

# DETHRIDGE WHEEL

T.BAINTAMILSELVAN,BE,MBA.,

Upper Vellar Sub-Basin

I have visited Australia on a study tour arranged by TN IAMWARM project from 24-02-2007 to 10-03-2007. During my visit I have seen **Dethridge wheel** which is used to measure water flow in a distributary channel. By the use of this flow measurement device the volume of water used by the farmer for a particular field is measured and the water charges has been collected, in the previous year. Now the same water flow is measured by computerized shutters by canal Automation and water charges are collected accordingly. The canal Automation is very costlier and need so much safty measures including yearly maintainence also. But the **Dethridge wheel** is a cheaper water measuring device and with out any yearly maintaince charges and hence, it can be adopted for developing countries like India.



The same type of **Dethridge wheel** has been manufactured at salem in Tamilnadu State, India and erected in Kariyakovil Reservoier project, Left main canal, Right side distributary to measure the water flow.

**About the Dethridge wheel in KKR Dam in Upper Vellar Sub Basin (KKRP Site) Salem, Tamil nadu, India.**

Loction : Upper Vellar sub Basin, Salem

Kariyakovil Reservoier project, Left Maincanal, Rightside distributary.

Diameter of the Drum : 100 cm

Blade Depth : 23 Cm

Material used ( For wheel ) : Steel plate ( 16 Gauge )

Material used (for measuring device) : Nylon Plastic Gear wheels

Volume of water discharge : : 360 litre / Rotation or 0.36 m<sup>3</sup> / Rotation

Total Cost : > Rs.10,000/-

Accuracy :  $\pm$  10%

Findings : It is more accurate in small distributaries where the water flow  
is slow and steady.

Reference :

[www.murrayirrigation.com.au](http://www.murrayirrigation.com.au)

[www.powerhousemuseum.com/collection/database/?irn=167968](http://www.powerhousemuseum.com/collection/database/?irn=167968)

Theory and practice of irrigation by A.M.MICKEL

Water Management by Thiruvengadam.

## **About the Dethridge wheel in Australia.**

The **Dethridge wheel** is used throughout [Australia](#) and in many other countries, including the [United States](#), [Israel](#) and in [Africa](#), to measure the flow of water delivered to [farms](#) for [irrigation](#).

The wheel consists of a drum on an axle, with eight v-shaped vanes fixed to the outside. It sits laterally across a channel and is turned by water flow. The revolving wheel measures flow from the irrigation supply channels into the farm channels, providing the basis upon which irrigation farmers are charged for water. Wheels generally last for 15 to 20 years, and the axle is replaced every 5 years.<sup>[1]</sup>

The wheel was invented by John Dethridge in Australia in 1910. Dethridge was then commissioner of the [Victorian State Rivers and Water Supply Commission](#)

### **Technology in Australia 1788-1988**

As the area under irrigation increased, landowners developed a better understanding of the Australian climate and the water needs of different forms of agriculture. The concurrent increase in the assessment of the country's water resources indicated that there were significant limits to the exploitation of these resources. All these factors pointed to the need for measuring the volumes of water delivered to individual farms. This need was satisfied by the development in 1910 of the Dethridge Meter, (Fig. 6) a simple flow measuring device characterised by integration of total discharge, accuracy over a wide range of discharge, low head loss, robust and simple construction, ease of maintenance and relatively low cost. The Dethridge Meter has been progressively improved over a number of years with the use of new materials and construction techniques and the introduction of features aimed at eliminating interference by landowners, but the essential elements of the original hydraulic design were virtually unchanged. The meter delivers up to 12 ML/d within an overall accuracy of  $\pm 3$  per cent.

### **6 (above) Dethridge -Meter Wheel (below) Dethridge -Long Meter Wheel**

In recent times higher flow rates and lower head losses have been required for supply to improved farm layouts using land forming controlled by laser levelling. The hydraulic concept of the meter was reassessed and significantly improved through design complemented by hydraulic testing, to give increased flow rates up to 21 ML/d, still with high accuracy. The wheel vane shape and number of vanes and emplacement floor shape had been modified for the revised Dethridge-Long Meter. The Dethridge wheel is used throughout Australia and in many other countries including U.S.A., Israel and Africa.

## Description

Water meter, Dethridge wheel, steel, used by Murrumbidgee Irrigation Pty Ltd, Australia, 1990.

The wheel consists of a drum around an axle with 4 spokes originating from each end of the axle. Eight v-shaped vanes are fixed to the outside of the drum. Some of them are bent on the edges, as a result of use. Shaft on which wheel turns is broken at one end.

### include information about the design, manufacture and marketing of an object. Production notes

The original Dethridge wheel was designed by John Dethridge in 1910.

This particular Dethridge wheel was made in Griffith NSW from parts that were fabricated in Leeton, NSW.

This wheel would have been made in 1990. The life of a wheel is generally 15 to 20 years. Normally the axle is replaced every 5 years.

### include facts about what has happened to an object since manufacture. This could include who owned it and how it was used (provenance). It may also describe any cultural meanings with which it may have become associated. History notes

This wheel was used on a horticultural farm near Griffith, NSW.

Murrumbidgee Irrigation Ltd replaced the wheel with an electronic water meter on the farm.

## Acquisition credit line

gift of Murrumbidgee Irrigation Pty Ltd

## Marks

none

The of an object is a unique identifying number applied by the museum at the point of acquisition. Current numbering format comprises the year of acquisition, followed by a sequential number. For example, '2007/45' is the Registration Number that represents the 45th acquisition in the year 2007.

## Registration number

99/97/1

**Production date**

1990

**Depth**

610 mm

**Diameter**

1290 mm

**99/97/1 Water meter, Dethridge wheel, steel, used by Murrumbidgee Irrigation Pty Ltd, Australia, 1990.**