriction on watering lawns applies	Permitted for one week after laying after which level 2 restriction on watering lawns applies	Permitted for one week after laying after which level 3 restriction on watering lawns applies	Not permitted.	Not permitted.	Not permitted.
Washing down walls or paved surfaces	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted	Not permitted

Residential Water Use Continued.						
Topping up private swimming pools/spas	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day.	Only between hours of 0700-0900 and between 1800-2000 hrs, every day provided pool covers are used	Only between hours of 0700-0900 and between 1800-2000 hrs, every day. Pool covers must be used.	Not permitted	Not permitted
First fill of private swimming pools	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day	Only with Council permission and provided pool covers are used.	Only with Council permission and after water savings elsewhere within property. Covers must be used.	Not permitted	Not permitted
Washing cars at home	Permitted with bucket and rinse with trigger hose on lawn at any time.	Permitted with bucket and rinse with trigger hose on lawn between 0900-1200 hrs any day.	Permitted with bucket only on lawn between 0900-1200 hrs any day.	Permitted with bucket only on lawn between 0900-1200 hrs any day.	Not permitted	Not permitted
Baths, showers	Permitted	Permitted	Permitted	Five (5) minute showers, one bath per person per day	Three (3) minute showers, one bath (100 mm depth) per person per day	Three (3) minute showers, one bath (100 mm depth) per person per day
Washing of clothes	Permitted	Permitted	Full loads only encouraged.	Full loads only permitted.	Full loads only permitted.	Two full loads of clothes per week
Use of evaporative air conditioners	Permitted	Permitted	Permitted	Permitted only 0700-2400 hrs daily	Permitted only 0700-2400 hrs daily, exemptions may be granted to aged accommodation or nursing homes.	Permitted only 1800-2200 hrs daily, exemptions may be granted to aged accommodation or nursing homes.
Inflatable or temporary children's pools	Permitted	Permitted	Permitted	Permitted	Not permitted	Not permitted

Non-Residential Water Use						
Watering of Lawns ***Note:*** *Subject to varying* ***Summer*** *and* ***Winter Times***	Watering systems, microsprays, drip systems, soaker hoses, non-fixed sprinklers hand held hoses only. **Summer Time** between 1800-0900 hrs only daily. **Winter Time** 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Not permitted	Not permitted	Not permitted

Non Residential Water Use Continued						
Watering of Gardens ***Note:*** *Subject to varying* ***Summer*** *and* ***Winter times***	Watering systems, microsprays, drip systems, soaker hoses, non-fixed sprinklers hand held hoses only. **Summer Time** between 1800-0900 hrs only daily. **Winter Time** 0600-1000 hrs and 1600-2200 hrs daily.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 0600-0900 hrs and between 1800-2100 hrs every second day as per odds and evens system. **Winter Time** between 0700-1000 hrs and between 1600-1900 hrs every second day as per odds and evens system.	Watering systems, non-fixed sprinklers, hand held hoses not permitted at any time. Microsprays, drip systems, soaker hoses, only. **Summer Time** between 1800-2000 hrs only on each Wednesday and Sunday. **Winter Time** 1600-1800 hrs on each Wednesday and Sunday.	Watering systems, non-fixed sprinklers, hand held hoses, microsprays, drip systems, soaker hoses, not permitted at any time. Bucket / watering can only. **Summer Time** between 1800-2000 hrs on Sunday only. **Winter Time** between 1300-1500 hrs on Sunday only.	Not permitted
Topping up public swimming pools/spas, including those in motels etc.	Permitted	Only between the hours of 0700-0900 and between 1800-2000 hrs, every day.	Only between hours of 0700-0900 and between 1800-2000 hrs, every day provided pool covers are used	Only between the hours of 0700-0900 and between 1800-2000 hrs, every day. Pool covers must be used.	Not permitted	Not permitted
First fill of public swimming pools/spas, including those in motels etc.	Permitted	Only between hours of 0700-0900 and between 1800-2000 hrs, every day	Only with Council permission	Only with Council permission and after water savings elsewhere within property. Covers must be used.	Not permitted	Not permitted

Non Residential Water Use Continued						
Turf farm irrigation, market gardens	Permitted	Permitted	Irrigation only between 2000-0800hrs. Business must prepare WSAP.	Business must implement and comply with WSAP	Not permitted	Not permitted
Irrigation of new turf on non-residential premises	Permitted for one week after laying after which level 1 restriction on watering lawns applies	Permitted for one week after laying after which level 2 restriction on watering lawns applies	Permitted for one week after laying after which level 3 restriction on watering lawns applies	Not permitted.	Not permitted.	Not permitted.
Public car and truck wash facilities	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Construction industry eg mortar or concrete mix	Permitted	Permitted	Permitted	Permitted	Permitted	Not permitted.
Construction - wash down, paint prep, curing.	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Cleaning - exterior	Permitted with trigger hoses, any time.	Permitted with pressure trigger hoses, any time.	Permitted with pressure trigger hoses. Business must prepare WSAP.	Business must implement and comply with WSAP	Business must implement and comply with WSAP	Not permitted.
Commercial or Government nurseries	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Abattoirs	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Food or pet food production	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Canneries	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.

Non Residential Water Use Continued						
Pet care	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Public water features	Permitted	Permitted	Permitted, but WSAP must be prepared.	WSAP must be implemented.	WSAP must be implemented.	Not permitted.
Child care	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Public parks, gardens, aviaries, plant houses, zoos	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Schools, technical colleges, colleges, universities	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Hospitals, hospices, nursing homes, rehab centres	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP
Aged accommodation	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.
Motels, caravan parks, cabins	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Hotels, registered clubs	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.
Businesses with cooling towers	Permitted	Permitted	Permitted, but business must prepare WSAP.	Business must implement and comply with WSAP.	Business must implement and comply with WSAP.	Not permitted.

NOTES
ODDS & EVENS SYSTEM EXPLAINED This means that if the street number of your property is odd you can water in accordance with the restrictions on odd days. If your property has an even number you can water in accordance with the restrictions on even days. If your property has a range of street numbers then it should be treated as odd or even as per the first number in the range. For example if your property is 12-15 Smith Street then you can water on even days in accordance with the restrictions. If your property has no street number then it should be treated as an even property. For example if your property is "Tara" then you can water on even days in accordance with the restrictions.
OTHER SOURCES OF WATER These restrictions are restrictions that Council is placing on the use of its potable water supply. If the restrictions say "Not permitted" for a particular use, this means that Council's potable water supply cannot be used for this purpose. Water from another source, however, could be used for this purpose.
TIMES The times quoted in the restrictions are based on a 24 hour clock. For example, if the restrictions state 2200 hrs it is equivalent to 10pm.
Summer Time Refers to Daylight Saving period 2.00am Eastern Standard Time on the first Sunday in October to Eastern Daylight Saving Time 3.00am on the first Sunday in April
Winter Time Refers to the period outside of Daylight Saving Time
WSAP This refers to a Water Savings Action Plan; an enterprise specific plan to adopt water efficiency prepared in accordance with "Guidelines for Water Savings Action Plans", Dept of Energy, Utilities and Sustainability, October 2005. A copy of this document is now available from the NSW Office of Water. At certain levels of restrictions a business may be required to prepare a WSAP. The completed WSAP must be approved by Council. Further water restrictions may permit the continued use of water for that activity but only if the business strictly complies with its approved WSAP.

Targets	
Level	**Target**
	(L/Person/Day)
1	163
2	159
3	152
4	131
5	123
6	100

Table 10 - Water Level Targets

8.0 Bulk Water Carting

Water carting may be an acceptable option, as a last resort, when all other supply sources fail.

An indication of the feasibility of water carting is provided in Table 11:

Population	Water Carting Feasibility	Advantages / Disadvantages
10	Yes	Low cost, quick to implement
100	Yes	Low cost, quick to implement
1000	Maybe	Medium cost, implementation efficiency dependant on source
5000	Probably not	Expensive
20,000	No	Very expensive
50,000	No	Very expensive, Logistically almost impossible to organise and co-ordinate, Long lead times required to prepare

Table 11 - Feasibility of Water Carting

The table indicates that water carting would be expensive, and that it probably will **not** be feasible, but it may be the only option (apart from evacuation of the towns and villages) in extreme emergencies.

Evacuation is not a sensible or realistically viable option for a Shire the size of Greater Hume. It would be extremely difficult logistically and would result in significant social disruption.

During drought, there is Government assistance (via the Minister for Primary Industries) towards the cost of any necessary water cartage, subject to agreement with the NSW Office of Water of the proposed volumes to be carted and the arrangements for transportation. The subsidy is reviewed periodically, with the current arrangements being that the Minister may meet all freight charges in excess of $1.86 per kilolitre – for those towns without a water supply.

Financial assistance is not available for hiring or operating temporary pumps or pipelines, or for costs of management measures.

However, in considering drought assistance for capital works, water carting costs provide a benchmark for NSW Office of Water and NSW Treasury. (Source: Drought Relief for Country Towns, NSW Office of Water, November 2009).

Potential supply sources for carting water to Culcairn are from the Albury City Town supply; the Wagga Wagga (Riverina Water) Town supply and the Corowa Town supply.

There are existing standpipes at each of the water supply sources.

A major difficulty in implementing any water cartage program is the acquisition and employment of a sufficient number of trucks.

9.0 Links to Other Plans

This Drought Management and Emergency Response Plan should be read in conjunction with similar, relevant strategic plans prepared by Council, including:

- Demand Management Strategy;
- Integrated Water Cycle Management Plan - Evaluation Study (developed by Hydroscience Pty Ltd as a Regional Strategy)

Reference should also be made to the Murray Water Sharing Plan which contains the rules for sharing water between the environmental needs of the river and water users, and also between different types of water use such as town supply, rural domestic supply, stock watering, industry and irrigation.

The NSW Office of Water is also developing a Water Sharing Plan for the Murray Unregulated and Alluvial Water Sources which may impact on the Culcairn water supply system.

10.0 Monitoring

A: Operational Monitoring: Culcairn

Location: Culcairn Water Treatment

Frequency: Daily

- pH
- Turbidity
- Free chlorine
- Total chlorine

Operational Monitoring

Location: Culcairn distribution system (Retic – 4 locations)

Frequency: One location per week

- pH
- Turbidity
- Free chlorine
- Total chlorine
- Site No.: 5 South Street Culcairn
  45 McBean Street Culcairn
  101 Munro Street Culcairn
  13 Wattle Street Culcairn

NSW Health Drinking Water Monitoring

Location: Culcairn distribution system (Retic)

Frequency: One location per week

- Microbiological (E.coli & Total Coliforms)
- Site No.: GH02002 5 South Street Culcairn
  GH02003 45 McBean Street Culcairn
  GH02004 101 Munro Street Culcairn
  GH02005 13 Wattle Street Culcairn

NSW Health Drinking Water Monitoring

Location: Culcairn Water Treatment Plant

Frequency: 6 Monthly

- Physical & Chemical Quality
- Site No.: GH02001

B: Operational Monitoring – Villages Supply Scheme

Location: Jindera Gap WSPS, Urana Road Lavington

Frequency: Weekly

- pH
- Turbidity
- Free chlorine
- Total chlorine

Operational Monitoring

Location: Village Water Supply distribution system (Retic)

Frequency: One location from each zone is monitored weekly

- pH
- Turbidity
- Free chlorine
- Total chlorine
- **Site:**

Zone 1
Jindera Gap Reservoir
Pioneer Park Jindera
Jindera Hall
Farm 'Springhurst' Urana Road Jindera

Zone 2
Burrumbuttock Reservoir
Burrumbuttock Hall
Greschke Park Burrumbuttock
Big Brock Reservoir

Zone 3
Little Brock Reservoir
Brocklesby Hall
Brocklesby School

Zone 4
Gerogery Reservoir
Gerogery Park
Gerogery Hall

NSW Health Drinking Water Monitoring

Location: Villages Water Supply distribution system (Retic)

Frequency: One location per week

- Microbiological (E.coli & Total Coliforms)
- Site No.:

GH01001	Zone 3	Brocklesby Hall, Main Street Brocklesby
GH01002	Zone 2	Burrumbuttock Hall, Urana Road Burrumbuttock
GH01003	Zone 4	Gerogery Park, Main Street Gerogery
GH01004	Zone 1	Jindera Pioneer Park, Urana Road Jindera

NSW Health Drinking Water Monitoring

Location: Jindera Gap WSPS, Urana Road Lavington

Frequency: 6 monthly

- Physical & Chemical Quality
- Site No.: GH01999

11.0 Media Communication Strategy

Council's media/communication strategy is as follows:

1. *General Water Conservation Campaign*

   Council will conduct an annual media campaign to provide the community with information and tips on ways to effectively conserve water. This Campaign will be conducted via all media outlets (newspapers, radio and television) as well as via Council's own publications, website (www.greaterhume.nsw.gov.au) and newsletters and there will also be a direct letter box drop to all residences when necessary.

2. *Notification of Restrictions*

   These will be communicated to the community via:

- Public notices in newspaper
- Notice on Council's website
- Radio announcements
- Television announcements
- General media releases

3. *Emergency Situations*

   These will be communicated to the community via:

- Radio announcements
- Letter box drop to all affected residences
- Public notices in newspapers

12.0 Revisions

It is proposed that this Plan be reviewed annually and any revisions formally recorded on a Record of Document Control.

A data base of all recipients of the Plan will be established, so that revisions can be managed and disseminated appropriately.

13.0 Contact List

A. GHSC - Manager Water & Sewerage

Telephone:
Fax:
Email: Email: mail@greaterhume.nsw.gov.au

B. NSW Office of Water / State Water

Albury Office:	(02) 6024 8880
Regional Director (Wollongong):	(02) 4224 9744
State Water	1300 662 077

C. Culcairn State Emergency Service

Telephone: (02) 6029 8866

D. Radio - 2AY

Telephone: (02) 6023 4111

14.0 Appendices

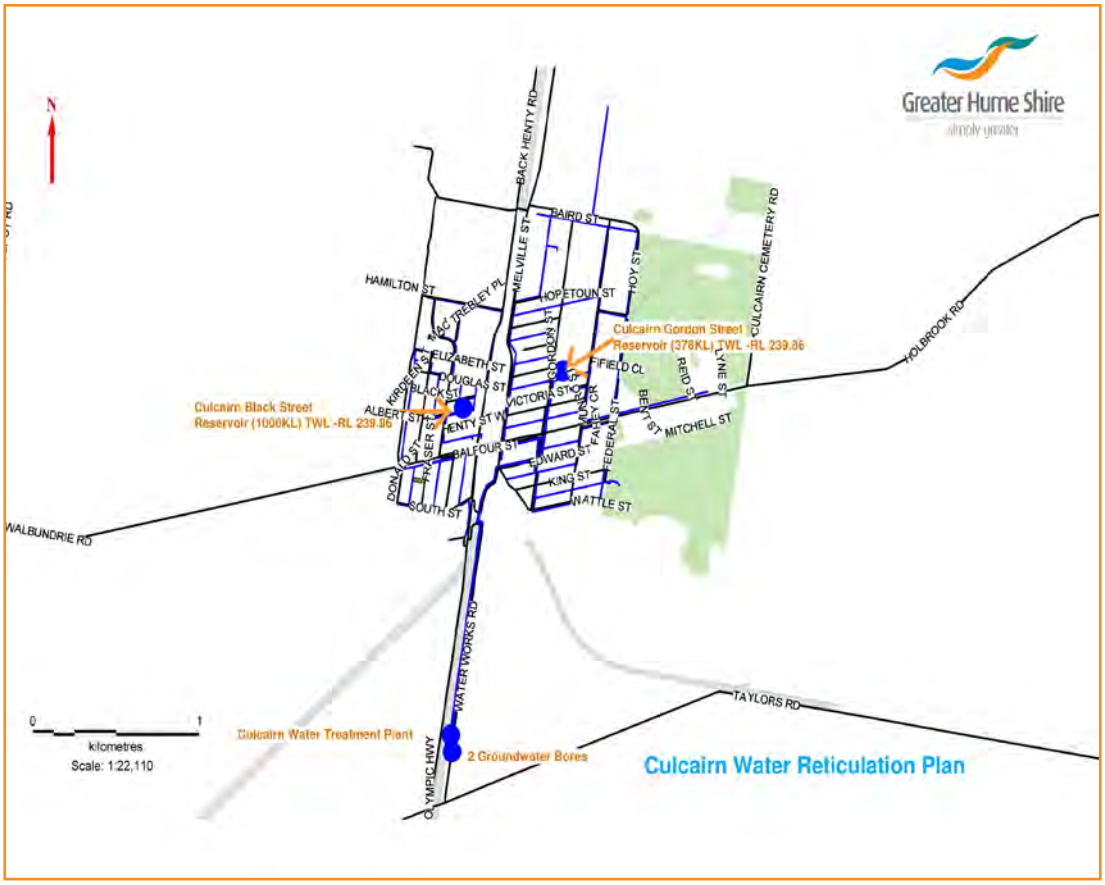
14.1 Appendix A: NSW Office of Water: Drought Management Plan Checklist

Topic	Outcome Achieved	Addressed?
Executive Summary	A. Covers all major issues objectives planning strategies and monitoring for existing essential supplies of water to the service area(s).	Yes
	B. Includes a summary of the drought management plan and an adopted schedule of trigger points for timely implementation of appropriate water restrictions.	Yes
Background	A. Includes the existing water supply system(s) in the service area(s) and a locality map.	Yes (section 3.1)
	B. Includes history of past droughts.	Yes (section 3.5)
	C. Includes information on the impact of past droughts on water services e.g. Restrictions effect of restrictions on demands any emergency sources identified etc.	Yes (section 3.5)
Objectives	A. Identifies key objectives required to maintain a basic/restricted supply to all users. There is a need to consider social and environmental impacts.	Yes (section 2)
	B. Tailor strategies relevant to the service areas.	Yes (section 2)
	C. Endorse and implement a plan that minimises the risk of the community running out of water.	Yes (section 2)
Data	A. Identification of all communities served by the LWU's reticulated water supply those with private reticulated water services and those with no reticulated water services within the service area(s).	Yes (section 3)
	B. Identification of any properties, businesses other LWUs etc. that may seek water in times of drought.	Yes (section 3.8)
	C. Identification of all water requirements. Identify the normal and minimum potable and non-potable water requirements.	Yes (section 3.6)
	D. Identify water dependent industry/businesses any fire fighting requirements and opportunities for recycled water use.	Yes (section 3.7)
	E. Includes a description and plan of all water supply schemes in the service area(s).	Yes (section 3.1)
	F. Includes height/storage volume and height/surface area graphs for all water supply dams and weirs.	NA
	G. Historical performance of rivers dams weirs and bores in previous droughts.	Yes (section 3.1)
	H. Includes the average rainfall figures and evaporation rates.	Yes (section 4.1)
Note: All data to be specified on a daily basis.		

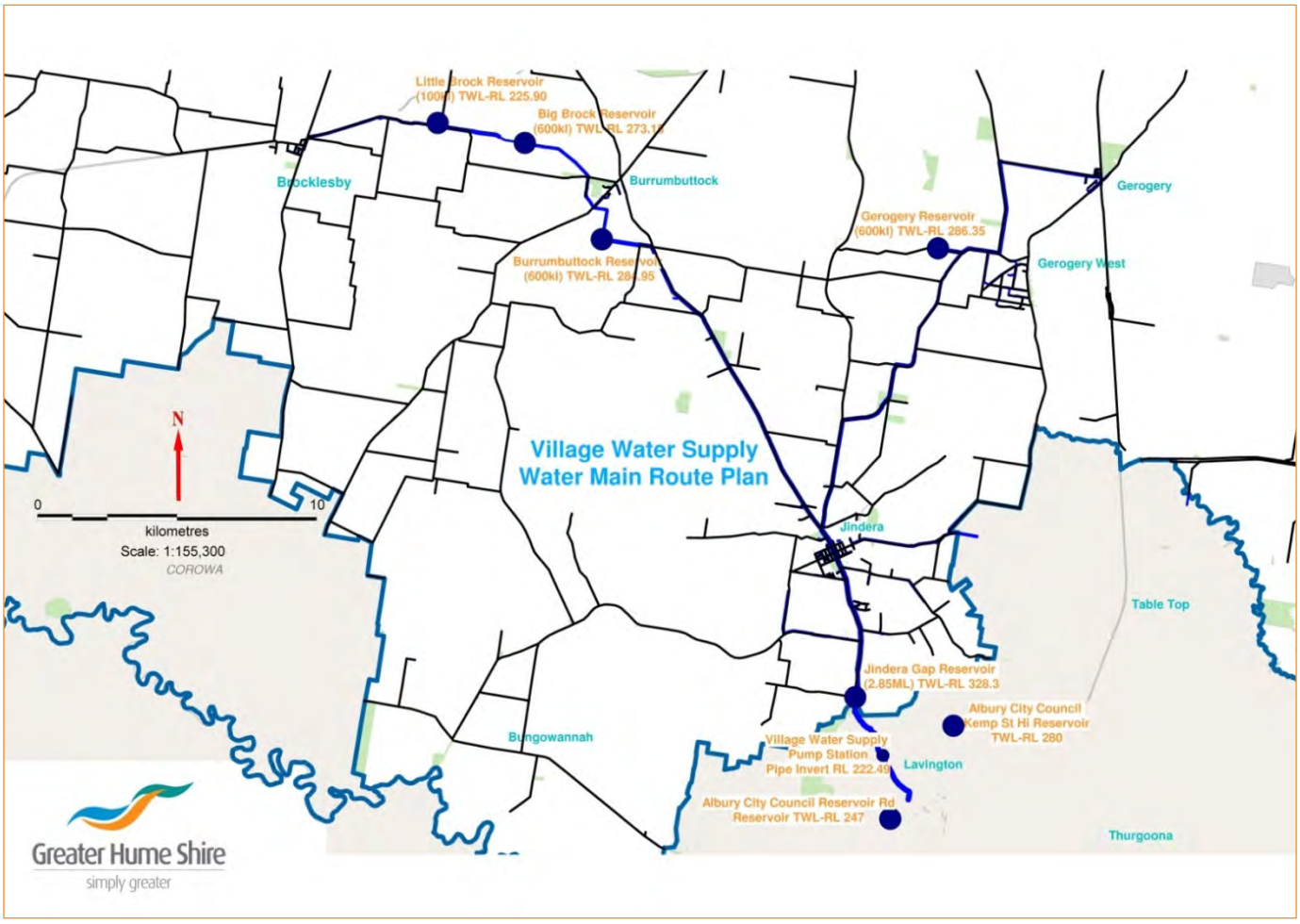
Topic	Outcome Achieved	Addressed?
Plan	A. Demand management options.	Yes (section 5)
	B. Restriction strategies including means and methods for the enforcement of restrictions and the expected results of imposing restrictions.	Yes (sections 7 & 8)
	C. Adopted schedule of trigger points for the timely implementation of appropriate water restrictions in order to minimise the risk of failure in times of drought.	Yes (section 7)
	D. Availability of alternative water sources (including estimated costs and times to implement).	Yes (section 5.4)
	E. Water cartage options.	Yes (section 8 & Appendix C)
	F. Identify legislation local laws and council policies affecting the contingency arrangements.	Yes (section 1.3)
	G. Links to water sharing plans/committees water management plans/committees irrigators etc.	Yes (section 9)
	H. Impact of extraction on downstream stakeholders.	NA
	I. Impact of reduced flows in watercourses.	NA
	J. Level of prediction and intervention.	Yes (sections 7 & 8)
	K. Identify human resource requirements.	Yes (section 3.3)
Monitoring During Drought	A. Daily monitoring of demands.	Yes (section 10)
	B. Daily monitoring of water supply sources (dams, bores and streams).	Yes (section 10)
	C. Monitoring impact of restrictions on consumption.	Yes (section 10)
	D. Monitoring the electrical conductivity alkalinity and algae levels in the water sources.	Yes (section 10)
Consultation	A. Comprehensive media strategy and public consultation.	Yes (section 11)
	B. Regular consultation with appropriate government agencies (DWE, DECC, NSW Health etc).	Yes (section 11)
Operation of Drought Management Plan (DMP)	A. DMP should discuss analyse and identify any impact on other regions and localities i.e. Upstream, downstream or conjunctive water users.	NA
	B. DMP should demonstrate a sustainable strategy that considers all other stakeholders.	Yes
	C. DMP documents an agreed procedure for progressive implementation of water restrictions	Yes

14.2 Appendix B: Supply System Schematics

Culcairn Water Reticulation Plan



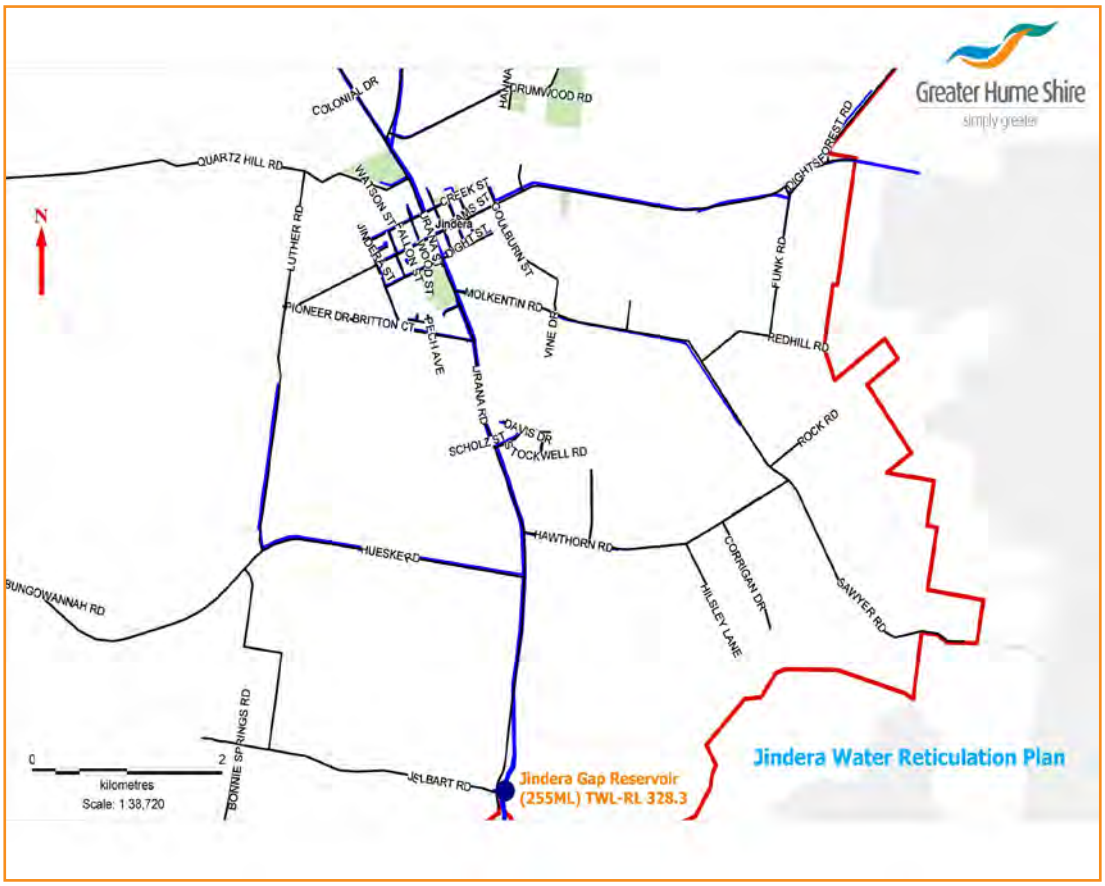
Villages Water Supply Main Route Plan



Appendix B: Supply System Schematics Continued

Villages Water Supply System Plans

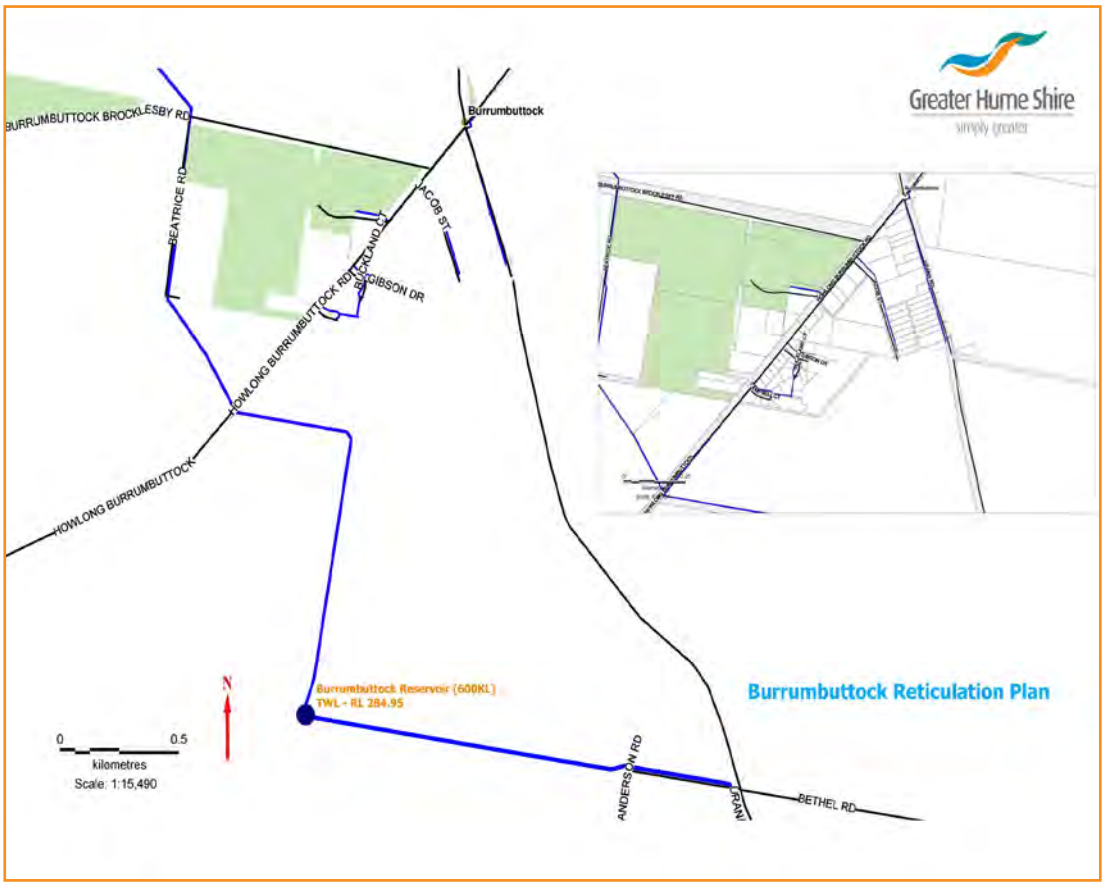
Jindera Water Reticulation Plan



Appendix B: Supply System Schematics Continued

Villages Water Supply System Plans

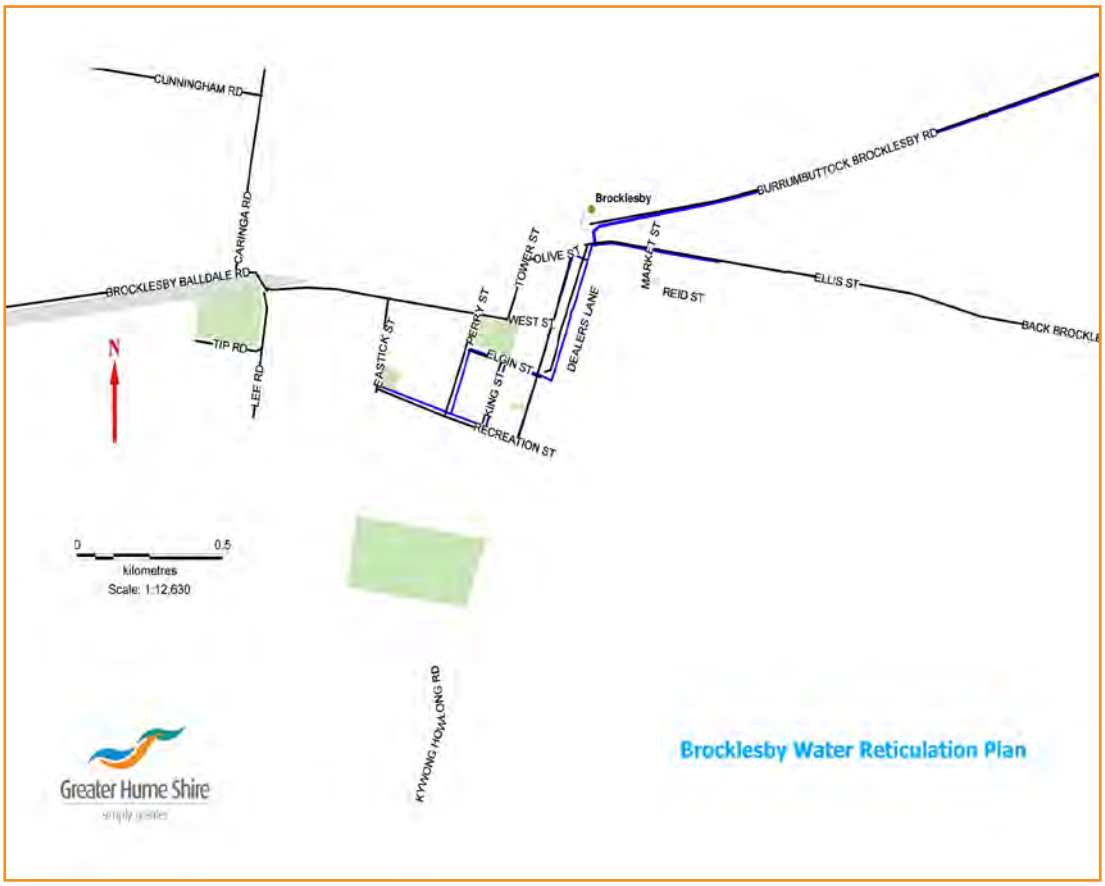
Burrumbuttock Water Reticulation Plan



Appendix B: Supply System Schematics Continued

Villages Water Supply System Plans

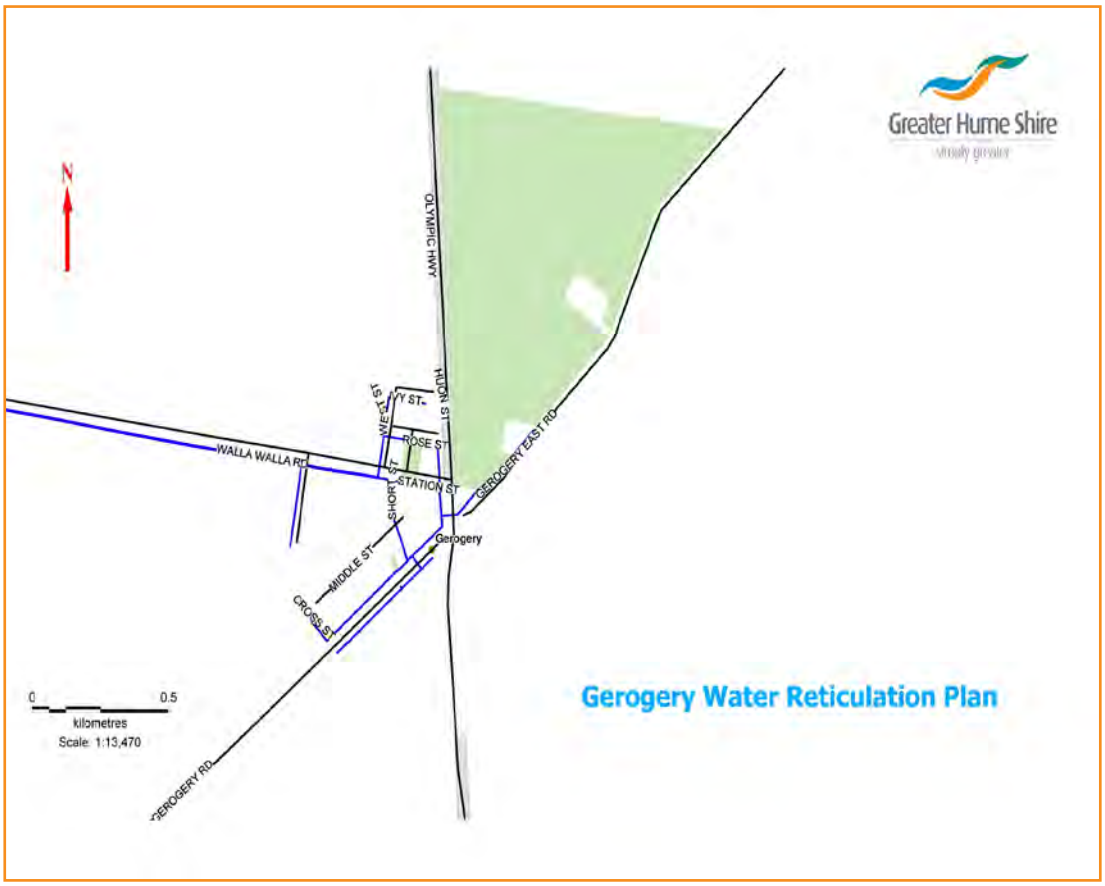
Brocklesby Water Reticulation Plan



Appendix B: Supply System Schematics Continued

Villages Water Supply System Plans

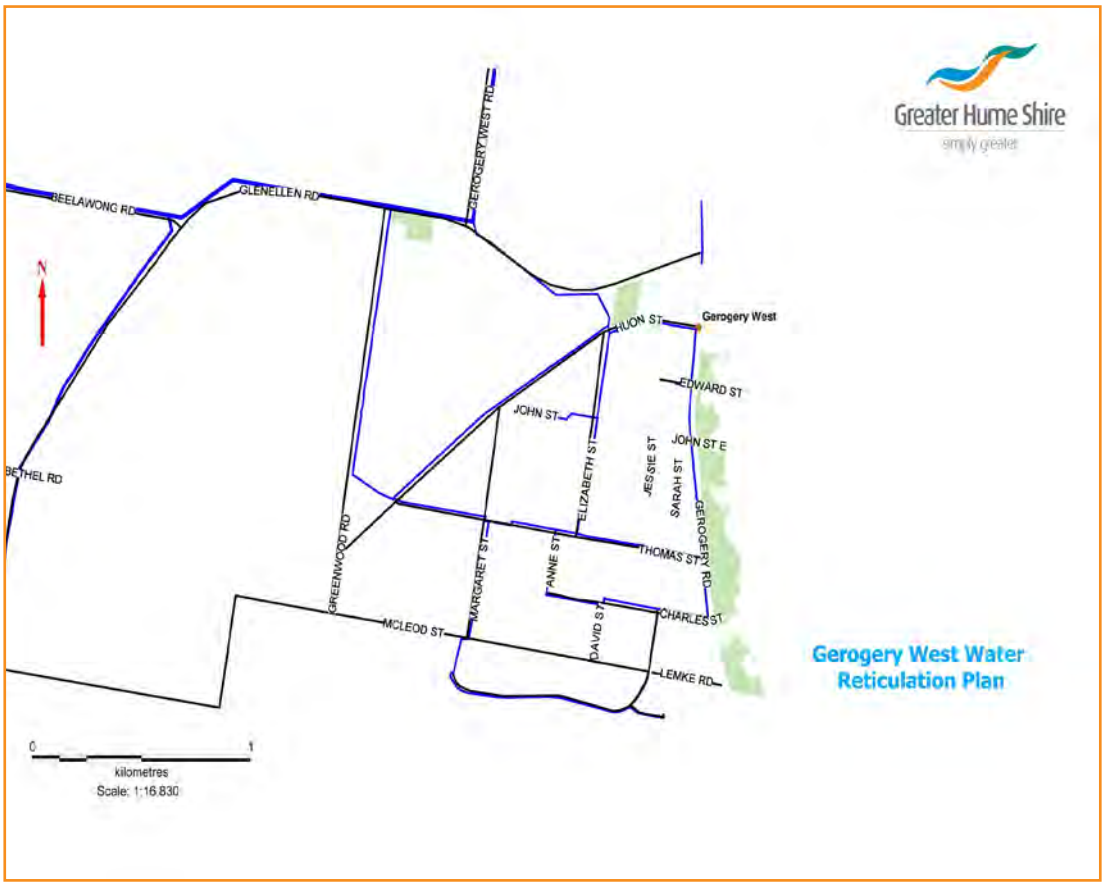
Gerogery Water Reticulation Plan



Appendix B: Supply System Schematics Continued

Villages Water Supply System Plans

Gerogery West Water Reticulation Plan



14.3 Appendix C: Emergency Water Carting Plan & NSW Health Guidelines for Water Carters

Water Carting Plan for Greater Hume Shire -Section 1

Section 1 - Preliminary Details		
1	Date water supply failed:	N / A *Please forward a current "Emergency Water Carting Plan for Greater Hume Shire" to the NSW Office of Water at Wollongong in the event of a failure of the Greater Hume Shire town water supply.* *Email peter.ledwos@water.nsw.gov.au.*
2	Is Council looking at alternate source options?	Yes, Council would look at an emergency drilling program, emergency repairs or replacement to sections of pipelines, or installing a temporary pump station or additional pumps, or installing diesel generator sets to maintain power; depending on the given nature of the problem.
3	What is the normal source of water for the Greater Hume Shire Water Scheme?	Hume Shire Council receives treated water from Albury City for the Villages of Jindera, Burrumbuttock, Brocklesby, Gerogery, Gerogery West, and connected rural areas and supplies Culcairn from a groundwater supply just east of the town.
4	What has interrupted normal supply?	1. Drought 2. Emergency
5	Date water carting commenced:	TBA
6	Proposed time period of water carting?	TBA
7	Purpose for which carted water is being used:	All essential purposes

Emergency Water Carting Plan & NSW Health Guidelines for Water Carters Continued

Water Carting Plan for Greater Hume Shire - Section 2

Section 2a - Preliminary Water Carting Demands for Culcairn					
	Category	Amount	Approved Rate	Estimate	Quantity (L)
"Drought Relief for Country Towns Brochure"					
1	Residents	1,300	95 L/head/day		123,500
2	Hospital Patients	20	330 L/person/day		6,600
3	Nursing Home Patients	-	154 L/person/day		-
4	School Students (non-residents) – 3 schools	500	37 L/person/day		18,500
5	Hotels	1		5000 L	5,000
6	Clubs	1		5000 L	5,000
7	Cafes/ restaurants	3		3000 L	9,000
8	Tourists	100		95 L/p/day	9,500
9	Motels	1		5000 L	5,000
10	Public Toilets	2		5000 L	10,000
11	Other	-		250 L	-
	TOTAL				183,100
Total Quantity of Carted Water/day for Culcairn is 183 kilolitres/day (0.183ML/d)					

So the total quantity of water required to be carted to Culcairn should the Culcairn Water System fail is 183 kL/day, i.e. 0.183 ML/day.

Section 2b - Preliminary Water Carting Demand for Villages Water Supply					
	Category	Amount	Approved Rate	Estimate	Quantity (L)
"Drought Relief for Country Towns Brochure"					
1	Residents	3,200	95 L/head/day		304,000
2	Hospital Patients	-	330 L/person/day		-
3	Nursing Home Patients	21	154 L/person/day		3,234
4	School Students (non-residents) – 6 schools	500	37 L/person/day		18,500
5	Hotels	4		5000 L	20,000
6	Clubs (Jindera Golf Club)	1		5000 L	5,000
7	Cafes/ restaurants	5		3000 L	15,000
8	Tourists	200		95 L/p/day	19,000
9	Motels	1		5000 L	5,000
10	Public Toilets	6		5000 L	30,000
11	Other	-		250 L	-
	TOTAL				419,734
Total Quantity of Carted Water/day for the Villages schemes is 420 kilolitres/day (0.42ML/d)					

So the total quantity of water required to be carted should the Villages Water System fail is 420kL/day, i.e. 0.42 ML/day.

The total required to be carted if both systems fail is 603 kL/day or 0.623 ML/day.

Water Carting Plan for Greater Hume Shire - Section 3

Section 3 - Preliminary Sources of Carted Potable Water		
3a Preferred Carting Location – Albury		
Transferring water from Albury to Culcairn (for distribution to the Villages also)		
1	Locations from which water is carted:	Albury City Town Water Supply
2	Distance from potable supply; and carting route:	50km; along the Hume Highway and Riverina Highway;- all sealed roads
3	Number of trips/day from source/s	Say the trip from Albury to Culcairn is 45 minutes each way - a return trip is one and a half hours. Plus half hour to fill and half hour to empty. Giving a total turnaround time of two and a half hours for each tanker. **Each tanker can therefore do 3 trips per hour working day, Allow 6 trips per 16 hour/day during an emergency operation** **(as an operational average – includes stoppages, changeover, breakdown etc)**
4	Tanker Volume Required For a normal day For an emergency operation	Normal day Tanker volume: 603 kL/ 3 trips per day = 201 kL of volume Emergency operation Tanker volume: 603 kL/ 6 trips per day = 102 kL of volume
5	Number of tankers required	A small tanker may be 10 kL. A large tanker may be 30 kL. Minimum number of tankers: Using the largest tankers of 30 kL each: Then 603 kL /30 kL tanker = 20 tanker trips /day. With each tanker doing 6 trips per day, carting water to Culcairn from Albury would need a minimum of 4 tankers. Allowing for breakdowns, hold-ups etc, Greater Hume Shire would need to source say 6 tankers of 30 kL each. [By comparison, the maximum number is (assuming 10 kL tankers) 603 kL /10 kL = 61 trips. 61/3 = 20 tankers of 10 kL each]. Somewhere between 6 and 22 tankers would therefore, likely be needed.
6	Estimated Cost of carting water	Using $5/km + $50/hour, then a 100 km round trip taking 2.25 hours costs $612.50. The minimum operational cost of transport, using 4 larger tankers, making 20 tanker trips per day is **$12,250 per day.** [A maximum cost is 3 times this – 61 trips costing **$37,363/day**]. Then the estimated operational cost of water carting is a **minimum of $85,750 per week;** and more likely to be say $100,000 per week for the duration of water carting.

Loading Up at Albury

There are existing, suitable potable water standpipes at Albury.

Water Carting Plan for Greater Hume Shire - Section 3 continued

Section 3 - Preliminary Sources of Carted Potable Water		
3b Alternate Carting Location (1) – Wagga Wagga		
Transferring water from Wagga Wagga to Culcairn (for distribution to the Villages also)		
1	Locations from which water is carted:	Wagga Wagga Town Water Supply
2	Distance from potable supply; and carting route:	77 km; along the Olympic Highway;- all sealed road
3	Number of trips/day from source/s	Say the trip from Wagga Wagga to Culcairn is 60 minutes each way - a return trip is two hours. Plus half hour to fill and half hour to empty, giving a total turnaround time of three hours for each tanker. **Each tanker can therefore do 2 trips per 8 hour working day, Allow 5 trips per 16 hour/day during an emergency operation** **(as an operational average – includes stoppages, changeover, breakdown etc)**
4	Tanker Volume Required For a normal day For an emergency operation	Normal day Tanker volume: 603 kL/ 2 trips per day = 302 kL of volume Emergency operation Tanker volume: 603 kL/ 5 trips per day = 121 kL of volume
5	Number of tankers required	A small tanker may be 10 kL. A large tanker may be 30 kL. Minimum number of tankers: Using the largest tankers of 30 kL each: Then 603 kL / 30 kL tanker = 20 tanker trips /day. With each tanker doing 5 trips per day, carting water to Culcairn from Wagga Wagga would need a minimum of 4 tankers. Allowing for breakdowns, hold-ups etc, Greater Hume Shire would need to source say 5 tankers of 30 kL each. [By comparison, the maximum number is 603 kL /10 kL = 61 trips. 61/2 = 21 tankers of 10 kL each]. Somewhere between 5 and 22 tankers would therefore, likely be needed.
6	Estimated Cost of carting water	Using $5/km + $50/hour, then a 154 km round trip taking 3 hours costs $920. The minimum operational cost of transport, using 4 larger tankers, making 20 tanker trips per day is **$18,400 per day.** [A maximum cost is 2.5 times this – 61 trips costing **$56,120 per day**]. Then the estimated operational cost of water carting is a **minimum of $128,800 per week;** and more likely to be say $150,000 per week for the duration of water carting.

Loading Up at Wagga Wagga

There are existing, suitable potable water standpipes at Wagga Wagga.

Water Carting Plan for Greater Hume Shire - Section 3 continued

Section 3 - Preliminary Sources of Carted Potable Water		
3c Alternate Carting Location (2) – Corowa		
Transferring Water from Corowa to Culcairn (for distribution to the Villages also)		
1	Locations from which water is carted:	Corowa Town Water Supply
2	Distance from potable supply; and carting route:	108 km; along the Olympic and Riverina Highways;- all sealed road
3	Number of trips/day from source/s	Say the trip from Corowa to Culcairn is one and a half hours each way - a return trip is three (3) hours. Plus half hour to fill and half hour to empty. Giving a total turnaround time of four (4) hours for each tanker. **Each tanker can therefore do 2 trips per 8 hour working day, Allow 4 trips per 16 hour/day during an emergency operation** **(as an operational average – includes stoppages, changeover, breakdown etc)**
4	Tanker Volume Required For a normal day For an emergency operation	Normal day Tanker volume: 603 kL/ 2 trips per day = 302 kL of volume Emergency operation Tanker volume: 603 kL/ 4 trips per day = 151 kL of volume
5	Number of tankers required	A small tanker may be 10 kL. A large tanker may be 30 kL. Minimum number of tankers: Using the largest tankers of 30 kL each: Then 603 kL / 30 kL tanker = 20 tanker trips /day. With each tanker doing 4 trips per day, carting water to Culcairn from Corowa would need a minimum of 5 tankers. Allowing for breakdowns, hold-ups etc, Greater Hume Shire would need to source say 6 tankers of 30 kL each. [By comparison, the maximum number is 603 kL / 10 kL = 61 trips. 61/2 = 21 tankers of 10 kL each]. Somewhere between 6 and 22 tankers would therefore, likely be needed.
6	Estimated Cost of carting water	Using $5/km + $50/hour, then a 216 km round trip taking 4 hours costs $1,280. The minimum operational cost of transport, using 5 larger tankers, making 20 tanker trips per day is **$25,600 per day.** [A maximum cost is 3 times this – 61 trips costing **$78,080 per day**]. Then the estimated operational cost of water carting is a **minimum of $179,200 per week;** and more likely to be say $200,000 per week for the duration of water carting.

Loading Up at Corowa

There are existing, suitable potable water standpipes at Corowa.

Emergency Water Carting Plan & NSW Health Guidelines for Water Carters Continued

Water Carting Plan for Greater Hume Shire - Section 4

Section 4 - Size and Number of Tankers Available and Contact Details		
Name	**Contact Number**	**Tanker Size (kL)**
GHSC	(02) 6029 8588	
Albury City Council	(02) 6023 8111	
Riverina Water County Council	(02) 6922 0608	
Corowa Shire Council	(02) 6033 3317	
Private contractors	Refer list from GHSC, below	

Water Carting Plan for Greater Hume Shire - Section 5

Section 5 - Register of Water Carters	
Name	**Address**
Rick Toseland	30 Sarah St Gerogery West
S & R Scheetz & Co P/L	"CALOOL" Culcairn NSW
ICG Wagga PTY LTD	14 Forrest St Wagga 2640
Kelli & Pete Mair	120 Jelbart Rd Jindera
Ken Collins	1959 Gerogery Rd Gerogery
Mark Draper	748 Castle Creek Rd Wodonga
Bill Schulz	85 Commercial St Walla Walla NSW
Bruce Jacobs	PO Box 9, Tangambalanga VIC
ExcellGrayBruni	4 Moulder Crt Wodonga Vic 3690

Water Carting Plan for Greater Hume Shire - Section 6

Section 6 - Discharge of Carted Water		
1	Where is the carted water to be discharged?	Discharge direct into Council's Storage Reservoirs.
2	What is the access like for semi-trailers?	Easy access for B-Double or road- train.
3	Alternative discharge points?	As an alternative, temporary discharge points could be set up. The tanker would discharge to one or more plastic tanks. A petrol pump would then pump from the plastic tanks into the reservoir. It would require some temporary polythene piping into the top of the reservoir.

Water Carting Plan for Greater Hume Shire - Section 7

Section 7 - Water Quality and Testing Details		
1	Are there water quality test results from emergency water source (circle):	yes / no
2	If yes please attach copies.	
3	If source previously used in similar situation (circle):	yes / no

Policy Directive

Department of Health, NSW
73 Miller Street North Sydney NSW 2060
Locked Mail Bag 961 North Sydney NSW 2059
Telephone (02) 9391 9000 Fax (02) 9391 9101
http://www.health.nsw.gov.au/policies/

Water Carters (Guidelines for) - NSW Health

Document Number	PD2005_269
Publication date	27-Jan-2005
Functional Sub group	Population Health - Water Personnel/Workforce - Occupational Health & Safety
Summary	Specifies requirements of containers etc for water carters.
Author Branch	Environmental Health
Branch contact	9816 0292
Applies to	Area Health Services/Chief Executive Governed Statutory Health Corporation, Board Governed Statutory Health Corporations, Affiliated Health Organisations, Affiliated Health Organisations - Declared, Environmental Health Officers of Local Councils, NSW Dept of Health, Public Health Units
Distributed to	Public Health System, Environmental Health Officers of Local Councils, NSW Department of Health, Public Health Units
Review date	27-Apr-2012
Policy Manual	Not applicable
File No.	02/6890
Previous reference	2002/111
Issue date	12-Dec-2002
Status	Active

Director-General

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is **mandatory** for NSW Health and is a condition of subsidy for public health organisations.

NSW HEALTH DEPARTMENT

CIRCULAR

File No	02/6890
Circular No	2002/111
Issued	12 December 2002
Contact	Adrian Farrant (02) 9816 0541 Environmental Health Branch

NSW HEALTH GUIDELINES FOR WATER CARTERS

NSW Health has developed the following public health guidelines for the operation of water carting vehicles supplying water for drinking and domestic use.

These guidelines are in addition to any provisions required by the local council (water supply authority) to protect their assets.

Water carters may offer an alternative water supply in areas where the water supply is insufficient or is temporarily unsuitable.

1. LEGISLATION

The treatment and handling of water that is used or intended to be used for human consumption gives rise to a general duty of care and is also specifically regulated by law under the Public Health Act, 1991, the Food Act, 1989, and the Local Government Act, 1993.

i) Food Act, 1989

Section 3 of the Food Act, 1989, defines food as:

> "a substance or compound commonly used, or represented as being for use, as food or drink for human consumption or as an ingredient (whether or not after processing) of food or drink for human consumption or use,....".

If a water supply authority sells water to a water carter as potable and fit for human consumption then it is a food for the purposes of the Food Act, 1989. Similarly, if a water carter sells water to a consumer as potable and fit for human consumption then it is a food.

If the water contains any foreign matter it may be considered adulterated under Section 8(n) of the Food Act, 1989, and the supplier may have committed an offence under section 9(3) of that Act by selling the water.

Distributed in accordance with circular list(s):

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The water tank and hoses etc are also subject to specifications set out in the document issued by Safe Food Australia, *A Guide to the Food Safety Standards*- Standard 3.2.2, Division 5 – Cleaning, sanitizing and maintenance (clauses 19 to 21).

ii) Public Health Act, 1991

Under section 101 of the Public Health Act, 1991, the Chief Health Officer may give direction to prevent or restrict the use of water supplied by a carter or give directions to bring the water into a safe condition.

iii) Local Government Act, 1993

The Local Government Act, 1993, and Local Government (Orders) Regulation, 1999, also contain specific provisions for the regulation of water carting vehicles by local councils. Section 124 of the Act sets out the council's powers to order the owner or operator of a vehicle used for the storage and transportation of food (including drinking water) to take action as specified by the council to render the vehicle in a clean or sanitary condition. Part 4, Clause 19 of the Orders Regulation specifies particular requirements, including that a water carting vehicle must have an aperture that is large enough to enable easy inspection and thorough cleaning of the interior and must have a cover that is able to be kept clean.

A clean or sanitary condition has not been defined in the Local Government Act, 1993, but if the conditions below are met the water and vehicle would be considered clean and sanitary.

Section 68(2) Part B(1) of the Local Government Act, 1993, allows a person to draw water from a council water supply and sell the water, but only with the prior approval of the council.

The Local Government Act, 1993, also contains a provision excluding liability and claims under certain circumstances, if the matter or thing (actions or omissions) was done in good faith for the purpose of executing the Act. However if the Council (water supply authority) is aware of the problem and has failed to do anything to remedy the situation, it is unlikely that it is acting in good faith.

2. WATER QUALITY

i) Guidelines

Water carter operators providing potable water for human consumption should source water from a water supply that meets the 1996 NHMRC/ARMCANZ *Australian Drinking Water Guidelines (ADWG)*. The water must meet the microbiological guidelines as a minimum. Appropriate sources of water would include abstraction from reticulated supplies, or directly from a bulk water supplier at the point of treatment.

The water source must not exceed drinking water guidelines for blue-green algae or their toxins. It is the responsibility of the water carter to ensure that this requirement has been met.
Note: When water that meets the ADWG is added to an empty rainwater tank it may resuspend the sludge in the bottom of the rainwater tank creating taste and turbidity problems.

ii) Treatment

The water source should be chlorinated prior to carting, to ensure the safety of the supply. The operator must maintain an adequate chlorine residual up to the point of supply to consumers. An adequate free chlorine residual would be between 0.2 -1.0mg/L, depending on the quality of the source water. This can be obtained by adding 8 grams (one dessert spoon) of calcium hypochlorite (granular) at 65% strength per 10,000 litres giving 0.5 mg/L of chlorine. Alternatively, if sodium hypochlorite (liquid) is used add 40 mL at 12.5% strength per 10,000 litres of water to give 0.5 mg/L of chlorine. (Free chlorine will be less depending on turbidity, colour etc and should be checked.)

3. WATER TANK AND VEHICLE

Ideally, the water tank should be used only for the transport of potable water. If this is not possible, then at a minimum the tank must not be used for transport of effluent (treated or otherwise), petroleum products, or other potentially hazardous materials that may be prejudicial to health.

Where the tank has been used for transport of non-hazardous materials other than potable water, the tank must be cleaned and disinfected prior to filling with potable water. First, the tank should be physically cleaned inside, flushed out and then filled with water and chlorinated to at least 5.0 mg/L free chlorine for a minimum of 30 minutes. This can be achieved using 76 grams of calcium hypochlorite at 65% strength per 10,000 litres of water or if sodium hypochlorite is used 400 mL at 12.5% strength per 10,000 litres of water.

All tanks constructed of mild steel should be coated or lined with a material that complies with *AS/NZS 4020:1999 Products for use in contact with drinking water*.

The vehicle tank and apparatus should be submitted once every twelve months for inspection by Council.

4. HOSE

Hoses must be made of food grade material. Hoses and fittings must be capped or stored in a dust proof container during transport or when not being used.

Where the tank has been used for transport of non-hazardous materials other than potable water, the hose must be cleaned, flushed out and then disinfected by filling with water and chlorinated to at least 5.0 mg/L free chlorine for a minimum of 30 minutes.

5. STANDPIPES AND HYDRANT BOXES

Fixed standpipes must have an air gap to prevent backflow into the reticulated supply.

Hydrant boxes should be self draining, mounted above ground level and not collect surface runoff.

Any tanks being filled from a reticulated supply via a removable standpipe must have a backflow prevention device that complies with the *NSW Code of Practice for Plumbing and Drainage*.

Removable standpipes should be flushed if the hydrant box is full of water, to discard any contaminated water.

6. LOG BOOKS

A water carter must keep a log book in each vehicle to record information of deliveries. Details must include the following:

- All dates of extraction and delivery
- Source of water
- Location of extraction
- Customers name and delivery address
- Volume delivered
- When the tank was last cleaned and materials transported
- Free chlorine level.

7. REGISTER OF WATER CARTERS

A record of water carters that draw from the reticulated water supply must be kept by the Local Council.

Details should include:

- Name of owner
- Name of business
- Contact details for owner of the business
- Details of water carting vehicles, drivers, make, model, registration, tank volume, type of tank eg temporary mounted tanks, etc
- Date of last inspection of each vehicle.

For further information contact your local Public Health Unit. (Under *Health* in the white pages or at www.health.nsw.gov.au/public-health/phus/phus.html).

Robyn Kruk
Director-General

14.4 Exemption Request & Water Conservation Plan Application

Exemption Request and Water Conservation Plan Application

For filling an existing swimming pool or spa

Under the requirement of water restrictions, a customer wanting to fill an existing pool or spa with a capacity of 2000 litres or more is required to submit a Water Conservation Plan to their Government water retailer for approval. The Water Conservation Plan should set out proposed water savings that will be achieved on an annual basis to off-set the volume of water required to initially fill the pool.

Customer details

Name: _____

Address: _____

Town: _____

Pcode: _____

Address: *(where pool is located if different from above)*

_____

_____

_____

Contact Numbers:

(Home): _____

Business: _____

Mobile: _____

☐ Existing Pool ☐ New pool

Notes

1) As a demonstration off the compliance with you Water Conservation Plan, please provide either:
   - A copy of receipts of products purchased or
   - Plumbing Industry Commission - Certificate of Compliance.

2) If you have previously fitted the water saving devices listed, your application may still be approved. Please indicate in each section those initiatives that you have completed previously.

3) The savings shown in the following tables are indicative only and provide an approximate savings per year.

4) Greater Hume Shire Council reserves the right to undertake random audits of compliance with the Water Conservation Plan.

5) For the purposes of the Drought Management Plan an 'existing pool' is defined as an existing structure. This specifically precludes the filing of pools of any size that are temporary/portable/inflatable in nature.

Bathroom savings

Install or replace existing shower roses with a AA or a 3 star rated shower rose or flow control valve rated at 9 litres.

People in Household	Typical litre savings per year
1	10,950
2	21,900
3	32,850
4	43,800
5	54,750

Estimated shower savings per year

☐ **Litres**

Toilet savings

Install or replace toilet with a 6/3 litre dual flush toilet

People in Household	Typical annual litre savings by Replacing a 11/5 Litre dual flush	Typical annual litre savings by an 11 litre single flush (litres/yr)
1	8,000	14,000
2	14,000	26,000
3	19,000	35,000
4	23,000	42,000
5	27,000	50,000

Estimated toilet savings per year

☐ **Litres**

Rainwater Tank

Install a rainwater tank for garden irrigation

Size of tank	Estimated annual savings
1	3,600
2	6,000
3	10,000
4	14,000
5	22,000

Estimated tank savings per year

☐ **Litres**

Greywater reuse systems

Please provide details of system
(size of tank, intended use of water, etc)

_____
_____
_____
_____
_____

Laundry

Install or replace an existing washing machine with a AAAA rated or better washing machine

Average number of Washes per week	Estimated annual savings
2	8,000
4	18,000
7	28,000

Estimated laundry savings per year

☐ **Litres**

Garden irrigation

Install rain/soil moisture sensors on a garden irrigation system

Size of property	Estimated annual savings
600sq metres	20,000
900sq metres (1/4 acre)	30,000

Estimated garden savings per year

☐ **Litres**

Other

Please indicate (X) if you have put in place any other water conservation practices at the property. These activities will be considered in assessing your application.

- ☐ Garden Mulching
- ☐ Water tap restrictor devices
- ☐ Swimming pool/spa cover
- ☐ Tap aerator or tap mixer
- ☐ Reduced water use inside the home (please explain)

_____
_____
_____
_____

- ☐ Reduced water use outside the home (please explain)

_____
_____
_____
_____
_____

Total estimated savings

(excluding "Other" above)

Estimated total litres in a year ☐

Estimated litre volume of water For pool (refer to Pool Co.) ☐

Water Conservation Plan certified
(Customer signature)

☐

PLEASE NOTE: IN THE EVENT THAT A HIGHER STAGE OF WATER RESTRICTIONS IS IMPOSED THIS EXEMPTION WILL NO LONGER APPLY.

Water Conservation Plan approved
(Signed by authorised officer)

☐