



**GLEN INNES SEVERN COUNCIL**  
**DROUGHT MANAGEMENT PLAN**



February 2019

**Cover photo** – Beardy Weir during 2014 drought.

**Document Control**

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## 1.0 EXECUTIVE SUMMARY

This document outlines the procedures to be implemented in the event of drought occurring within the Glen Innes and Deepwater areas.

### The Key Objectives of the Plan

To maintain necessary restricted water supply to all consumers, with consideration of the associated risks:

- Economic:
  - Water dependent industries;
  - Cost of new infrastructure to secure water sources;
  - Cost of water cartage;
  - Exposure to fire;
  - Reduced income during water restrictions due to users pays policy.
- Infrastructure:
  - Exposure of infrastructure due to low water levels;
  - Effects on parks and gardens;
  - Effect on Council works programme;
  - System leakage and pressure.
- Environmental:
  - Water Quality;
  - Disease;
- Social:
  - Education of the community of water saving initiatives;
  - Confrontation and conflict from consumers i.e. loss of business etc.;
  - Mental and physics stress within the community.

The purpose of a Drought Management Plan is to ensure that the community does not completely run out of water in any circumstance, for example climate change and unknown future impacts relating to those changes. Implementation of the Drought Management Action Plans and associated water restrictions are vital to reduce this risk for Council and the community.

### Ongoing action

- Increase public awareness of water saving initiatives;
- Continue development of off stream storage facility
- Reduce volumes of unaccounted for water (UFW);
- Review / implement policies / procedures for the following:
  - Implementation of water restrictions (media releases, policing restrictions, authorisation to increase level of restrictions, cartage of water);
  - Blue-green algae outbreak;

Emergency response procedures for fire-fighting requirements during drought and major system failure.

## Security of Water Supply

The longest recorded period of restrictions occurred in 1987 and lasted 146 days (nominally five months). In 2014 a similar period of restrictions was implemented lasting just one day less. The level within the Beardy Weir dropped to 1200 mm below top water level during the 2014 drought. At the time of writing the level in the Beardy Weir is at that same point, however due to the capacity contained within the Eerindii Ponds restrictions have not yet been introduced in Glen Innes in the current event.

In times of nil rainfall occurring during the hottest months of summer, it was predicted that the Beardy Reservoir will fall to a level 1500mm below the weir in as short as a three month period. That scenario has now essentially occurred in the current event, where extreme heat and nil runoff events have combined to provide a worst case scenario.

In that scenario the off stream storage then becomes the supply, in conjunction with the two Red Range Road bores. The development of the Glen Innes Aggregates Off Stream storage facility with a capacity of 565ML, combined with a supply from the Red Range Rd bore of 7 litres per second, provides in excess of 24 month's supply at average consumption rates. **The current remaining drought reserve capacity of 24 months, assuming no rainfall occurring in the catchment over the entire period, is therefore at least 22 months greater than the longest recorded period of implemented restrictions.** This provides a significant buffer, which will increase further as the off stream storage continues to develop.

## Review of Plan

This Drought Management Plan will be reviewed following any drought event. Any amendments required to procedures, policies and actions plan would be undertaken at this time.

Notwithstanding this the Drought Management Plan will be reviewed every three (3) years or following significant changes within the water supply system for Glen Innes or Deepwater.

## 2.0 BACKGROUND

### 2.1 Existing Water Supply System

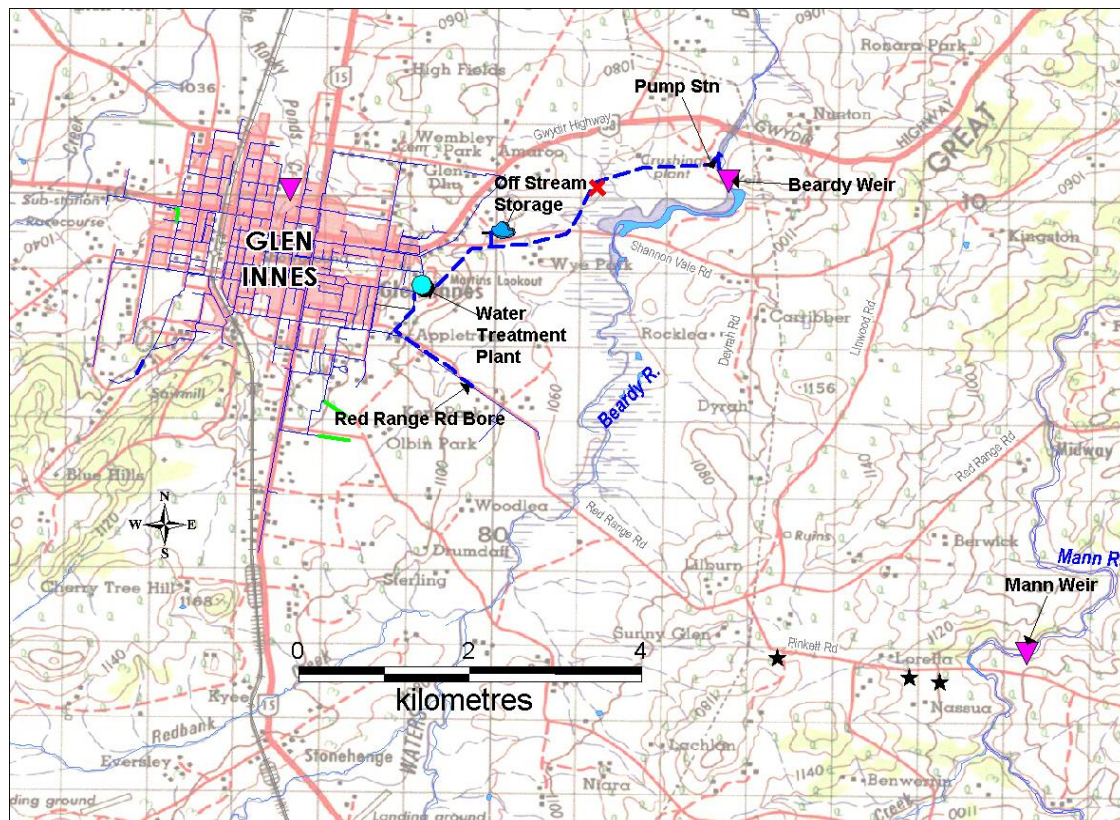
#### 2.1.1 Glen Innes

The Glen Innes area is serviced by a network of reticulation water mains from the three (3) clear water storage tanks (6.4 ML) at the Glen Innes Water Treatment Plant located at Martins Lookout with a treatment capacity of 10 ML/day. Water is sourced from the Beardy Waters Reservoir located east of Glen Innes and is pumped approximately 3.2 km along a DN 375 MSCL / DICL rising main to the Eerindii Ponds.

An off stream storage facility (Eerindii Ponds) has been created in 2012 adjacent to the rising main, as the Glen Innes Aggregates Quarry ceases operations within progressive pits. Stage 1 capacity of this storage is 250ML, stage 2 added 365ML providing a current combined storage of 565ML. Water is now pumped from this storage on a daily basis to the Glen Innes water treatment plant at Martins Lookout. A 90kW solar array provides energy to three pumps (plus one standby) on a floating pontoon in the southern storage. The southern storage is kept full by pumping weekly from the Beardy Weir, and the 365 ML northern storage when pumping is discontinued from the Beardy Weir at the 1500mm level. This arrangement is in place to ensure that water is able to be well aerated in the southern storage to address quality issues, and to utilise the solar power for the 70 meters of vertical lift to the treatment plant.

Two bores have also been commissioned on the Red Range Road to the east of Glen Innes. These bores are capable of delivering seven (7) litres per second to the water treatment plant via a 150mm diameter PVC rising main.

The old Mann River system has been decommissioned however the extraction licence has been retained.



- Weir 488 ML
- Water Treatment Plant 10 ML/day
- Clear Water Storage 3 (6.4ML)

- Service Reservoirs 1 (0.91 ML)
- Pumping Stations 2 (135l/s)
- Reticulation Mains 85.6 km
- Bore 2 (7l/s combined)
- Off Stream Storage 565MI

### 2.1.2 Deepwater

Water for the Deepwater area is sourced from the Deepwater Weir located Northwest of Deepwater. Water passes through a DAFF treatment plant with a capacity of 0.7 ML/day. A second reservoir has been constructed at the Deepwater Treatment to assist with the management of water quality during high turbidity events resulting from storm activity in the catchment.

- Weir 1
- DAFF treatment plant 1
- Reservoirs 2
- Pumping Stations 1
- Reticulation Mains 8.7 km

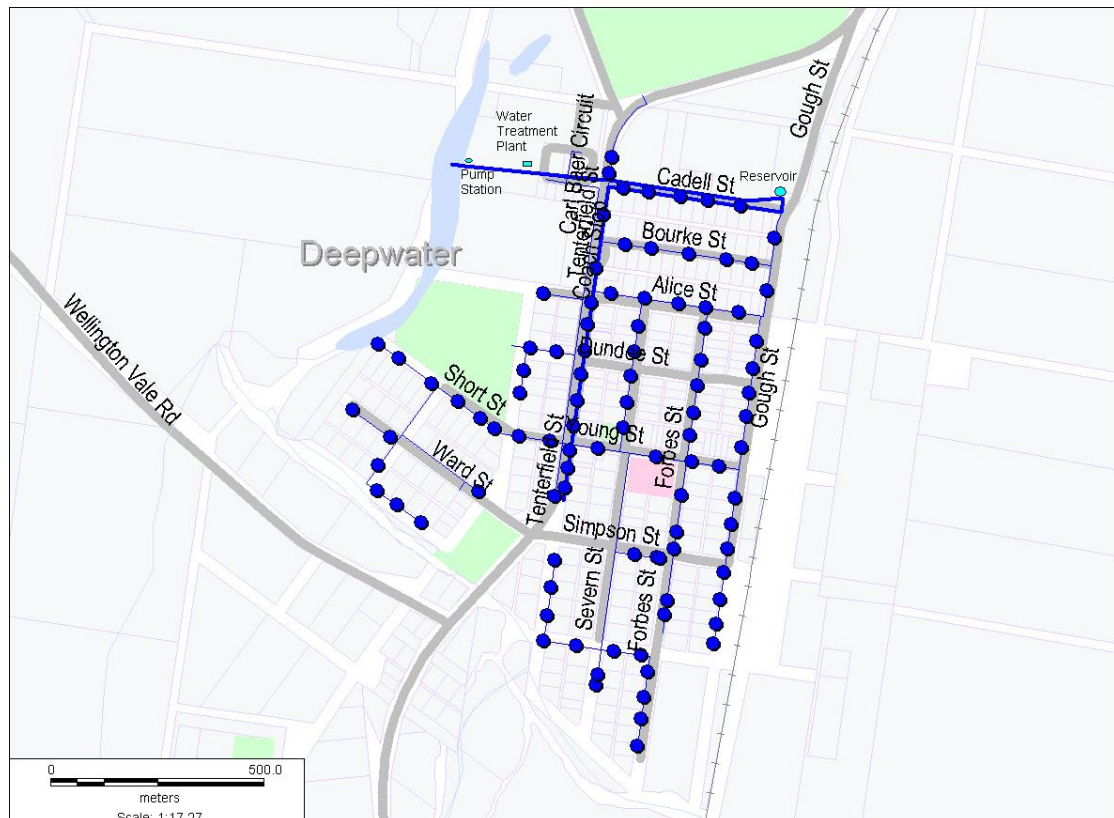


Figure 2-2 - Deepwater Existing Water Supply System

### 2.1.3 Other Villages

Emmaville, Red Range, Glencoe, Wellingrove, Dundee and Tent Hill have no reticulated water supply system.



## **2.2 Drought History**

### **2.2.1 Glen Innes**

In 2014, the Beardy Waters Weir dropped to 1200mm below top water level at which stage level 5 water restrictions were imposed, allowing only bucket watering of gardens. Restrictions were in place for 145 days due to drought.

Major periods of water restrictions have been implemented in the following years:

- 2014 – severe water restrictions 145 days;
- 2005 – severe water restrictions 90 days;
- 1995 – severe water restrictions 94 days;
- 1994 – severe water restrictions for 146 days;
- 1993 – severe water restrictions for 49 days;
- 1992; 1990; 1989; and 1985 – drought years where water restrictions were applied.

The Beardy Waters Weir was increased to its current storage capacity in 1987.

### **2.2.2 Deepwater**

The following restrictions have been enforced for the Deepwater area, however it should be noted that the Deepwater weir was constructed in 1994/5, alleviating the village's immediate water shortage problems:

- 2003– water restrictions for approximately 73 days;
- 2002 – water restrictions - October;
- 1995 – water restrictions for approximately 70 days;
- 1994 – severe water shortage and water was pumped from deep holes within the common area of the river upstream of Deepwater in order to replenish supply for the villages immediate needs;
- 1993 – water restrictions for approximately 57 days;
- 1992 – water restrictions for approximately 35 days;
- 1991 – water restrictions for approximately 48 days;
- 1990 – water restrictions – December;
- 1987 – water restrictions for approximately 150 days;
- 1986 – water restrictions for approximately 130 days;
- 1984 – water restrictions for approximately 47 days;
- 1983 – water restrictions for approximately 56 days;
- 1980 – water restrictions for approximately 112 days;

## **3.0 OBJECTIVES**

### **3.1 Key Objectives**

To maintain necessary restricted water supply to all consumers, with consideration of the associated risks:

- Economic:
  - Water dependent industries;
  - Cost of new infrastructure to secure water sources;
  - Cost of water cartage;
  - Exposure to fire;
  - Reduced income during water restrictions due to users pays policy.
- Infrastructure:
  - Exposure of infrastructure due to low water levels;
  - Effects on parks and gardens;
  - Effect on Council works programme;
  - System leakage and pressure.
- Environmental:
  - Water Quality;
  - Disease;
- Social:
  - Education of the community of water saving initiatives;
  - Confrontation and conflict from consumers i.e. loss of business etc.;
  - Mental and physical stress within the community.

### **3.2 Strategic Planning**

Glen Innes and Deepwater townships have been considered separately when comprising the Drought Management Action Plans to ensure their relevance to their water supply area.

### **3.3 Implementation**

The purpose of a Drought Management Plan is to ensure that the community does not completely run out of water in any circumstance, for example climate change and unknown future impacts relating to those changes. Implementation of the Drought Management Action Plans and associated water restrictions are vital to reduce this risk for Council and the community.

## **4.0 DATA**

### **4.1 Existing Consumers**

- Residential:
  - Glen Innes 6,800
  - Deepwater 400
- Commercial;
- Hospital;
- Schools;
- Sale Yard;
- Nurseries;
- Retirement Homes;
- Sports Grounds;
- Licensed Club;
- Ready Mixed Concrete;
- Steel Fabricators.

### **4.2 Others seeking water in times of drought**

Properties adjacent to Beardy Waters within the catchment area with permission to draw under harvestable rights

Rural Properties – town water supply cartage

Potential businesses that may require exemptions to water restrictions during drought include, but not limited to the following:

- Horticulture;
- Funeral Homes;
- Butchers;
- Kennels;
- Car detailers;
- Saleyards

### **4.3 Water Requirements**

Normal potable water usage for the Glen Innes Township is estimated at 2 ML/day. Minimum volume potable water required for household use is in the order of 130 L/person/day, this equates to approximately 0.91 ML/day for an estimated peak population of 7,000 persons. The largest maximum day recorded is 6.5 ML/day. The minimum daily recorded water consumption in recent years is 1.0 ML. This indicates that there are some non-essential (or non-potable) uses of water during times of severe restrictions. Deepwater potable water minimum usage is calculated at 43 kL/day. In the village of Emmaville, a non-potable water supply is provided to the school, caravan park and swimming pool.

### **4.4 Water Dependent consumers**

- Nurseries and commercial flower gardens
- Ready Mixed Concrete
- Hospital
- Schools
- Licensed Clubs
- Bowling Green (Glen Innes Bowling Club)

#### 4.5 Water Supply Schemes

The Glen Innes Township is serviced by town water supply and has minimal use of irrigation systems within public parks. The Glen Innes Golf Course is irrigated reusing effluent from the nearby Sewage Treatment Plant (STP). Due to the current grade of effluent produced at the STP, large capital expenditure outlay for pipelines, and relatively high rainfall levels, other areas of the town are not irrigated with effluent.

#### 4.6 Existing Storage

##### 4.6.1 *Beardy Waters Weir*

- Actual storage approximately 488 ML;
- Weir crest 1059.09m AHD;
- Catchment area 227 km<sup>2</sup>;
- Surface Area when full 39 ha.

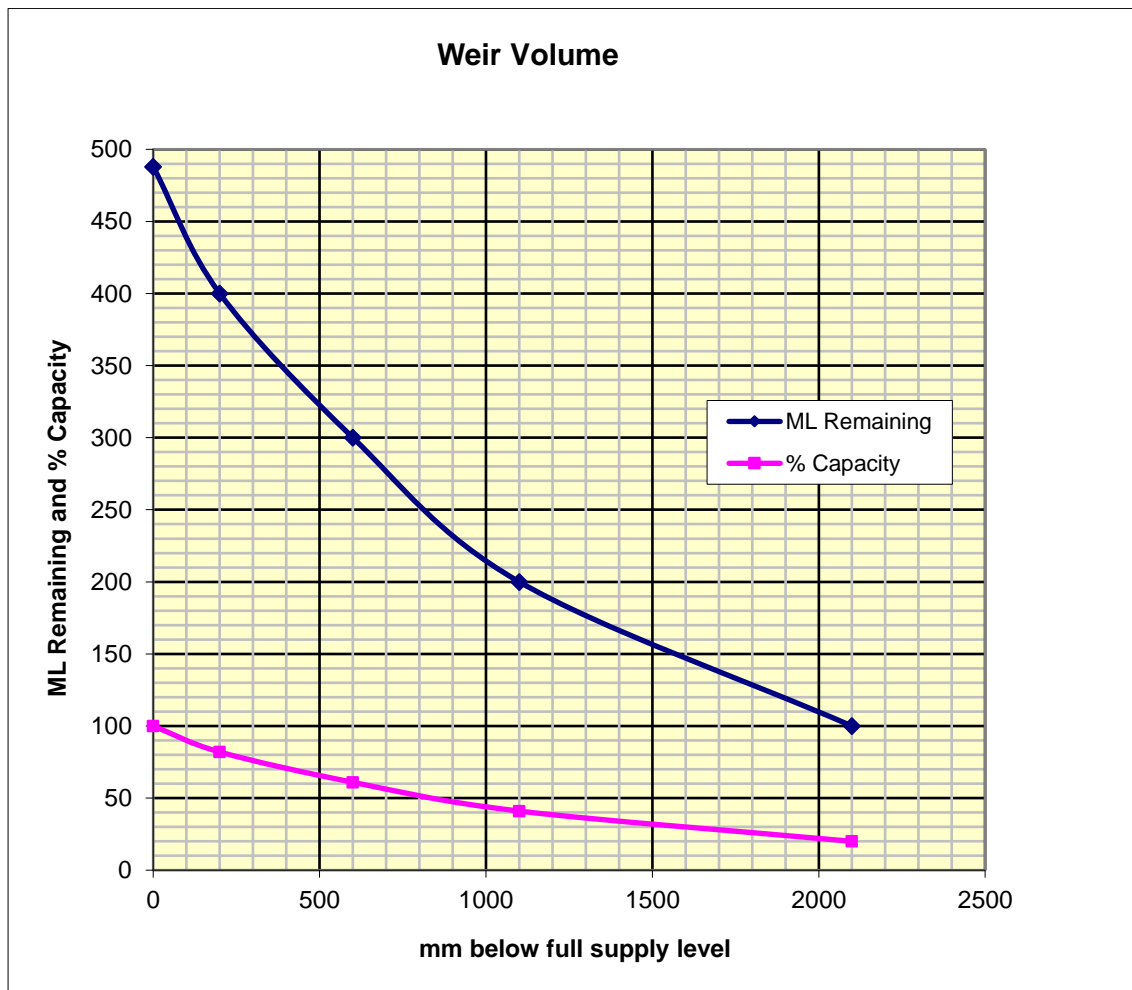


Figure 4-1 Beardy Waters Weir Storage Prediction Graph

##### 4.6.2 *Deepwater Weir*

- Storage volume 62 ML;
- Weir crest 956.8m AHD;
- Catchment area 217 km<sup>2</sup>;
- Surface Area when full 3.4 ha.

#### 4.7 Rainfall and Evaporation

Mean monthly rainfall and daily evaporation for Glen Innes area:

Month	Mean Monthly Rainfall (mm)	Mean Daily Evap. (mm)
January	101	5.5
February	101	4.8
March	78	4.2
April	37	3.2
May	35	2.0
June	35	1.6
July	43	1.7
August	46	2.4
September	55	3.6
October	86	4.4
November	105	5.1
December	106	5.6

## **5.0 DROUGHT MANAGEMENT PLAN**

### **5.1 Demand Management Options**

The following options are discussed in detail throughout this section:

- Restrictions Strategies;
- Alternative Water Sources:
  - Red Range Rd Bore
  - Glen Innes Aggregates Off Stream Storage (Eerindii Ponds)

Ongoing Actions for Council:

- Increase public awareness of water saving initiatives;
- Reduce volumes of unaccounted for water (UFW);
- Review / implement policies / procedures for the following:
  - Implementation of water restrictions (media releases, policing restrictions, authorisation to increase level of restrictions, cartage of water);
  - Blue-green algae outbreak;
  - Emergency response procedures for fire-fighting requirements during major system failure.

## GLEN INNES - DROUGHT MANAGEMENT ACTION PLAN

Level	Trigger	Actions
Ongoing		<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives;</li> <li>• Monitor/minimise unaccounted for water</li> </ul>
<b>1 Low</b>	<ul style="list-style-type: none"> <li>• <b>Beardy Waters Weir at 30%, 1500mm below weir level.</b></li> <li>• <b>Off-Stream Storage 100% both North and South Pits</b></li> <li>• <b>2 Years remaining</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> <li>• Review emergency procedures.</li> <li>• Initiate pumping from Red Range Rd Bores if not already in use</li> <li>• Cease weekly pumping from the Beardy Waters Weir, commence weekly pumping from North Pit to South Pit to maintain South Pit at 90% capacity (180 MI)</li> </ul>
<b>2 Low - Moderate</b>	<ul style="list-style-type: none"> <li>• <b>Eerindii Ponds South Pit 100%</b></li> <li>• <b>North Pit 200MI</b></li> <li>• <b>17 Months remaining</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> <li>• Use alternative water sources (not reticulated) for roadworks.</li> </ul>
<b>3 Moderate</b>	<ul style="list-style-type: none"> <li>• <b>Eerindii Ponds South Pit 100%</b></li> <li>• <b>North Pit 100MI</b></li> <li>• <b>13 Months remaining</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> <li>• Implement construction of New Bore at Off-Stream Storage</li> </ul>
<b>4 Moderate – High</b>	<ul style="list-style-type: none"> <li>• <b>North Pit Depleted</b></li> <li>• <b>Off-Stream Storage contains 200MI in South pit</b></li> <li>• <b>8 Months remaining</b></li> </ul>	<ul style="list-style-type: none"> <li>• Community consultation and increase public awareness of water saving initiatives and current restrictions;</li> </ul>
<b>5 High – Extreme</b>	<ul style="list-style-type: none"> <li>• <b>Off-Stream Storage contains 100MI in South Pit</b></li> <li>• <b>4 months remaining</b></li> <li>• <b>Major System Failure</b></li> <li>• <b>Contamination of Water Supply</b></li> </ul>	<ul style="list-style-type: none"> <li>• Community consultation and increase public awareness of water saving initiatives and current restrictions;</li> </ul>

**Note:** Figures quoting remaining months of supply are average figures. The actual length of time will vary depending on the time of year at which storage levels are falling. For example, seven months remaining water over winter may only be 3 months (or less) over summer.

Average daily water consumption for the 3 year period 2003/04 – 2005/06 are as follows:

July	1553 kl	January	2371 kl
August	1615 kl	February	2180 kl
September	1819 kl	March	2009 kl
October	2128 kl	April	2093 kl
November	2200 kl	May	1965 kl
December	2257 kl	June	1742 kl

## DEEPWATER - DROUGHT MANAGEMENT ACTION PLAN

Level	Trigger	Actions
Ongoing		<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives;</li> <li>•</li> </ul>
<b>1 Low</b>	<ul style="list-style-type: none"> <li>• <b>Weir level 300mm below top water level</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> <li>• Review alternative water source availability;</li> <li>• Review emergency procedures.</li> </ul>
<b>2 Low - Moderate</b>	<ul style="list-style-type: none"> <li>• <b>Weir level 600mm below top water level</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> </ul>
<b>3 Moderate</b>	<ul style="list-style-type: none"> <li>• <b>Weir level 800mm below top water level</b></li> </ul>	<ul style="list-style-type: none"> <li>• Increase public awareness of water saving initiatives and current restrictions;</li> </ul>
<b>4 Moderate – High</b>	<ul style="list-style-type: none"> <li>• <b>Weir level 1000mm below top water level</b></li> </ul>	<ul style="list-style-type: none"> <li>• Community consultation and increase public awareness of water saving initiatives and current restrictions;</li> <li>• Initiate procedures for water from alternative sources.</li> </ul>
<b>5 Extreme</b>	<ul style="list-style-type: none"> <li>• <b>Weir level 1500mm below top water level</b></li> <li>• <b>or</b></li> <li>• <b>MAJOR SYSTEM FAILURE</b></li> <li>• <b>CONTAMINATION OF WATER SUPPLY</b></li> </ul>	<ul style="list-style-type: none"> <li>• Community consultation and increase public awareness of water saving initiatives and current restrictions;</li> <li>• Implement emergency fire-fighting procedures:</li> <li>• Water carted in from Glen Innes or best available source</li> </ul>



## 5.2 Restriction Strategies

Restriction Level	1	2	3	4	5
<b>DOMESTIC</b>					
<b>Garden Watering</b>	Sprinklers 2hrs/d *	Hand Held Hose or Drippers 2hrs/d	Buckets restricted to 2hrs/d	No watering	No Watering
<b>Swimming Pools Private</b>	Hose can only be used for 2hrs/d	Permit required for filling pools over 2,000l	No filling of pools over 2,000l. Top up only with buckets for 2hrs/d	Filling & topping up of pools prohibited	Filling & topping up of pools prohibited
<b>Wash paved areas and roof</b>	Hose can be used for 2hrs/d	Buckets only except as required by law	Buckets only except as required by law	Banned only except as required by law	Banned only except as required by law
<b>PUBLIC / COMMERCIAL</b>					
<b>Public Gardens</b>	Sprinklers 2hrs/d *	Sprinklers 1hr/d #	Hand Held hoses 2hrs/d *	Hand Held hoses 1hr/d #	Reused water only
<b>Sports Grounds</b>	Sprinklers 2hrs/d *	Sprinklers 1hr/d #	Hand Held hoses 2hrs/d *	Hand Held hoses 1hr/d #	Reused water only
<b>Market Gardens and Orchards Nurseries and Commercial Flower Gardens Washing Motor Vehicles</b>	Sprinklers 6hrs/d \$	Sprinklers 6hrs/d \$	Sprinklers 4hrs/d +	Sprinklers 4hrs/d +	With council permit only
<b>Bowling Greens</b>	Sprinklers 2hrs/d *	Sprinklers 1hr/d #	Hand Held hoses 4hrs/d +	Hand Held hoses 2hrs/d *	With Council permit only
<b>Fountains</b>	No Restrictions	Hose only to be used for 2hrs/d	Manual buckets only Machine recirculation only	Manual buckets only Machine recirculation only	Banned only except as required by law
<b>Household Water Cartage from Town Water Supply Automatic flush Toilets</b>	Sprinklers 2hrs/d *	Sprinklers 1hr/d #	Hand Held hoses 2hrs/d *	Hand Held hoses 1hr/d #	Reused water only
<b>INDUSTRIAL</b>					
<b>Ready Mixed Concrete Others</b>	Hose can only be used for 2hrs/d	Topping up prohibited	Banned	Banned	Banned
	No Restrictions	No Restrictions	No Restriction	No Restriction	With Council permit only
	No Restrictions	No Restrictions	Banned	Banned	Banned
	No Restrictions	No Restrictions	With Council Permit Only	With Council Permit Only	With Council Permit Only
	No Restrictions	No Restrictions	With Council Permit Only	With Council Permit Only	With Council Permit only

\* between 6-8 pm

# between 6-7 pm

+ between 6-8 am & 6-8 pm

\$ between 6-9 am & 6-9 pm

## 5.3 Alternative Water Sources

The most likely reliable option for alternate water supply in times of severe drought is the development of an additional bore field on the western side of Glen Innes.

The primary alternative source for Deepwater is to truck water from the Glen Innes supply.

## 5.4 Water Cartage Options

Water may be available from sources including water holes, brick pits, private dams and old mine sites.

Treated effluent from the Glen Innes Sewerage Treatment Works may be a source of water for fire-fighting, roadworks and emergency watering of public gardens to prevent losses.

### **5.5 Legislation, Laws and Council Policies**

- NSW Local Government Act 1993;
- NSW Water Management Act 2000;
- Australian Drinking Water Guidelines 2011.

### **5.6 Related Documentation and Sources**

- SKM (2005), *Glen Innes Water Supply Preliminary Hydrogeological Assessment for a Potential Groundwater Supply*.
- Department of Energy, Utilities and Sustainability (2004), *Best Practice Management of Water Supply and Sewerage Guidelines*.
- Water Directorate (2003), *Drought Management Guidelines*.
- Department of Public Works and Services (1997), *Glen Innes Water Supply Headworks Strategy Report 96078*.
- Department of Public Works and Services (1996), *Glen Innes Water Supply Augmentation Yield Study DPWS96076*.
- National Health and Medical Research Council (2011), *Australian Drinking Water Guidelines Version 3.4 Updated October 2017*

### **5.7 Stakeholder Impacts**

Consideration should be given to the impact any drought management strategies will have on:

- o businesses
- o residential customers
- o emergency services including aerial firefighting operations

### **5.8 Environmental Impacts**

Under the current arrangements environmental flows are not required from either the Beardy Waters or Deepwater River Weir.

### **5.9 Resources**

- Council staff:
  - o Enforce water restrictions;
  - o Daily monitoring of water supply status;
  - o Media releases;
  - o Approvals for water restrictions, and associated co-ordination;
  - o Assessment of water restriction exemption applications;
  - o Investigations into alternative water supply sources.
- Additional contract staff may be required;
- Emergency water cartage operator for intra-town supplies and fire-fighting support.

### **5.10 Associated Costs**

- Administration;
- Media releases;
- Inspections for policing of water restrictions;
- Pumping costs;
- Monitoring;

- Water cartage;
- Water quality;
- Potential new infrastructure to secure water supply.

## **6.0 MONITORING DURING DROUGHT**

### **6.1 Water Supply Sources**

Levels in the Beardy Waters Weir and Deepwater Weir will be monitored daily during times of drought to ensure due planning if water restrictions are to be increased / decreased to the next level, refer to Section 5.0.

### **6.2 Restriction Impacts**

Town water consumption is to be monitored daily in conjunction with an assessment of the impacts current water restrictions are having.

Enforcement of restrictions may be required through Council staff patrols and implementation of policies for warnings / fines for property owners / businesses found breaching the current restrictions.

### **6.3 Water Quality**

Continuous testing and monitoring of the water quality is required to ensure its acceptance for human consumption, refer to *Australian Drinking Water Guidelines*.

It is the responsibility of Council to alert consumers if the town water supply becomes unfit for human consumption.

### **6.4 Sewage System**

During periods of restricted water usage the towns sewage system will be closely monitored to ensure early detection of low flow problems i.e. blockages, odours etc.

## **7.0 CONSULTATION**

### **7.1 Public Awareness**

The announcement of water restrictions will be advertised through the following Media avenues:

- Newspapers Glen Innes Examiner;
- On line Council's web page and Facebook page
- Radio 2NZ, Gem FM;
- Letter box drop (Restriction Levels 4 and 5 only)

All media announcements should clearly state the level and details of water restrictions to be imposed and the date restrictions commence / cease.

Public awareness should be raised of the current water shortage situation, critical Dam levels etc. and be advised on water saving initiatives.

### **7.2 Government Agencies**

Regular update reports to be issued to the NSW Department of Primary Industries (Water).

## **8.0 OPERATION OF DROUGHT MANAGEMENT PLAN**

### **8.1 Impacts**

In order for Council to assess the effectiveness of this Drought Management Plan, detailed records must be kept of all future drought events. Information collated should include, but not be limited to the following:

- Demands;
- Dam levels;
- Water Quality;
- Rainfall and evaporation;
- Dates for each level of water restrictions;
- Breaches of water restrictions;
- Leaks / breaks;
- Impacts of restrictions on consumption;
- Operational problems due to low flows i.e. sewage blockages, odour etc.

### **8.2 Procedures**

Procedures are to be developed for the following:

- Implementation of water restrictions (media releases, policing restrictions, authorisation to increase level of restrictions, cartage of water);
- Blue-green algae outbreak;
- Emergency response procedures for fire-fighting requirements during major system failure.

### **8.3 Review**

This Drought Management Plan will be reviewed following any drought event. Any amendments required to procedures, policies and actions plan would be undertaken at this time.

Notwithstanding this the Drought Management Plan will be reviewed every three (3) years or following significant changes within the water supply system for Glen Innes or Deepwater.