

PART E - TECHNICAL SPECIFICATION

E1. DESCRIPTION OF THE WORKS

E1.1 Background

The Warragamba Pipeline consists of two pipelines, which carry water from Warragamba Dam through to Prospect Reservoir via a corridor of land owned by the SCA.

Due to the undulations of the land, the pipelines run above the ground, partially below the ground (in cuttings) and in some situations completely below the ground.

The corridor, from Warragamba Dam through to Prospect Reservoir, is crossed by a number of main roads, which are controlled by the Roads & Traffic Authority (RTA). The crossing roads divide the pipeline up into sections and can be used as reference points. For example:

- Warragamba Dam to Nepean river (Cross connection #1)
- Cross Connection #1 (Nepean River) to Mulgoa Road section
- Mulgoa Road to Vincent Road section
- Vincent Road to Garden Hill Road section
- Garden Hill Road to Littlefields Road section
- Littlefields Road to Northern Road section
- Northern Road (Cross Connection #2) to Luddenham Road section
- Luddenham Road to Mamre Road section
- Mamre Road to Old Wallgrove Road section
- Old Wallgrove Road to Wallgrove Road section
- Wallgrove Road section to Ferriers Road (Cross Connection #3) section
- Prospect pumping station grounds and outlet works.

Each section may include (but is not limited to):

- Side boundary fences, which run fully along either side of the outer pipe corridor
- Cross over road frontage fence lines (including gates), which run adjacent with main road and cross over the pipeline. Gates are used to access these sections
- Pipeline(s) and attached assets (e.g. valves, buildings, valve pits, survey concrete pads, compounds, customer off takes etc)
- A private SCA road, which travels between and parallel to the pipelines and runs from the cross over roads at either end of the section. The road is bitumen and/or concrete, with edges either kerbed and guttered or level with the surrounding ground surface.
- Creeks, drains and water courses.
- Poles, signpost, safety guideposts, guardrails, flood level indicators, etc.
- Control valves both major and minor (part of the pipeline)

- Scour valves, attached scour pipelines and valve pits (connected to the bottom of the pipeline and leading to a discharge point)
- Anti-vacuum air valves (located on the top of the pipe at high points)
- Customer off take pipes major or minor in size
- Anchor blocks, where the pipeline changes direction and/or gradient (each block is numbered – lowest number start at the Warragamba Dam end)
- Sill block and footings which support and hold the overall weight of the pipe on the ground
- Sill rings (stiffener rings) which go around the pipe, to both maintain its shape and hold it in place
- Expansion joint, located between two anchor blocks to allow for expansion and contraction of the pipe.
- Cross Connections, connecting pipes between the two pipelines to allow pipeline flows to be directed into the other pipe or stopped in times of shutdowns and dewatering sections.

Note - The structures, off take valves etc associated with the pipeline are identified in the aerial photos found on the CD ROM provided by the SCA.

E1.2 Purpose

The purpose of this Contract is to ensure that the subject site is maintained to a safe and presentable standard. The vegetation is to be maintained to ensure that authorised persons can safely:

- Access the work sites
- Travel between the various sections
- Carry out monitoring and inspections of assets and facilities
- Identify and control problems
- Operate and maintain assets
- Maintain fence lines for security.

E1.3 Specifications

Definitions

Terms defined in this Part E and used in other parts of the Contract have the same meaning as described in this Part E. The terms below have the following meanings:

- i. **'mow'** means the use of a front cut or other style of mower that produces an even neat cut of the subject area to the **specified height which is 50mm**

- ii. **'slash'** means the use of a hand held or tractor mounted cutting implement that produces a course but level cut over the subject area to the **specified height which is 70 – 100 mm**
- iii. **'shrub'** means woody species with trunk and/or branches up to 50mm in diameter
- iv. **'tree'** means woody species with trunk and branches over 50mm in diameter

E1.3.1 Specifications

To assist in the management of vegetation control and maintenance on the pipeline easement, the pipeline easement is divided into different sections. These different sections require different tasks, performance standards and service frequency.

The following are the sections of the pipeline easement:

- **Road Verge** – that area of land between the pipeline easement as defined by the fenceline and public roads for the width of the easement. **These areas are to be mowed.**
- **Entry Area** - that area of the pipeline corridor from the front fenceline to (30) meters into the easement inclusive of any structures, headwalls, cuttings and embankments. **These areas are to be mowed.**
- **Inner Corridor** - that area of the easement lying between the pipelines inclusive of all structures, headwalls, cuttings, embankments, drains, creeks bridges therein. **These areas are to be slashed.**
- **Outer Corridor** – that area of the easement lying between the pipelines and side fences inclusive of all structures, headwalls, cuttings, embankments, drains, creeks bridges therein. **These areas are to be slashed.**
- **Pipelines** – that area of the easement containing the pipelines and associated support structures, valves and customer off takes. **These areas are to be slashed.**

A diagrammatic representation of the identified areas above is attached in F10 - Appendix.

E1.3.1.1 Specific sections where the work is being performed

- **Road Verge**

Outside the SCA front boundary fence line and along the roadway for the width of the easement.

Vegetation is to be maintained to allow authorized personnel:

- a clear and safe view when they enter and leave the pipeline easement safely.
- a clearly view of the pipeline easement and assets, from the main overpass road to check both the site security and/or operational status.



Example Road Verge

- **Entry Area**

From inside the SCA front fence line for a distance of 30mtrs taking in the area between the two-side boundary fence lines.

Vegetation is to be maintained to allow authorized personnel to travel and/or work in the area to:

- check the fence line for security breaches
- check the pipeline and its assets for operational status
- access the pipeline and/or assets to undertake maintenance and repairs



Example Entry Area

- **Inner Corridor**

The area between the pipelines.

To allow authorised personnel to travel and/or work in the area to:

- View the pipeline from the SCA central roadway to check pipe and valve status, leakages and possible problem areas
- allow access to the pipeline and/or assets and/or compounds/buildings, valve chambers etc to allow operational activities to be performed and/or maintenance and repairs to be undertaken



Example of Inner Corridor Area

- **Outer Corridor**

Outside the pipelines between the side boundary fence and the pipes, including the side fence line:

- to allow a clear view of the pipeline and valves from the track near the pipeline
- for checks of the fence line to identify security breaches or repair needs
- to allow a buffer point in bushfire season.
- to allow safe access to the pipeline and/or assets to undertake maintenance and/or repairs and/or operational activities.





Examples of Outer Corridor Areas

- **Pipelines**

Under the pipeline & side embankments to allow:

- a clear view of the pipeline and valves for operational status
- safe access for personnel to carryout maintenance and repairs of the valves and pipeline
- identification of possible safety aspects which may impact on personnel when checking the pipeline or carrying out repairs
- the pipeline and embankment to be protected from overhanging or falling trees





Examples of Under the Pipeline

E1.3.1.2 Acceptable methods of vegetation control

- **Mowing**

Control the vegetation by the use of a mechanical ride on and/or hand (push) mower

- **Whipper snipping** (mechanical control)

Control the vegetation by the use of a whipper snipper to cut grass and other vegetation growing around, along, under and in structure, kerbed gutter, drains, hillsides etc. When whipper snippers are used care is to be taken to minimise damage to the base of tress.

- **Slashing**

Control the vegetation by the use of a tractor with mechanical slasher/mower attachment or hand held brush cutter.

- **Radial Arm slashing/mowing**

Control the vegetation by the use of a tractor with radial arm mechanical slasher/mower attachment

- **Vegetation Poisoning** (chemical control)

The use of poison has to be pre-approved by the Principal's Representative.

- Strip poisoning - Poison applied in a line or circle, to create a poisoned strip no more than 200mm wide under or around or along the object/item. **Where vegetation is growing on a slope and there is a possibility of erosion, poisoning is not to be used.**
- Spot spray poison- Poison applied to individual plants only.

- Foliage or cut stump poison – Poison applied to the foliage (leaves) of the plant to ensure an overall coverage or applied to the cut stump within 20 seconds of it being cut.
- Hand spraying only. No boom sprays are to be used.

NOTE:

1. Spraying is to be performed under no wind conditions and the nozzle of the applicator is to be as close to the point of application area as possible to reduce no selected kills and drift.
2. Only a foliage or systemic herbicide is to be used when poisoning vegetation. Ensure appropriate rates are used where different applications are required. At no time is soil sterilising herbicide to be used.

Clearing access ways

- a) Removal of overhanging shrubs and foliage over the pipes, paths, doors and/or gateways:
 - Cut the foliage by hand cutters or hedge trimmer (approx twice a year)
- b) Mow any grassed area leading up to the entry points (at the same frequency as the surrounding area)
 - Ensure the gate/door will open without being impeded by the vegetation.

NOTE: All cut foliage/branches etc. are to be removed from site and disposed of in accordance with clause E3.

E1.4 Work scope for specific sections

The following section identifies the level of service and/or tasks for the specific locations.

E1.4.1 Control of vegetation growing on road verges

- Collect all rubbish, debris & fallen limbs in the area prior to mowing, all rubbish to be taken off site for appropriate disposal in accordance with clause E3.
- Mow grass to the specified height of 50mm
- Prune lower limbs of trees that obstruct views of impede grounds keeping equipment
- All cut or fallen plant material to be disposed of off site
- Control vegetation around all man made structures, trees & shrubs

E1.4.2 Control of vegetation growing within the entry area

- Collect all rubbish, debris & fallen limbs in the area prior to mowing, all rubbish to be taken off site for appropriate disposal in accordance with clause E3.
- Mow grass to the specified height of 50mm
- Prune lower limbs of trees that obstruct views of impede grounds keeping equipment
- All cut or fallen plant material to be disposed of off site
- Control vegetation around all man made structures, trees & shrubs
- Ensure grass is removed from along fencelines

E1.4.3 Control of vegetation growing within the inner pipe corridor

- Slash grass to the specified height (75 – 100mm)
- Control of vegetation as specified in E1.4.7

E1.4.4 Control of vegetation growing in the outer pipe corridors

- Slash Grass to the specified height (75- 100mm)
 - i) Where the distance from the pipe or top of the embankment to the fence line, is less than or equal to 5 metres then cut any vegetation growing within the whole 5 metres.

OR

- ii) Where the distance from the pipe or top of the embankment to the fence line, is greater than 5 metres then any vegetation (which meet the above criteria) growing within the specified distance, is to be controlled as follows:
 - a. Control the vegetation growing in a strip 2 metres wide out from the pipe or embankment; and
 - b. Another strip inside the fence line. This strip is to be:
 - 2 meters wide (where the area is accessible to a tractor with slasher attachment or mower) **or**
 - At least 1metre wide strip cut in all other places.
 - c. The vegetation left uncut after points a. & b. (above) have been performed, will be slashed (where the terrain allows) at least twice a year during the fire bushfire season (October and January).
 - d. Keep fenceline clear of all fallen trees & foliage

E1.4.5 Control of vegetation growing under the pipeline

- The vegetation growing under the pipeline is to be controlled depending on the type of floor finish, edging and slope of ground.
- This includes all vegetation growing under the pipeline and in between the edges of the sill blocks or kerbed and gutter strips.

E1.4.5.1 Specific area in which the vegetation is to be controlled

There are basically three different ground surface finishes under the pipeline:

1) *Soil and/or rubble surfaces with no sidewalls or kerbed gutters:*

- Normally the surface level under the pipeline is of a similar level to the surrounding ground surface & should be maintained similarly
- The surface under the pipe is subject to erosion, as it has no sidewalls or kerbed gutters to retain the soil, therefore only mechanical controls will be used where the ground surface is uneven

2) *Soil and/or rubble surfaces with sidewalls or kerbed gutters:*

- Either mechanical or chemical control can be used in this situation
- All dead vegetation is to removed from site & disposed of

3) *Kerbed and guttered sides or concrete walls with a concrete base:*

- Remove all vegetation, soil & debris from these areas
- Chemical spraying is the preferred option in this situation

E1.4.6 Control of vegetation growing on the side of embankments or cuttings

- The embankments are of varying lengths, heights and slope
- The banks extend from the top of the sidewall or kerbed gutter, which runs alongside the pipeline, up to the top (where it meets the surrounding flat surface).

E1.4.6.1 Vegetation growing on the embankments and cuttings is to be controlled

- Vegetation is to be controlled (slashed) for a minimum of 3m down the bank or for as far as it is safe to do so depending on location and gradients
- Vegetation is to be controlled (slashed) for the entire length of the bank, wherever the bank is less than 1.5m in height
- All vegetation is to be kept clear of kerbs & sidewalls at the base of any embankment
- No vegetation on an embankment is to be allowed to grow higher than the top of the embankment on which it is growing.

NOTE: The remaining grass vegetation on the sloping embankments is to be left uncut, for both bank stabilization (erosion reduction) and personal safety.

E1.4.6.2 Woody species growing on the side of the embankment is to be controlled to protect the pipeline, paint coating and to maintain bank stability

- Woody shrubs and/or trees growing on the banks are to be:
 - Eradicated by cut down
 - The stump painted/sprayed/treated with herbicide to stop regrowth
- Logs/branches/foliage from the shrubs/trees are be:
 - Removed from the banks
 - Removed off site
 - Disposed of by the Contractor using appropriate approved environmental means

NOTE: Due to increased risk to the pipeline and personnel, any tree with a trunk diameter greater than 150mm will be cut down by a specialist Tree Lopper. Trees are not to be felled onto the pipeline.

E1.4.7 Control of Vegetation within the Pipeline Corridor

E1.4.7.1 Buildings, compounds and above ground valve chambers



Examples of typical structures

- Access to be clear of ground & overhead growth
- Vegetation to be poisoned and / or removed by hand

NOTE: All poisoned vegetation is to be removed after it has died and disposed of, off site using approved environmental means.

E1.4.7.2 Bridges



- All drains on bridges are to be kept clean & clear of silt & vegetation to ensure water flow

E1.4.7.3 Headwalls



Typical small drain headwall

- Headwalls are to be free of any vegetation growing over them so they can be clearly seen and water will drain away.

E1.4.7.4 *Drains and creeks*



Creek with headwall & sidewall



Drain under pipe



Drain from roadway

All vegetative growth within drains and creek beds is to be controlled to:

- Allow a free flow of water within the creek bed or drain
- Minimize the build up of debris and other matter against obstructions e.g. fences
- Clear water passage at scour pipe outlets points
- Clear drains, culverts and pits including those with grated openings of silt and debris

E1.4.7.5 Man made structures within the pipeline corridor

Examples of man made structures include but are not limited to:

- Posts & poles
- Armco railing fences
- Customer water off takes
- Concrete walls & pads
- Ladders & stairways
- Valve pits
- Level Indicators



Power poles, signposts, guide posts etc



Armco railing



Customer off-take pipeline and meter



Concrete survey block



Ladders & stairways



Valve chamber in ground

- Vegetation is to be controlled for at least a distance of 1 metre from each structure
- Heavy rain events make result in debris accumulating on or around structures. This material is to be removed after any such events.

E1.4.7.6 *SCA road located within the above designated area*



Typical SCA concrete roadway (level with surrounding ground level)



Roadway with kerbed gutter (road is below surrounding ground level)

Vegetation growing up to, on and over the SCA roadway is to be managed to ensure:

- No vegetation grows onto the road from the road edges (edges are to be visible for safe driving)
- No vegetation is growing up through the cracks or joins which are in the roadway
- No vegetation is growing over the kerbed gutters onto the roadway

E1.4.8 Security checks on the fence line

The Contractor, when performing the task of cutting the vegetation along the side fence line, shall visibly inspect the fence for any damage or other problem.

- i) Where damage to the fence line is of a minor nature, the Contractor shall:
 - repair the fence that same day as soon as possible to provide as far as practicable adequate security and animal proofing
 - The Contractor will be required to provide the materials (wire and steel star post posts) to carryout the minor repairs.
 - document in the monthly report any repairs carried out, the location and any comment on how the damage may have occurred.
- ii) Where the damage to the fence is major, the Contractor shall:
 - carry out such repairs (that same day) far as practicable adequate security and animal proofing
 - report the damage to the SCA immediately upon discovery
 - document in their monthly report any repairs carried out, the location and any comment on how the damage may have occurred.

NOTE: If the Contractor has caused the fence damage, reinstatement will be at the Contractor's expense.

E1.4.9 Minor civil works & weed control

The Contractor shall carry out minor civil works and weed control on an as-need basis. At the request of the Principal's Representative the Contractor may be asked to perform the following tasks:

i) Clearing drains

- The Contractor shall, on an as-need basis, clear drains of spoil, vegetation, rubble and debris.

ii) Removing rubbish

- The Contractor shall, on an as-need basis, clear up rubbish dumped on site and in gate ways.
- The rubbish is to be removed form site and disposed of at an EPA approved disposal site. The Contractor to provide documentary evidence of such disposal in accordance with clause E3.3.

iii) Weed control

The Contractor shall:

- identify and report on weeds in their monthly report
- control/eradicate weeds when requested by the Principal's Representative
- report on larger infestations of weeds

iv) One off specialist clearing mowing for operational maintenance activities

- The Contractor may be requested by the Principal's Representative to undertake specialist clearing and/or mowing around or up to assets, equipment etc. for operational maintenance activities

E1.5 Assisting the SCA by notifying of problems and incidents

The Contractor, while undertaking the Works, shall notify the SCA immediately of observations of any of the following incidents:

- Water leakages
- Illegal activities/trespassing
- Major breaks in boundary fence lines
- Accidents or incidents, which may involve injury to persons or damage to plant and equipment
- Any other situation or event, which may result in or lead to an incident occurring
- Embankment or ground slippages and/or new erosion areas
- Identify where safety marker post(s) or barricading for obstacles need to be installed to reduce impact on mowing, plant/equipment or danger to personnel
- Identify possible drainage problem areas

E1.6 SCA improvement works

From time to time the SCA may undertake works to clean, regrade, resurface, drain or stabilize headwalls, cuttings, embankments and areas under the pipeline. In the event the SCA does undertake improvement works the Contractor will be responsible for maintaining the subject area to its improved condition eg. areas cleared of silt build up are to be kept clear of silt.

E1.7 General Requirements

- The Contractor shall ensure that all Personnel have the appropriate licences and qualifications to operate plant and equipment and/or undertake specialist tasks
- All staff must be fully trained in the safe use of all chemicals used
- Machinery and equipment used are to be maintained in a safe and efficient manner by the Contractor
- The Contractor must comply at all times with all Statutory and Legislative OHS&R Regulations. All Personnel must be made aware of and practice the same regulations
- All Personnel shall wear identification. Identification should be clearly visible at all times
- All Personnel shall ensure that all gates are locked where necessary