**PROJECT NAME: WELBEDACHT PIPELINE**

**PROJECT LOCATION: BLOEMFONTEIN, MANGAUNG METROPOLITAN MUNICIPALITY**

**PROJECT VALUE: R 450M**

**PROJECT SUMMARY:**

**Project Background**

The Caledon-Bloemfontein Potable Water Supply Scheme, representing the principal bulk water supply to Mangaung Metropolitan Municipality (MMM) supplies water from the Welbedacht Dam Water Treatment Plant (WTP) to nearby De Hoek Reservoir, from where it gravitates via Uitkijk Reservoir to Brandkop Reservoir located in Bloemfontein. The entire 105,7km section of the gravity pipeline between De Hoek and Brandkop Reservoirs has reached its design lifespan, and due to its poor condition experiences water leakages and is prone to frequent bursts resulting in severe water disruptions to the Mangaung area spillway.

**CONTINUE TO DETAILED PROJECT SUMMARY**

**Project Location**

The Caledon-Bloemfontein Potable Water Supply Scheme was commissioned in the late 1960’s, and was operated and owned by the Department of Water and Sanitation (DWS) until 1991 when the assets listed below (with the exception of the Welbedacht Dam) were transferred to Bloem Water: an abstraction point at the Welbedacht Dam;

• Raw water pump station

• Water treatment plant with a capacity of 145 Ml/day high lift pump station

• 6,7km long, 1 200mm diameter steel rising main to De Hoek Reservoir

• 105,7km long, 1170mm diameter Pre-stressed Concrete (PCP) gravity main between De Hoek Reservoir and Brandkop Reservoir

* 3 x trunk main reservoirs

**Project Objectives**

In view of the deteriorating condition of the failing PCP, the following options were identified to address the increasing risk and severity of water supply disruptions to MMM:

construct 34km length of 1000mm diameter steel pipeline along the route of the originally proposed GRP bypass pipeline between Lieuwkop control chamber and Brandkop Reservoir; or refurbish the existing PCP along its entire 105km length (including relining where appropriate) in phases as per the bypass commissioning sequence; or construct a new steel pipeline bypassing the existing 105km long section of PCP gravity main between De Hoek and Brandkop Reservoirs. It was decided that a hybrid solution between the first and the last options represents the most beneficial approach from the practical, technical, time frame and financial considerations.

**General Design Philosophy**

Bloemwater appointed LTE to provide the professional services for the design and construction of a 1000mm diameter GRP bypass pipeline. The 33.7km length of the pipeline runs along the R702 with the starting point being 20km from Dewetsdorp, running towards Bloemfontein to the Bloemwater Brandkop reservoir. Subsequently on request of Department of Water and Sanitation (DWS) the design was changed to replace the GRP pipe material with steel pipes. The general operating pressure is 173m (static head). The operating design pressure used for the pipeline is 250m, which would be sufficient to accommodate the instantaneous peak surge event generated by a rapid valve closure. Preliminary calculations were confirmed and indicated that a 1200mm dia pipeline was required to allow the full capacity of the treatment works at Welbedacht to reach the Brandkop Reservoir and this would give BW the same capacity as the existing PCP pipeline. During a meeting with BW, BW confirmed that the full flow will not be required at Brandkop, and accordingly a lower demand was used to size the pipeline, resulting in the 1000mm diameter pipeline size.