
LESOTHO
HIGHLANDS
WATER
PROJECT

CONTENTS

- **Phase I**
- **Phase II**
- **Costs**
- **Implementation program**

✓Treaty signed on 24 Oct 1986

✓Phase II Agreement signed on 11 August 2011

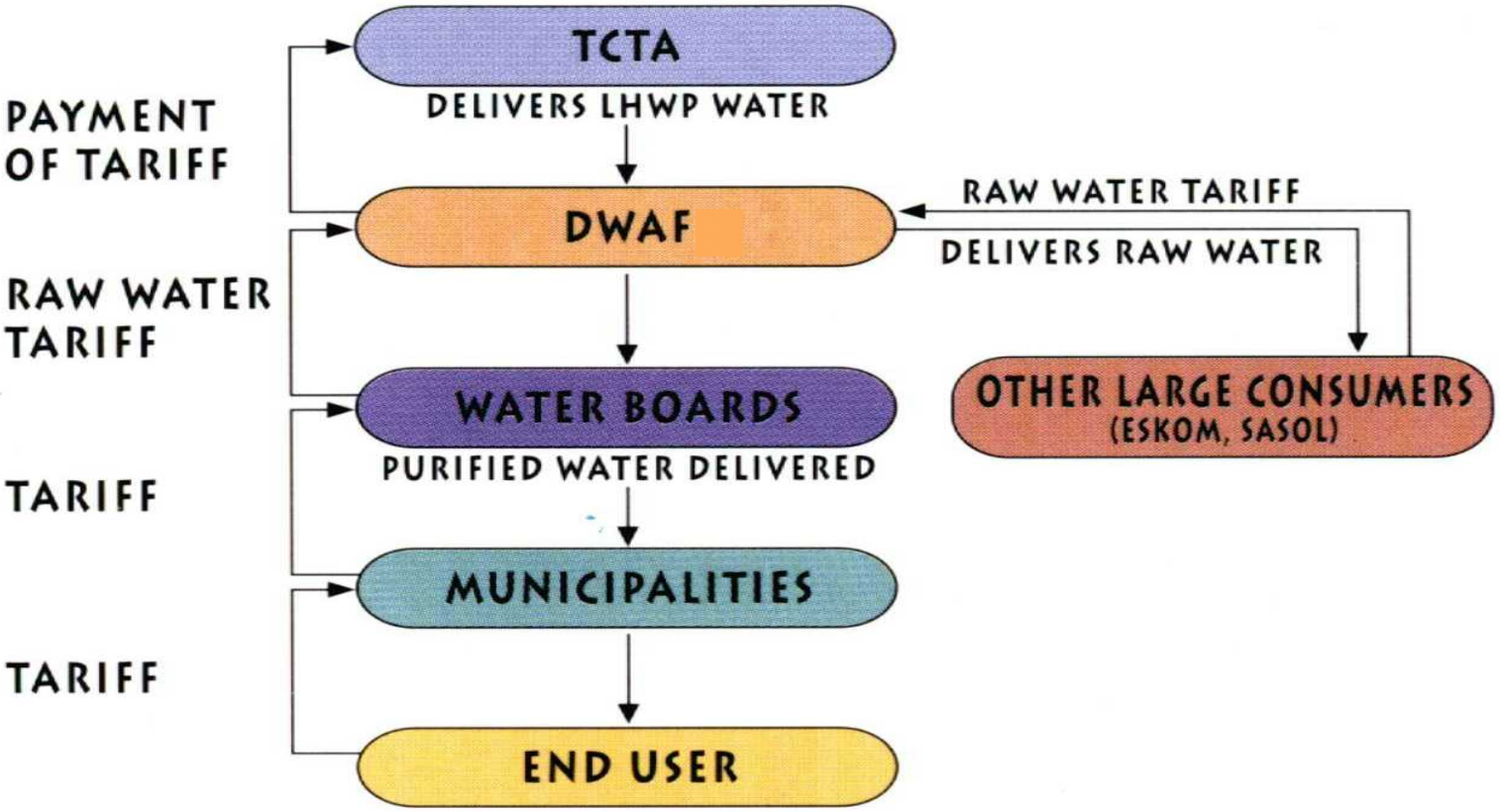
WHAT IS THE LHWP ?

- **Bi-national interbasin water transfer**
  - ultimate delivery 70 m^3/s
- **5 Phases - 30 year**
- **Implementation - LHWC, LHDA & TCTA**
- **One of largest engineering projects**
- **Worth $ 8 billion**

WHY THE LHWP ?

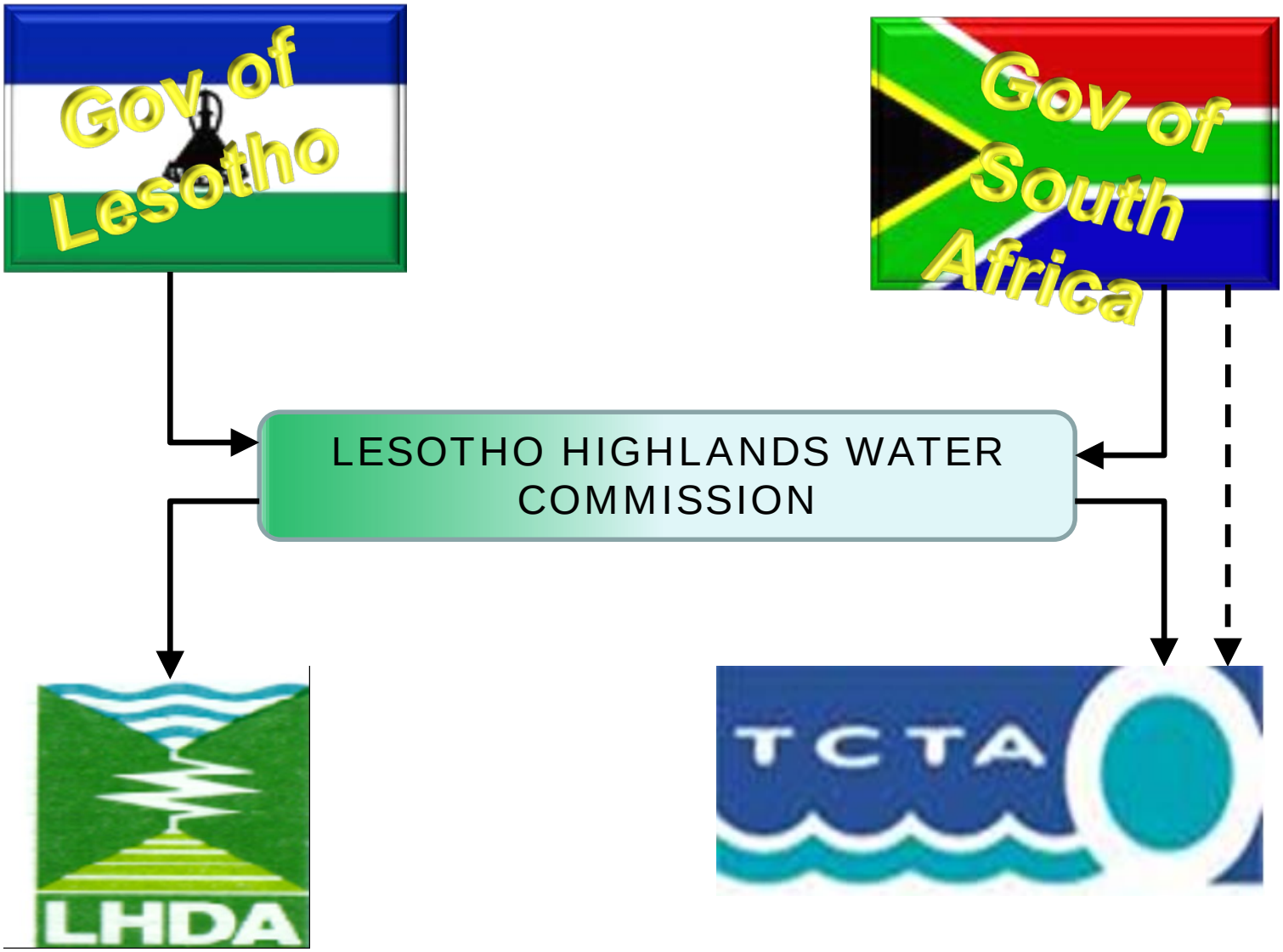
- **Augmentation for Vaal System in RSA**
- **Millions people without water**
- **Cheaper alternative source**
- **Good quality water**
- **Opportunity for regional development**
- **Hydro-electricity for Lesotho**

PARTIES THAT FEATURE IN WATER TRANSFER

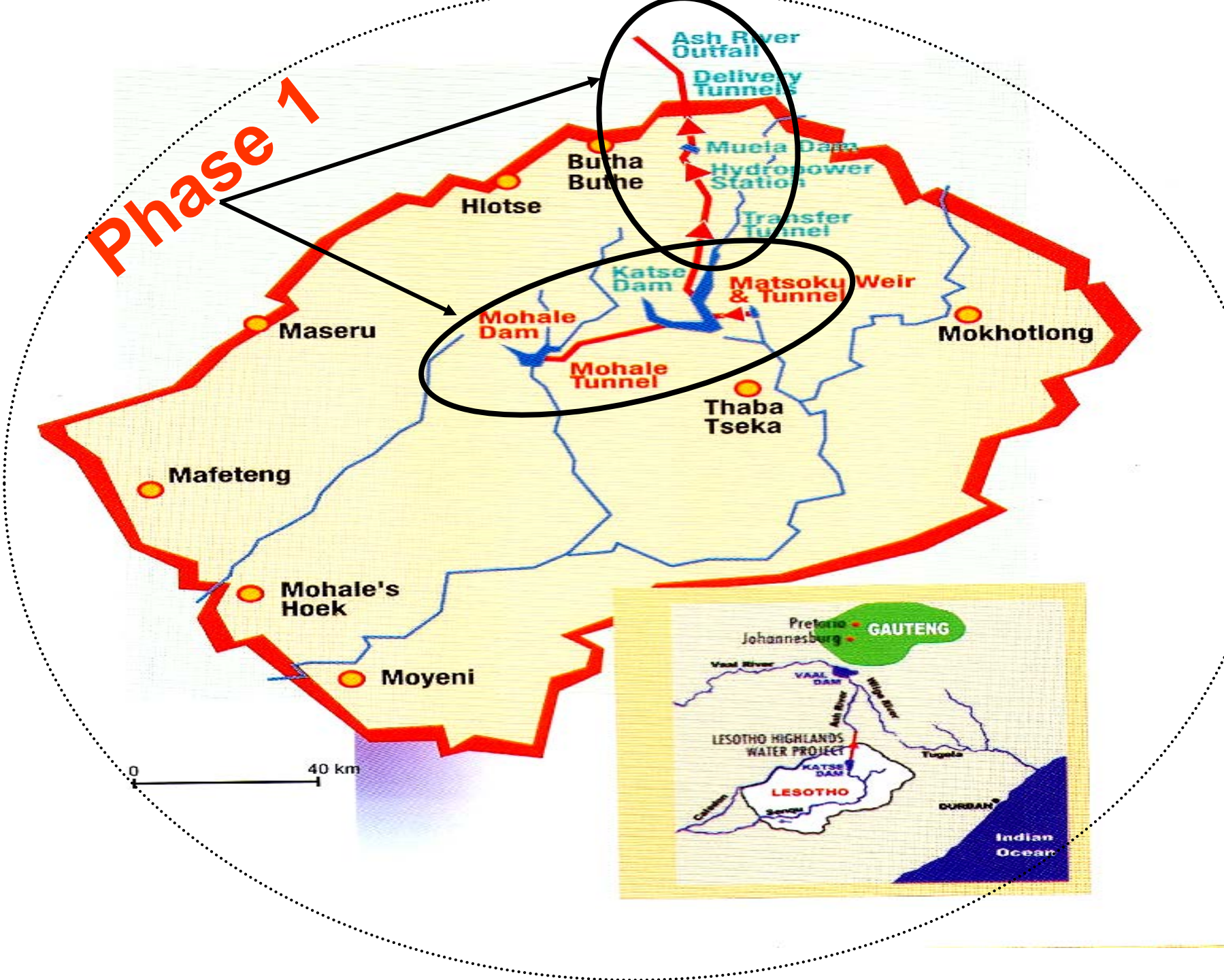


Funded by water users not RSA taxpayers

Project governance

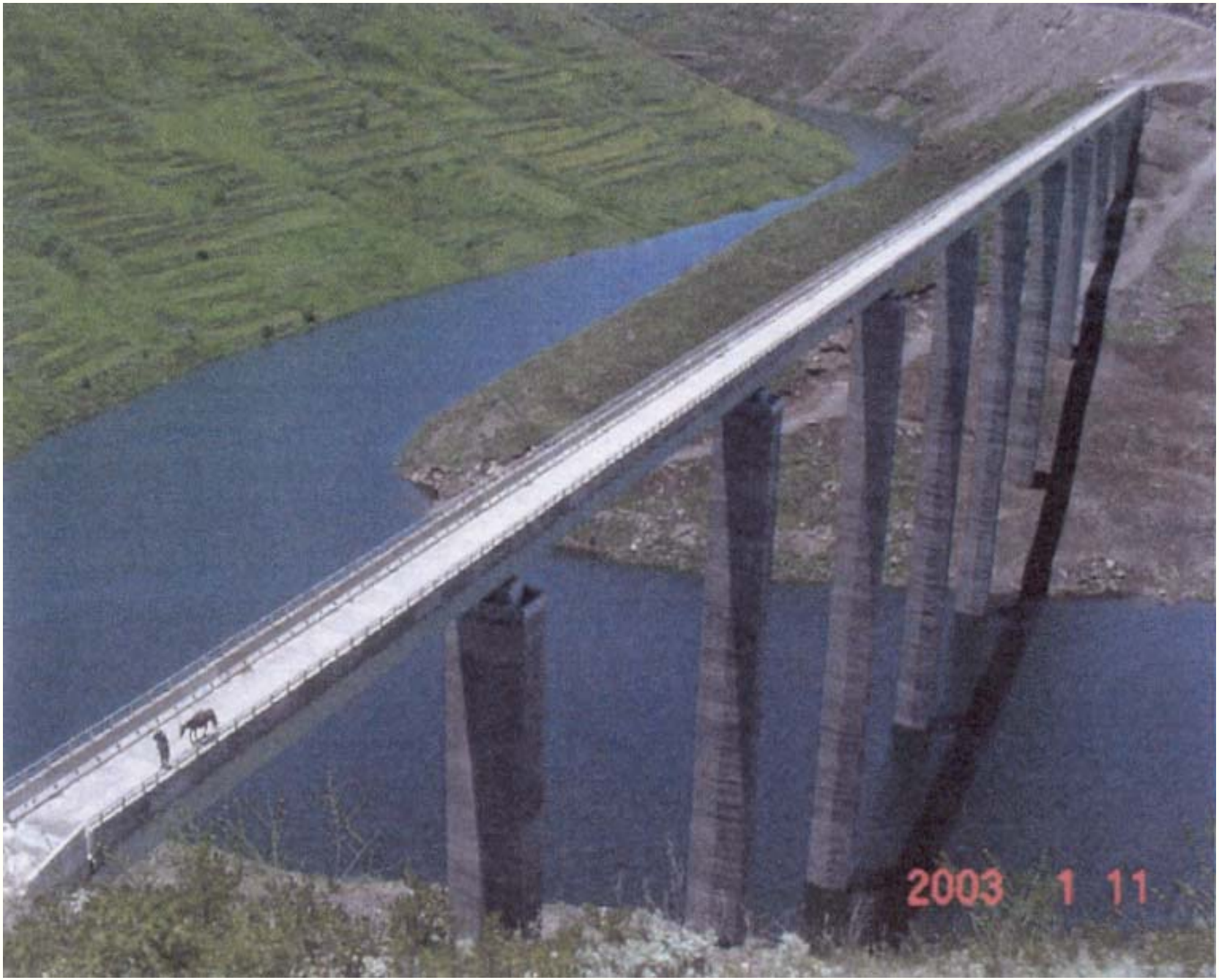


PHASE 1A & 1B


Phase 1
Ash River Outfall
Delivery Tunnels
Muela Dam
Hydropower Station
Transfer Tunnel
Butha Buthe
Hlotse
Katse Dam
Matsoku Weir & Tunnel
Mohale Dam
Mohale Tunnel
Maseru
Mokhotlong
Thaba Tseka
Mafeteng
Mohale's Hoek
Moyeni
0
40 km
Pretoria
Johannesburg
GAUTENG
Vaal River
VAAL DAM
Ash River
Wilge River
LESOTHO HIGHLANDS WATER PROJECT
KATSE DAM
Tugela
LESOTHO
Caledon
DURBAN
Indian Ocean

MUELA HYDRO POWER SWITCH YARD


POWERLINES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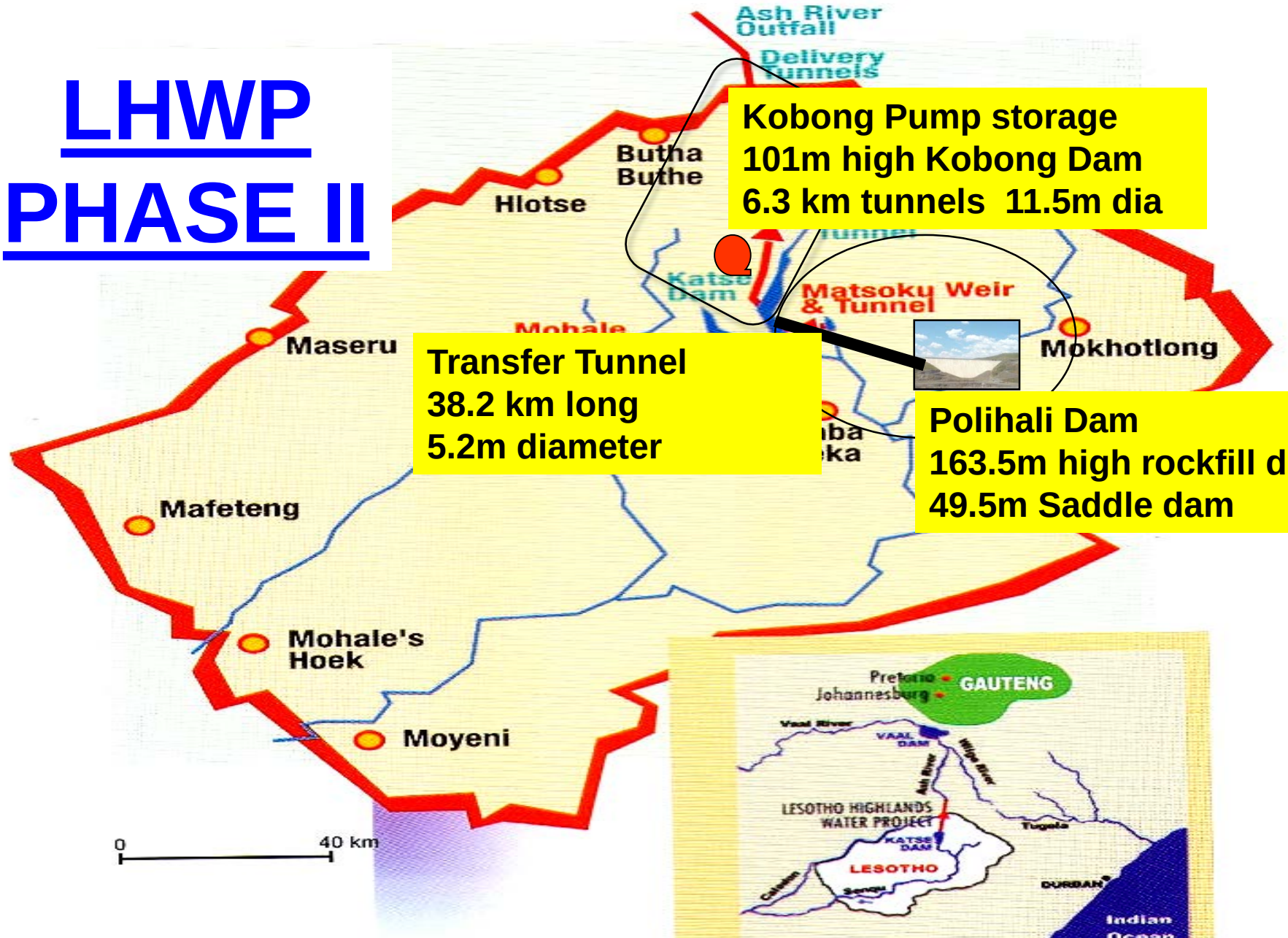
PHASE II
&
KOBONG
PUMP STORAGE
SCHEME

LHWP PHASE II

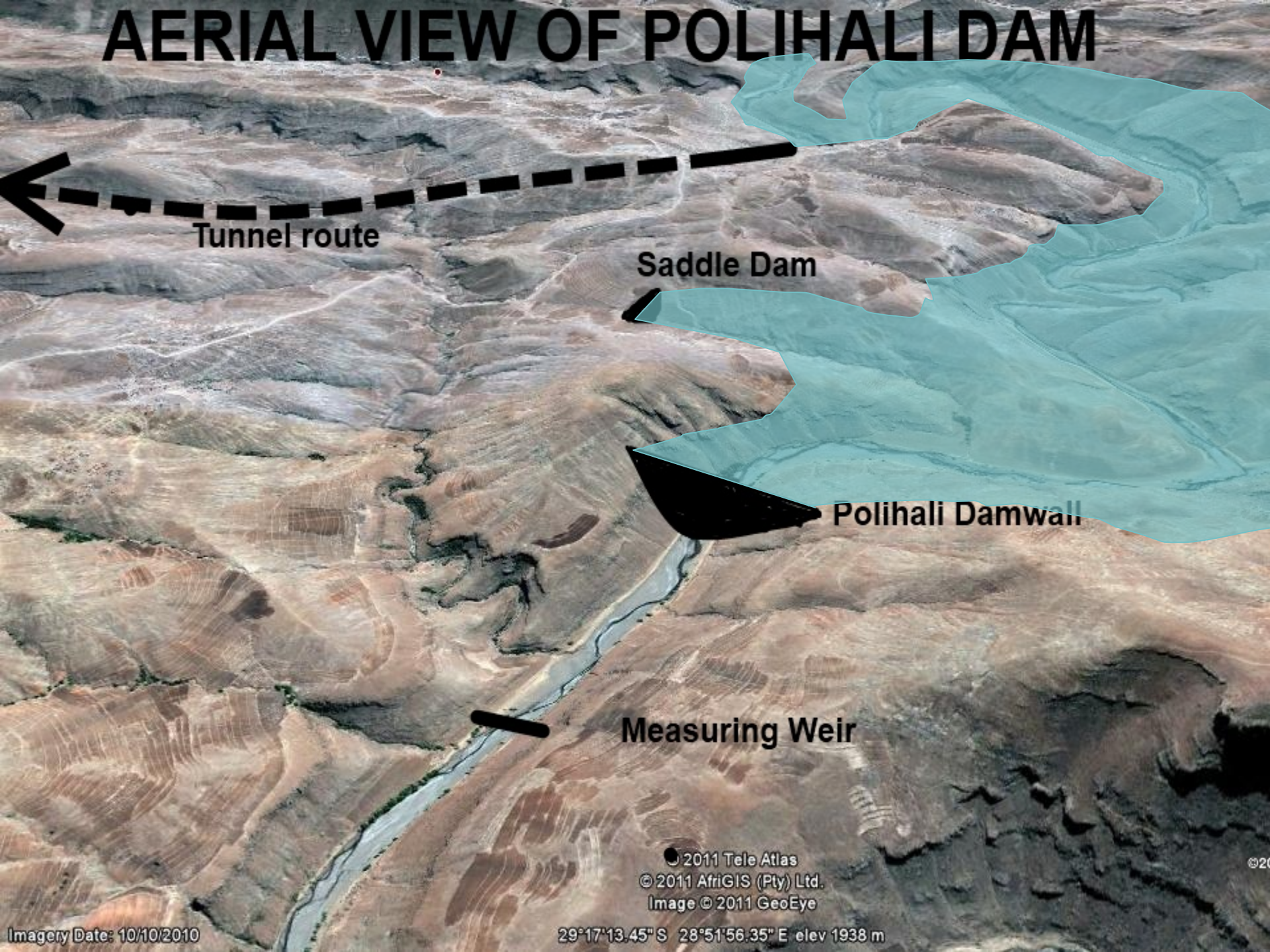
Kobong Pump storage
101m high Kobong Dam
6.3 km tunnels 11.5m dia

Transfer Tunnel
38.2 km long
5.2m diameter

Polihali Dam
163.5m high rockfill dam
49.5m Saddle dam



AERIAL VIEW OF POLIHALI DAM



POLIHALI to KATSE TUNNEL

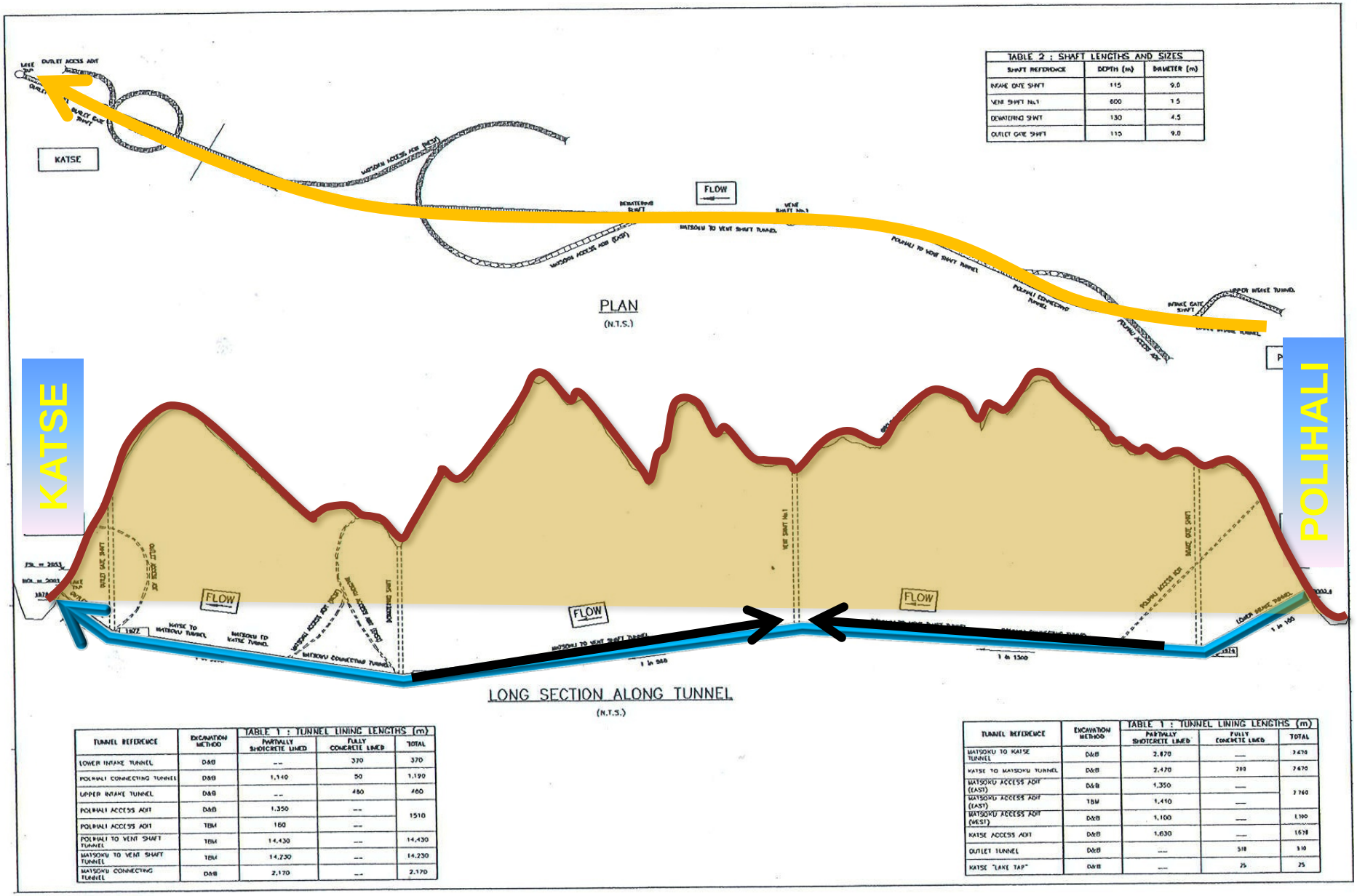


TABLE 2 : SHAFT LENGTHS AND SIZES

SHAFT REFERENCE	DEPTH (m)	DIAMETER (m)
INTAKE GATE SHAFT	115	9.0
VENT SHAFT No.1	600	7.5
DEWATERING SHAFT	130	4.5
OUTLET GATE SHAFT	115	9.0

TABLE 1 : TUNNEL LINING LENGTHS (m)

TUNNEL REFERENCE	EXCAVATION METHOD	PARTIALLY SHOTCRETE LINED	FULLY CONCRETE LINED	TOTAL
LOWER INTAKE TUNNEL	D&B	---	370	370
POLIHALI CONNECTING TUNNEL	D&B	1,140	50	1,190
UPPER INTAKE TUNNEL	D&B	---	460	460
POLIHALI ACCESS ADIT	D&B	1,350	---	1510
POLIHALI ACCESS ADIT	TBM	160	---	
POLIHALI TO VENT SHAFT TUNNEL	TBM	14,430	---	14,430
MATSOKU TO VENT SHAFT TUNNEL	TBM	14,230	---	14,230
MATSOKU CONNECTING TUNNEL	D&B	2,170	---	2,170

TABLE 1 : TUNNEL LINING LENGTHS (m)

TUNNEL REFERENCE	EXCAVATION METHOD	PARTIALLY SHOTCRETE LINED	FULLY CONCRETE LINED	TOTAL
MATSOKU TO KATSE TUNNEL	D&B	2,870	---	3,670
KATSE TO MATSOKU TUNNEL	D&B	2,470	280	2,670
MATSOKU ACCESS ADIT (EAST)	D&B	1,350	---	2,760
MATSOKU ACCESS ADIT (EAST)	TBM	1,410	---	
MATSOKU ACCESS ADIT (WEST)	D&B	1,100	---	1,100
KATSE ACCESS ADIT	D&B	1,030	---	1,030
OUTLET TUNNEL	D&B	---	510	510
KATSE "LAKE TAP"	D&B	---	25	25


TBM
BREAKTHRU

KOBONG PUMP STORAGE SCHEME


Upper dam
Tunnel
Powerhouse
Discharge tunnel


Tunnel Intake
Water transfer
to SA
Katse
reservoir
PS

KOBONG 1200MW PUMP STORAGE SCHEME

PROJECT STATUS

Lower Dam	**=**	**Katse Dam**
Upper Dam	**=**	**Kobong Dam**
Dam height	**=**	**101 meters**
Headrace Tunnel length	**=**	**4270 meters**
Headrace Tunnel diameter	**=**	**11.5 meters**

- **Detailed Feasibility Study funded by Swedish Government to commence in October 2010**
- **Feasibility Study complete Feb 2012**
- **Detailed design May 2012 to January 2014**
- **Construction to start March 2014**
- **Completion end 2018**

ADVANCED INFRASTRUCTURE

ROADS
St Peters to Oxbow Rd
Oxbow to Seate Bridge Rd
Seate Bridge to Mapholaneng Rd, etc….
= OR = Matsoku to Polihali Route

FEEDER ROADS
Mokhotlong to Mositeng
Chaba Li Maketse to Moeaneng
Ha Tlhakola to Makalong
Ramoruti to Ha Pohla
Ntlholohetsane to Ha Letjama
Various road bridges

RESIDENTIAL AREAS
Client, Engineer, Contractor facility, Lodge @ Mporosane and Polihali
Labour camps

CONSTRUCTION POWER
Reroute Letseng-Tlokoeng 33kV line
Reroute Tlokoeng-Mapholaneng 33kV line
Reroute Mapholaneng-Mokhotlong 33 kV line
New line 132kV line (Kao option done by LEC to be considered later)
= OR = Matsoku to Polihali line
Substation Polihali
Upgrade Ha Lejone sub station

TELECOMMUNICATIONS
Relocate existing lines
Polihale dam connection
Tunnel connection @ Polihali

COSTS
&
IMPLEMENTATION PROGRAM

RSA - WATER TRANSFER COSTS

	Dec 2010 COSTS (mill)
POLIHALI DAM	USD322M
TUNNEL	USD243M
INFRASTRUCTURE	USD148M
ENGINEERING	USD130M
ADMINISTRATION	USD78M
ENVIRONMENT	USD149
SOCIAL COSTS	
TOTALS	USD1,070M

GOL - HYDROPOWER COSTS

	2007 PRICES	Dec 2010 PRICES
1000mw Pump Storage	R 5200 million	R 6136 million
Transmission Line		R 1500 million
TOTALS	R 5 200 million	R 7 636 million

Total Phase II costs = USD1,9Billion


4 x 1


THANK YOU
QUESTIONS ?