

REPORT ON **MELTON WATER SUPPLY CATCHMENT**

On 4/8/61, the Shire of Melton applied to the Authority for proclamation of the catchment to a proposed town water supply reservoir on the Djerriwarrh Creek, west of Toolern Vale. Since then, a Melton Waterworks Trust has been formed, and the work on the new dam is to start during this year.

The following report aims to provide information required by the LUAC and Authority for consideration of the areas as a proclaimed catchment. It is accompanied by SCA Catchment Plan No. 1116. No name has yet been given to the catchment, as the name 'Melton' is likely to create confusion with the catchment to the existing Melton Reservoir (Exford Weir) on the Werribee River. The Trust has indicated that a decision on a name will be made in June.

GENERAL DESCRIPTION

The Reservoir Site. The new dam is situated on the Djerriwarrh Creek approximately one mile north of the Bacchus Marsh-Toolern Vale Road. The elevation above sea level of the creek bed at the dam site is approximately 670 ft, with the proposed full supply level at 700 ft. The storage capacity will be approximately 5000 acre feet.

- (i) Relation to SCA Districts. The Catchment covers parts of three districts. The Parish of Gisborne is part of the Central District; the Parish of Yangardook is part of the Yarra District and the Parishes of Bullengarook and Coimadai are part of the Moorarbool District. The main problems in the catchments are within the Yarra and Moorarbool Districts, and would also concern the Shires of Melton and Bacchus Marsh.
- (ii) Size. The catchment covers 10 square miles, of which approximately 5.5 square miles is alienated land. It is a relatively narrow area, being two miles wide at the widest point, and seven miles long. The most northerly point in Mount Gisborne at an elevation of 2109 ft.
- (iii) Physiography. The physiography of the area is determined by the presence of a fault line known as the Gisborne Fault, which in early Tertiary times produced a raised block of land to the north (Gisborne Highlands) and the sunken block to the south, which is part of the Port Phillip Sunkland.

Djerriwarrh Creek is the only main stream down to the reservoir site, where it is joined by its first significant tributary named Hughes Creek within ¼ mile of the dam site. Thus this creek is similar to two related creeks to the west, Coimadai and Goodman's Creeks. The Trust's consulting engineer, Mr J B K Ley, has indicated that ultimately water from these adjoining catchments may be brought into the reservoir by diversion channels if the growth of Melton requires additional water.

- (iv) Geology and Topography. The catchment is based on two main formations. The Mount Gisborne area of approximately 1½ square miles from the edge of the extensive Newer Basalt plain stretching to the north and west. The land then falls away very sharply to the south, where the bedrock consists of Ordovician sandstones and slates. A deposit of Miocene sediments, limited in extent, is found east of the reservoir site in the Hughes Creek area.

The topography is rolling in the northern part, but becomes hilly to steep as soon as the drainage lines flow into the sedimentary country. Slopes vary between 20% and 50%. The gradients within the drainage lines are mostly above 10%. Djerriwarrh Creek levels off to a more gentle gradient halfway through the catchment, but the slopes on both sides are steep throughout. Such slopes combined with very poor soils and stony areas, make the Djerriwarrh Creek a potential "flash flow" stream.

- (v) *Climate.* The catchment has a fairly even gradient of mean annual rainfall from the north to the south. Mount Gisborne has a probable rainfall to 26 inches (related to Gisborne, 28.6 inches), while the southern part probably receives a mean annual fall of about 22 inches (related to Toolern Vale 24.7 inches). The lower part of the catchment appears to be affected by the rain shadow effect which follows the foothills and plains below the highlands. Thus Melton, five miles to the south, has a mean annual fall of 18.9 inches.

The northern part of the catchment thus has a longer growing period with more reliable rainfall, but also greater extremes of temperature. Occasional heavy summer thunderstorms appear to affect the southern parts.

- (vi) *Soils and Vegetation.* The soils on the basalt area in the north are the most stable type in the catchment, and consist of brown clay loams with heavy greyish clay subsoil. The land on these soils is all cleared and developed for pastures and fodder cropping, with cattle and sheep being grazed. Because of significant slopes throughout this area, runoff is probably rapid but only isolated instances of shallow scours are seen.

The soils in the remaining part of the catchment are shallow, very poor yellow solodics with considerable amounts of quartz on the surface. In many steep places the soil is virtually absent or skeletal. Soils on the upper slopes are tunnel-prone, and on the lower more gentle slopes and flats gullying has resulted. Approximately 4.6 square miles of the poorest country is State Forest, under a low quality cover of stringybarks, red box and ironbark. There is very little timber in the area above firewood standard, though there is some improvement in the cover in the Hughes Creek area. Over most forested parts, trees are accompanied by scrubby undergrowth and very sparse tussock grass.

In the Hughes Creek sub-catchment, slopes are less severe and the valley is broader, allowing some farming in the better soils. A little cropping, mainly oats and barley, is done on the flatter land near the creek. Pastures are mostly unimproved and ground cover could be improved considerably. There are some small dams for watering stock.

LAND-USE PROBLEMS

The main problems in the catchment relate to gravel-stripped areas near the reservoir site, and the eroded, run-down condition of the hillslopes and drainage lines particularly in the cleared Hughes Creek area. These are all active contributors of silt and excessive runoff. Creek bank erosion is also active in Djerriwarrh Creek but will mostly be covered by the stored water.

- (a) *Gravel Stripping.* This has been practised for many years, particularly on allotment 79H, parish of Yangardook, and on allotments 21E1, 21L and other allotments to the west in parish of Coimadai. These areas have been stripped indiscriminately, and left in completely bare condition without any effort to prevent channelling of runoff water down slopes. The only cover is now isolated coppice growth from stumps. Rilling is active and badly placed tracks also feed silt-laden runoff to the creek. The consulting engineer, Mr Ley, has indicated that a part of this stripped area may be used for the supply of fill material for the dam wall.

Although it will be difficult to re-establish any sort of protective cover quickly, it is important that runoff from these areas should be controlled or regulated as soon as possible. Contour ripping and graded banks are recommended. In some places it may be possible to divert water out of the catchment towards suitable disposable places. This would remove a small amount of water from the catchment, but it would be insignificant, and may enable better protection of the slopes into the reservoir. Chisel ploughing and seeding will probably not be possible anywhere because of the gravelly conditions. Many of the steeper portions should be planted with native trees as soon as practicable. Ultimately all this land adjoining the reservoir should be returned to forest cover and treated as protective forest.

- (b) *Erosion in the Hughes Creek Sub-Catchment.* The main contribution of silt from this area is from erosion within the creek line and on the side of the road running parallel to the gully down to the dam site. The surrounding allotments, particularly number 78, 79 and 79b are

under poor grass cover. On allotment 79b this amounts to little more than isolated tussocks with some coppice growth from tree stumps where the land has been only partially cleared.

Some improvement of this sub-catchment is possible, though its potential for greater production is limited by the low fertility of the soil. Suggested practices are chisel ploughing and seeding of improved pasture species. *Phalaris tuberosa* should be introduced to the area. Ripping is necessary in tunnelled and sheet-eroded areas. A number of diversion banks and possibly a grassed waterway could be planned in conjunction with placing of some gully-head structures. Additional culverts would require box inlet structures to prevent heading back or undercutting at the road. In one instance, an active gully head could be converted into a grassed chute similar to the arrangement at the Authority's Pentland Hills Project. There are also good sites for silt traps. Tree planting should also be considered in a number of places, where fencing would need to be supplied.

- (c) *Bank Erosion in Djerriwarrh Creek.* There is severe bank erosion on the flats in the southern part of the catchment. Probably most of these flats will be submerged, but where this does not apply, some stone-in-mesh groyne work may be necessary on the bends.
- (d) *Method of Approach by Soil Conservation Authority.* It is felt that a considerable amount of assistance will be necessary to achieve the suggested treatments. There is unlikely to be much spontaneous support from the few local landholders concerned. The structural work would be partly the responsibility of the Shire concerned, in this case Melton, and partly on private property. Some of this work may require handling by the Authority similarly to engineering works in the Eppalock Catchment, if it is to be achieved at all. Possibly some assistance on a share basis could also be given for chisel ploughing. The amount of assistance required would not be very great, involving structural and non-productive work on an area of between 400 and 500 acres of agricultural land, and on approximately 100 acres of gravel-stripped land. Some fencing would be required.

RECOMMENDATIONS

1. The Catchment to the new Melton Water Supply Reservoir should be proclaimed as a water supply catchment and a land-use determination be made.
2. A more precise survey should be made in conjunction with further field work to assess the amount of earthworks and structural work necessary. This should be done particularly by the District Conservation Officers for Moorabool and Yarra, in whose districts the main erosion sites are to be found.
3. Gravel-stripping should be prohibited in the catchment.

(W R Rothols)

Investigations Officer