The Great Artesian Basin sustainability initiative—bore drain replacement (piping)

The Great Artesian Basin Sustainability Initiative (GABSI) provides funding for approved projects that focus on bore rehabilitation and the replacement of bore drains with piped reticulation systems. This fact sheet describes piped reticulation systems and the planning, design and installation considerations necessary for a successful project.

Once a GABSI application has been successful in the application stage, the next step is to prepare a property plan. A property plan includes the layout of pipelines and water point and identifies natural resource management issues.

Preparing a property plan

A property plan is prepared by all landholders involved in a scheme, with assistance from Department of Natural Resources and Water (NRW) staff. The plan identifies property boundaries, paddocks, land types, bore drains, pipeline routes and watering points. The location of pipe lines and watering points are planned after considering the following factors:

- detailed maximum stock numbers for each paddock
- location of watering points to avoid degradable soils and threatened and endangered ecosystems, and to consider shade, proximity to fences and wind direction.
- planning for future infrastructure e.g. stockyards and paddocks
- neighbouring properties requiring access to water supplies
- the needs of both Aboriginal and non-Aboriginal cultural heritage areas.

Design of the system

When the engineers design the system:

- The pipe sizes chosen will depend on the bore pressure, flow required now and in the future, stock demand and the distance serviced by the pipeline.
- The maximum number of stock run in a paddock at one time determines tank sizes and numbers. These storages are designed to provide water during peak demand periods over a day e.g. as a back up water supply
- Cooling of the water may be required. If the water temperature is greater than 50°C then it must be cooled in a cooling pond before entering the polyethylene pipes. The size of pond required will depend on the water temperature, stock demand and flow rate.
- Natural gases in the bore and air in the pipeline will need to be removed to ensure continuity of water flow. Double acting air valves may be used in this situation to remove air and gas.
- Pipelines need not follow the course of the bore drain. It may be more economical and practical to run the pipes away from the bore drains.
- Before piping is undertaken, there must be complete agreement by all land owners receiving water from the drain.

What part of the design does not attract a GABSI subsidy?

The GABSI project aims to water the same area and stock numbers as watered by the bore drains. As a result of this policy, some design conditions are not eligible for a GABSI subsidy. These include:

1. Watering points located in paddocks that are not currently watered by the bore drains.
2. Watering points placed further than 2 km from the current bore drains.
3. Increase in pipe sizes to allow for future pipe extensions.
4. Rotational grazing.

Clearing and installation

When clearing lines in preparation for the final survey, it is important to clear only in the locations and to the width indicated on the Development Permit Plan for Vegetation Clearing (usually between 7 and 10 metres, depending on the type of vegetation).

When installing the pipeline, consideration needs to be given to the machinery required. This can include dozer, grader, front-end loader, truck and tractor.

The pipe laying technique also depends on the machinery used and if required, additional laying equipment is available for hire from the department.

Pipelines are usually laid 600 mm (24 inches) deep, depending on the soil type.

Tanks are normally located close to a watering trough and should have enough capacity to supply water for a minimum of two days.

Rehabilitation of drains

The design of the water distribution system should consider the rehabilitation of the existing bore drains and adjacent areas. Also, the disturbed area around the pipeline routes may require remedial work.

Even after the pipes have been installed the bore drains still have the capability of contributing to land degradation e.g. erosion, weed infestation, feral animals. Rehabilitating bore drain routes can minimise these problems and assist with the re-establishment of pastures.

Bore drains are susceptible to erosion because they may interrupt and concentrate overland flow. It may be necessary to backfill drains or construct low earth banks across them to minimise these problems and to assist in the natural silting up process.

To prevent scouring along the pipeline route, it may be necessary to construct low earth banks. Some areas of particular concern may need to be fenced to allow rehabilitation without disturbance from stock.

Financial considerations

- Landholders will meet 25% of the cost for the survey, design, materials and supervision components in the Warrego and Surat zones, and 30% of the cost in all other management zones. In addition, installation costs of the piping schemes are at full cost to the landholder.
- An ‘up front’ deposit equal to one half of the estimated monetary contribution for materials plus the cost of any unsubsidised works is required before installation commences.
- Financial assistance is available through various other agencies including Queensland Rural Adjustment Authority and the Australian Tax Office.

For more information on financial assistance, contact your local NRW office.

Further information

The GABSI video is available and contains useful information and advice on planning, design and installation of pipeline systems.

For further information on GABSI or on other fact sheets, please contact your local NRW office.

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