



**mzimvubu**  
water project



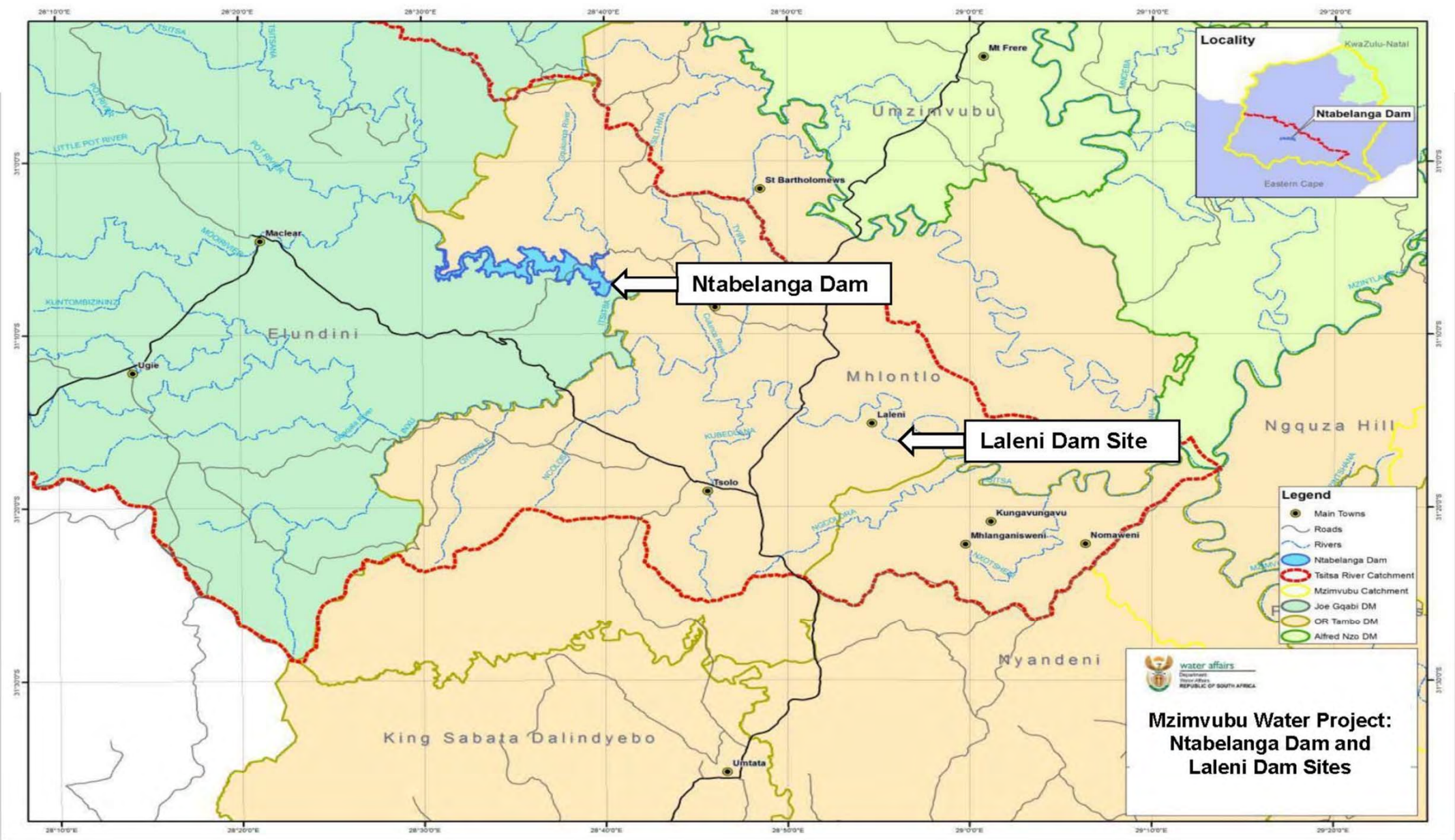
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LOCALITY PLAN  
MACRO



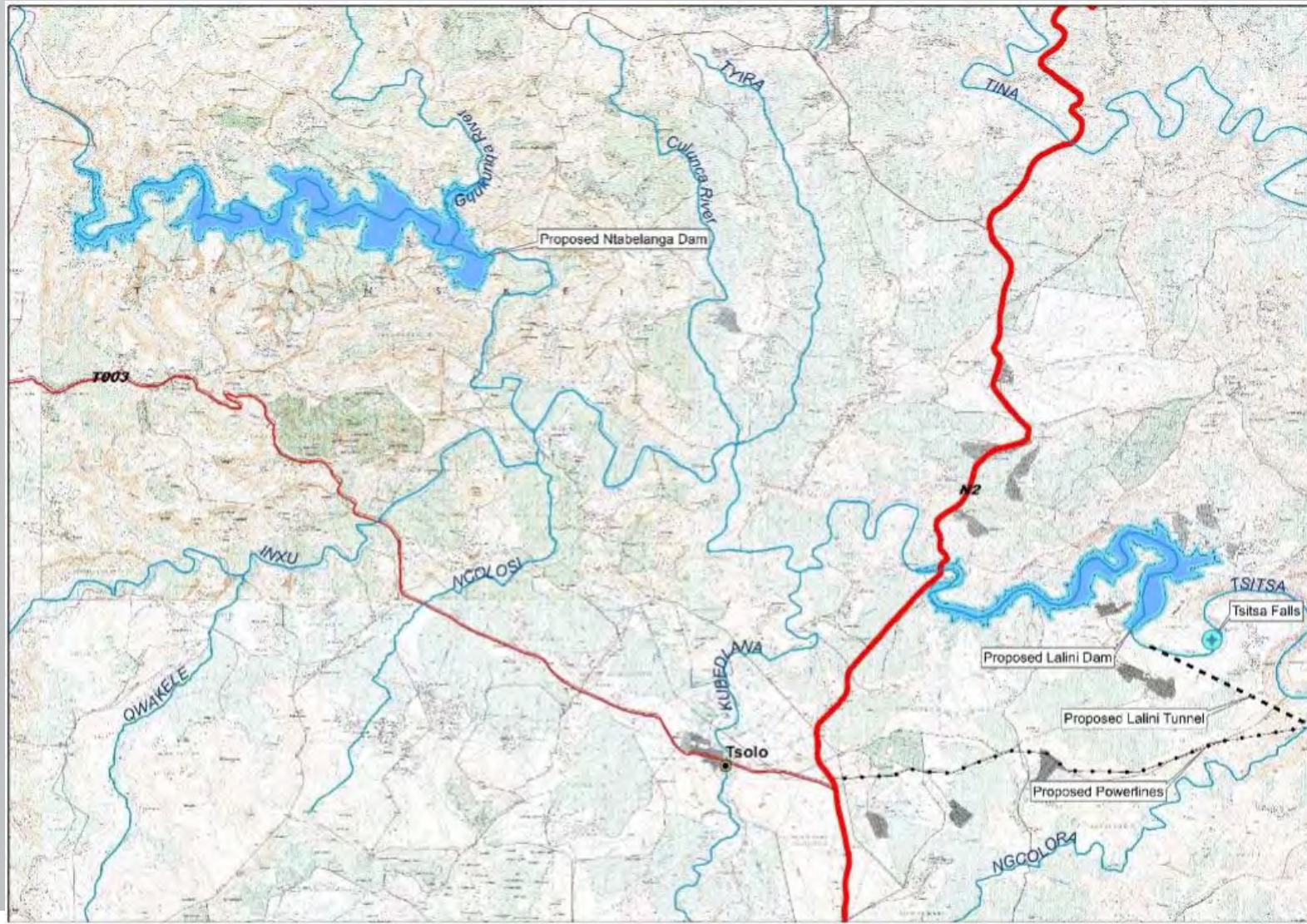


LOCALITY PLAN  
MICRO

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Department:  
Water Affairs  
REPUBLIC OF SOUTH AFRICA

**Mzimvubu Water Project:  
Ntabelanga Dam and  
Leleni Dam Sites**

# Locality in Supply Area:



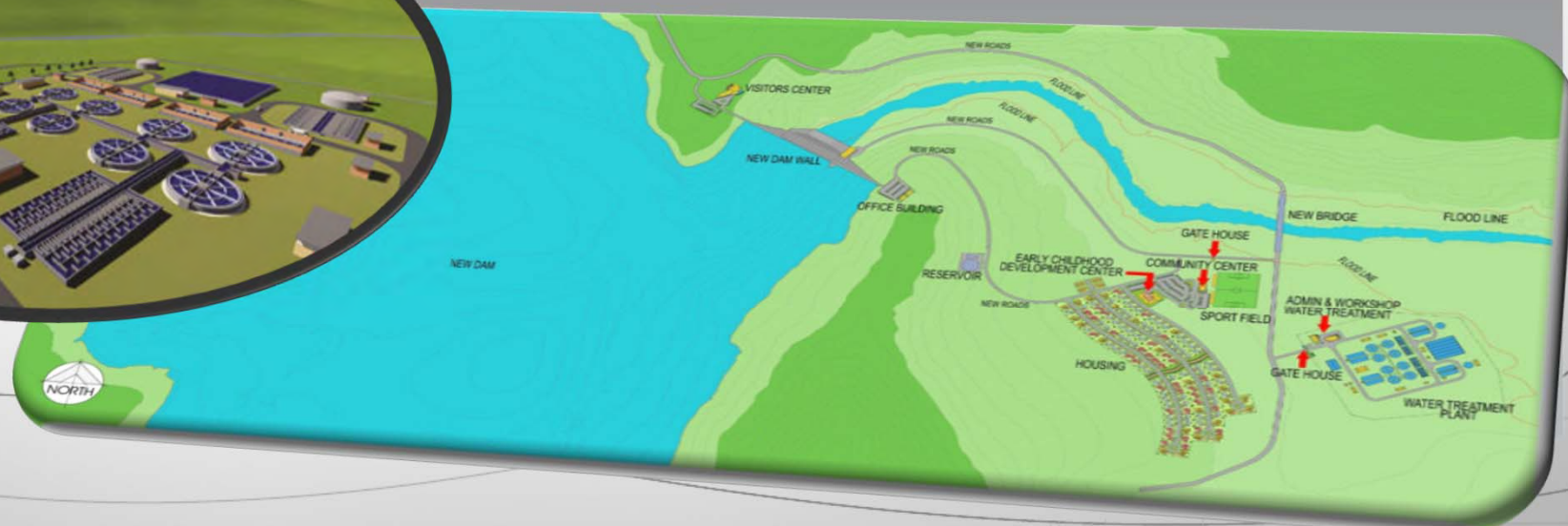
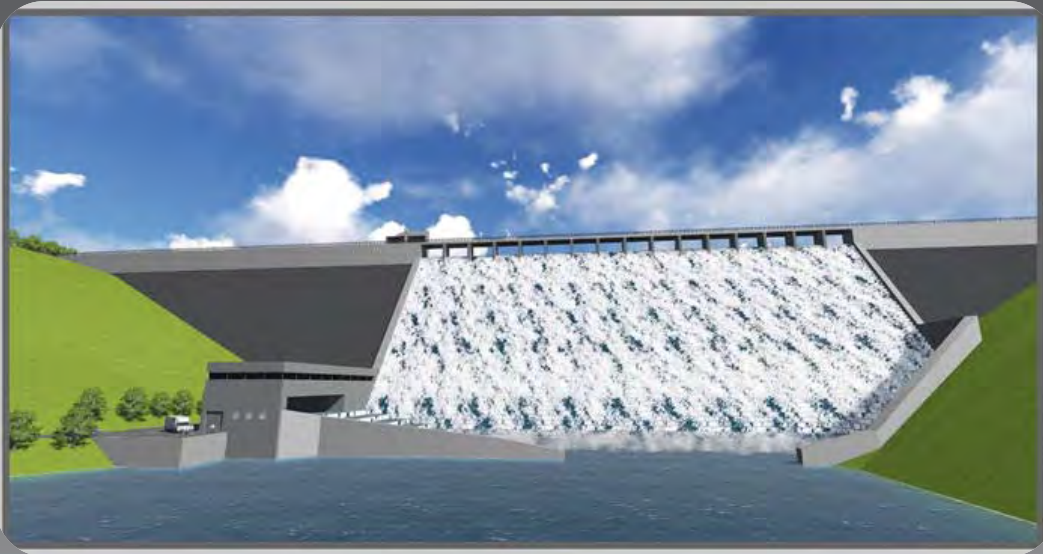
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# Mzimvubu Bulk Water Scheme

Project in Preliminary Design Stage  
2 New Dams (Including 1 Hydro Electric)  
100 Ml/d Water Care Works  
Water distribution System (1800km)  
Pump stations & Reservoirs  
Irrigation Bulk pipeline



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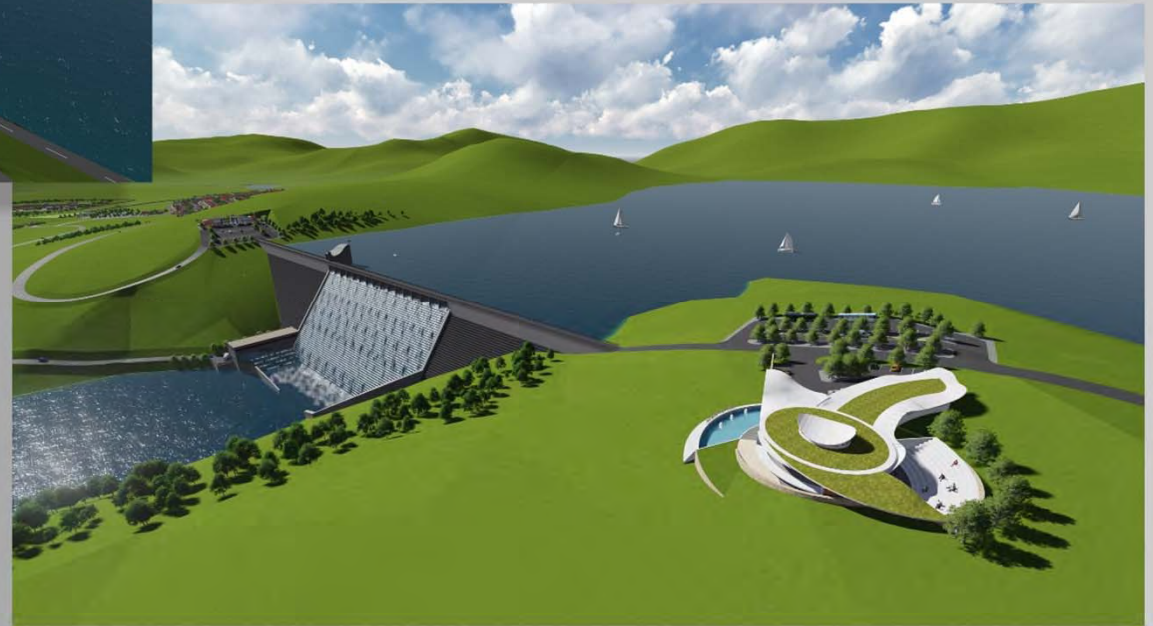
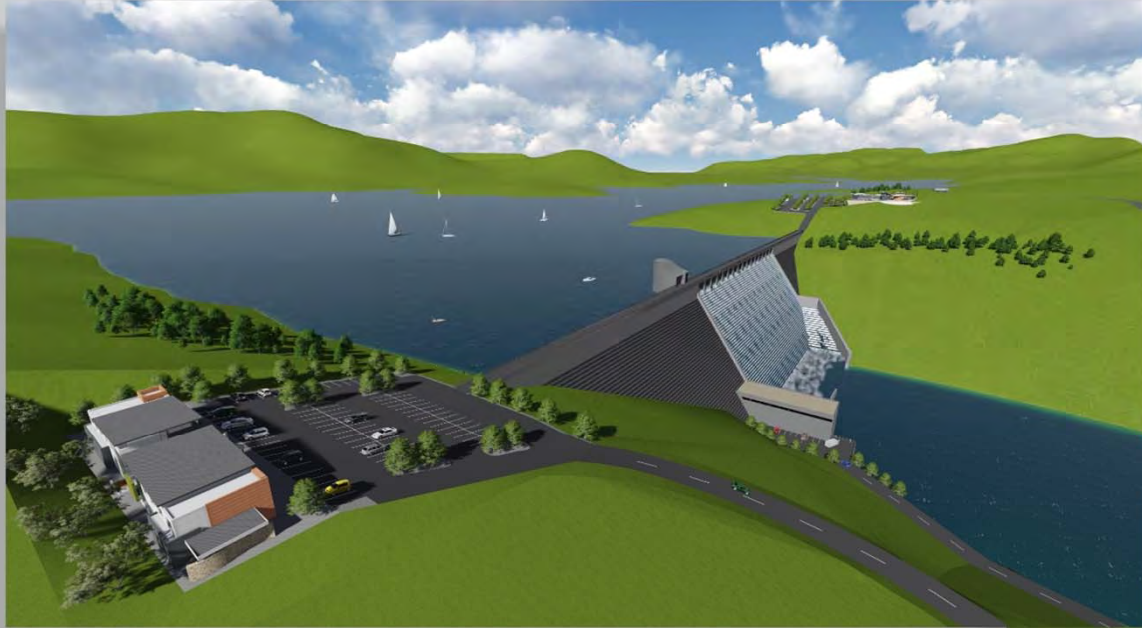
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# S I T E



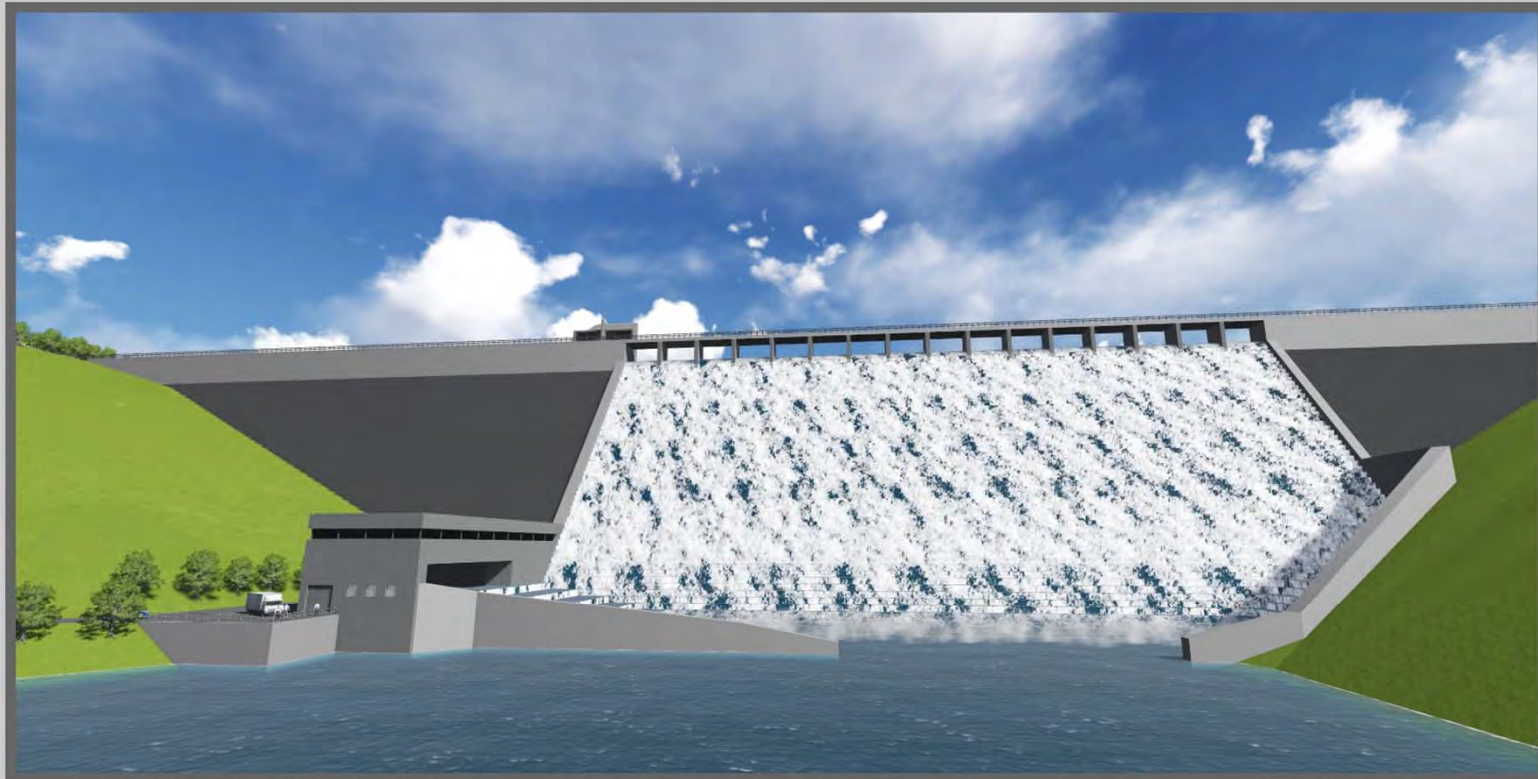
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S I T E  
S I T E P E R S P E C T I V E

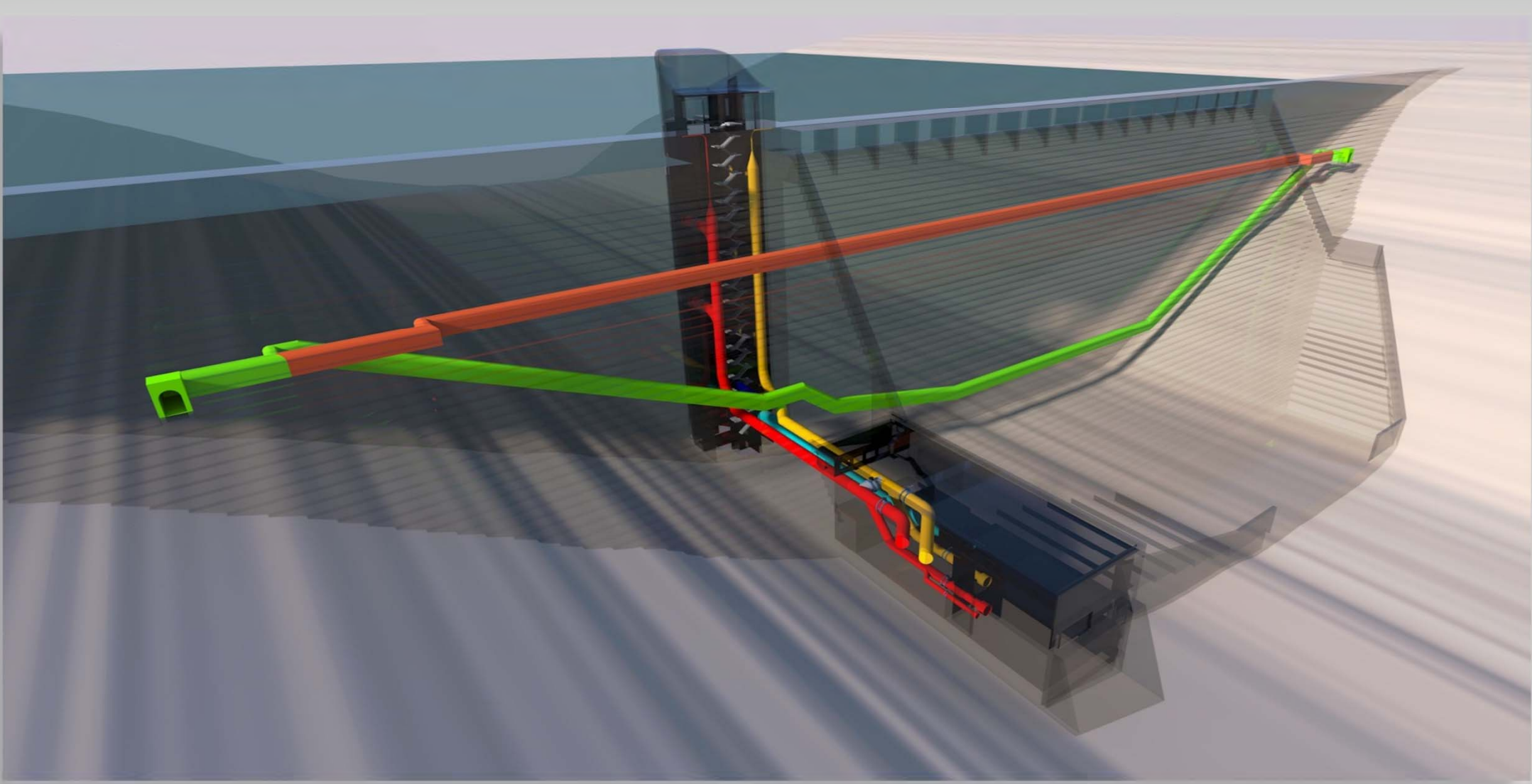
# D A M W A L L



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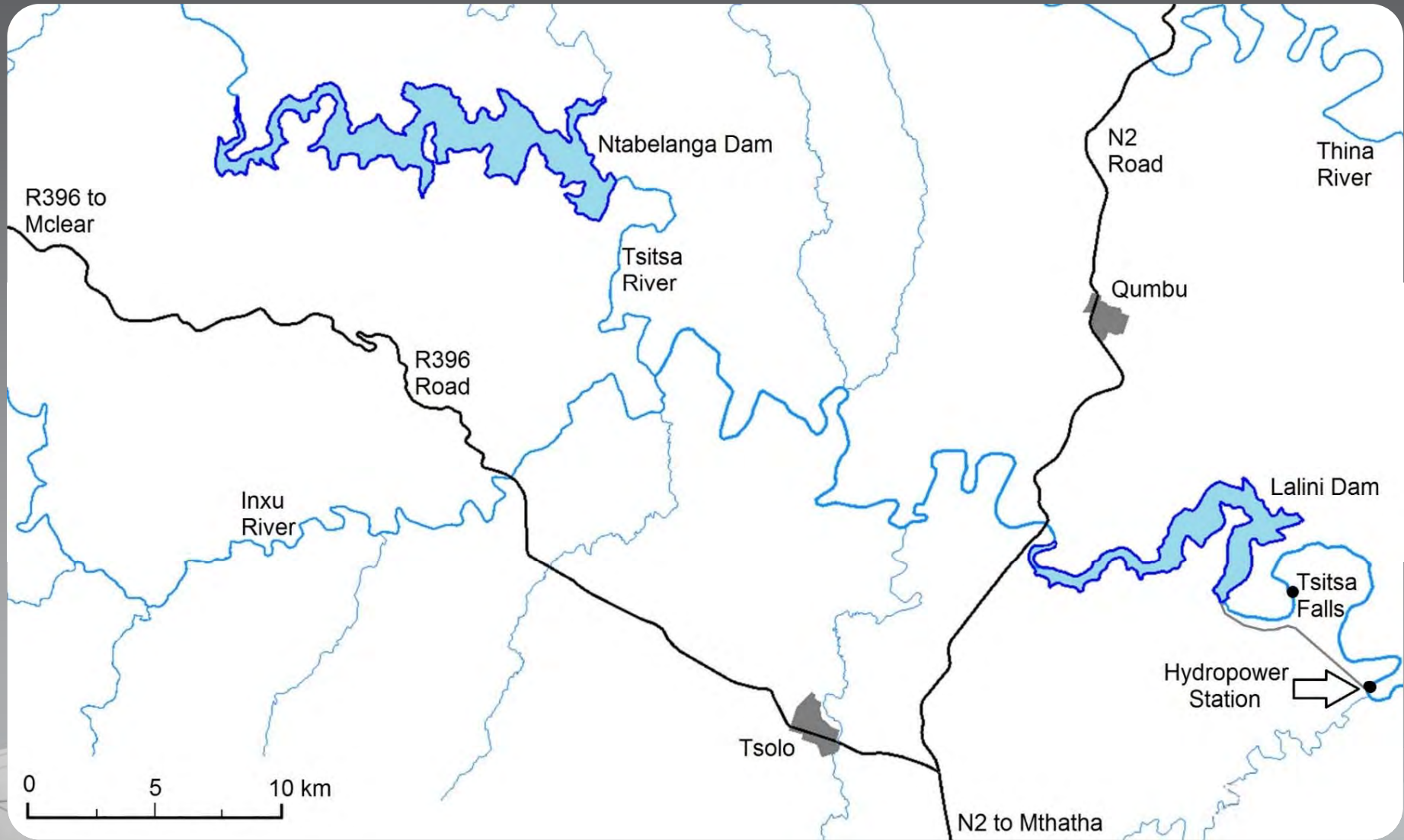




# DAM WALL INTERNAL RETICULATION



# Locality Plan



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## Ntabelanga Dam - Key Data:

Reservoir Capacity:	496 million m <sup>3</sup>
Type of Dam:	Roller Compacted Concrete (RCC) Gravity Dam
Maximum Wall Height:	67m
Crest Length:	420m

### Outlet Works Capacity:

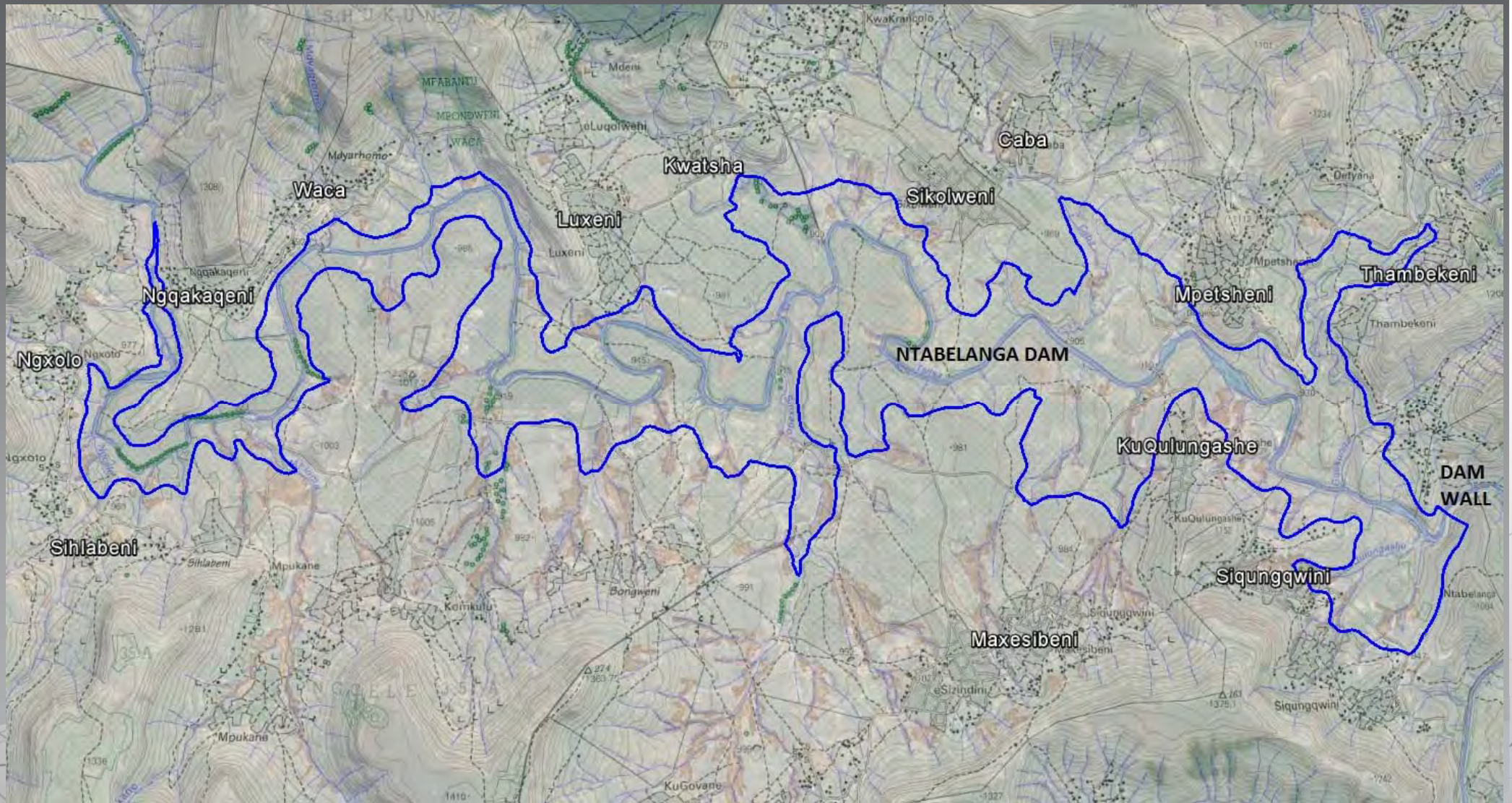
- Water Treatment Works (WTW):	1.2 m <sup>3</sup> /s
- Irrigation Water Supply:	1.1 m <sup>3</sup> /s
- River Releases:	25 m <sup>3</sup> /s
- Mini Hydro-electric Plant (HEP):	16 m <sup>3</sup> /s
- Base Hydro Electric Generation:	1.5 MW
- Maximum Hydro Electric Generation:	5.0 MW



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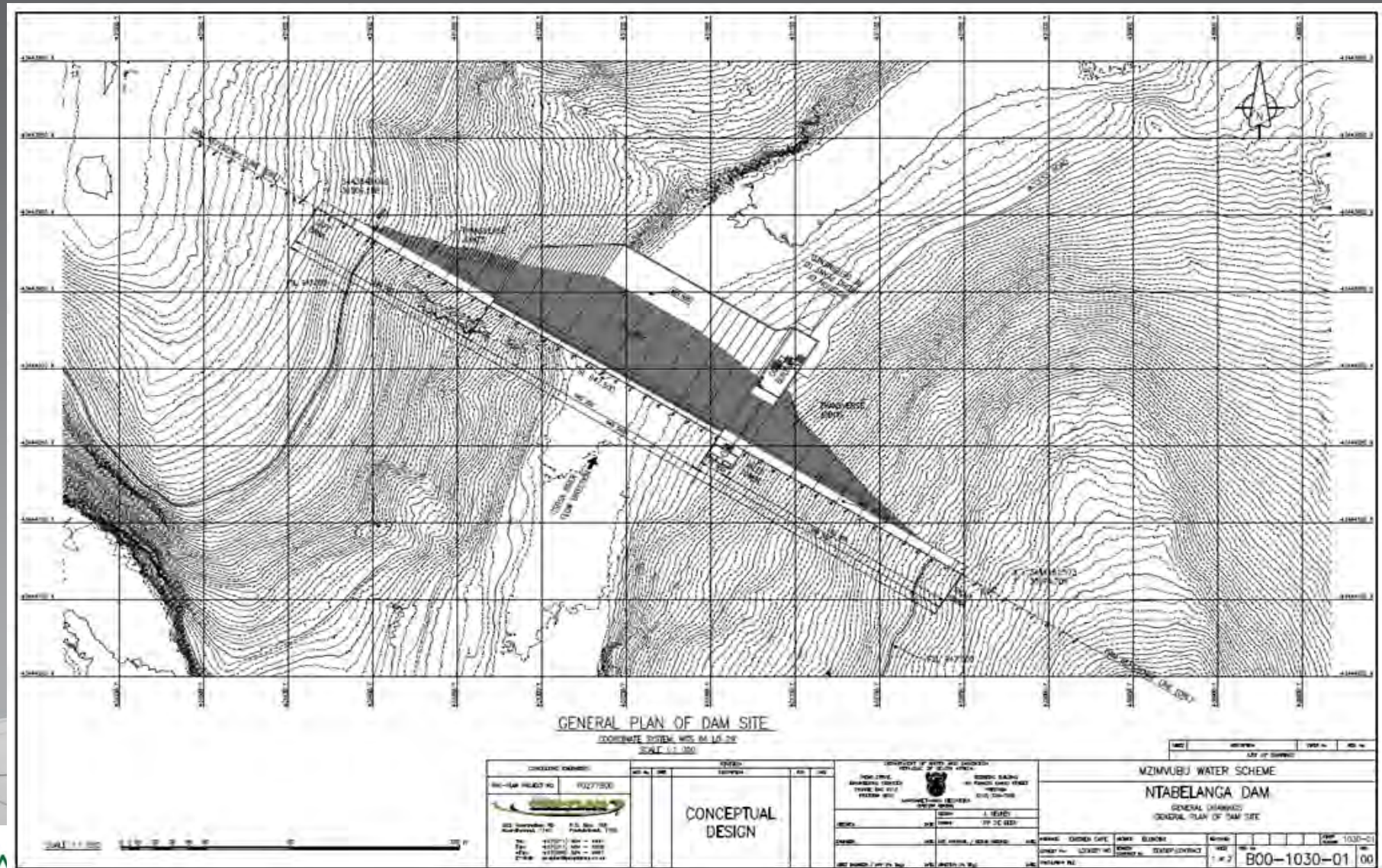
# Ntabelanga Dam



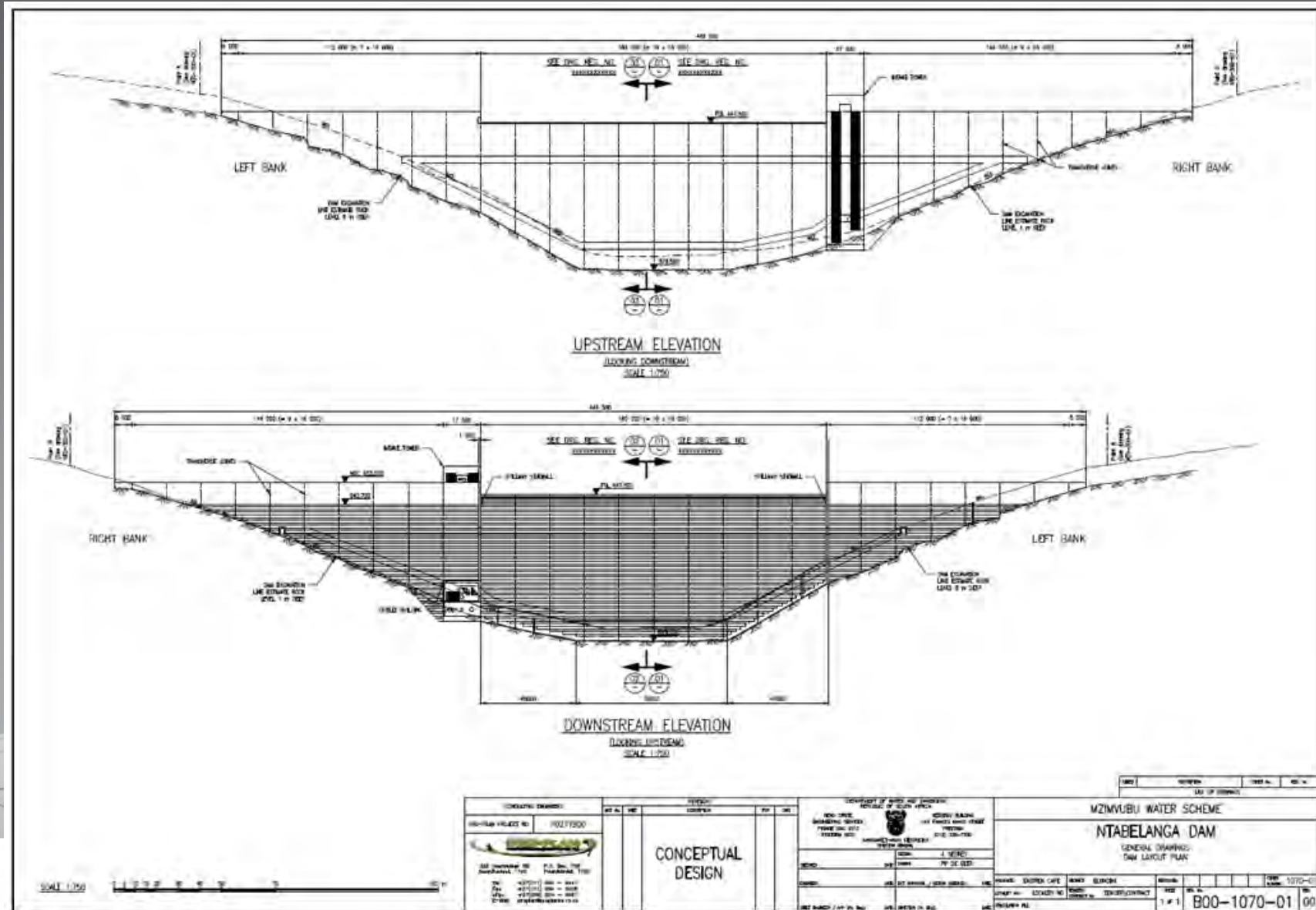
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# Ntabelanga Dam – Plan View:

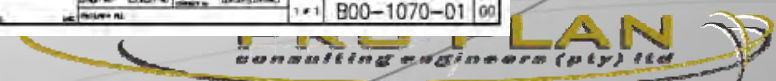


# Ntabelanga Dam – Elevations:

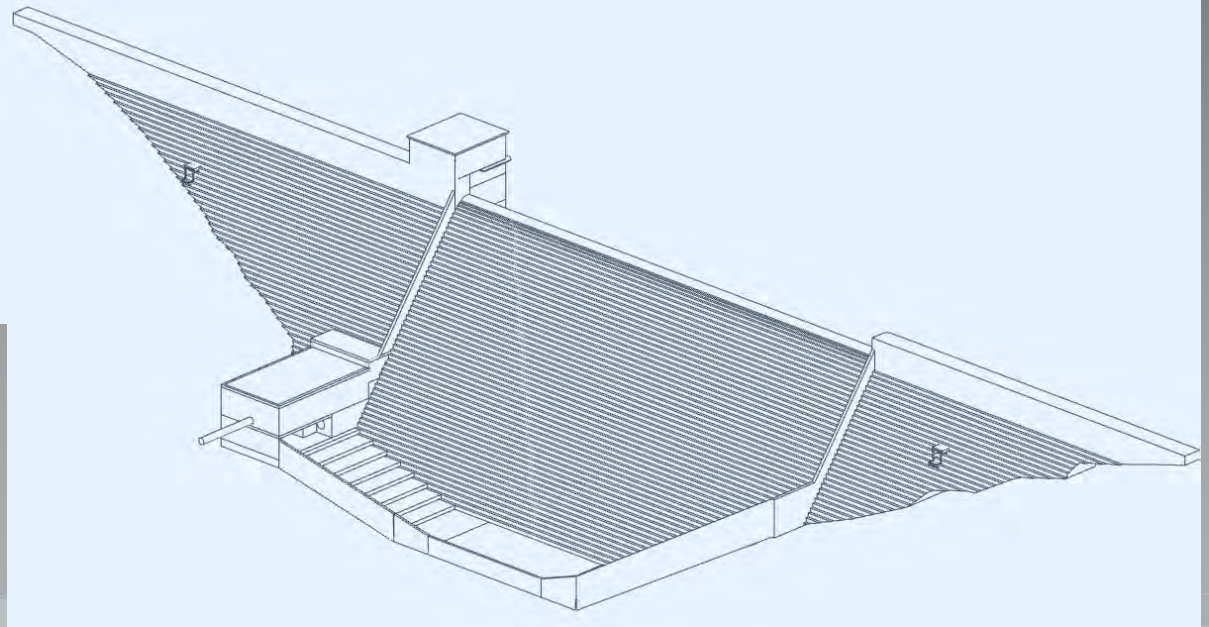
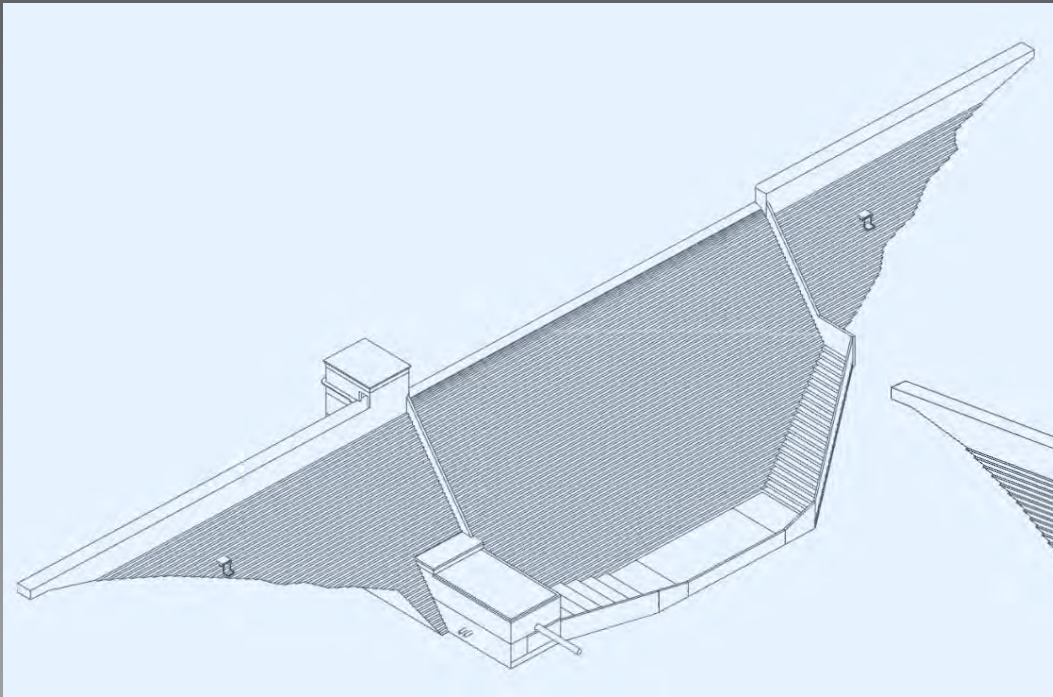


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CONSULTING ENGINEER: REG. NO. 10273/06 		PROJECT: MZIMVUBU WATER SCHEME Ntabelanga Dam	
DRAWING NO.: 10273/06-01 DATE: 10/10/2011		SHEET NO.: 1 OF 1 DRAWING TITLE: CONCEPTUAL DESIGN	
PROJECT MANAGER: REG. NO. 10273/06 		CLIENT: MZIMVUBU WATER SCHEME REG. NO. 10273/06	
DESIGNER: REG. NO. 10273/06 		CONTRACT NO.: B00-1070-01 DATE: 10/10/2011	



# Ntabelanga Dam – 3 Dimensional Views:

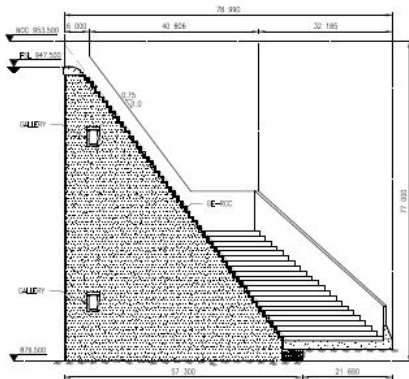


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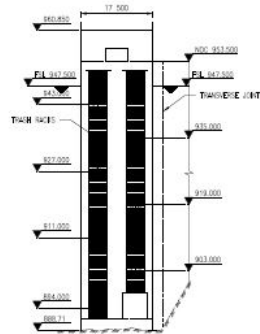
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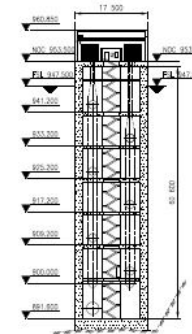
# Ntabelanga Dam



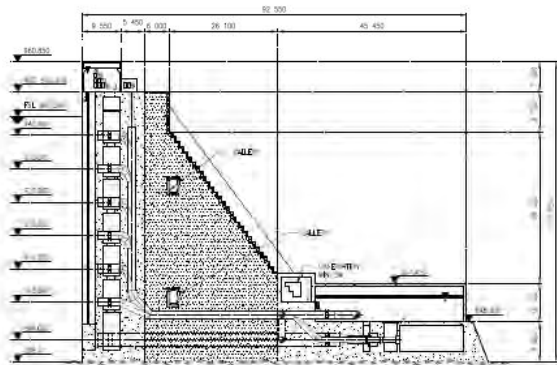
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SCALE 1:500



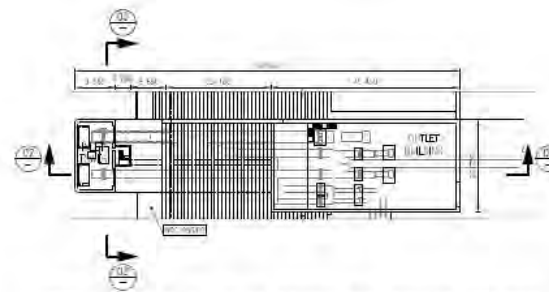
UPSTREAM ELEVATION OF INTAKE TOWER SEE DRG. REG. NO. XXXXXXXXXXXX  
SCALE 1:500



SECTION 03-03 SEE DRG. REG. NO. XXXXXXXXXXXX  
SCALE 1:500



SECTION 02-02 SEE DRG. REG. NO. XXXXXXXXXXXX  
SCALE 1:500



TYPICAL LAYOUT OF INLET TOWER AND OUTLET BUILDING  
SCALE 1:500

SCALE 1:200

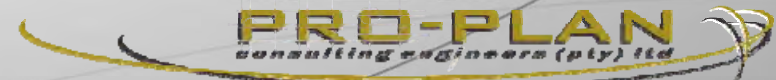


PROJECT: NTABELANGA DAM DRAWING NO: 351-1030-03		TITLE: PRELIMINARY		MZIMVUBU WATER SCHEME NTABELANGA DAM GENERAL DRAWINGS TYPICAL LAYOUTS, SECTIONS & ELEVATIONS	
PROJECT MANAGER: [Name] DESIGNER: [Name] CHECKER: [Name]	DATE: [Date] SCALE: [Scale]	DRAWN BY: [Name] CHECKED BY: [Name]	PROJECT ENGINEER: [Name] APPROVED BY: [Name]	SHEET NO: 03 OF 03 TOTAL SHEETS: 03	DRAWING NO: 351-1030-03



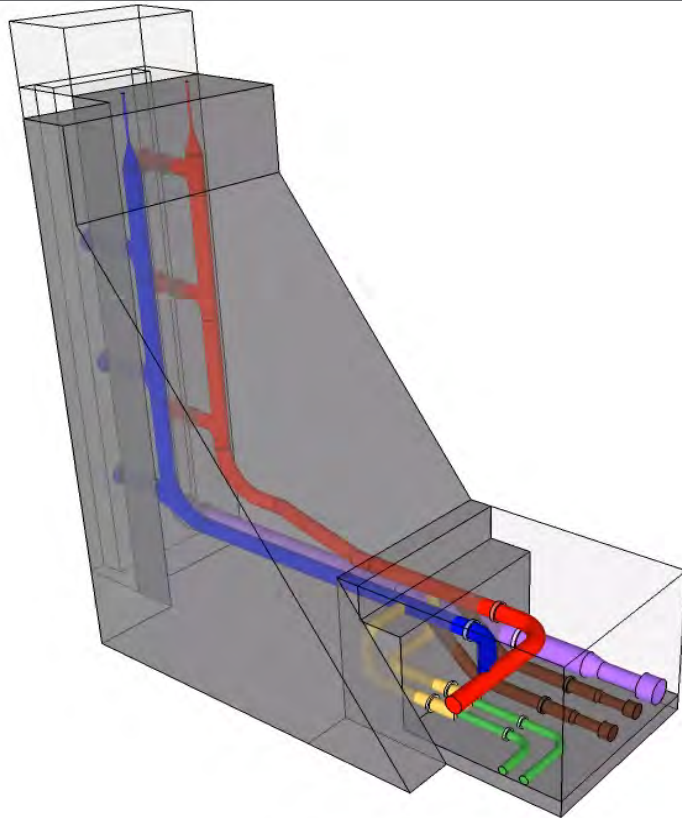
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# Ntabelanga Dam – Outlet Works:



## LEGEND:

Pipes to WTW and Irrigation

Pipes to HEP

Pipes for River Releases

Pipes for Silt Outlet



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# Model Study



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# Model Study



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# Lalini Dam - Key Data:

Reservoir Capacity: 232 million m<sup>3</sup>

Type of Dam: Roller Compacted Concrete (RCC) Gravity Dam

Maximum Wall Height: 53m

Crest Length: 365m

## Outlet Works Capacity:

- River Releases: 60 m<sup>3</sup>/s
- Lalini Dam Small Hydro-electric Plant (HEP): 16 m<sup>3</sup>/s
- Tsitsa Falls Main Hydro-electric Plant (HEP): 25 m<sup>3</sup>/s

## Hydropower Generation (Installed Capacity):

- Lalini Dam HEP: 6.7 MW
- Tsitsa Falls HEP: 45 MW



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## Tsitsa Falls Hydro-Electric Plant - Key Data:

Water will be conveyed from the Lalini Dam to a Hydropower Station via a pipe and tunnel.

Total Length of Conveyance System (Pipe and Tunnel): 7.5 km

Approximate Diameter: 3 m

Maximum Flow 25 m<sup>3</sup>/s

Installed Capacity 45 MW

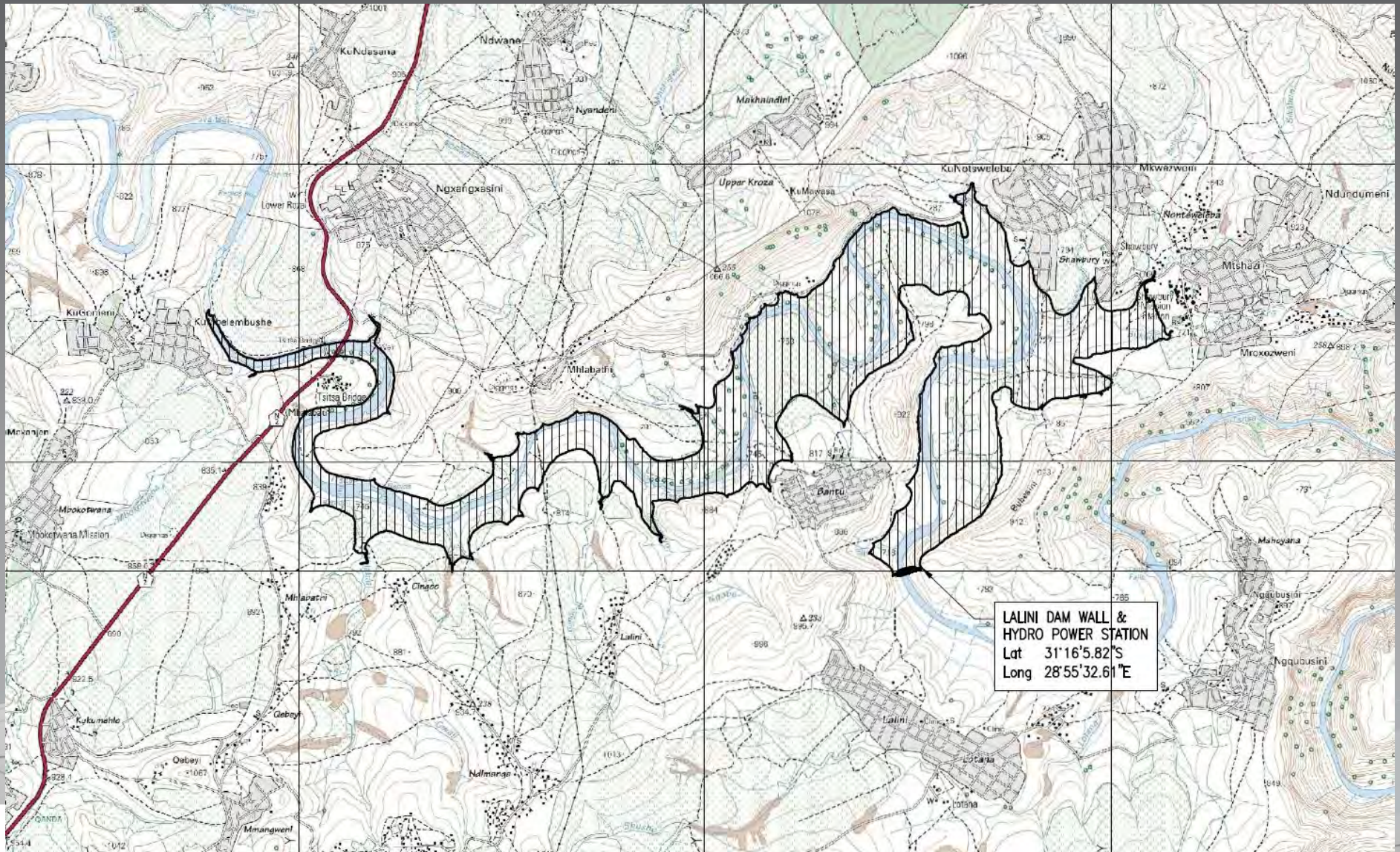


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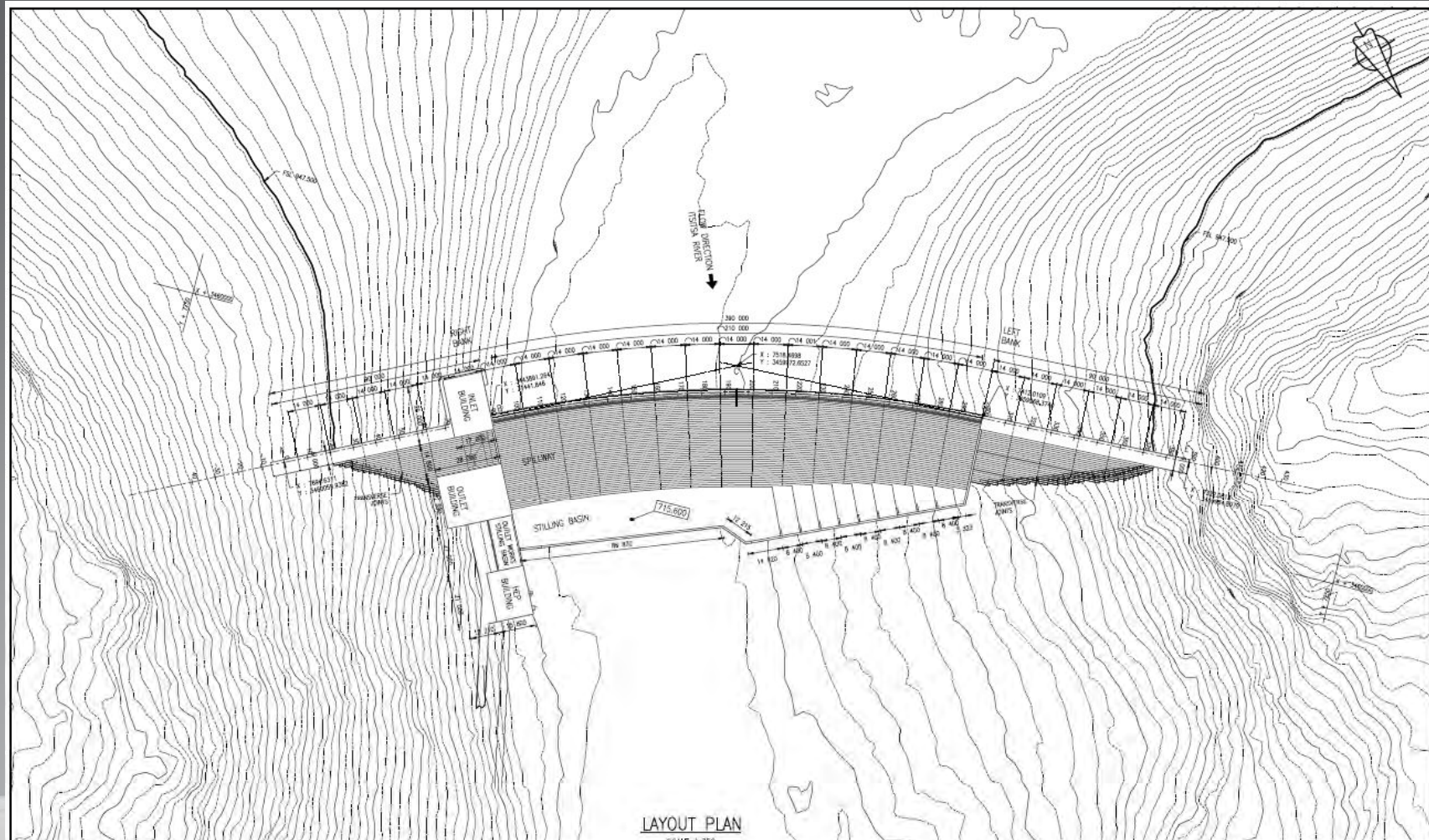


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# Lalini Dam



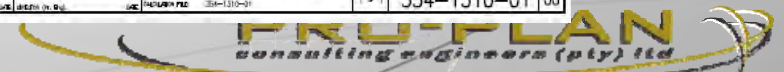
LAYOUT PLAN  
SCALE 1:750

NO.	DESCRIPTION	DATE	BY

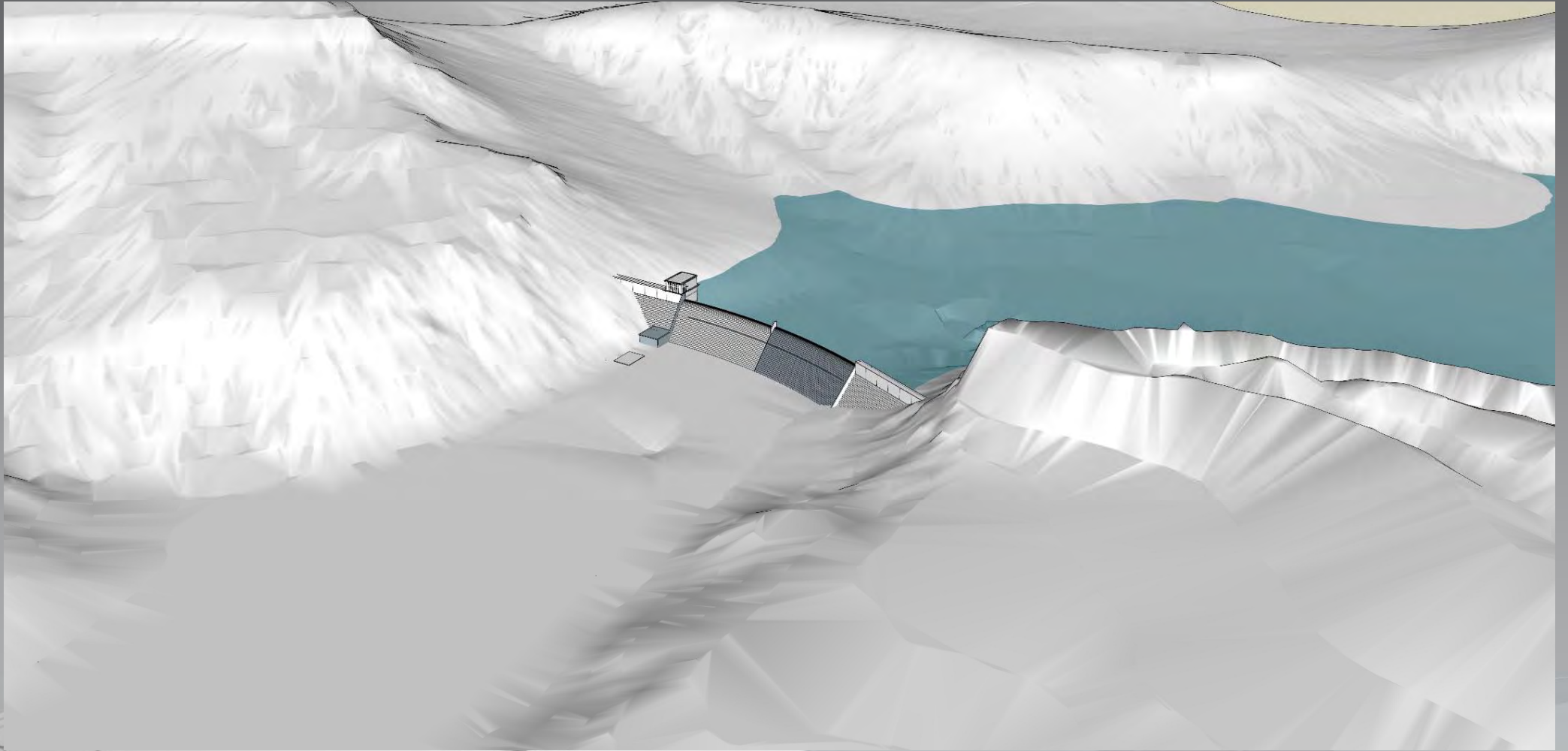
CONSULTING ENGINEER		REVISION		DEPARTMENT OF WATER AND SANITATION REPUBLIC OF SOUTH AFRICA		MZIMVUBU WATER SCHEME	
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		PRELIMINARY				LIST OF DRAWINGS	
						NO.	DATE
322 Woodville RD. P.O. Box 738 Sandton, 1518 Tel: 011 881 4441 Fax: 011 881 4600 E-mail: info@proplan.co.za				ENGINEERING 105 PARK ROAD TOWN (010) 546-7000 J. J. J. (J. J. VAN NIEK)		DRAWN: DOTTEN CAPE CHECKED: ELIJAH DATE: 13/10/01 PROJECT NO.: 354-1310-01 DRAWING NO.: 01	
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# Lalini Dam

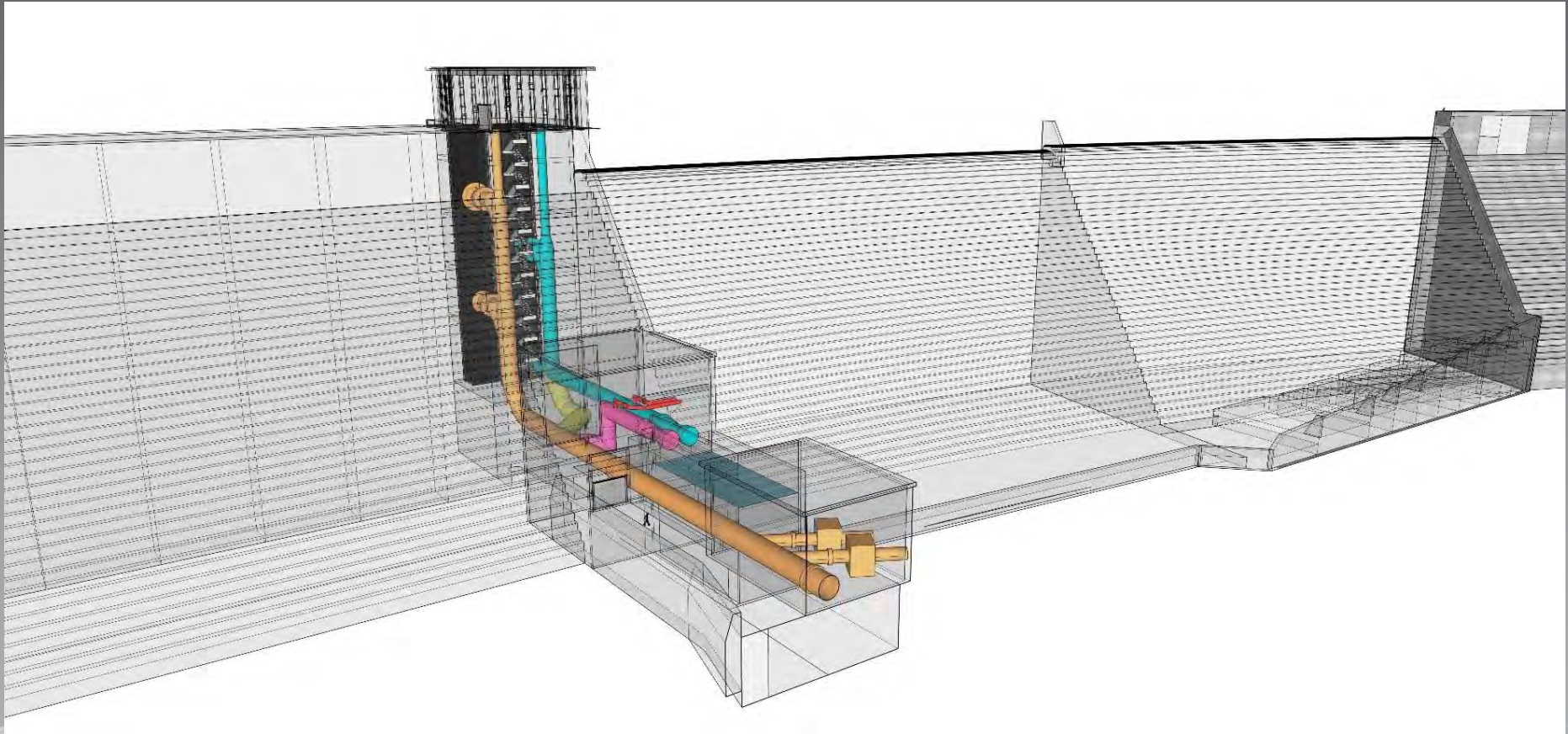


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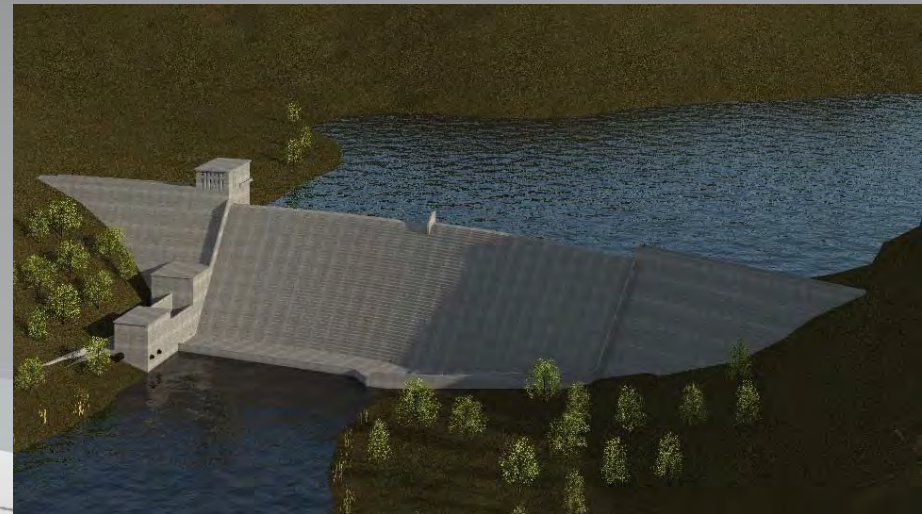
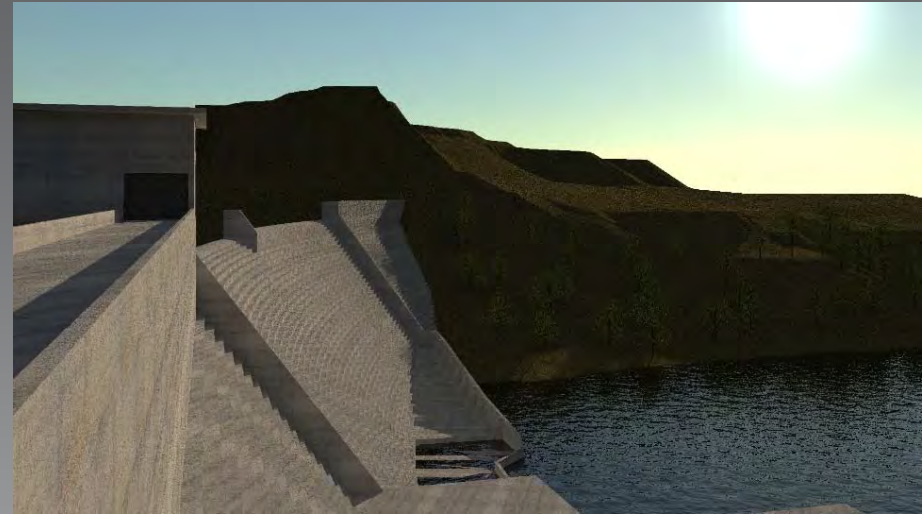
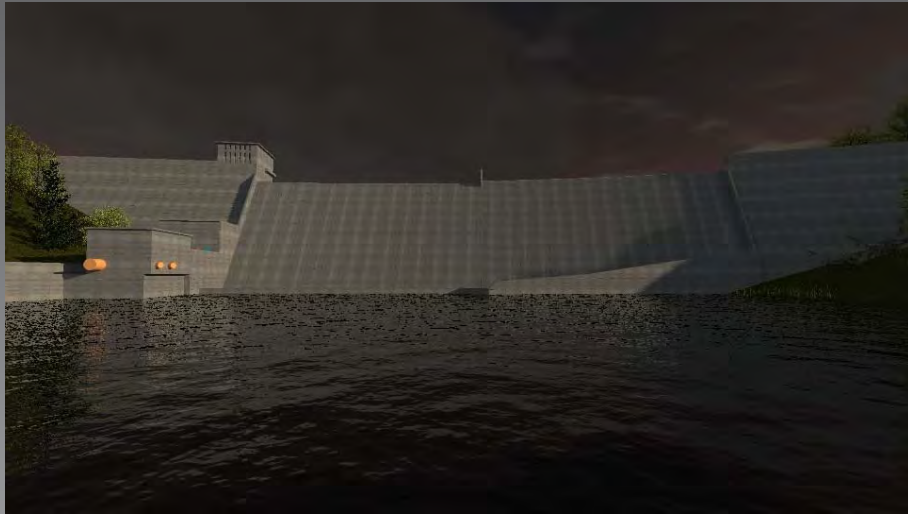
# Lalini Dam



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# Lalini Dam



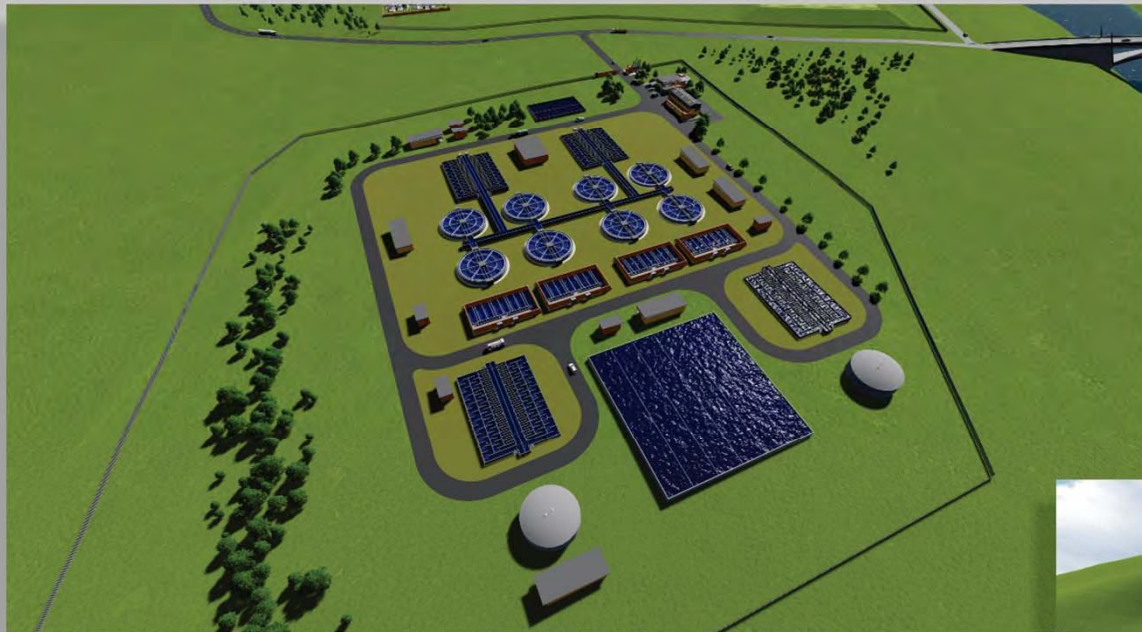
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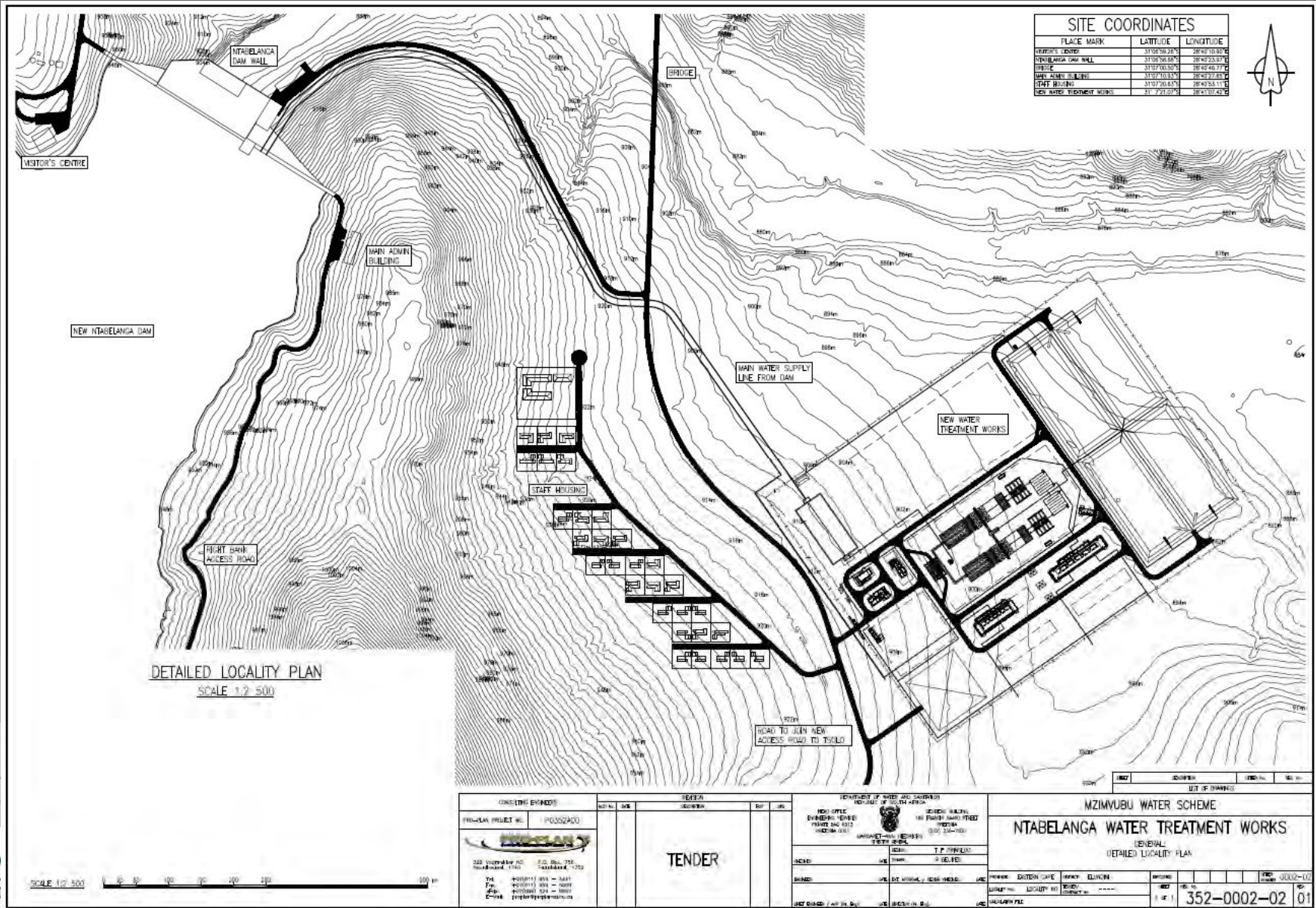
# Ntabelanga

# Water Treatment Works



# WATER TREATMENT PLANT FLOOR PLAN

# Water Treatment Plant:



SCALE 1:2 500

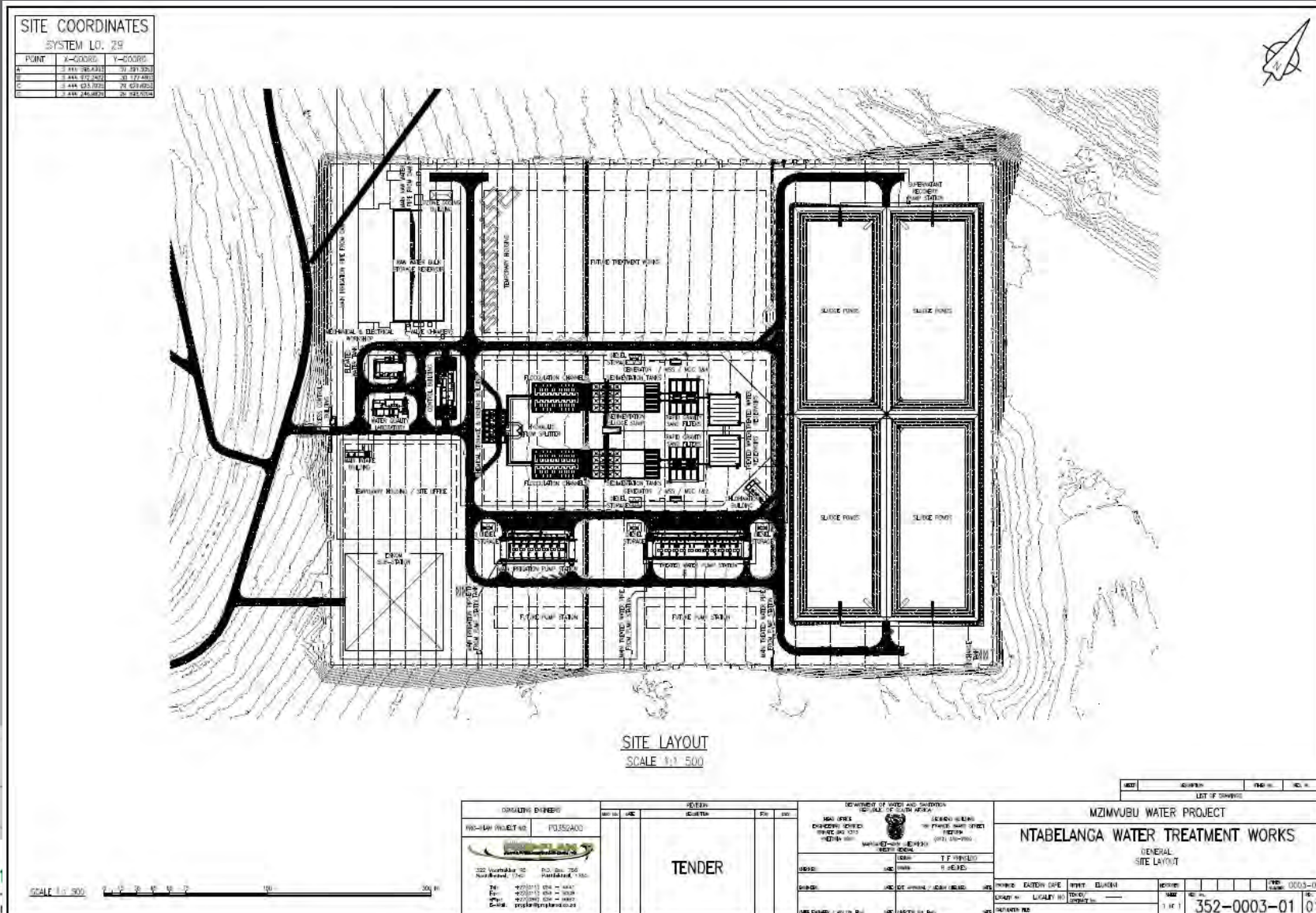
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PROJ/PLAN PROJECT NO. 1 P0002400			<b>MZIMVUBU WATER SCHEME</b>
			<b>NTABELANGA WATER TREATMENT WORKS</b>
			GENERAL LOCALITY PLAN
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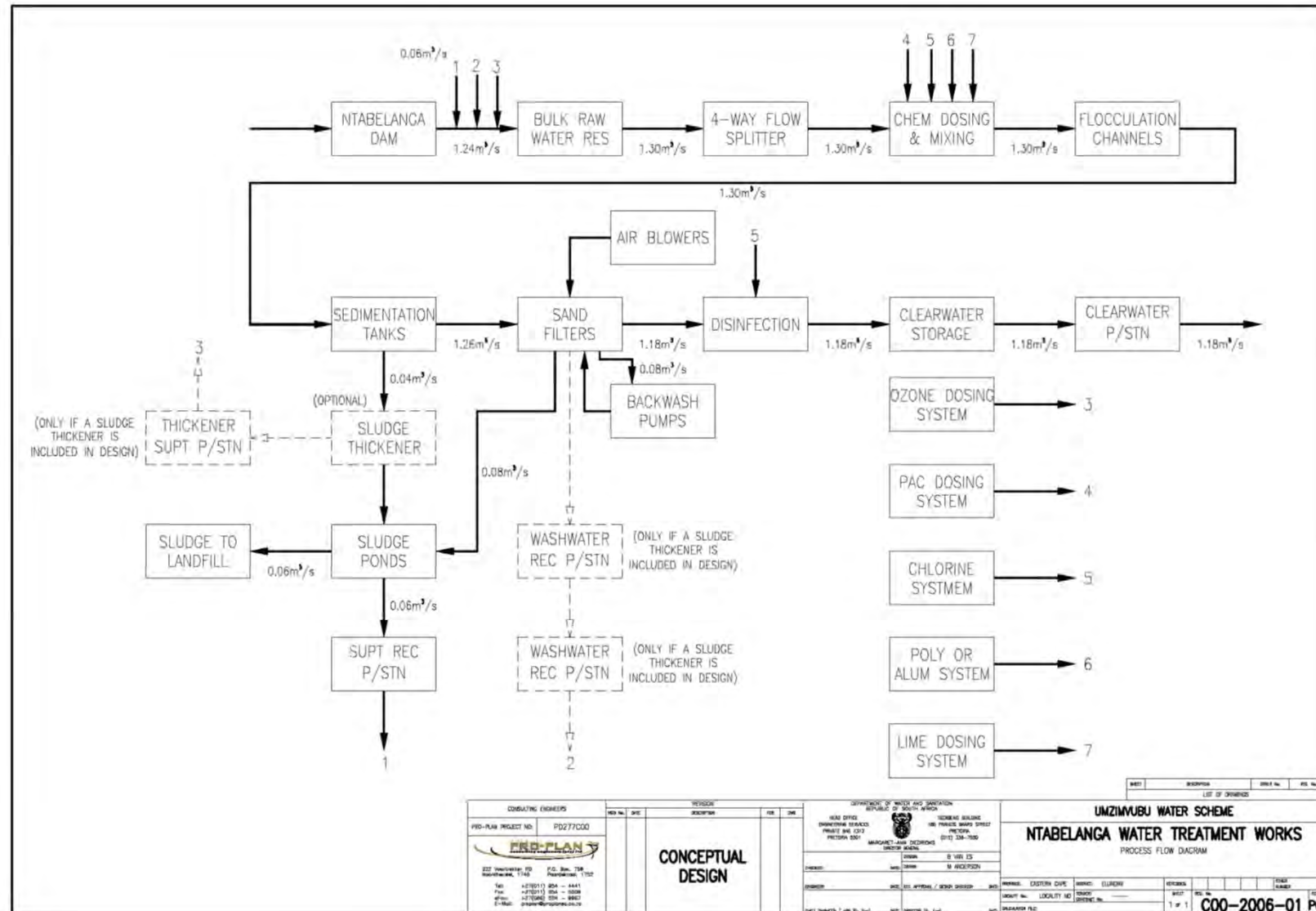
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# Water Treatment Plant:



# Water Treatment Plant:



## Water Treatment Plant:

- 100 Ml/d Capacity
- Raw water supply and storage
- Flow division
- Chemical storage, flash mixing, coagulation and flocculation
- Sedimentation and filtration
- Disinfection
- Treated water storage and distribution
- Waste management (sludge and filter washwater)
- Pipelines, earthworks, roads, stormwater drainage and buildings

# Ntabelanga

# Water Distribution System

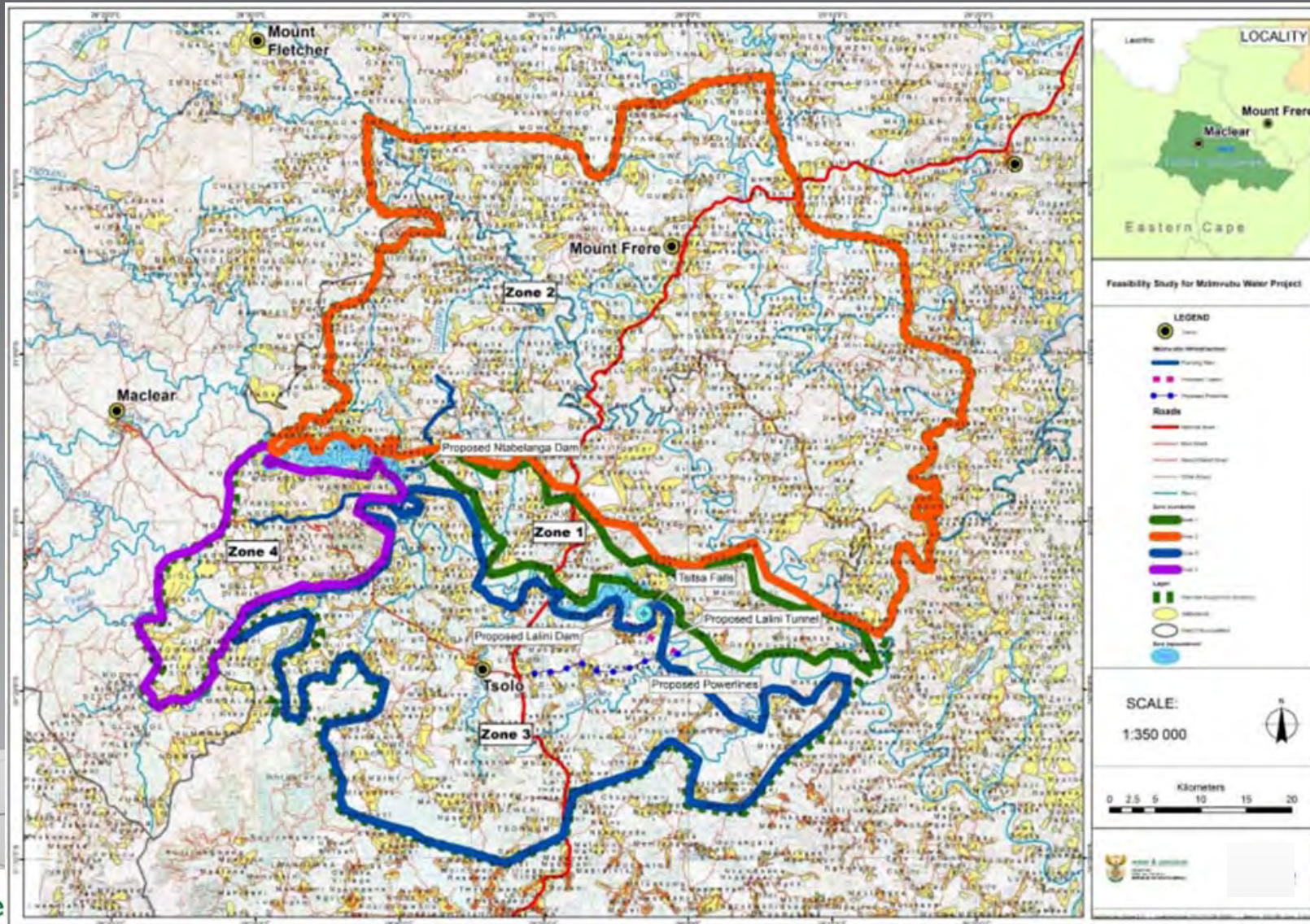


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# Water Distribution System:

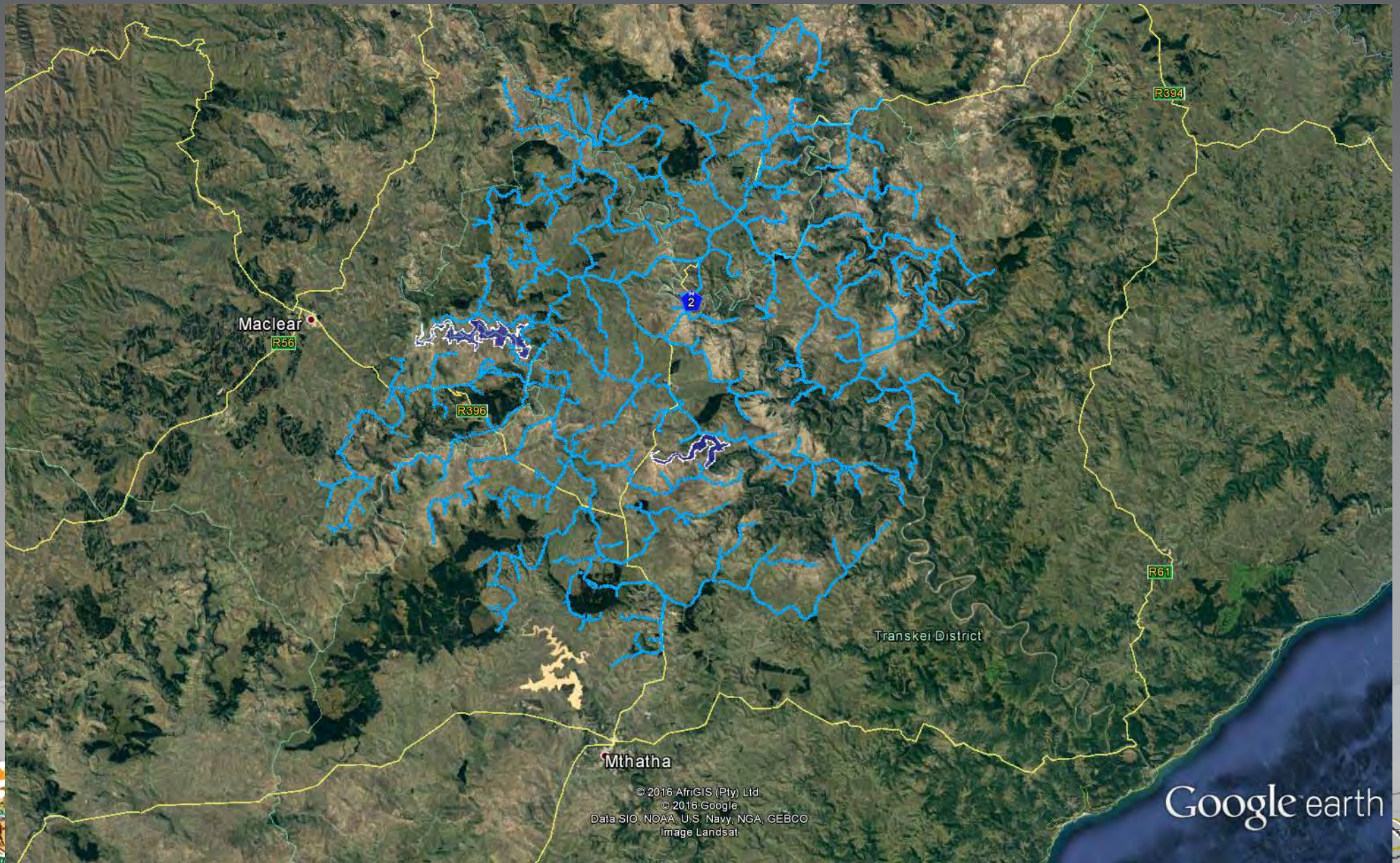


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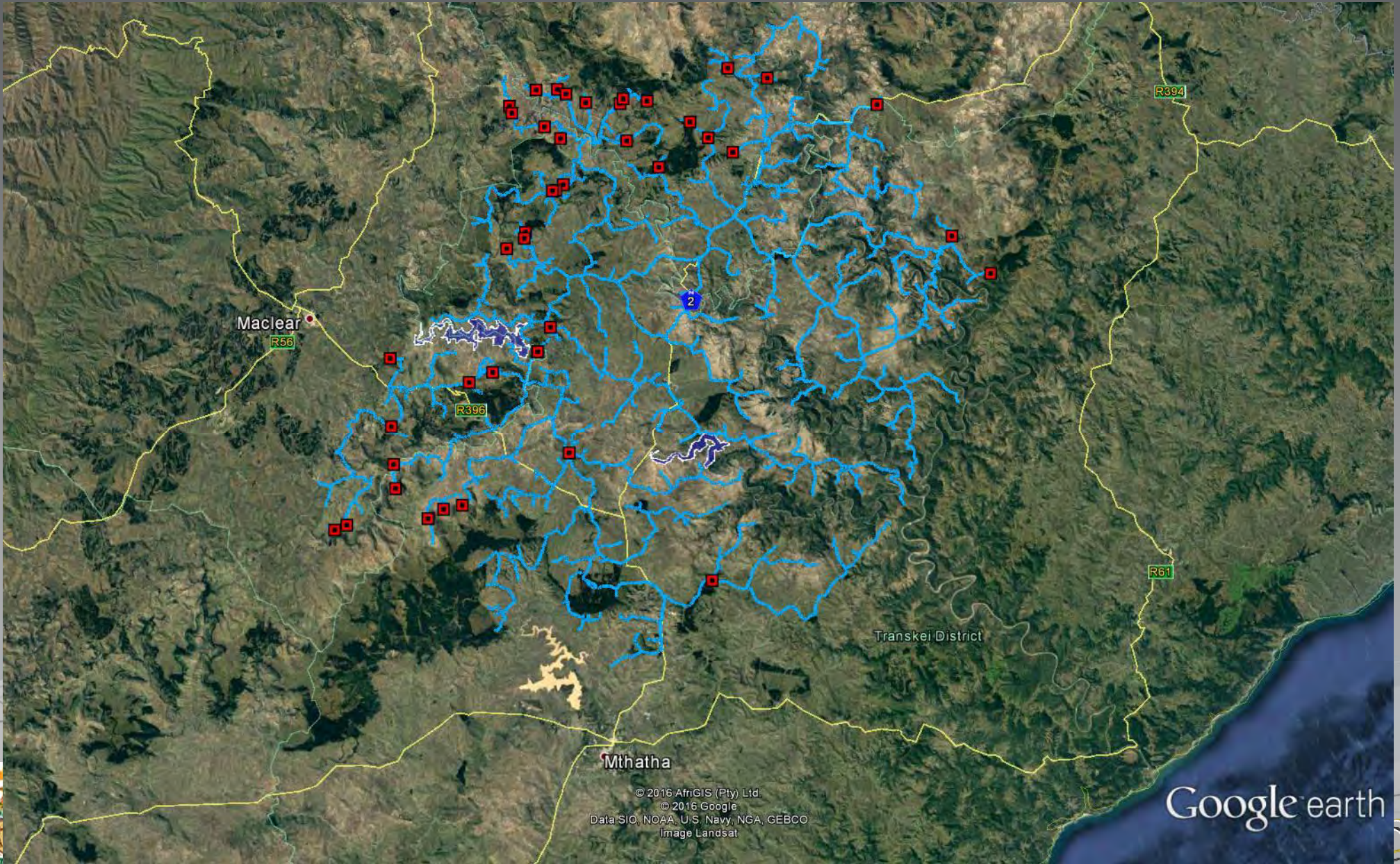
# Ntabelanga BDS – Bulk Distribution System



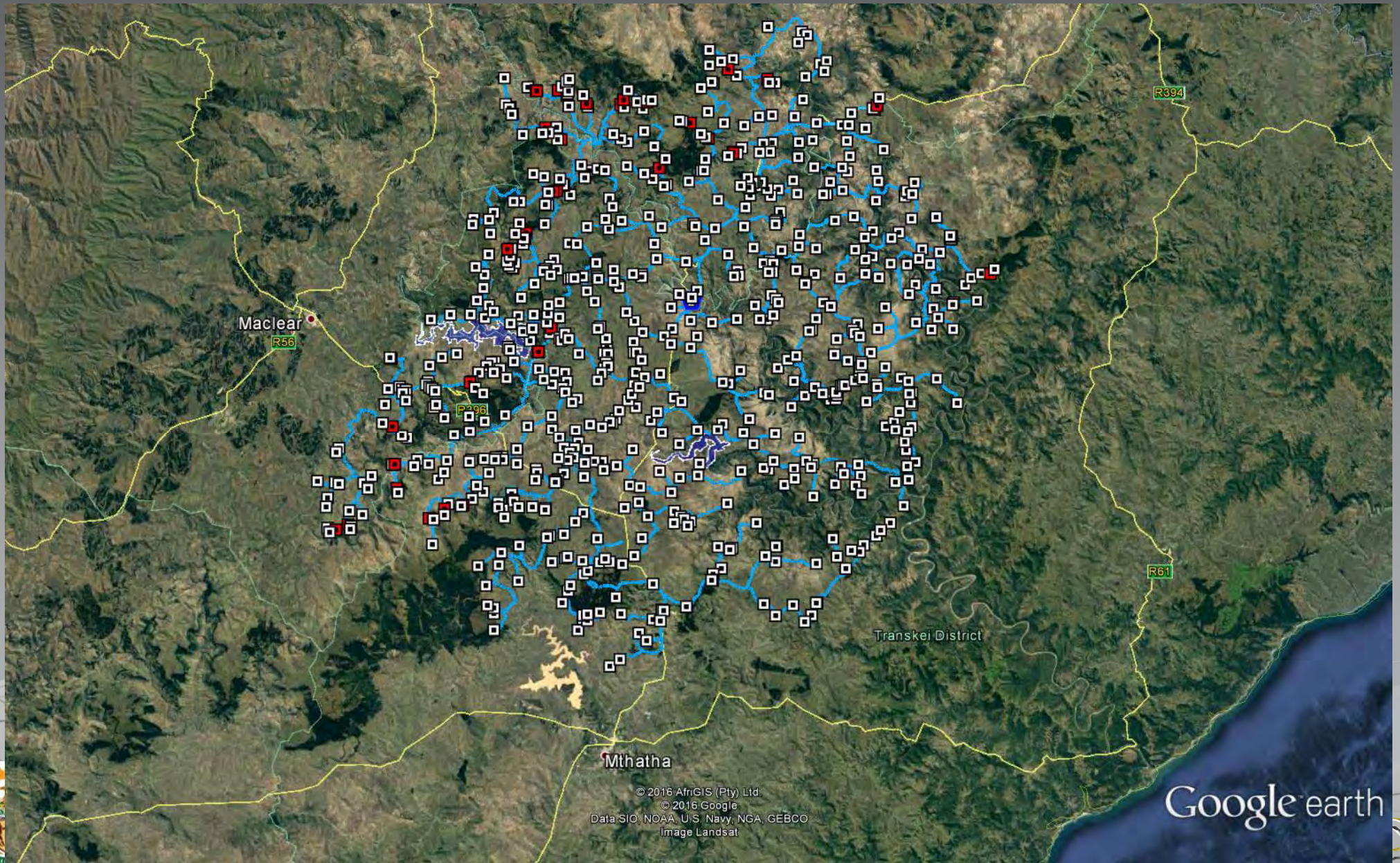
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat

Google earth

# Ntabelanga BDS – Pump Stations



# Ntabelanga BDS – Villages

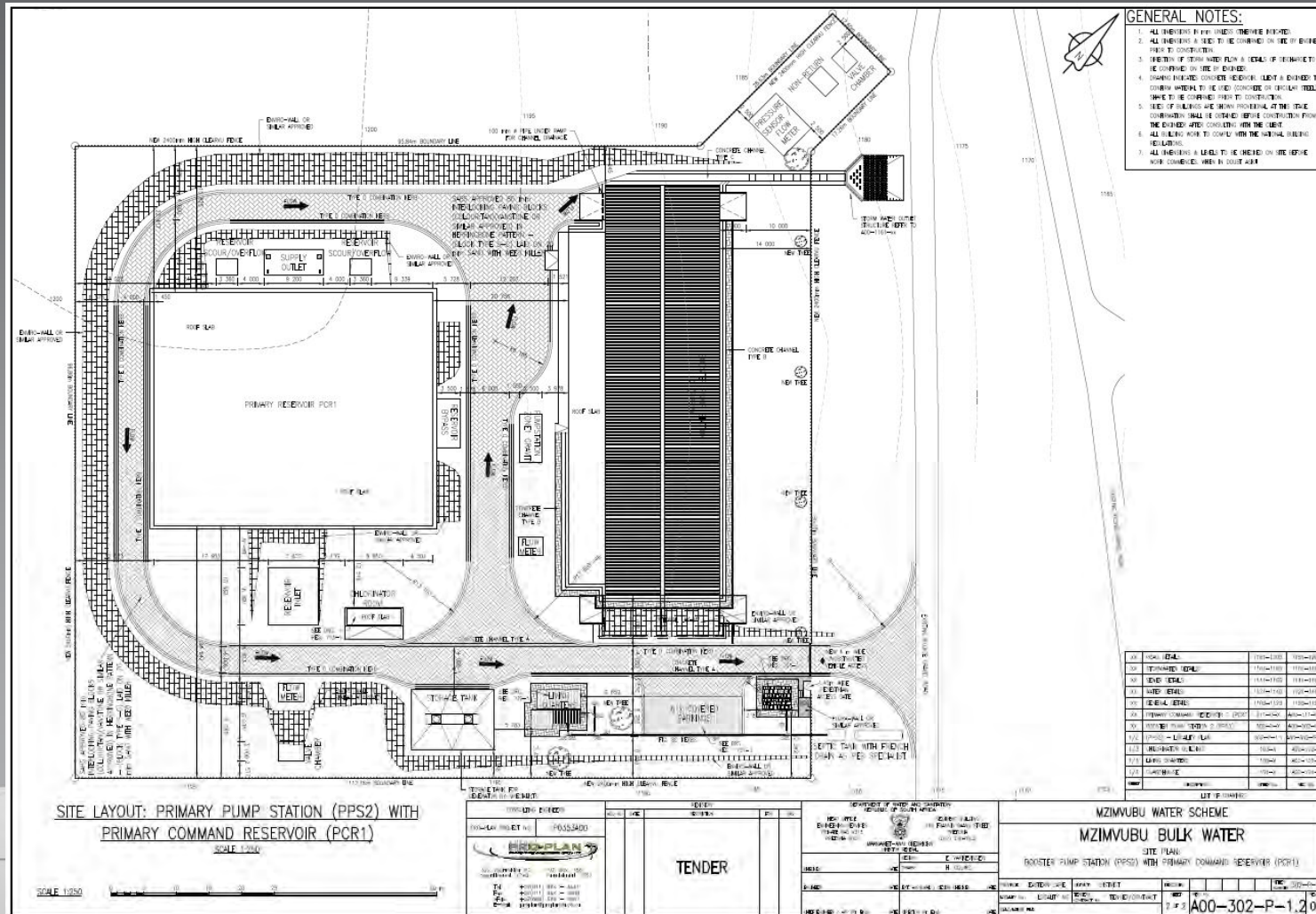


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Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat

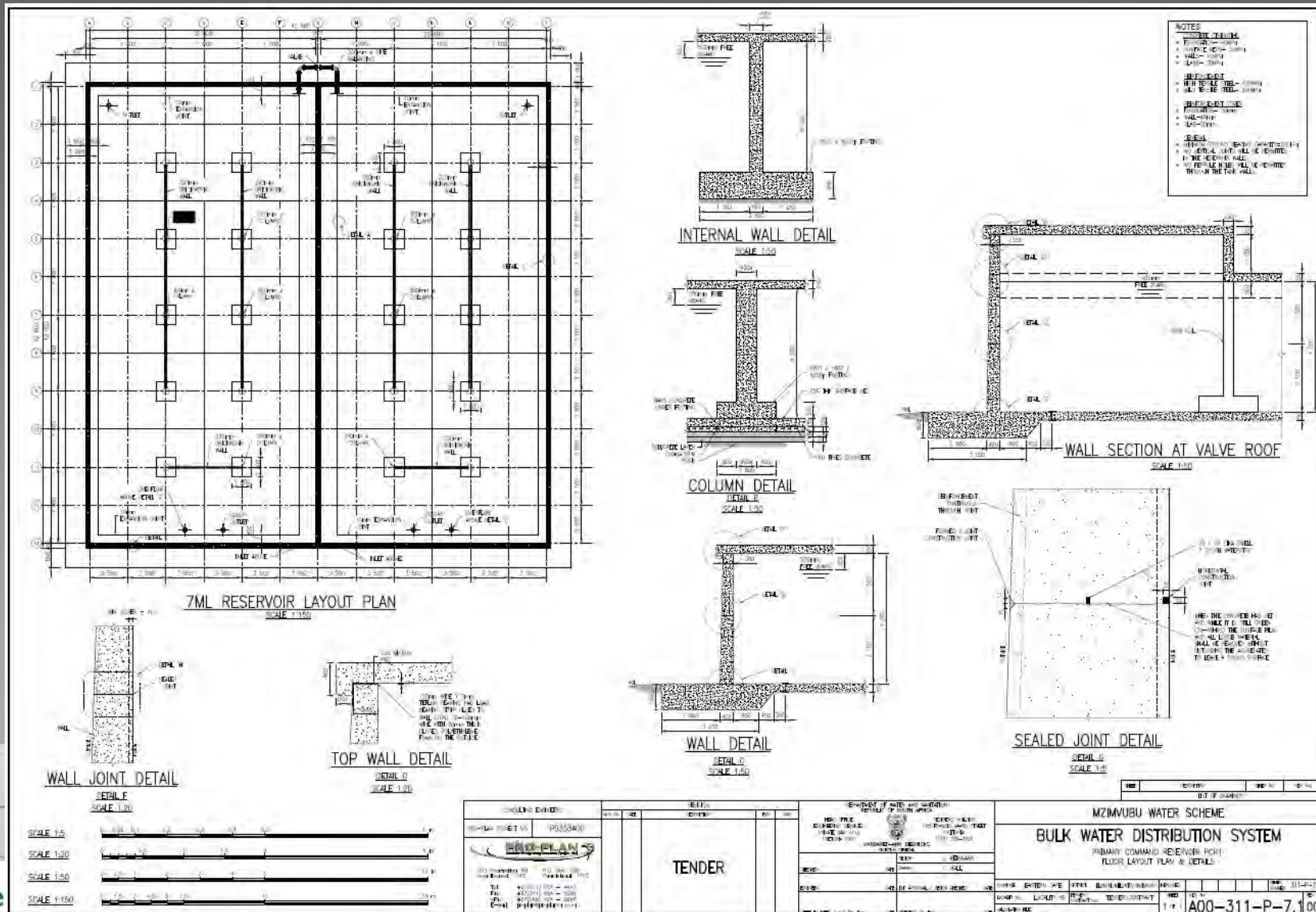
Google earth



# Water Distribution System – Reservoir and Pump station :



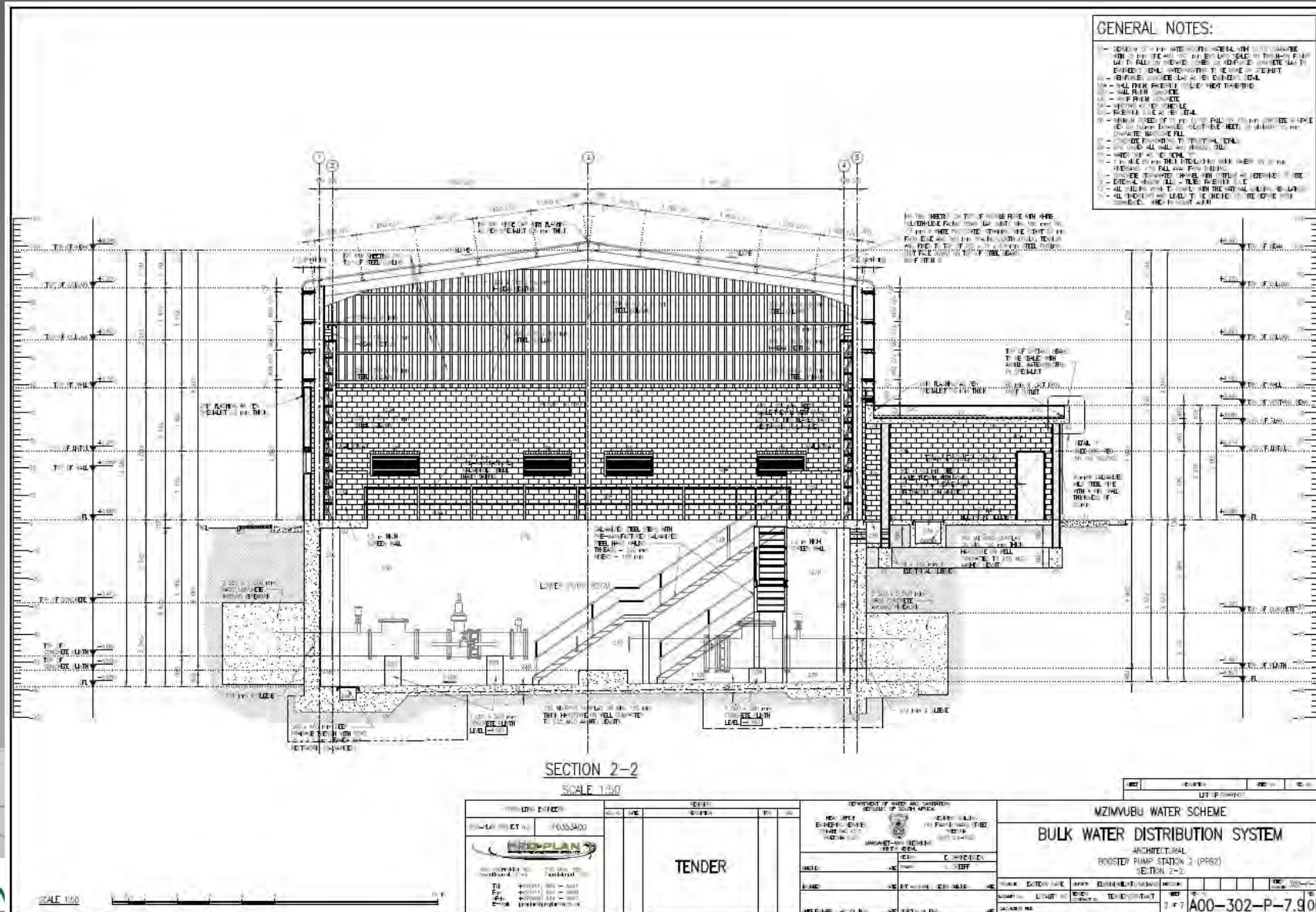
# Water Distribution System - Reservoir :



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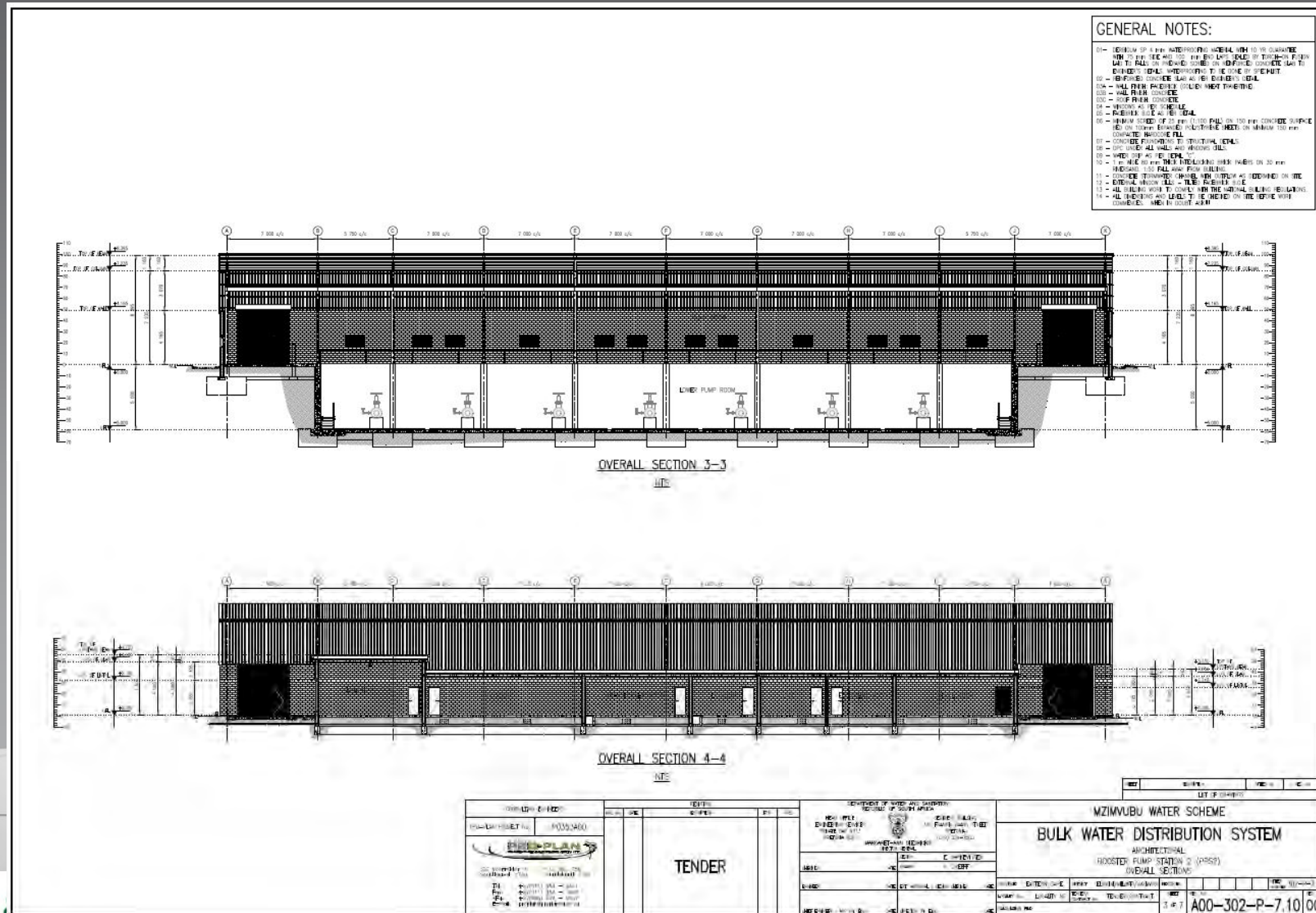
# Water Distribution System - Pump station :



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# Water Distribution System - Pump station :

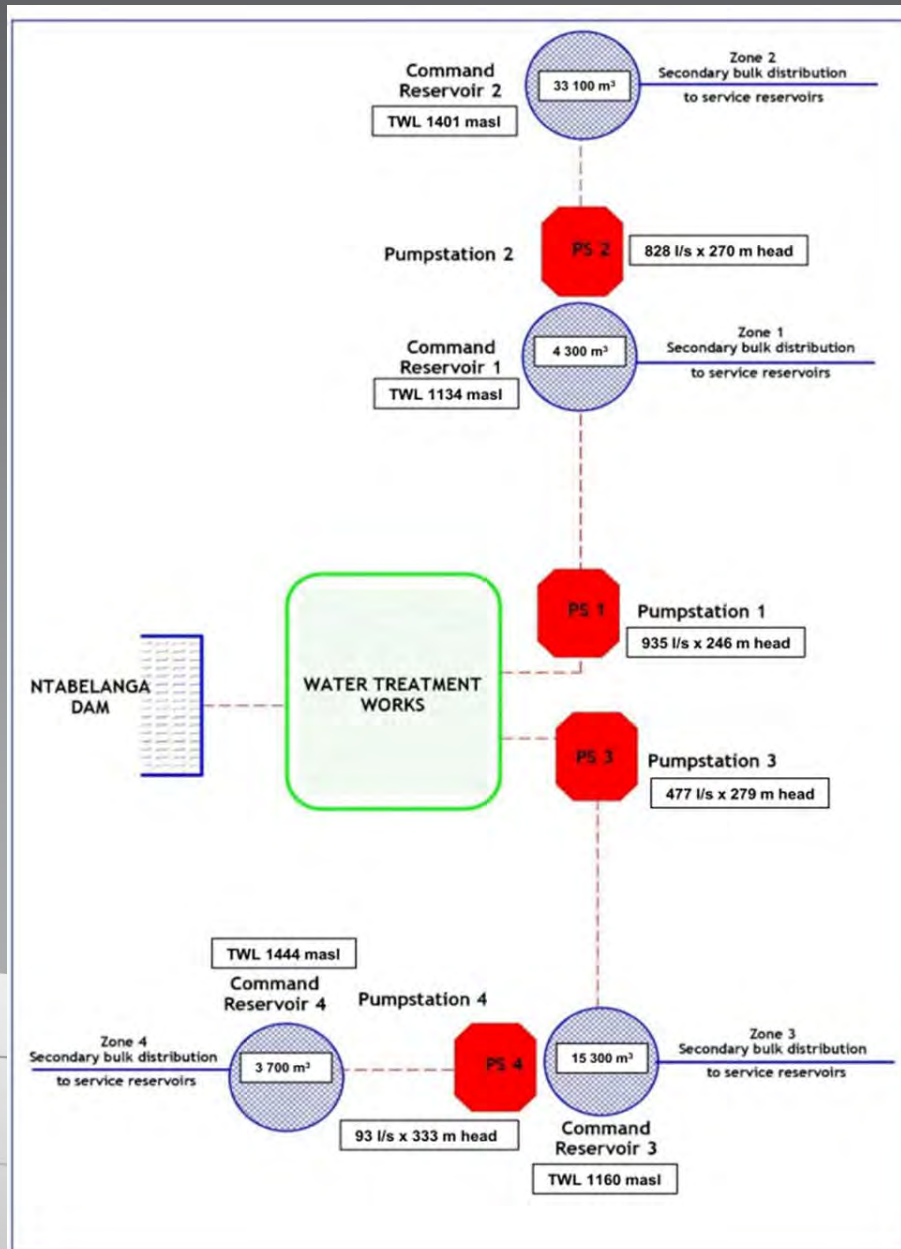


## Water Distribution - Population Data:

	Population				
	2013	2020	2030	2040	2050
Alfred Nzo DM	165 735	177 691	196 281	216 816	239 500
Joe Gqabi DM	33 513	35 931	39 690	43 842	48 429
OR Tambo DM	303 574	325 472	359 524	397 138	438 687
<b>Totals</b>	<b>502 822</b>	<b>539 094</b>	<b>595 495</b>	<b>657 797</b>	<b>726 616</b>
	Households				
	2013	2020	2030	2040	2050
Alfred Nzo DM	33 859	36 301	40 099	44 294	48 928
Joe Gqabi DM	6 847	7 340	8 108	8 957	9 894
OR Tambo DM	62 018	66 492	73 448	81 133	89 621
<b>Totals</b>	<b>102 723</b>	<b>110 133</b>	<b>121 656</b>	<b>134 383</b>	<b>148 443</b>

	Population				
	2013	2020	2030	2040	2050
Zone 1	39 404	42 247	46 667	51 549	56 942
Zone 2	288 234	309 026	341 357	377 071	416 521
Zone 3	147 195	157 813	174 324	192 562	212 708
Zone 4	27 988	30 007	33 147	36 615	40 445
<b>Total</b>	<b>502 822</b>	<b>539 094</b>	<b>595 495</b>	<b>657 797</b>	<b>726 616</b>

# Water Distribution - Population Data:



## Water Distribution System:

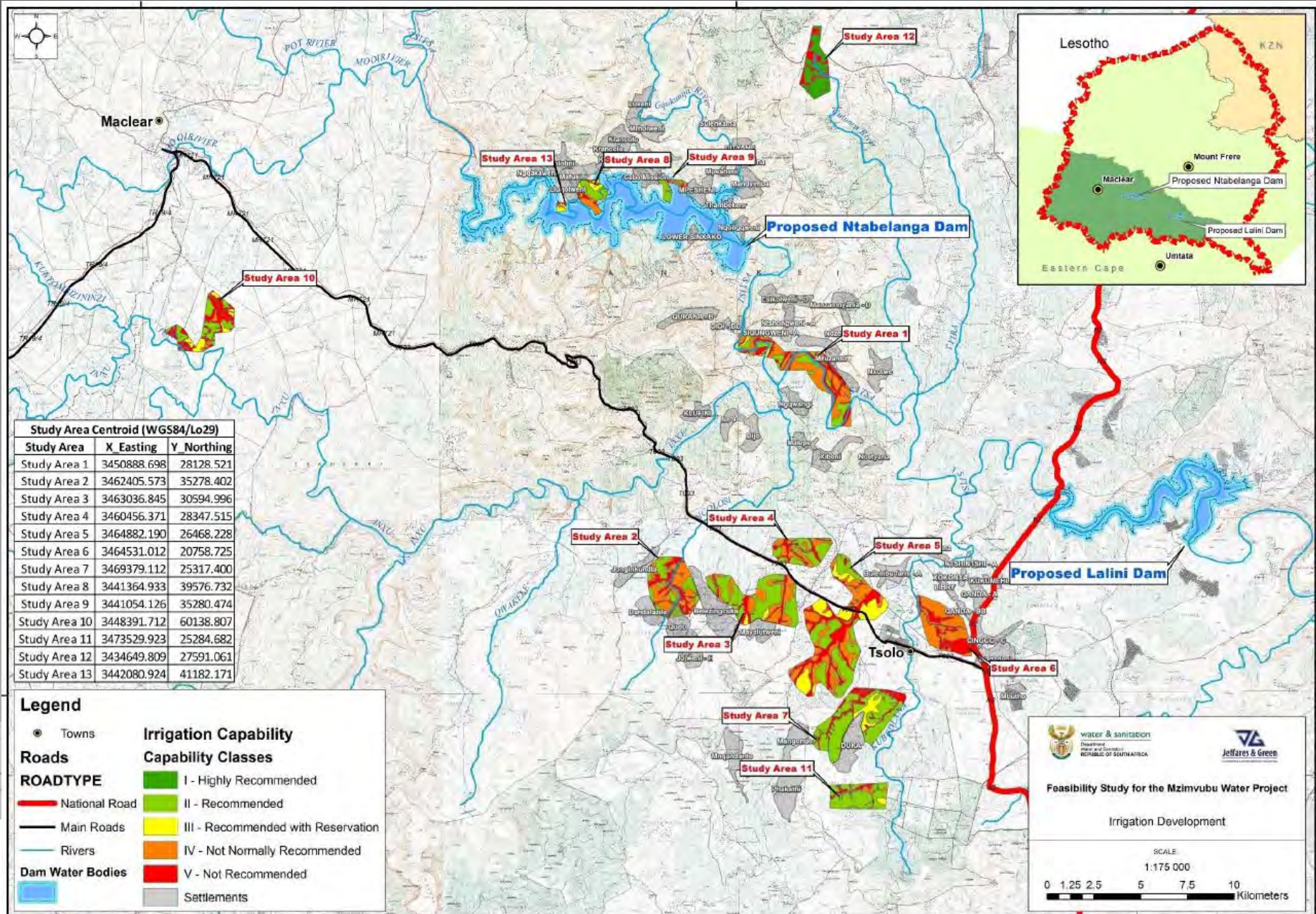
km	Zone 1	Zone 2	Zone 3	Zone 4	Total
Primary	41.66				<b>41.66</b>
Secondary	28.54	86.56	91.44		<b>206.54</b>
Tertiary	102.68	483.36	319.01	133.32	<b>1 038.37</b>
<b>Total</b>	<b>41.66</b>	<b>131.22</b>	<b>569.91</b>	<b>133.32</b>	<b>1 286.56</b>



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# Water Distribution – Irrigation System:





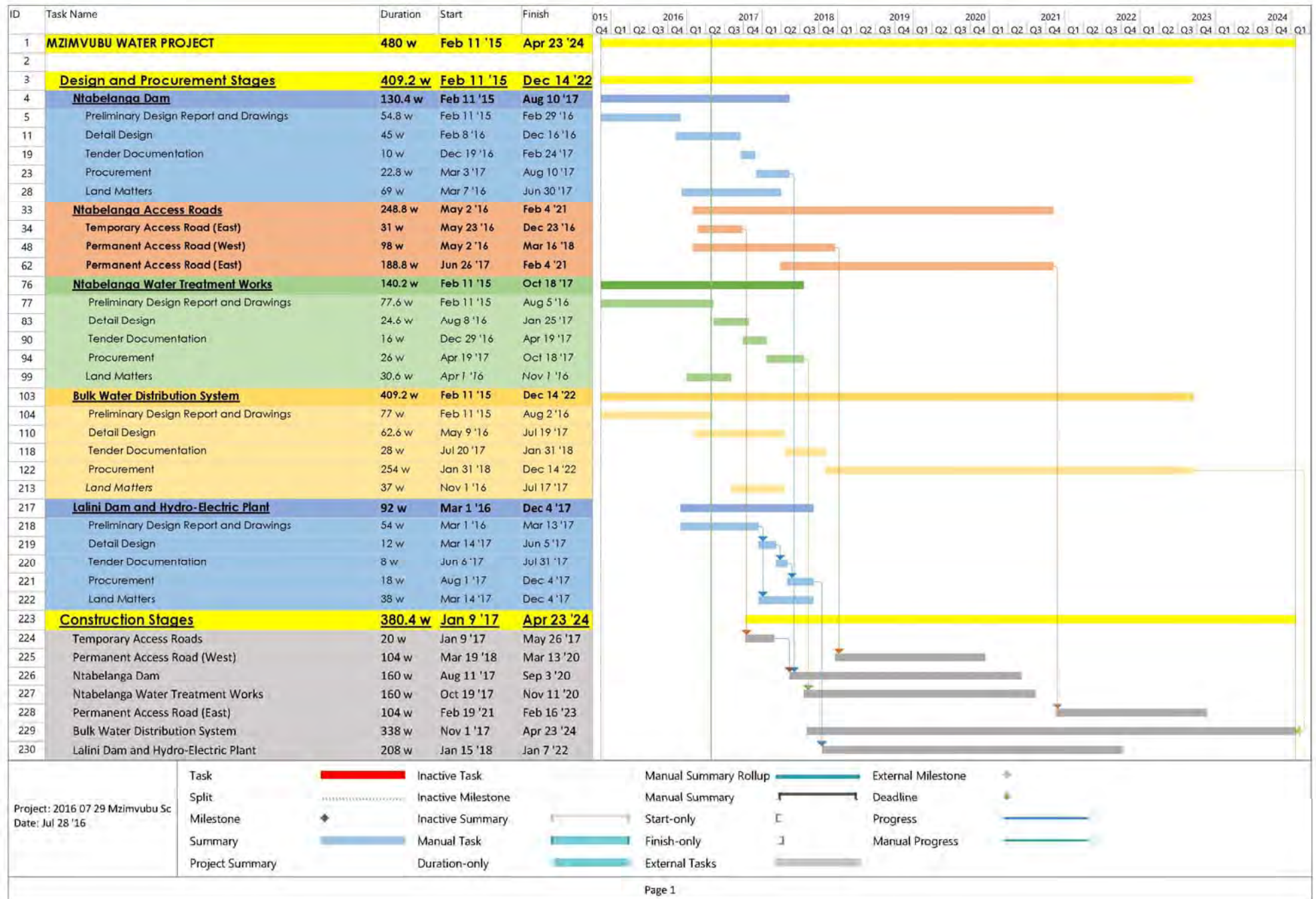
# Programme – Main



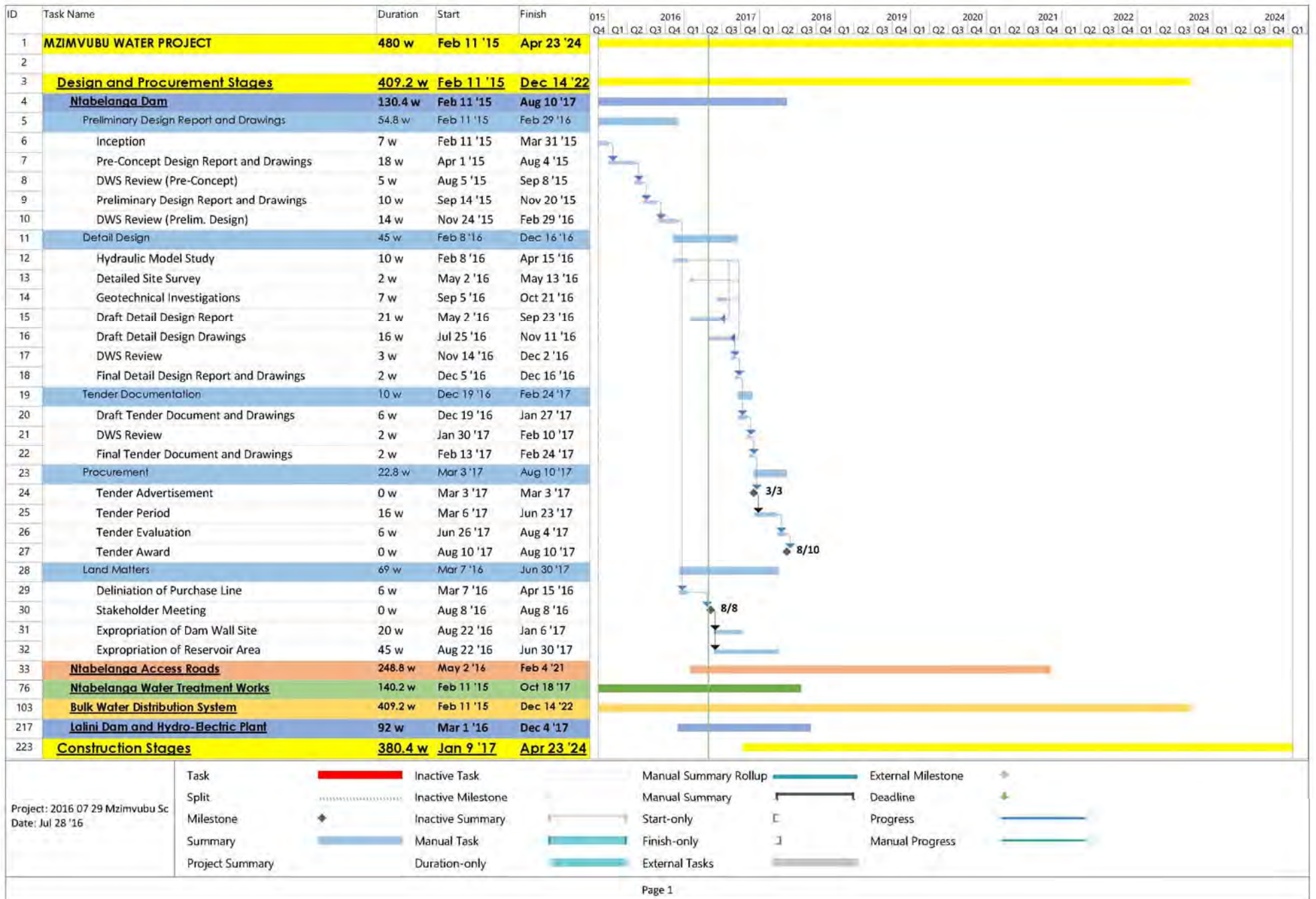
Project: 2016 07 29 Mzimvubu Sc  
Date: Jul 28 '16

Task		Inactive Task	Manual Summary Rollup		External Milestone	
Split		Inactive Milestone	Manual Summary		Deadline	
Milestone		Inactive Summary	Start-only		Progress	
Summary		Manual Task	Finish-only		Manual Progress	
Project Summary		Duration-only	External Tasks			

# Programme – Design and Procurement - Summary



# Programme – Ntabelanga Dam



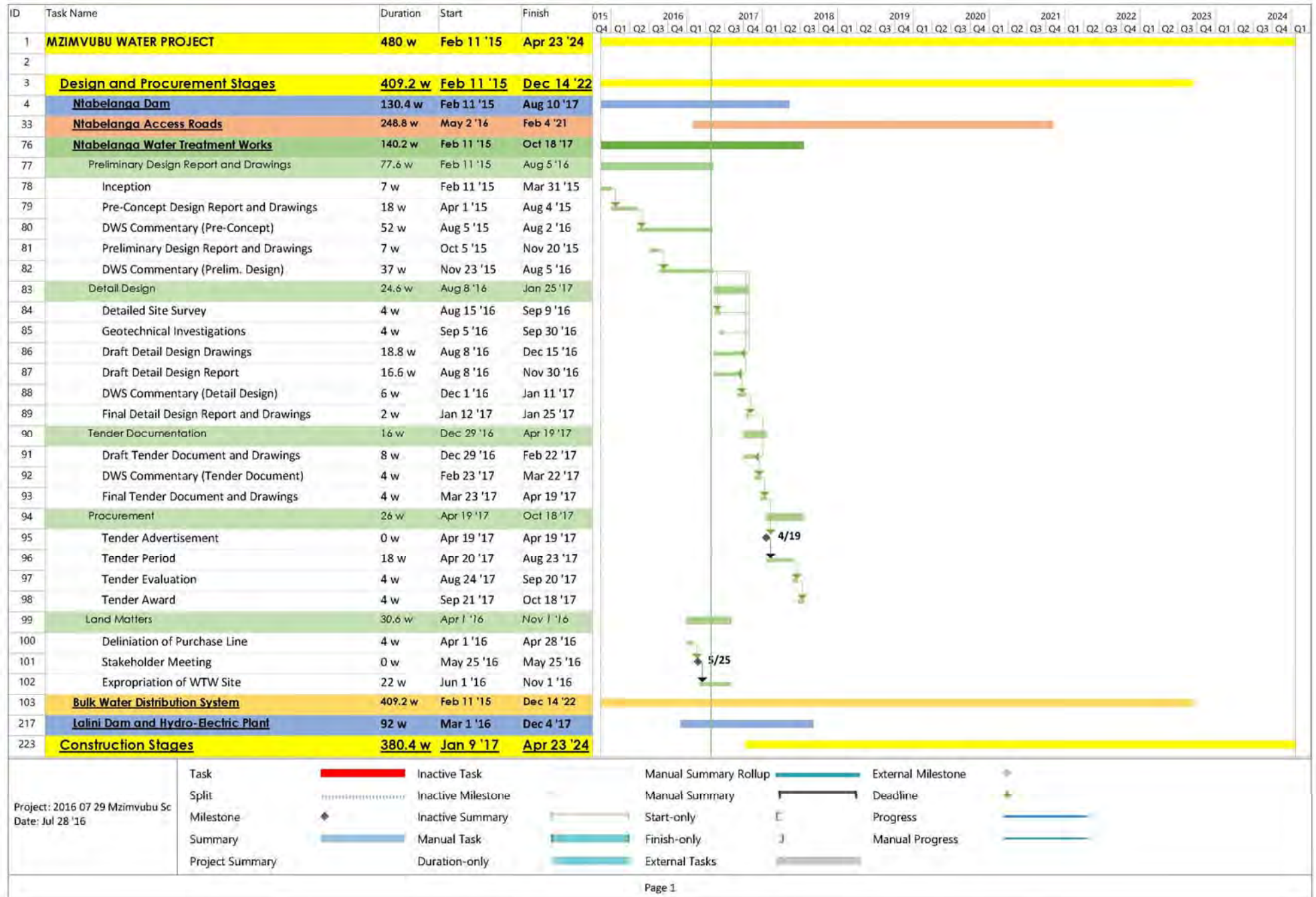
# Programme – Ntabelanga Dam: Roads



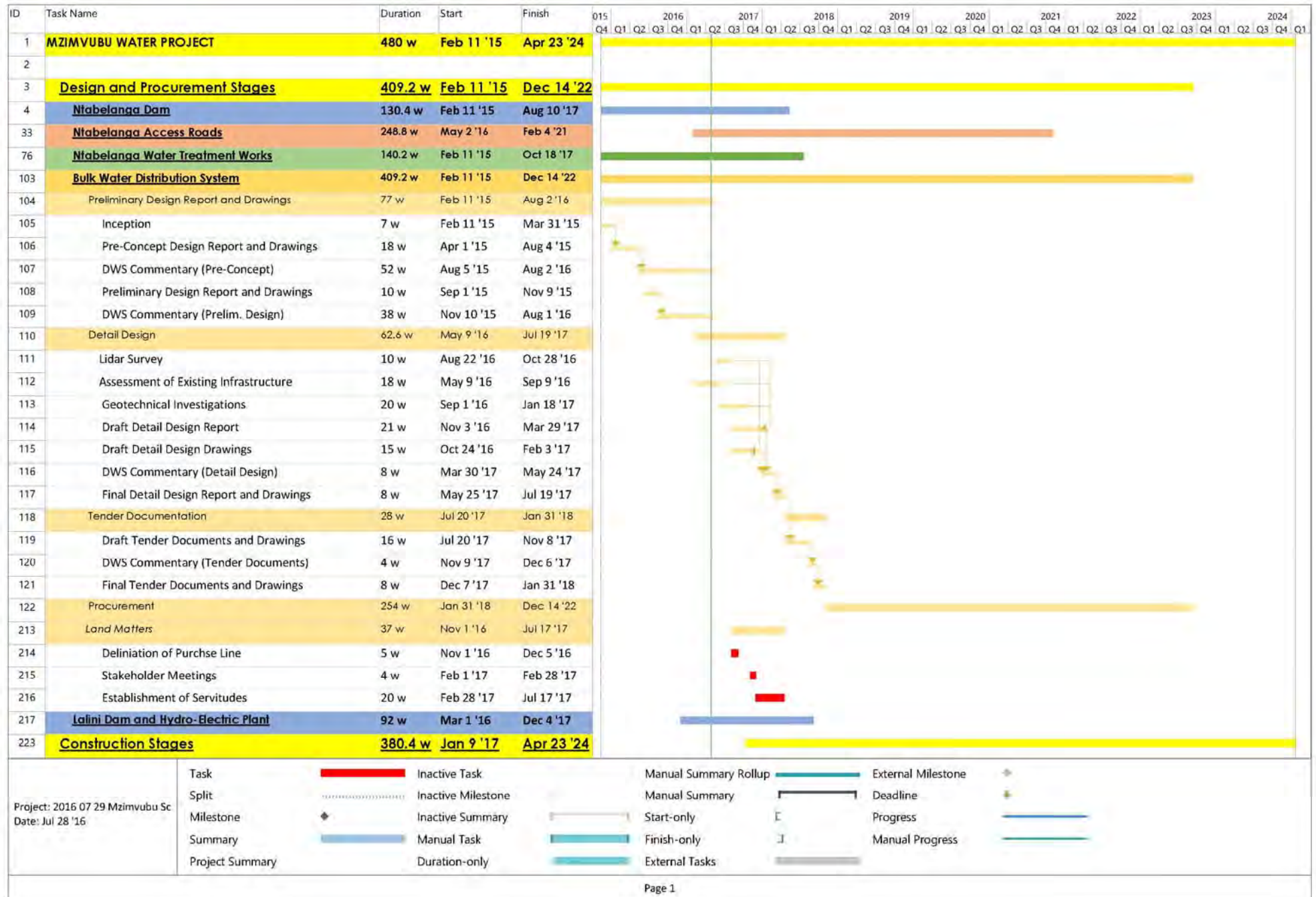
Project: 2016 07 29 Mzimvubu Sc  
Date: Jul 28 '16

Task		Inactive Task		Manual Summary Rollup		External Milestone	
Split		Inactive Milestone		Manual Summary		Deadline	
Milestone		Inactive Summary		Start-only		Progress	
Summary		Manual Task		Finish-only		Manual Progress	
Project Summary		Duration-only		External Tasks			

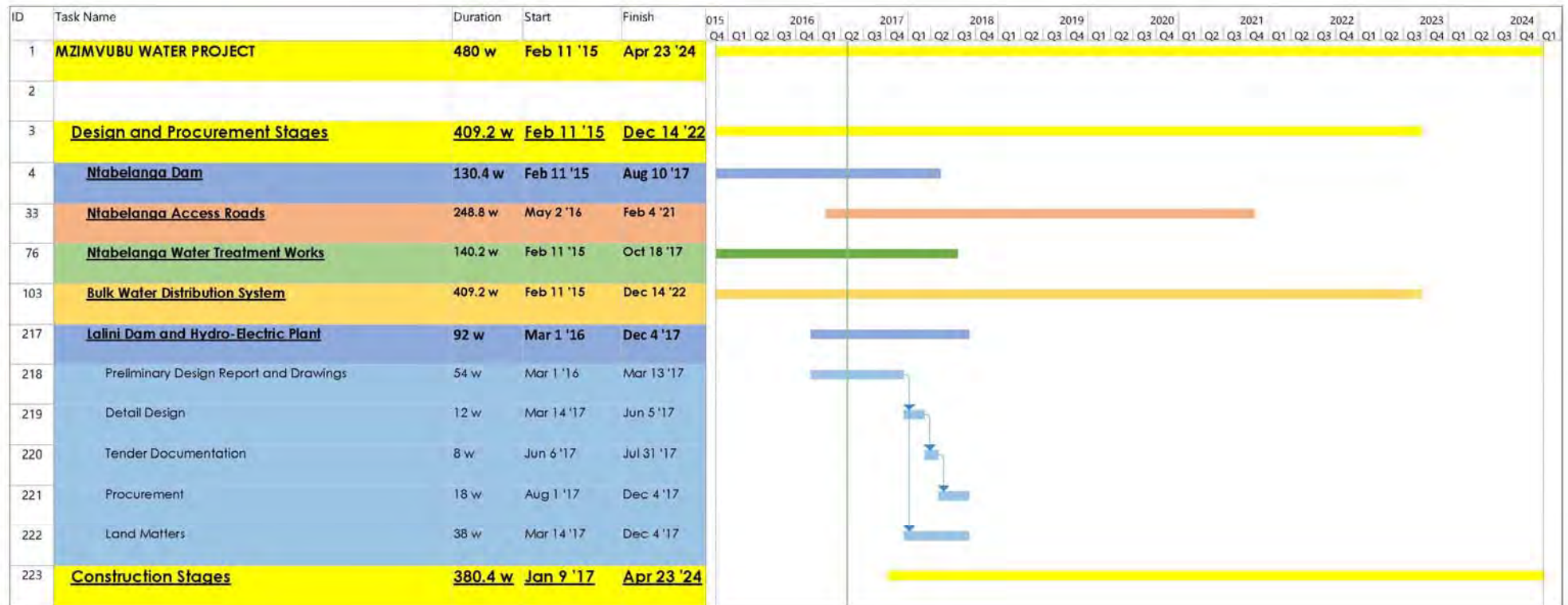
# Programme – Water Treatment Works



# Programme – Bulk Distribution System



# Programme – Lalini Dam



Project: 2016 07 29 Mzimvubu Sc Date: Jul 28 '16	Task		Inactive Task	Manual Summary Rollup		External Milestone	
	Split		Inactive Milestone	Manual Summary		Deadline	
	Milestone		Inactive Summary	Start-only		Progress	
	Summary		Manual Task	Finish-only		Manual Progress	
	Project Summary		Duration-only	External Tasks			

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# Programme – Construction



Project: 2016 07 29 Mzimvubu Sc  
Date: Jul 28 '16

Task		Inactive Task	Manual Summary Rollup		External Milestone	
Split		Inactive Milestone	Manual Summary		Deadline	
Milestone		Inactive Summary	Start-only		Progress	
Summary		Manual Task	Finish-only		Manual Progress	
Project Summary		Duration-only	External Tasks			

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## Implementation Cost Estimates:

Mzimvubu Water Project	
Ntabelanga Dam and Associated Works	R 2,303,125,000
Water Treatment Works	R 980,150,000
Bulk Distribution System	R 7,788,973,775
Lalini Dam and Tsitsa Falls Hydropower Works	R 3,630,000,000
Total (excl. VAT)	R 14,702,248,775



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## Income Generation Estimates:

The selling of electricity will be the major source of income for the Water Project. The generation capacity and estimated annual income are indicated below:

Component	Annual Energy Yield (GWh/a)	Annual Gross Income
Ntabelanga Dam Small HEPP	13.25	R 10,600,000
Lalini Dam Small HEPP	19.28	R 15,424,000
Tsitsa Falls HEPP	295.27	R 236,216,000
<b>Total</b>	<b>327.80</b>	<b>R 262,240,000</b>

(The above is based on an electricity selling rate of R 0.80 /kWh)

The annual electricity consumption by the scheme itself, when operated at full capacity (by 2050) is estimated to be less than 33% of the above, with the remainder of electricity to be sold.

# Thank you



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