

**BACKGROUND INFORMATION DOCUMENT
FOR THE
TUBUSSIS WATER SUPPLY SCHEME**

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1. INTRODUCTION

The Tubussis scheme is located approximately 50 km north of Usakos in the Kunene Region. Tubussis is a groundwater scheme supplying potable water to the Oe#gab Primary School and hostel, the police station, a clinic (which all get water from the school) and a few private consumers.

The location of Tubussis is depicted in **Figure 1**.

The EMP is for an existing scheme and it is therefore only for the operation and maintenance of the scheme.

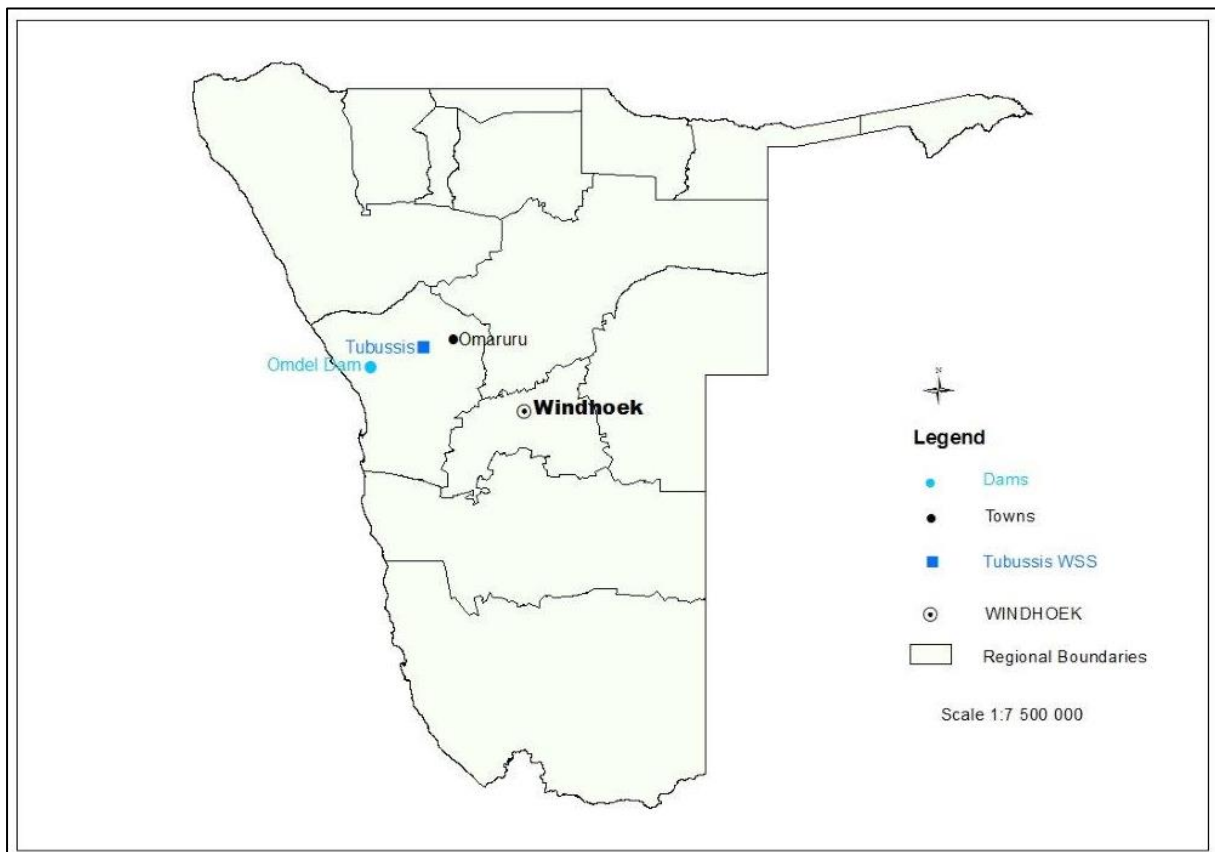


Figure 1: Tubussis Location Map

2. DESCRIPTION OF THE EXISTING INFRASTRUCTURE

2.1 Water Source

The Tubussis Water Supply Scheme consists of three boreholes (WW 16601, WW 25477 and WW 25480). The boreholes pump water into a 170 m³ concrete ground reservoir from where it is distributed into the reticulation system.

The boreholes are between 60 m and 73 m deep. The three boreholes each yield 2 m³/h.

A schematic layout of the existing infrastructure is indicated in **Figure 2** below.

2.2 Water Quality and Disinfection

The quality of water supplied to Tubussis was evaluated for compliance with the NWQS and the NWQG. According to the NWQG the water can be classified as Group B (Appendix).

Chlorination is done inside the reservoir by means of a floating dispenser.

2.3 Pipe Work

The pipe work from the boreholes to the reservoirs consists of approximately 2 km of 50 mm diam., 0.9 km of 63 mm diam. and 12 km of 90 mm diam.

The theoretical pipe capacities for the 50 mm diam., 63 mm and diam. 90 mm diam. uPVC pipes at a velocity of 1 m/s are 4.5 m³/h, 7 m³/h and 18 m³/h respectively.

2.4 Reservoirs

The storage facility consists of a 170 m³ concrete ground reservoir. The ventilation sieves on the pipes have been damaged and need to be repaired.

The reservoir is secured and permanently closed.

2.5 Power Supply and Control System

The scheme is completely manually operated. The operator starts the pumps manually (on demand) and shuts off when the reservoir is full.

Electric power to the boreholes is supplied from 25 kVA pole-mounted transformers each with a 3-phase kWh meter in a meter kiosk. Electricity is supplied by NamPower. No telemetry system is installed at this scheme.

2.6 Scheme Processes/Operation

There is a fulltime NamWater scheme operator, who does checks on a daily basis whether all the systems are functional.

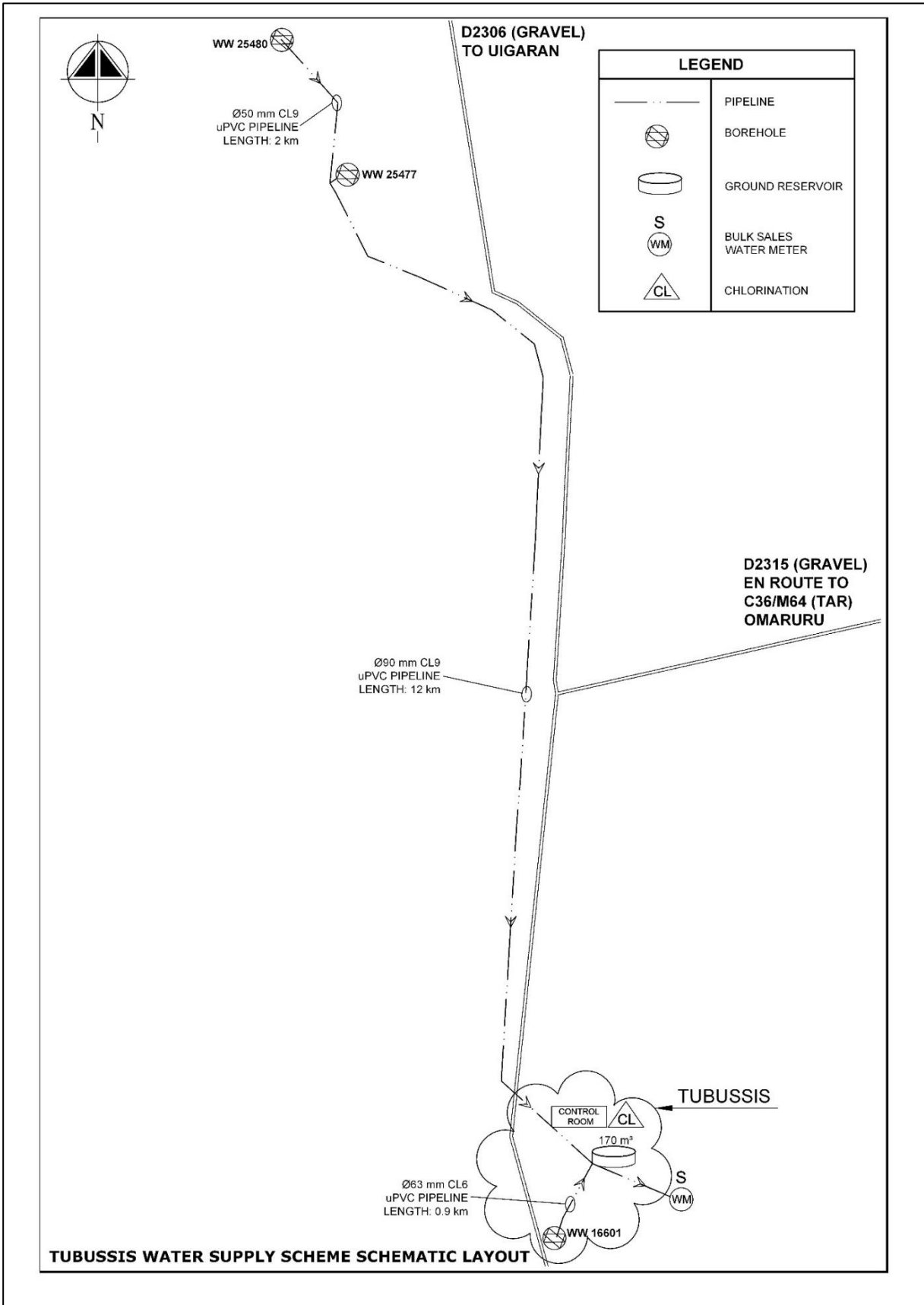


Figure 2: Tubussis Scheme Layout

3. ENVIRONMENTAL MANAGEMENT ACT (NO 7 OF 2007) (EMA)

The Environmental Management Act (EMA) was promulgated in 2007 by Parliament and gives effect to the Environmental Assessment Policy. The Act specifies the environmental assessment procedures to be followed as well as the listed activities (activities that require an EIA). Of relevance to this project are the following listed activities, as provided in Section 27 of this Act, which includes:

- Water use
- Bulk water transportation

According to the Environmental Management Act (Act No.7 of 2007), construction of bulk water pipeline is a listed activity (as shown in Table 1. below) and thus requires an EIA. NamWater is always vigilant in executing Environmental Impact Assessments (EIAs) for all projects with listed activities.

4. DESCRIPTION OF THE ENVIRONMENT

The baseline description provided below focuses on the Tubussis receiving environment:

4.1 Climate

Tubussis has a semi-arid climate with warm to hot summers and mild winters. This climate is highly influenced by the desert environment and the coast that are both found very close to Tubussis.

4.1.1 Precipitation

Tubussis receives rain in summer months, occurring usually between December and April. Rainfall ranges between 150mm and 200mm, and the relative humidity is 20% - 30% (Mendelsohn, *et al.*, 2009)

4.1.2 Temperature

The average maximum temperature is between 32°C to 34°C, which occurs during the hottest months of December and January. The average minimum temperature is measured during the coldest month of July, and is between 8°C to 10°C (Mendelsohn, *et al.*, 2009).

4.2 Geology

According to Haughton, *et al.*, 1939, the geology of the central region is dominated by the various types and the dominant soil is deposits of sand and surface limestone. In the area south of Tsomtsaub and Nei-Neis and west of Tubussis increased erosion by tributary streams of the Omaruru River has led to a remodelling of the surface and a renewed prominence of the Marble horizon. Other intrusive rocks around Tubussis includes; Erongo Granite, Dykes of Quartz Porphyrite, Quartz Porphyry and Granite-Porphyry).

4.3 Natural Fauna and Flora

Tubussis is located in the western highlands biome regions., which supports a variety fauna, such as; baboons (*Papio*), ostriches (*Struthio camelus*), desert kudu (*Tragelaphus strepsiceros*), springbok (*Antidorcas marsupialis*), gemsbok (*Oryx gazella*), eland (*Taurotragus oryx*), Impala (*Aepyceros melampus*), mountain zebra (*Equus zebra hartmannae*), black-faced impala (*Aepyceros melampus petersi*) waterbuck (*Kobus ellipsiprymnus*), burchell's zebra (*Equus quagga burchellii*), hartebeest (*Alcelaphus buselaphus*), giraffe (*Giraffa*) and damara dik-diks (*Madoqua kirkii*), lion (*Panthera leo*),

leopard (*Panthera pardus*), cheetah (*Acinonyx jubatus*), spotted hyena (*Crocuta crocuta*), and brown hyena (*Hyaena brunnea*) (Mendelsohn, *et al.*, 2009).

Around the Tubussis area, the dominant vegetation structure is known as varied shrubland and grasslands. Most tree species are camel thorn (*Acacia erioloba*), sweet-thorn (*Acacia karroo*), black-thorn (*Acacia mellifera*), devil's claw (*Harpagophytum*), tsamma melon (*Citrullus lanatus*), bushmen grass (*Schmidtia kalahariensis*), six-weeks three-awn grass (*Aristida adscensionis*), red-thorn (*Acacia reficiens*), lovegrass (*Eragrostis nindensis*), trumpet thorn (*Catophractes alexandri*), rose natal grass (*Melinis repens s. grandiflora*), soft-feather pappus grass (*Enneapogon cenchroides*) and sickle bush (*Dichrostachys cinerea*) (Goldblatt, *et al.*, 1998)

5. REFERENCES

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