WALLBRIDGE & GILBERT
Consulting Engineers

DISTRIBUTION PIPELINE DESIGN REPORT

WATER PROOFING THE EAST

Prepared For
EASTERN REGION ALIANCE

JOB NO.: WAD130330

REV A

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Document History and Status

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1 INTRODUCTION

As part of the 'Waterproofing the East' Project a piped distribution network will deliver recycled water for irrigation purposes around the Burnside, Norwood Payneham St Peters, and Walkerville council districts.

In order to optimize the distribution network a WaterCAD model was developed allowing for the affects of varying pipe sizes, pump capacities and demands to be simulated.

The required outcomes of the modelling were to assist Council with:

- Selection of pipe and pump sizes;
- Obtaining likely pressure heads at demand points;
- Planning of future network expansions and customer connections.

2 METHODOLOGY

The following methodology was adopted in developing the WaterCAD model:

- Reviewed demands.
- Produced draft distribution pipe network route.
- Discussed route with Council and updated as required.
- Input network to WaterCAD model basing pipe sizes on expected flows.
- Discussed scheduling with Council and identified the critical scheduling event.
- Ran the model noting pressure heads and flows.
- Presented results at a workshop allowing for further Council input.
- Revised the model reflecting Council comments.

3 MODEL ASSUMPTIONS

Through developing the model the following assumptions were made:

- Flow rates ranging between 1 - 10L/s were set based on the peak requirements for the given reserve/customer.
- Two schedules have been utilised within the model, irrigation of council reserves and schools are simulated in the following:-
    - **Reserves: Monday, Wednesday, Friday**
    - **Schools/Commercial Customers: Tuesday, Thursday, Saturday**
- Pressure Reducing Valves (PRVs) will be used at the boundary of the reserves that exceed the given irrigation pressure requirement.
- Demand pressures that do not meet the irrigation requirements will need an onsite tank and pump.

4 NETWORK ROUTE

A map of the proposed distribution network route is included in Appendix A.

5 DISTRIBUTION NETWORK COMPONENTS

Pipes

The pipe sizes selected for use in the distribution network include the following:

- 125mm PE 12.5
- 180mm PE 12.5
- 280mm PE 12.5

Pumps

Distribution Pumps - The pump criteria identified fort the modelling of the distribution pumps within the recycled water network were primarily based on the existing council irrigation infrastructure requirements. The following pumping capacities were utilised at each distribution point.

Pump Location	Design Flow Rate (L/s)	Design Pressure Head (m)
Marden Pump Station	5-60	90
Shakespeare Booster Station	5-50	90
Langman Pump Station	5-50	60

Tanks

It was identified that due to significant static head differences throughout the scheme that tank storage would be required to provide a location to boost hydraulic pressure within the system. Furthermore due to limited extractable flow rates at the given bore, tank storage would be necessary to satisfy the instantaneous flow requirements.

Tank locations were determined based on recommendations made by council that would both provide sufficient area for the footprint of a tank and pump station. Table 2 summarises the tank locations and volumes, it should be noted that tanks could either be above or below ground installations.

Table 1 - Tank Location and Size

Tank Location	Tank Size (KL)
Marden Pump (Corner of Ascot Avenue and Obahn Expressway)	500
The Gums Reserve	250
Langman Reserve	500

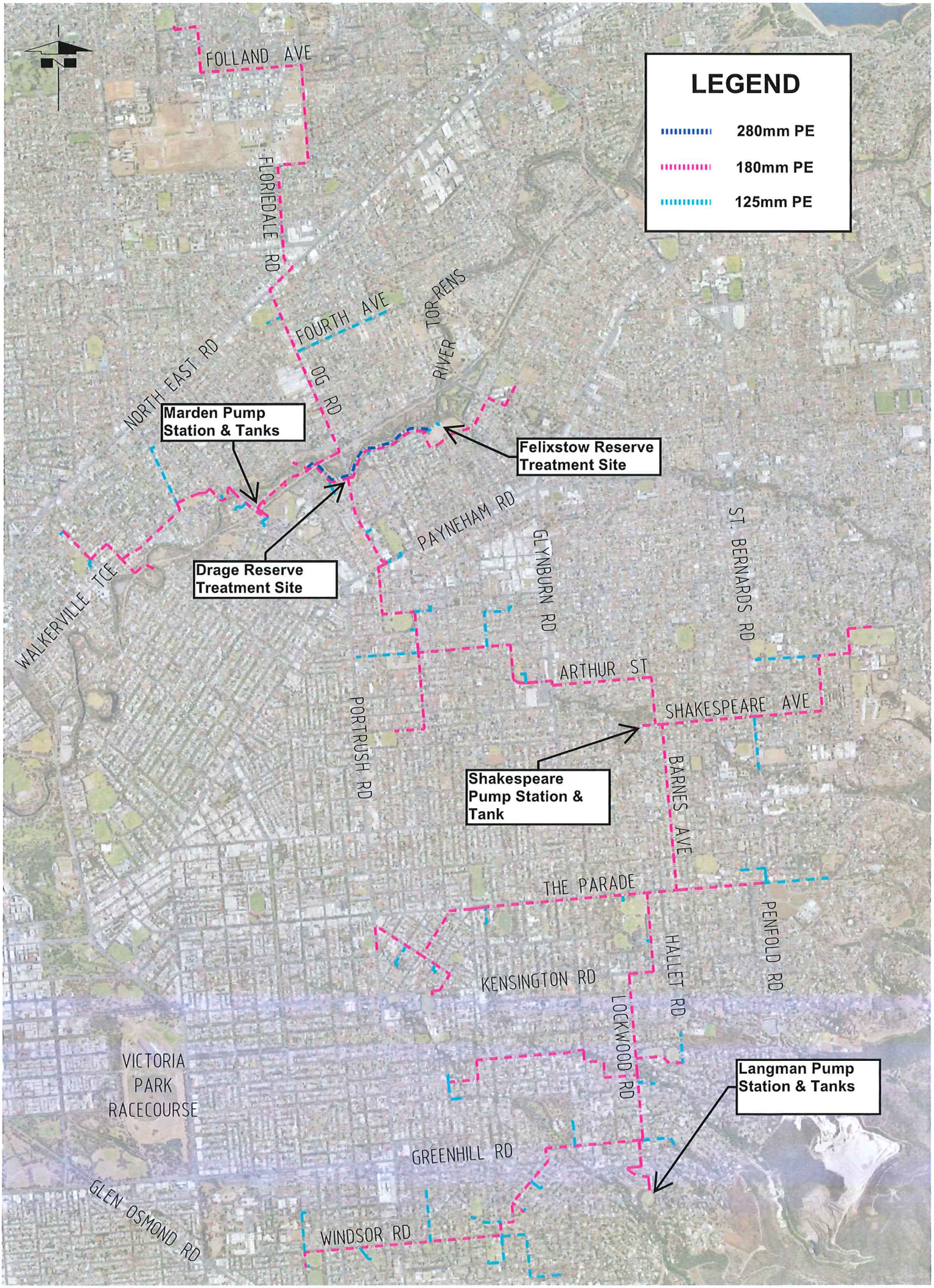
6 FURTHER DISCUSSION

The following points are raised for further discussion:

- It is noted that the model developed is considered suitable as a planning tool to estimate delivery pressures based on a set of demands, network and operational conditions.
- If additional commercial demands are to come online, the consideration for the creation of more bores would need to be investigated to optimise the efficiency of the system.

APPENDIX A

DISTRIBUTION NETWORK MAP


LEGEND
280mm PE
180mm PE
125mm PE
FOLLAND AVE
FLORIEDALE RD
FOURTH AVE
TORRENS RIVER
OG RD
NORTH EAST RD
Marden Pump Station & Tanks
Felixstow Reserve Treatment Site
Drage Reserve Treatment Site
PAYNEHAM RD
GLYNBURN RD
ST. BERNARDS RD
WALKERVILLE TCE
ARTHUR ST
SHAKESPEARE AVE
PORTRUSH RD
Shakespeare Pump Station & Tank
BARNES AVE
THE PARADE
PENFOLD RD
KENSINGTON RD
HALLET RD
LOCKWOOD RD
Langman Pump Station & Tanks
VICTORIA PARK RACECOURSE
GREENHILL RD
GLEN OSMOND RD
WINDSOR RD