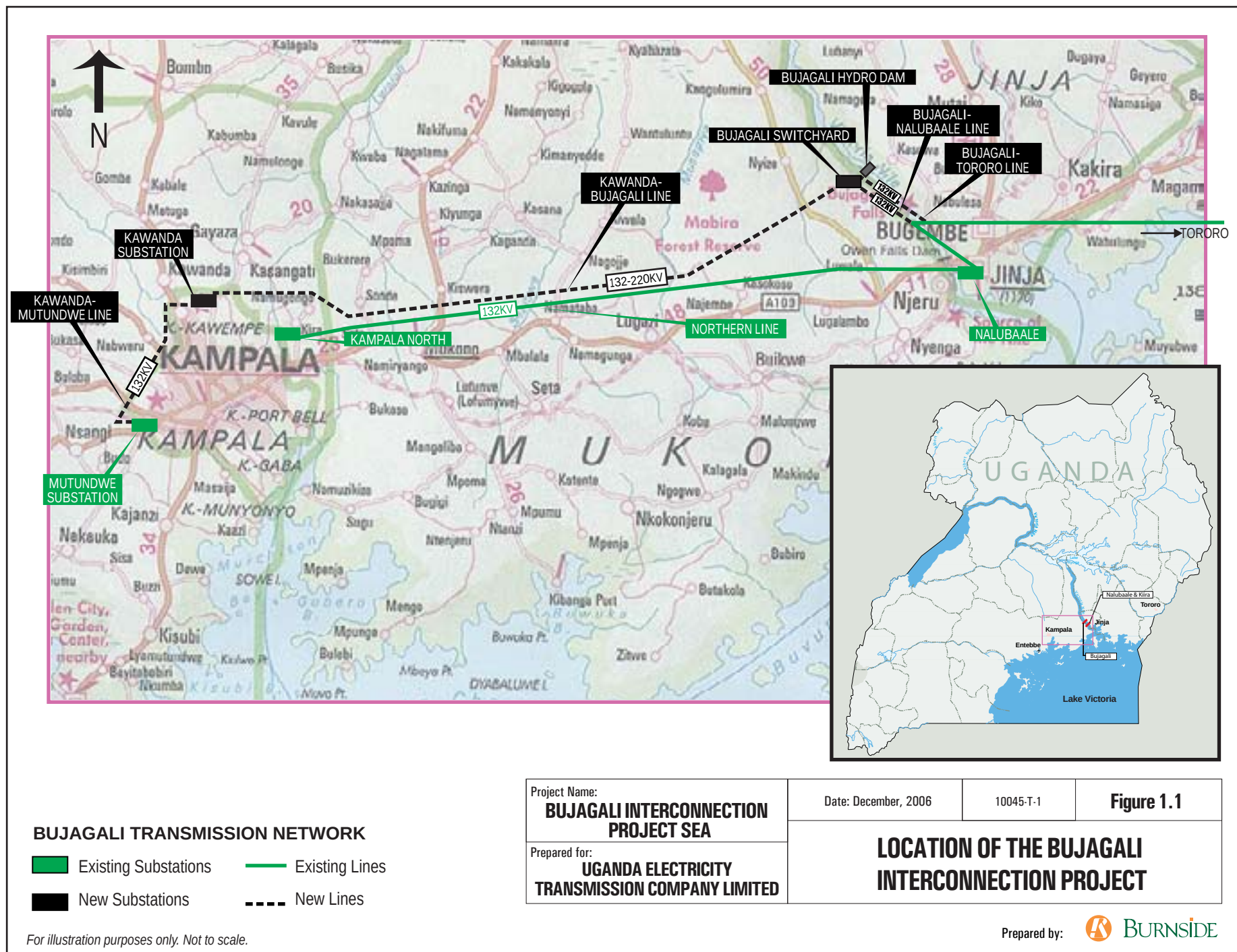
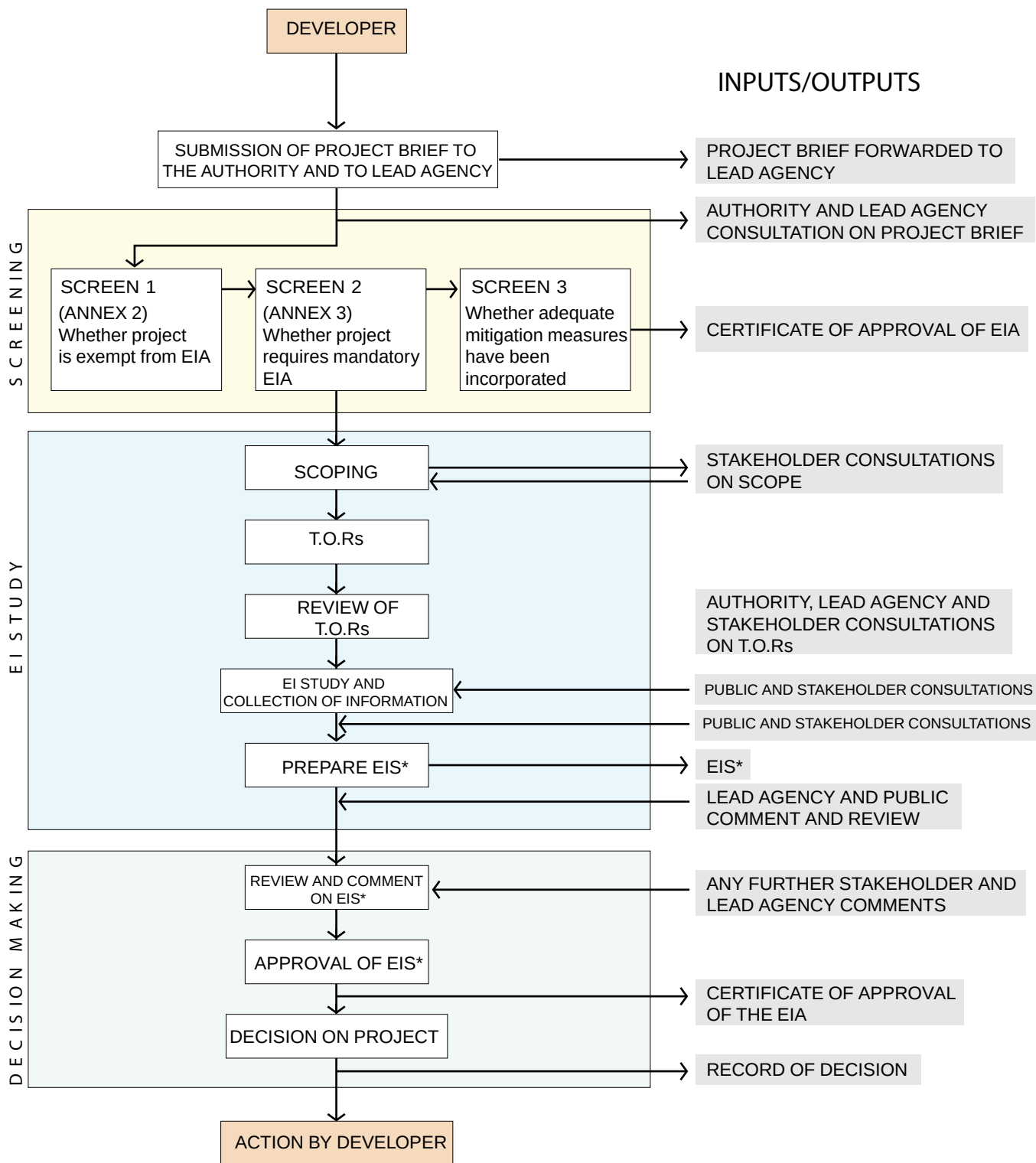


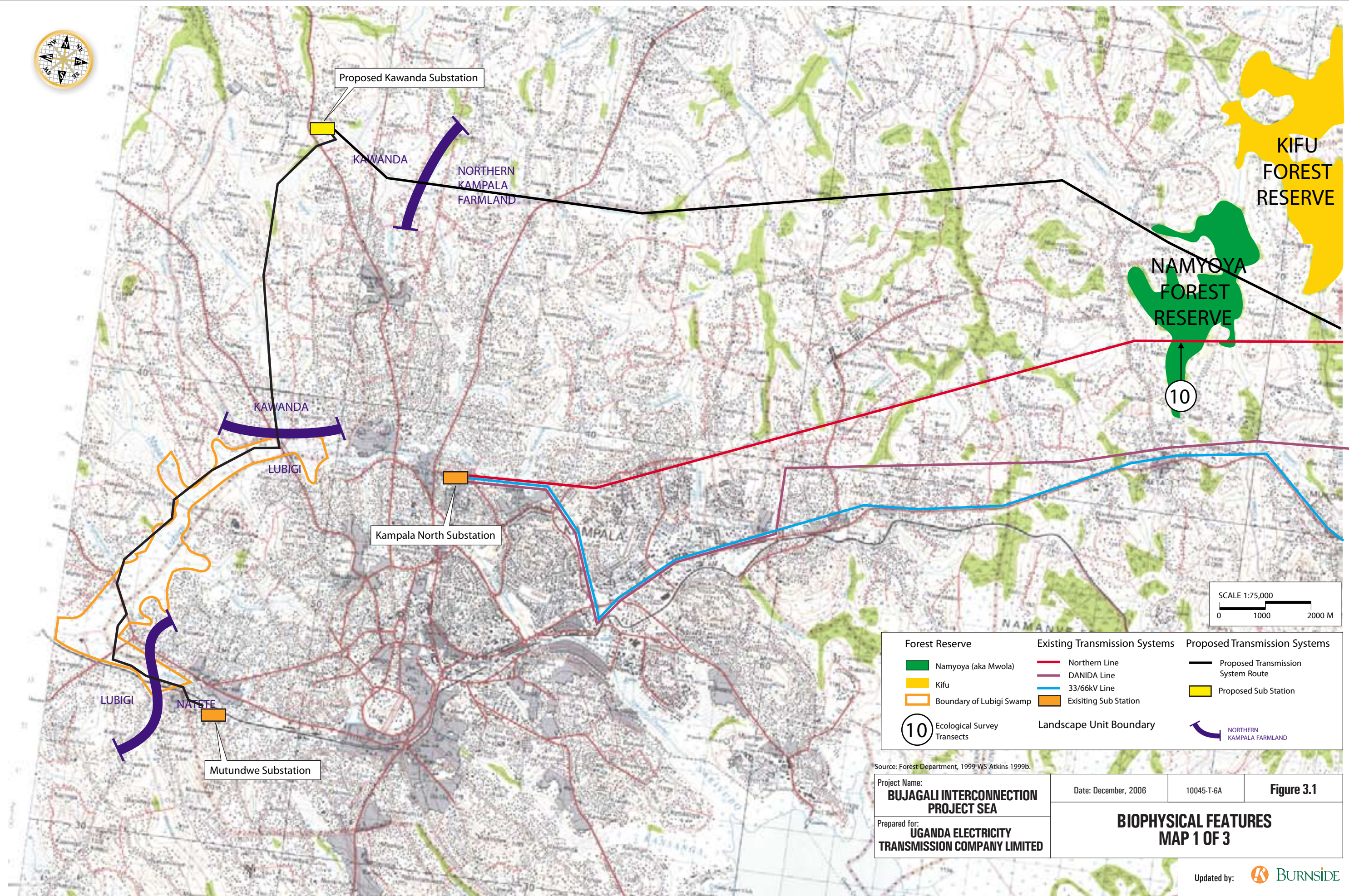




* EIS synonymous with SEA Report
Source: Adapted from NEMA (1997)

Adapted from NEMA (1997)

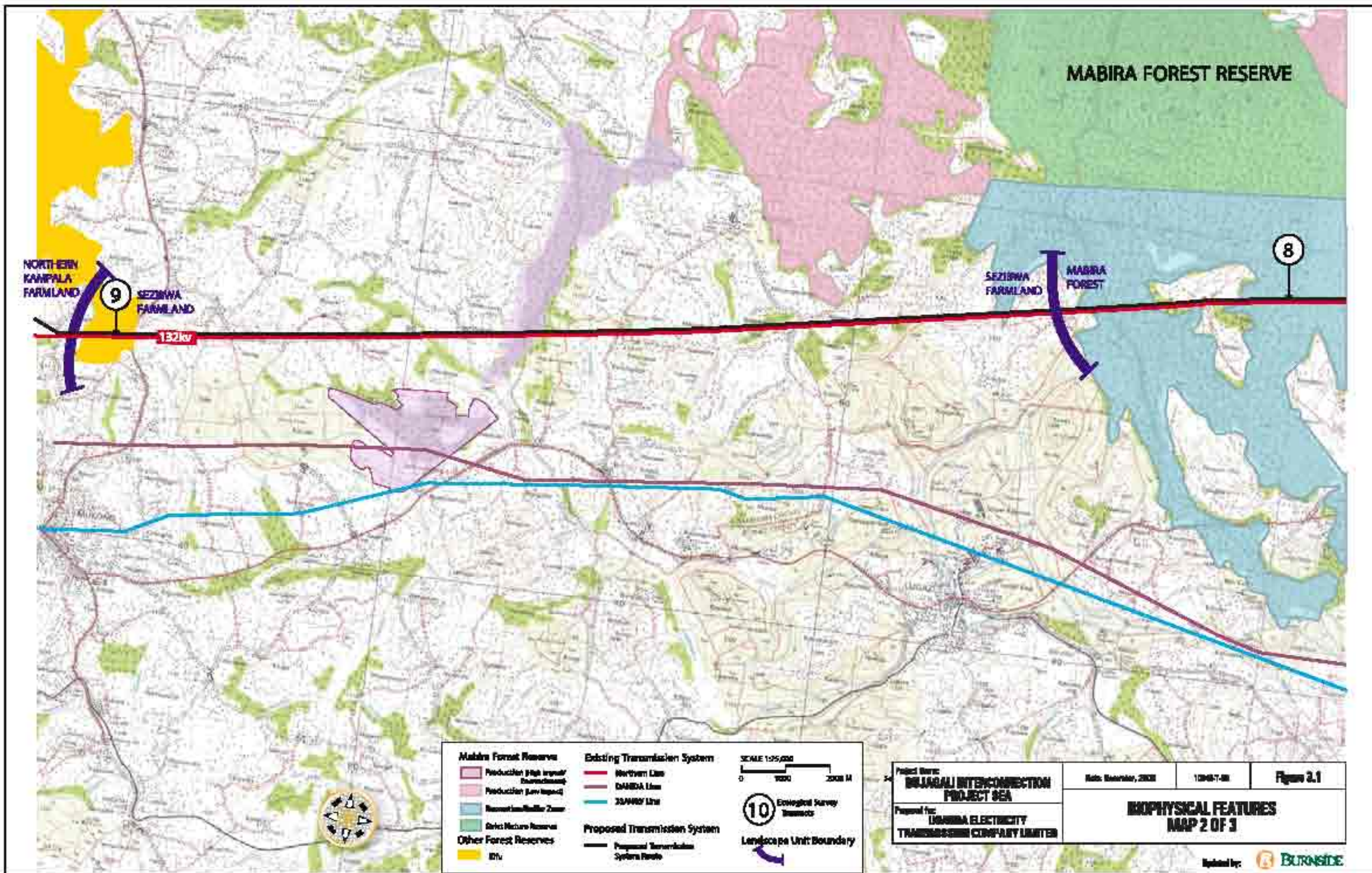
Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-5	Figure 2.1
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	EIA PROCESS FLOWCHART FOR UGANDA		

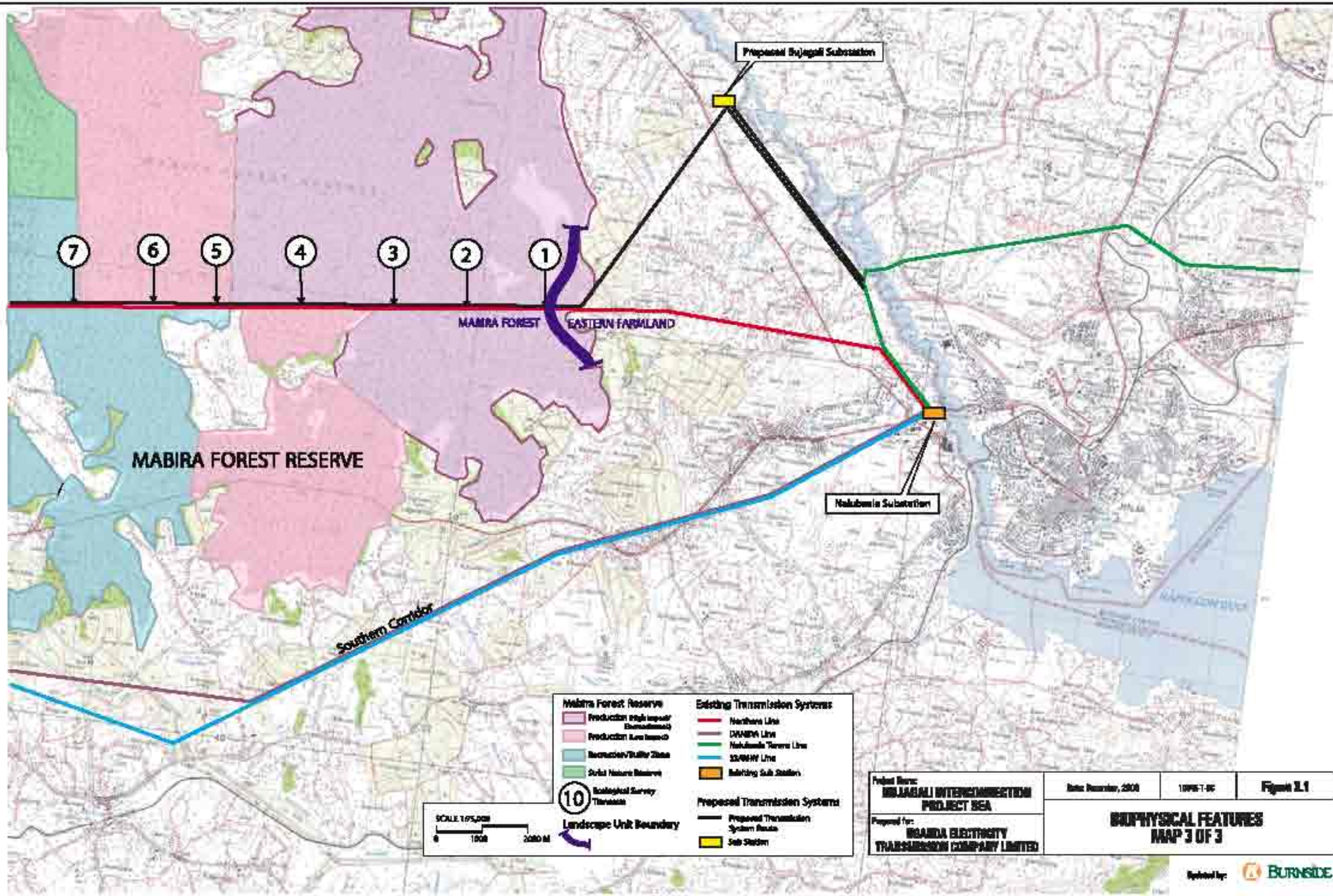


Forest Reserve		Existing Transmission Systems	Proposed Transmission Systems	
	Namyoya (aka Mwola)		Northern Line	 Proposed Transmission System Route
	Kifu		DANIDA Line	 Proposed Sub Station
	Boundary of Lubigi Swamp		33/66kV Line	
	Existing Sub Station			
	Ecological Survey Transects	Landscape Unit Boundary		 NORTHERN KAMPALA FARMLAND

Source: Forest Department, 1999 WS Atkins 1999b.

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-6A	Figure 3.1
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	BIOPHYSICAL FEATURES MAP 1 OF 3		







Typical peri-urban
landscape near Natete.
(January 2006)



Lubigi Swamp, showing agricultural
encroachment in the foreground
(January 2006)



Landscape typical of
Kawanda area.
(February 2000)

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-7A	Figure 3.2A
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF LANDSCAPE UNITS Along the Proposed Transmission System Route		



Northern Kampala
Farmland
(February 2000)



Sezibwa Farmland
(February 2000)



Mabira Fringes
(February 2000)

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-7B	Figure 3.2B
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF LANDSCAPE UNITS Along the Proposed Transmission System Route		

Updated by:





Mabira Forest. Looking east of the existing transmission line, within the western portion of Mabira FR. Buffer zone is to the left of the transmission line. Recreation zone is to the right of the transmission line. (January 2006)



Eastern Farmland. (February 2000)

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-7C	Figure 3.2C
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF LANDSCAPE UNITS Along the Proposed Transmission System Route		



Tower 138 Ssese looking west
(January 2006)



Tower 154 west looking towards Tower 153
(January 2006)



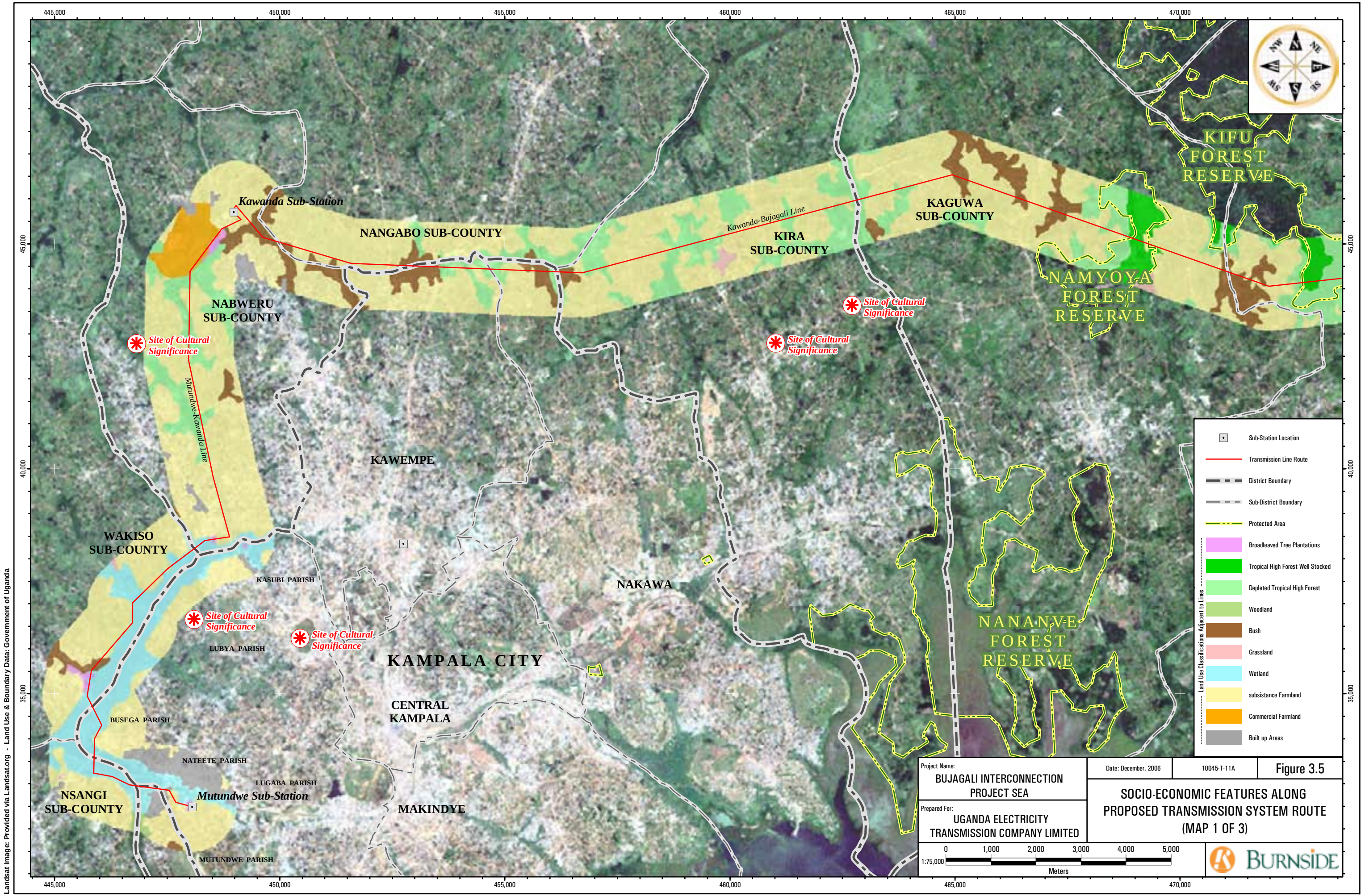
Tower 180 looking west
(January 2006)

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-10A	Figure 3.4A
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF WAYLEAVE WITHIN MABIRA FOREST RESERVE		

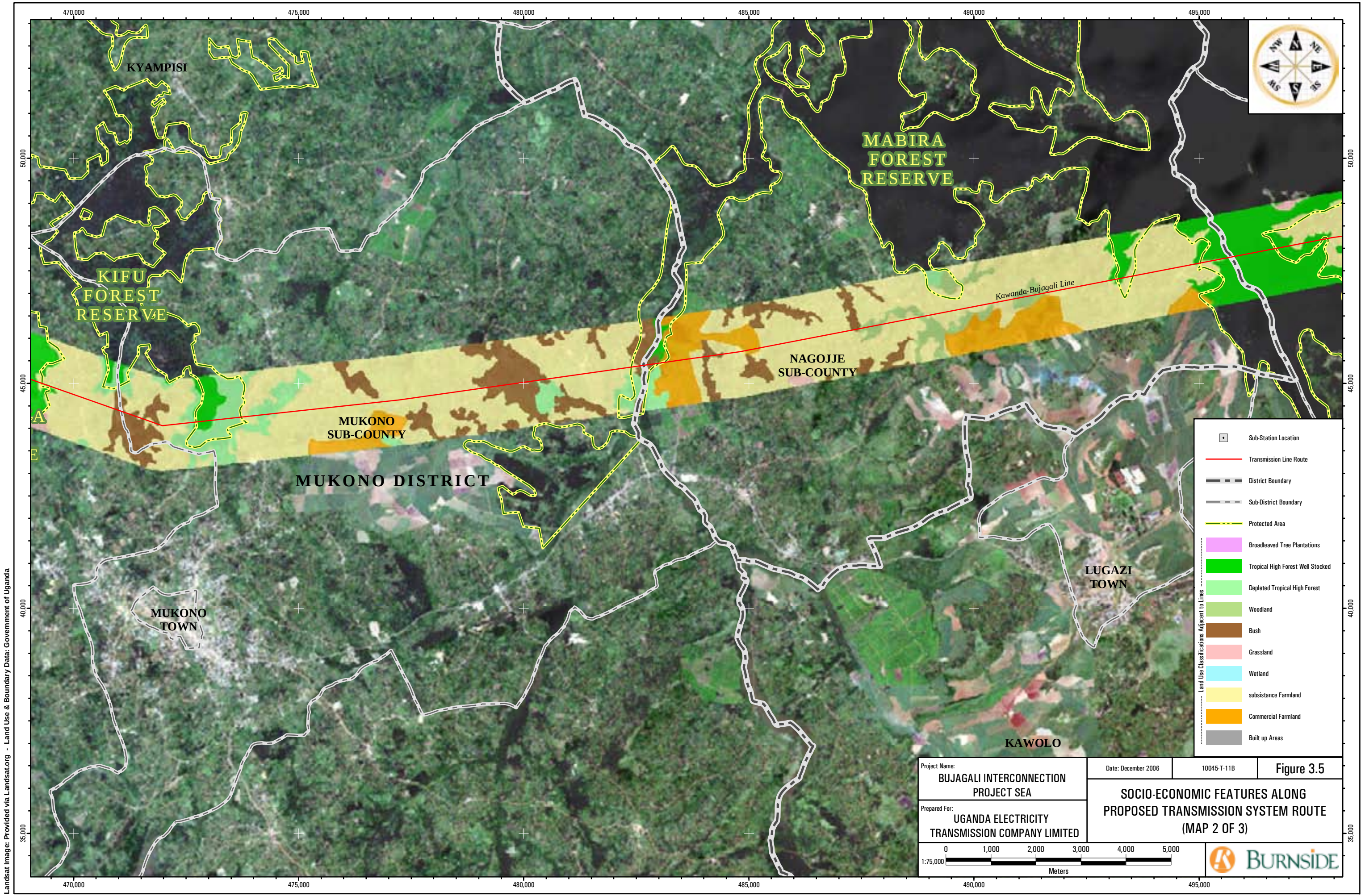


Recently-upgraded bridge over the Waliga River between Towers 169 and 170
(January 2006)

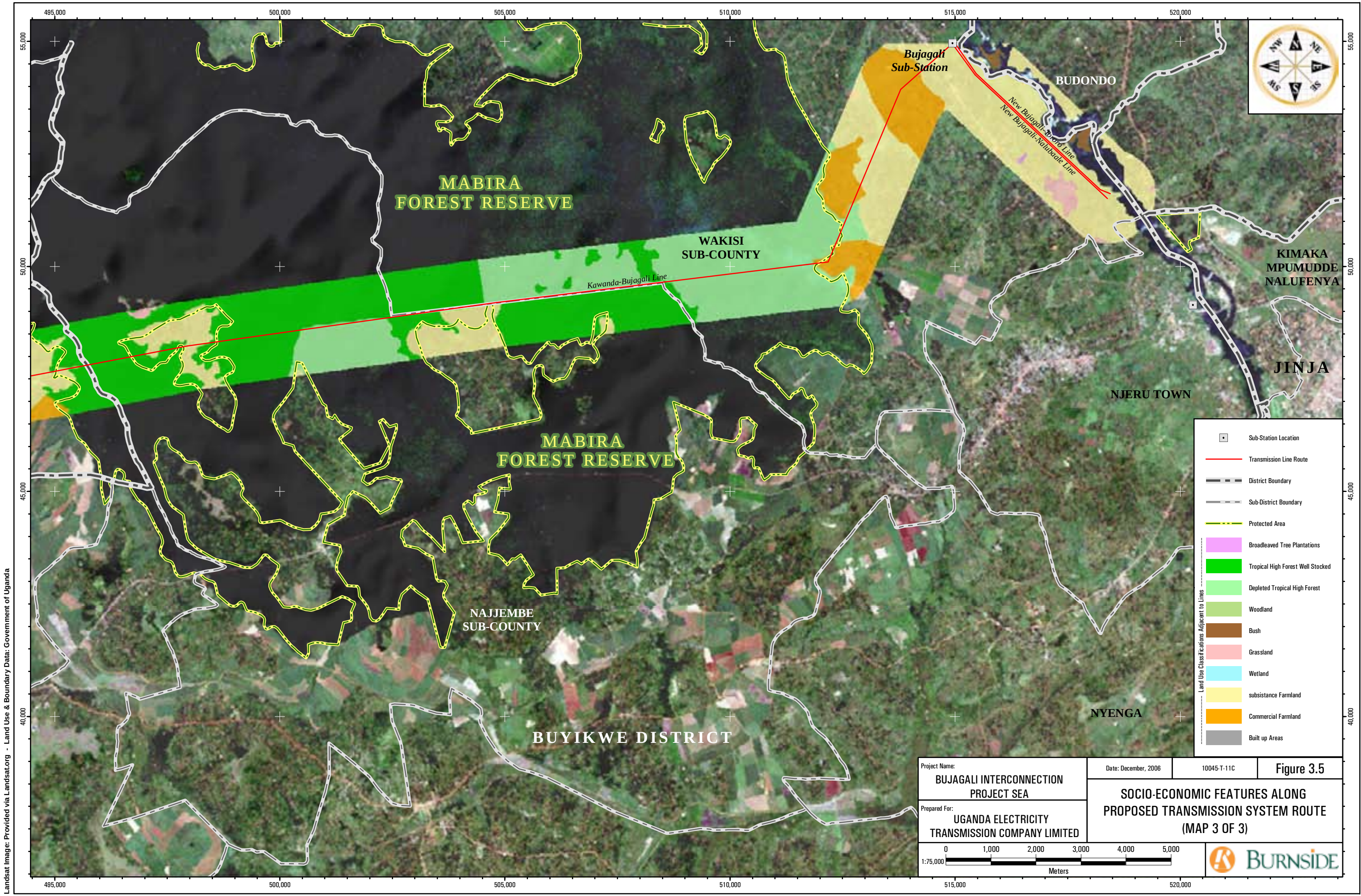
Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-10B	Figure 3.4B
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF WAYLEAVE WITHIN MABIRA FOREST RESERVE		



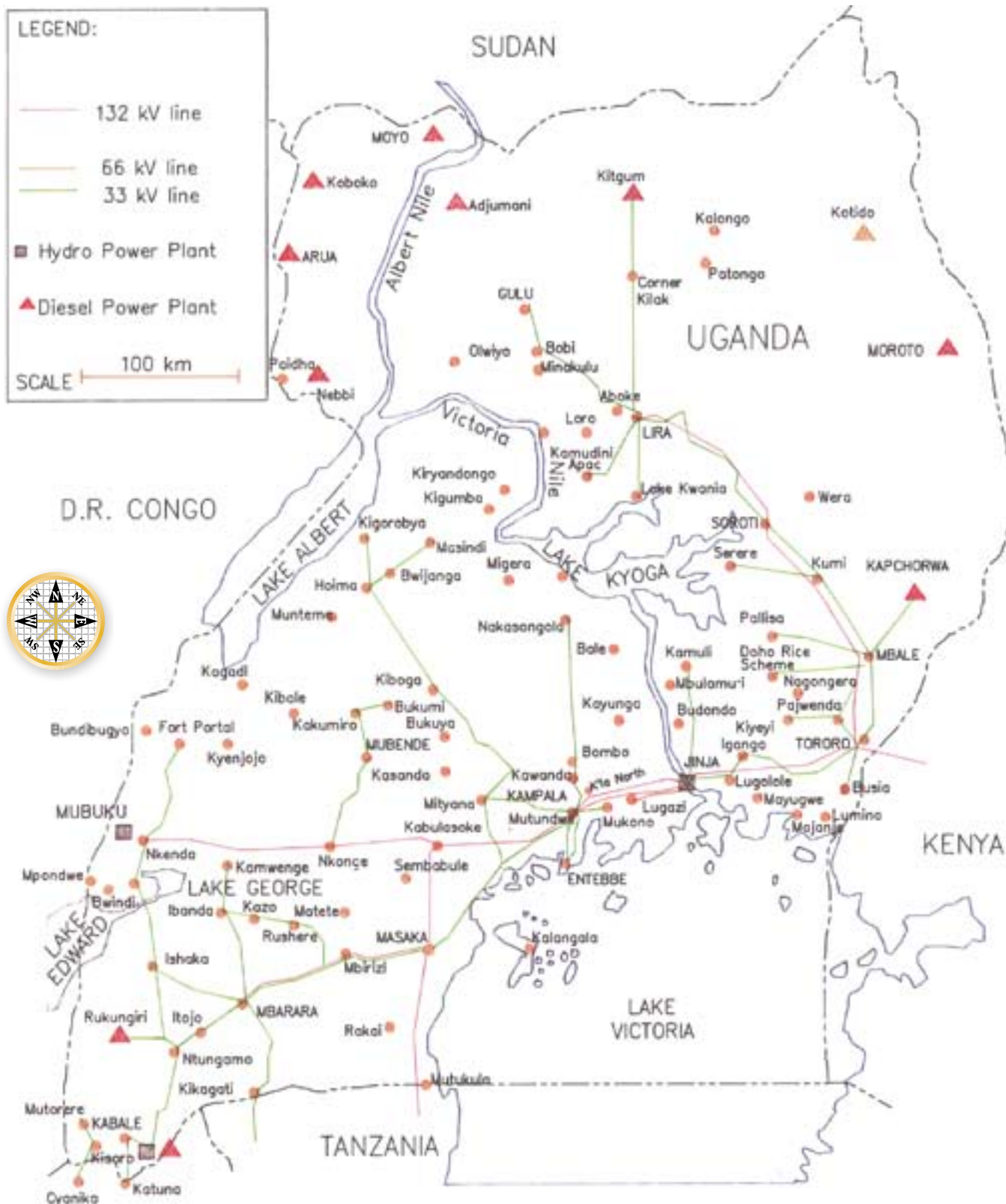
Landsat Image: Provided via Landsat.org - Land Use & Boundary Data: Government of Uganda



Landsat Image: Provided via Landsat.org - Land Use & Boundary Data: Government of Uganda



Landsat Image: Provided via Landsat.org - Land Use & Boundary Data: Government of Uganda



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-12	Figure 4.1
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PRESENT ELECTRICAL NETWORK IN UGANDA		

The diagram illustrates the existing or committed infrastructure for the KCCA Water Supply Project. It shows a network of substations and transmission lines. Key components include:

- KAMPALA** (top left)
- KAMPALA NORTH SUBSTATION**
- MUTUNDWE SUBSTATION**
- LUGOGO SUBSTATION**
- NALUBAALE SUBSTATION**
- KIIRA GENERATING STATION**
- NALUBAALE GENERATING STATION**
- JINJA**
- MUKONO**
- LUGAZI**
- TORORO** (top right)

Transmission lines are labeled with voltages: 132kV, 33kV, and 66kV. Arrows indicate directions: "TO KABULASOKE" (left), "TO TORORO" (right), and "TO TORORO" (up).

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-13a	Figure 4.2a
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SCHEMATIC DIAGRAMS OF POWER SYSTEM OPTIONS		



BURNSIDE

Diagram 2

Base (AESNP) Option

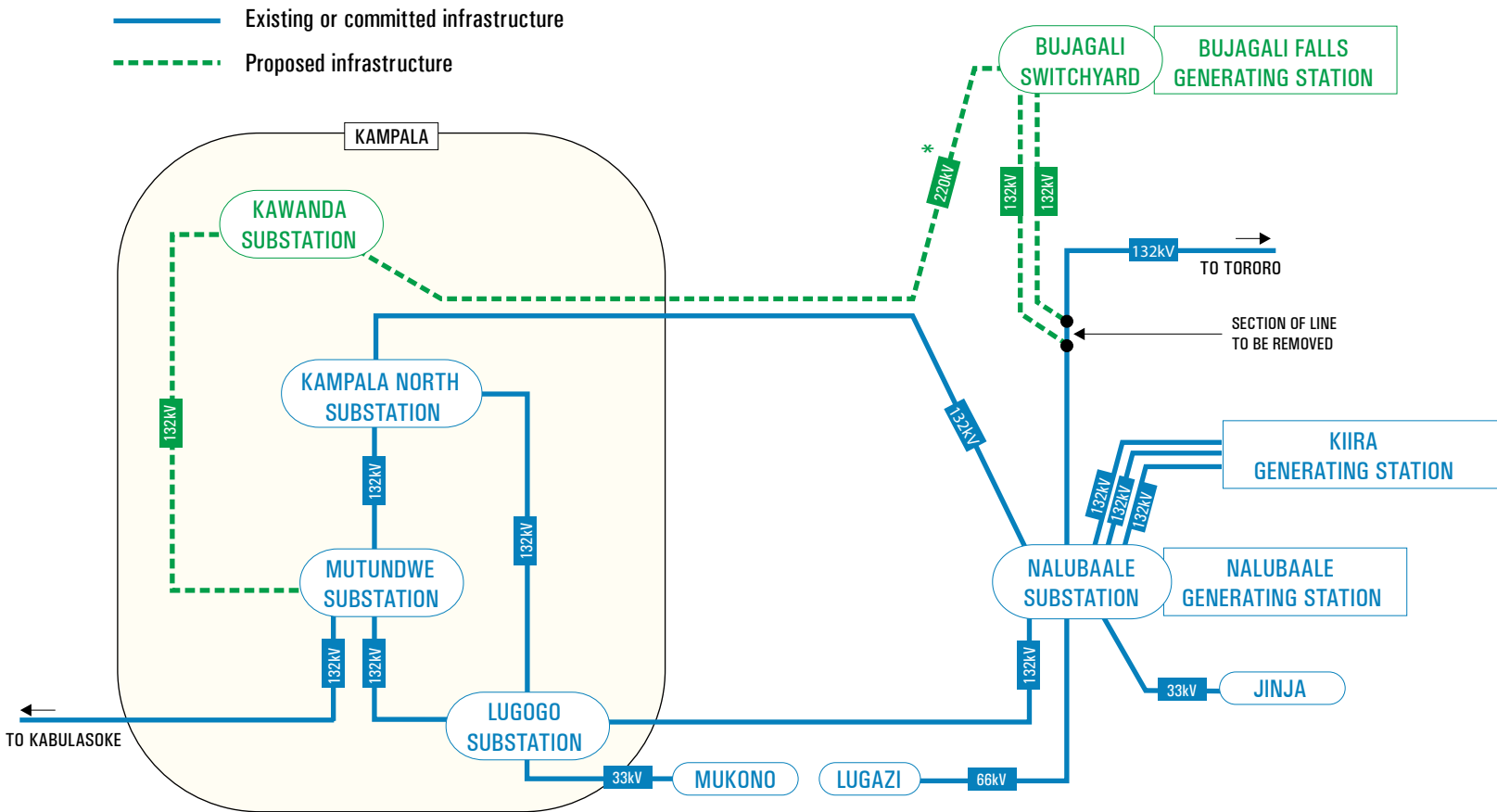
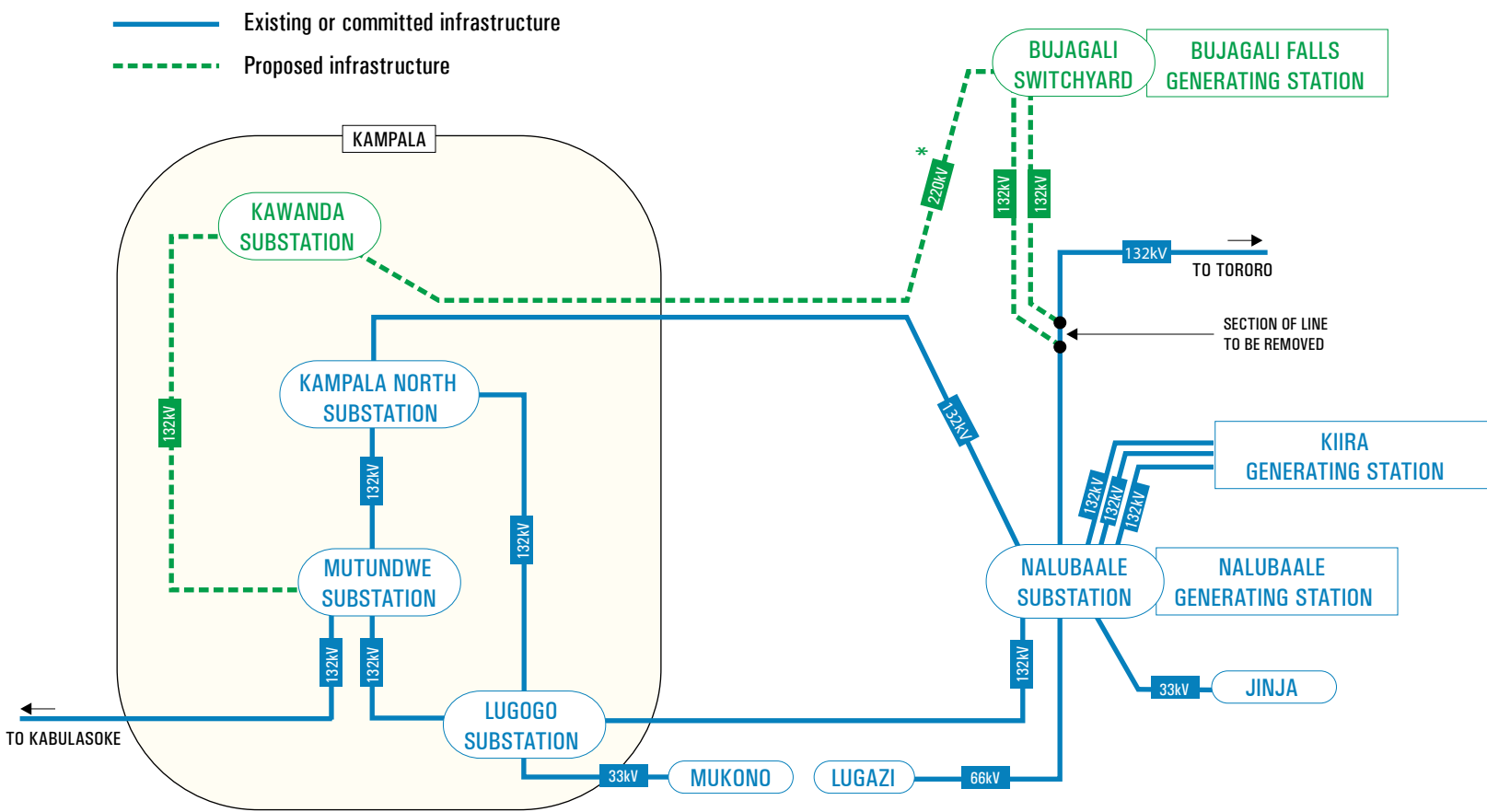


Diagram 3 Option 1



- * Line built with double circuit towers but only one circuit installed.

NOT TO SCALE

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-13b	Figure 4.2b
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SCHEMATIC DIAGRAMS OF POWER SYSTEM OPTIONS		

Updated by:  BURNSIDE

Diagram 4
Option 2

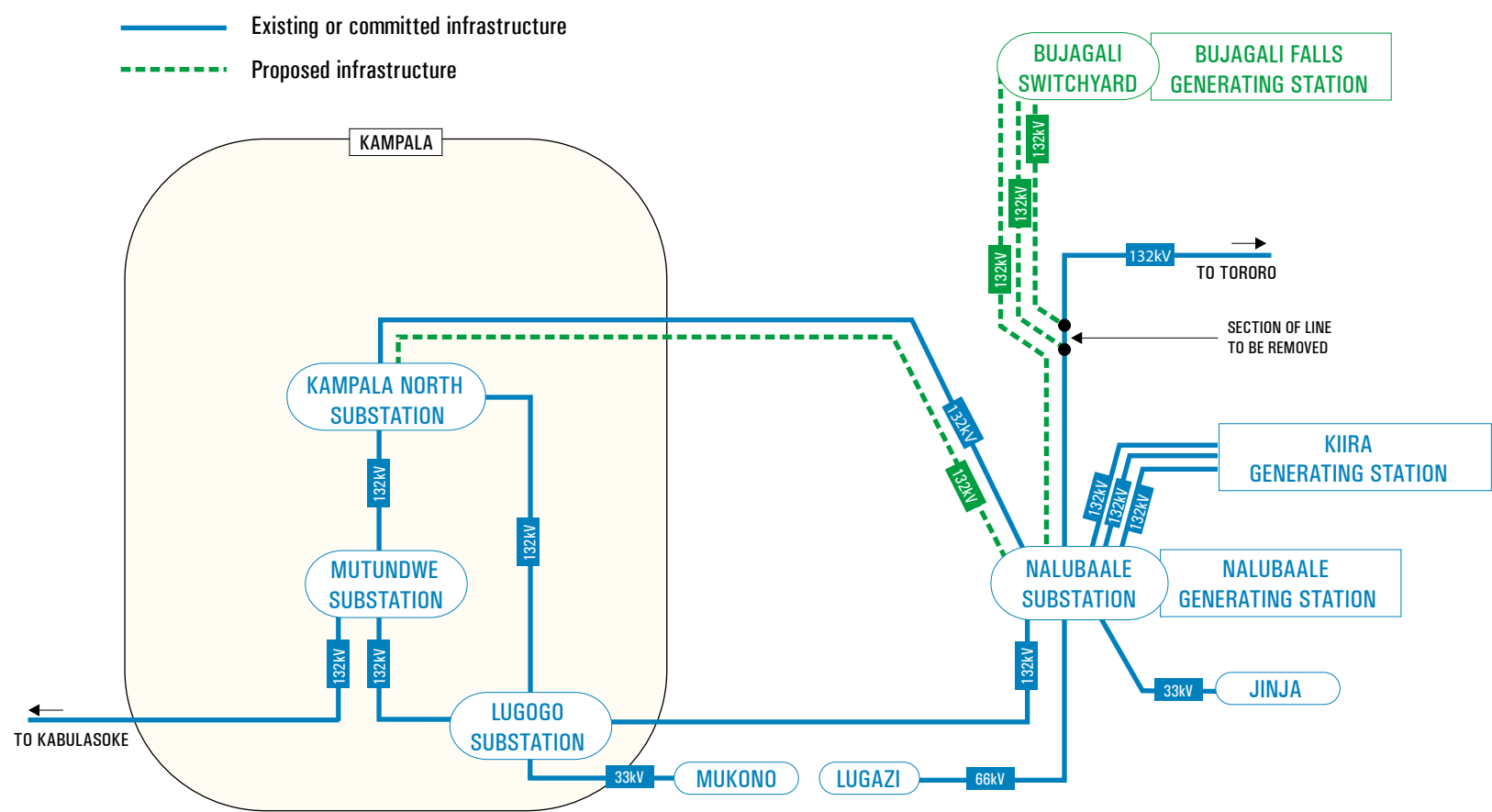
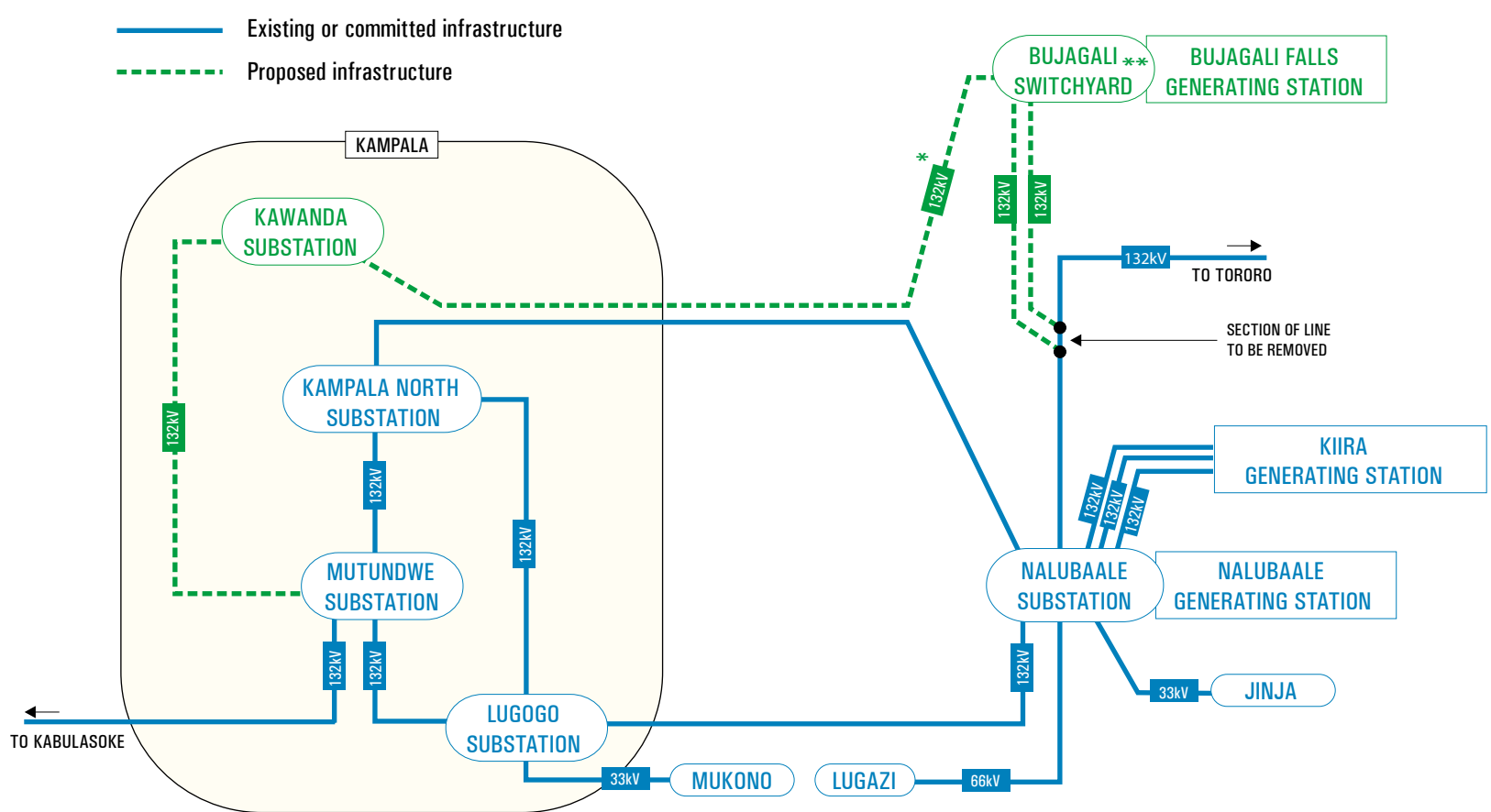


Diagram 5
Option 3, 3a, 3aR



* Option 3: Line constructed for 2 circuits at 220kV but only one circuit installed and updated at 132kV.

Option 3a + 3aR: Double circuit line constructed at 220kV standard but operated at 132kV.

** Option 3aR: Series Reactors installed at the Bujagali Switchyard

NOT TO SCALE

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-13c	Figure 4.2c
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SCHEMATIC DIAGRAMS OF POWER SYSTEM OPTIONS		

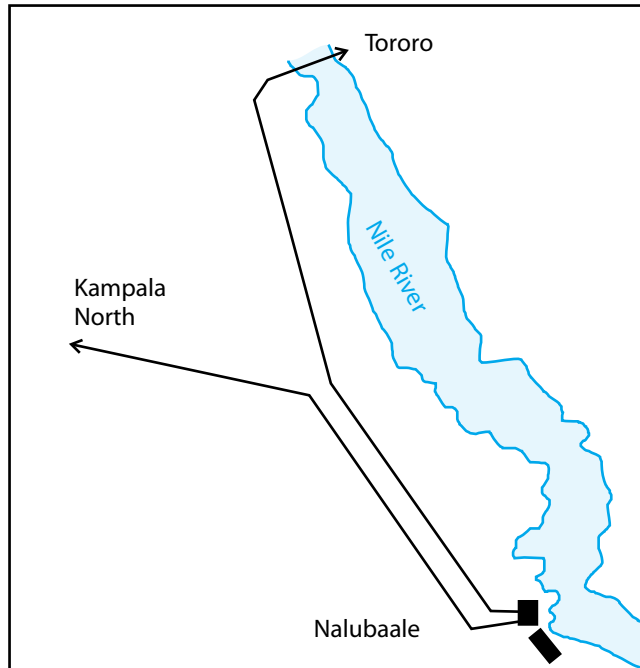


Figure 4.3a
EXISTING 132 kV ENTRIES INTO NALUBAALE SWITCHYARD

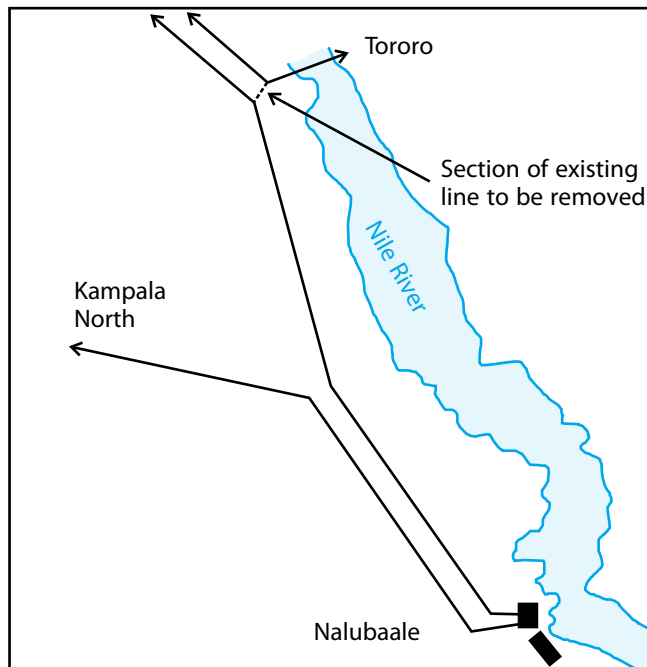
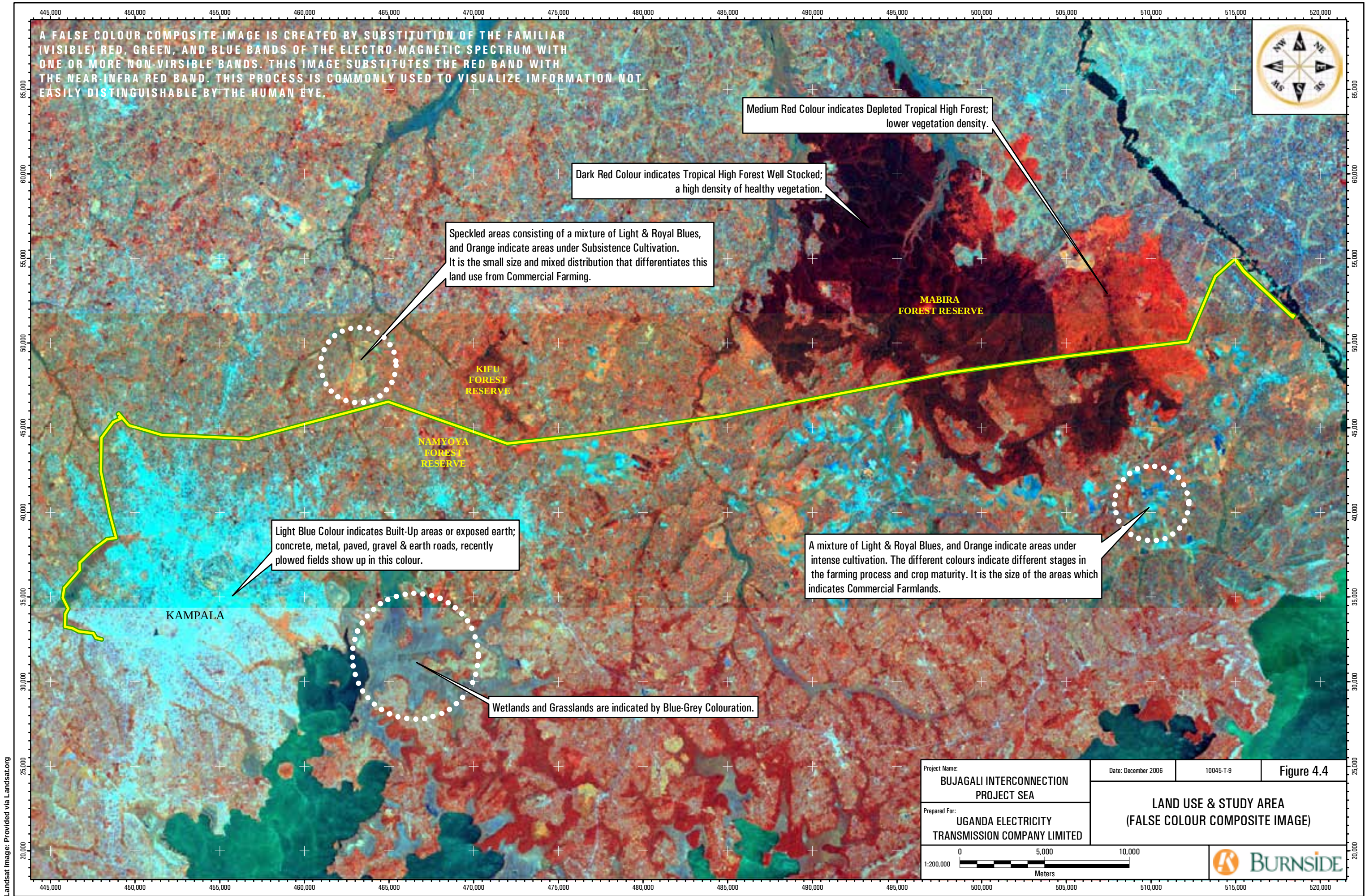


Figure 4.3b
REARRANGED 132 kV ENTRIES INTO EXISTING
NALUBAALE SWITCHYARD

Source: Knight Piésold and Merz & McLellan, 1999

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-15	Figure 4.3
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	BUJAGALI PROJECT CONNECTION TO NATIONAL NETWORK		





View of 132kV corridor in vicinity of Kampala North Substation.



View of land use in vicinity of Kampala North Substation.

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-16	Figure 4.5
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF LAND USE NEAR KAMPALA NORTH		



Example of dense land use in vicinity of Nalubaale Substation.



View of squatter settlement in potential corridor for 132kV Bujagali-Nalubaale Line.

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-17	Figure 4.6
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PHOTOGRAPHS OF LAND USE NEAR NALUBAALE SUBSTATION		

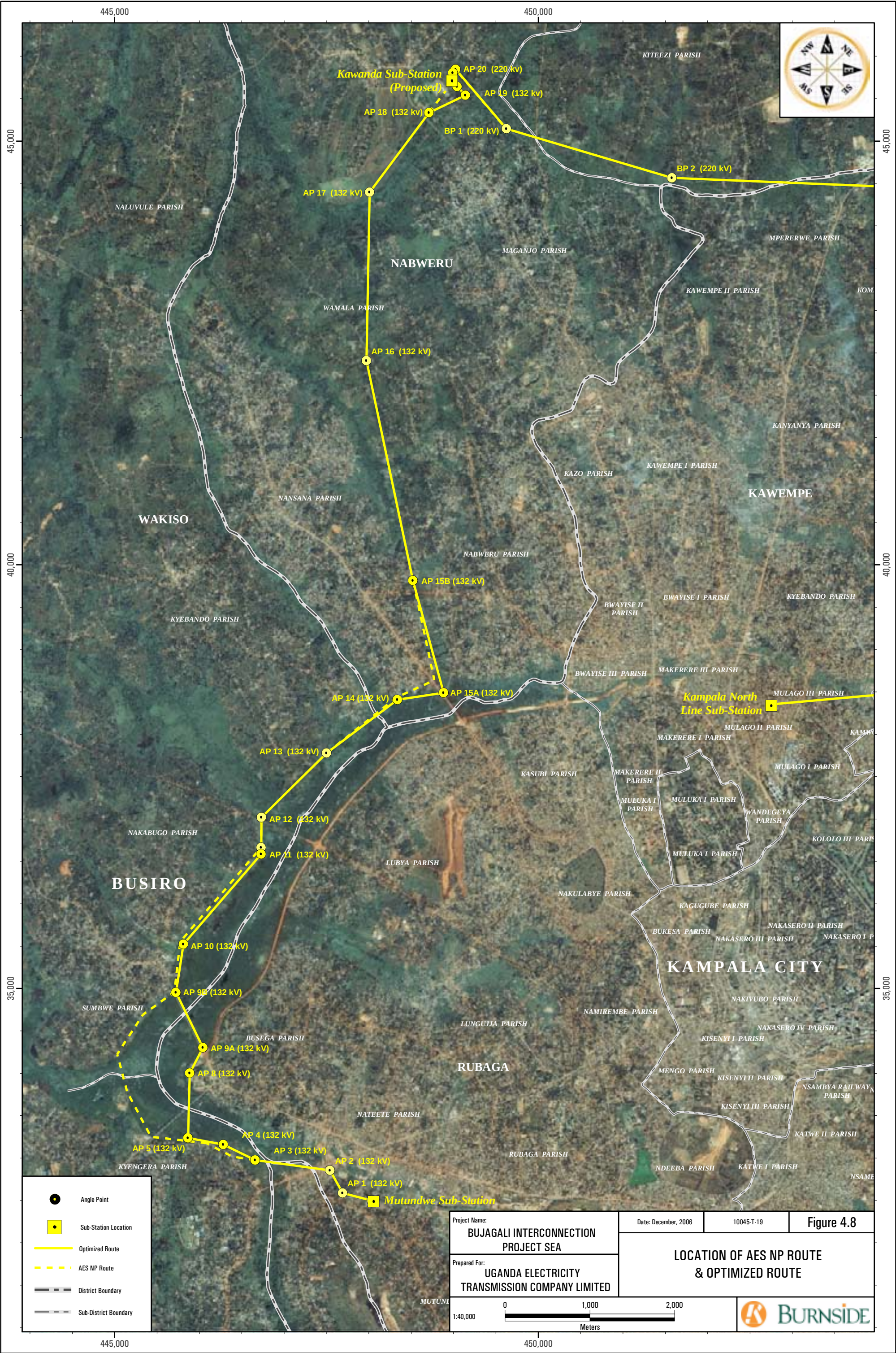
Figure 4.7a - AES NP Original Layout



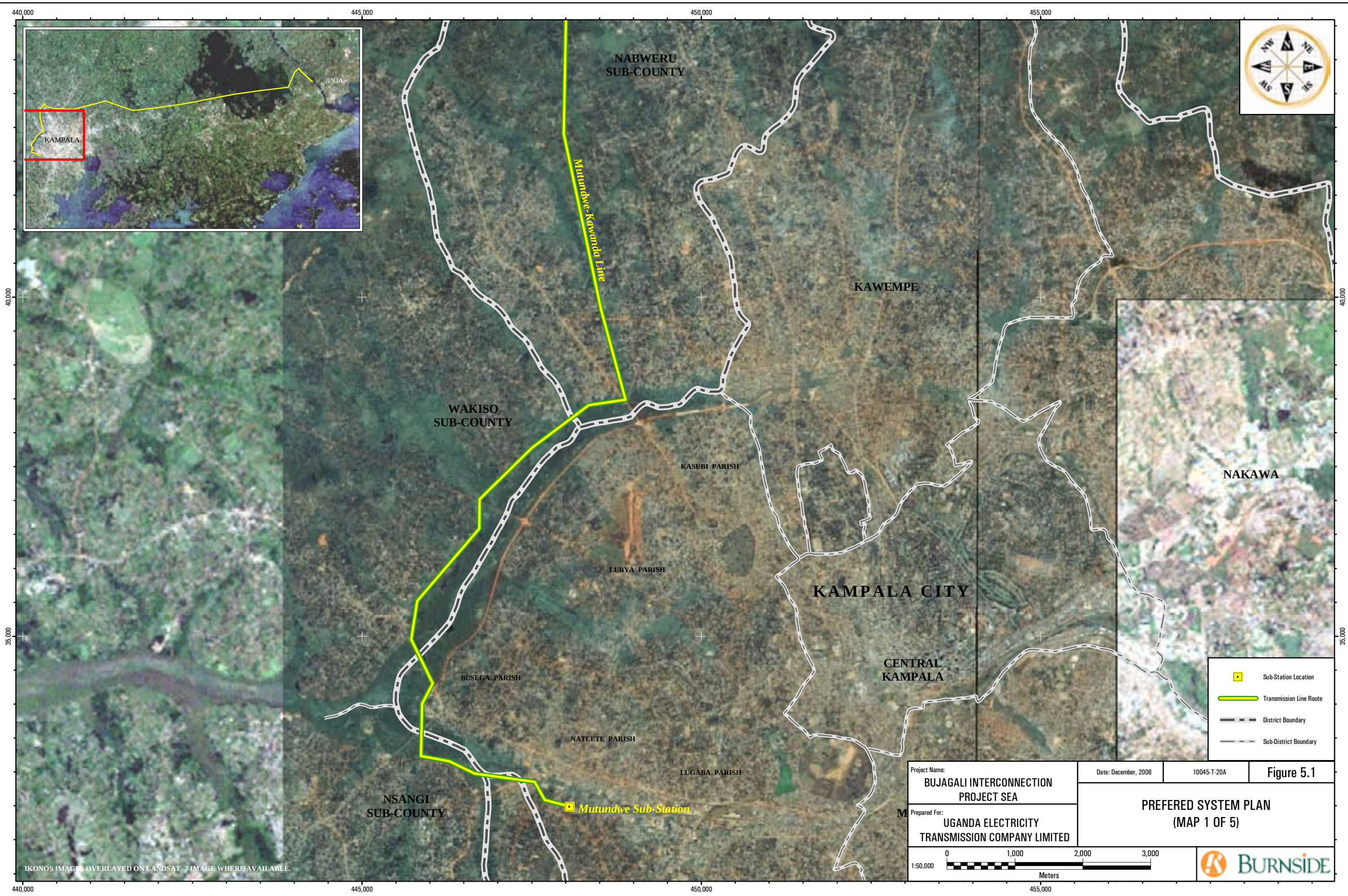
Figure 4.7b - Optiomal Route Layout

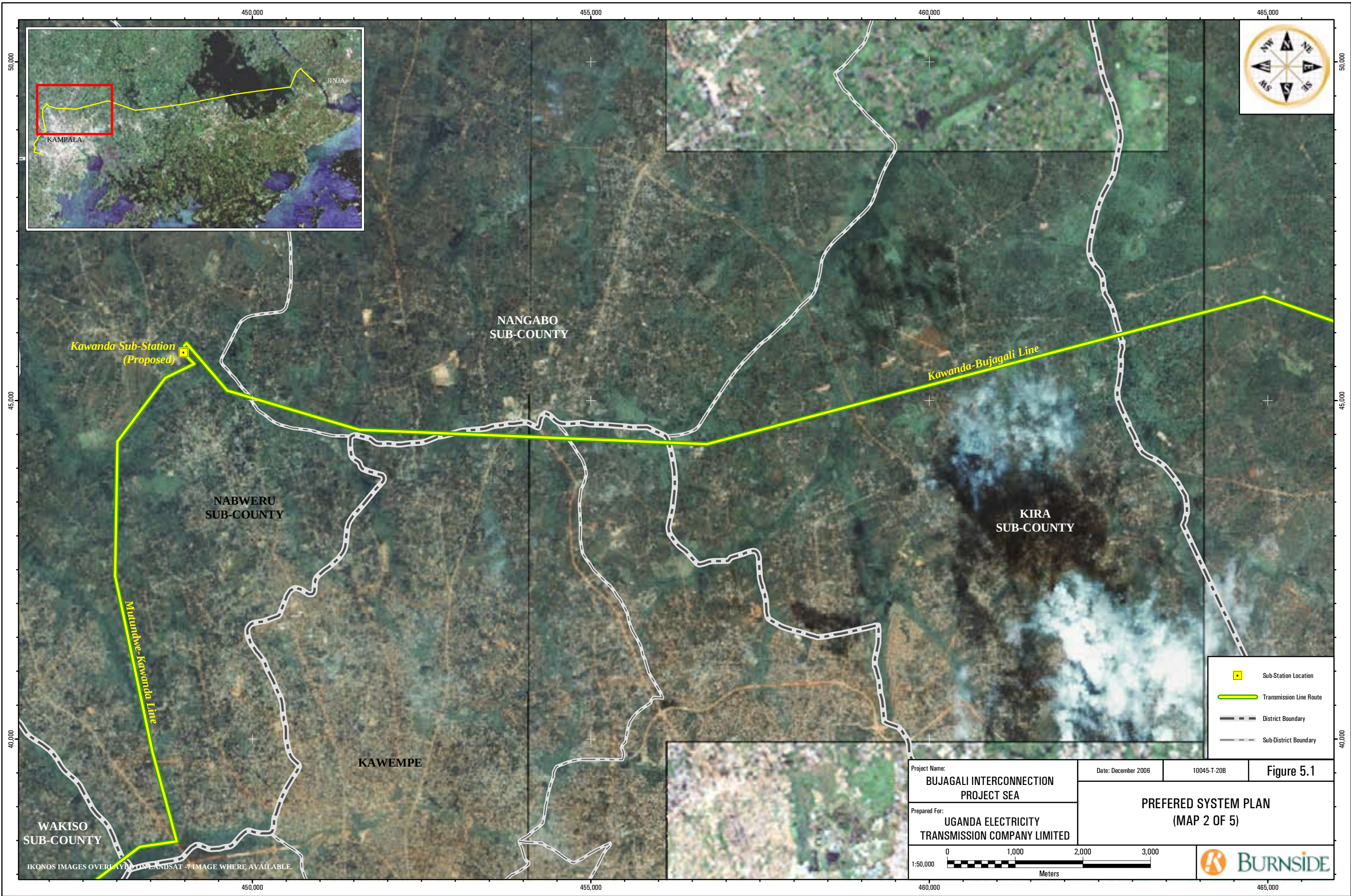


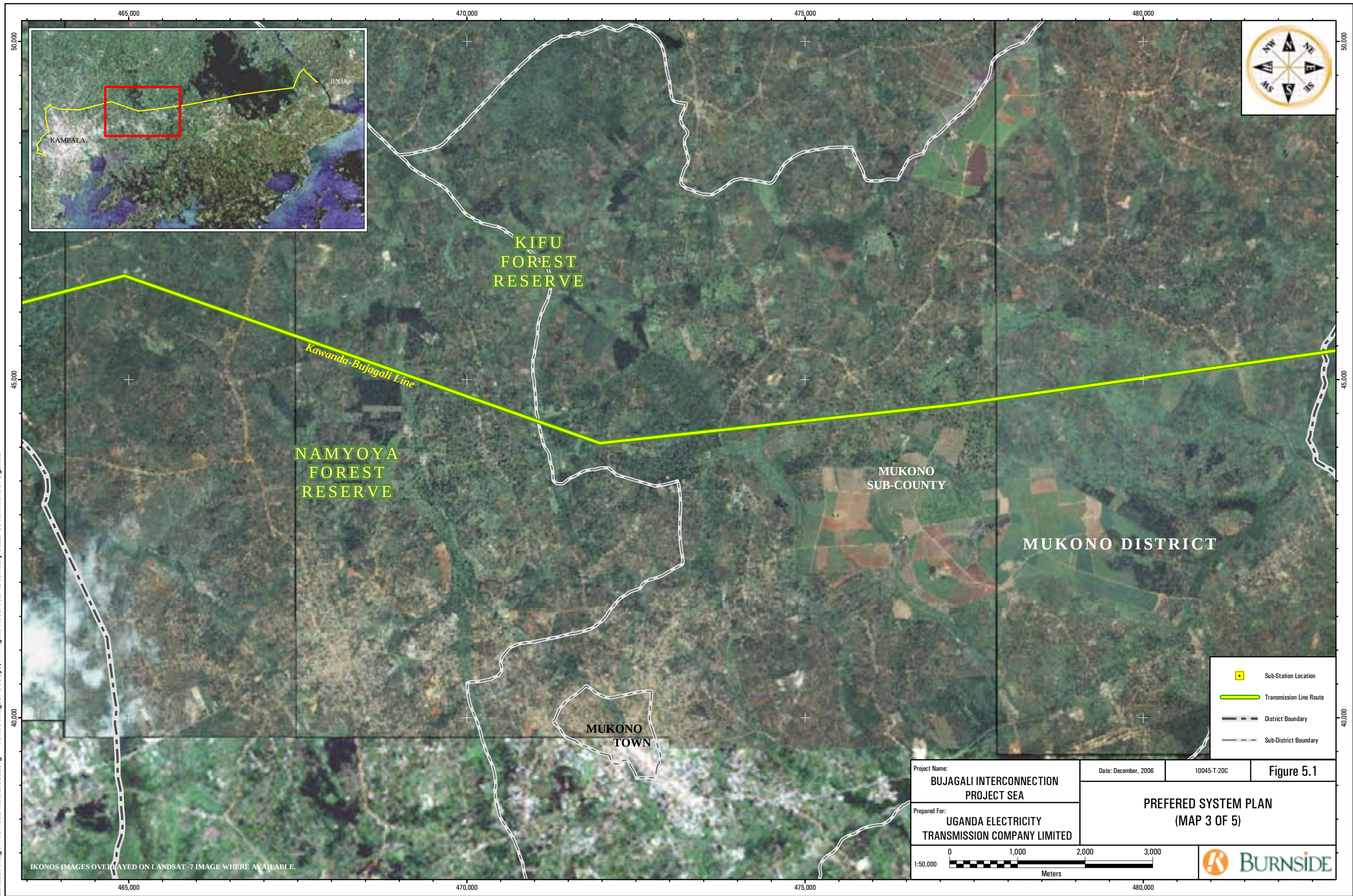
Project Name:	BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-18	Figure 4.7
Prepared For:	UGANDA ELECTRICITY AND TRANSMISSION COMPANY LIMITED	OPTIMIZED LAYOUT FOR KAWANDA SUBSTATION		
1:4,000	0 100 200 Meters			



Landsat Image: Provided via LandsatOrg - Ikonos Images: GeoEye, All Rights Reserved - Boundary Data: Government of Uganda

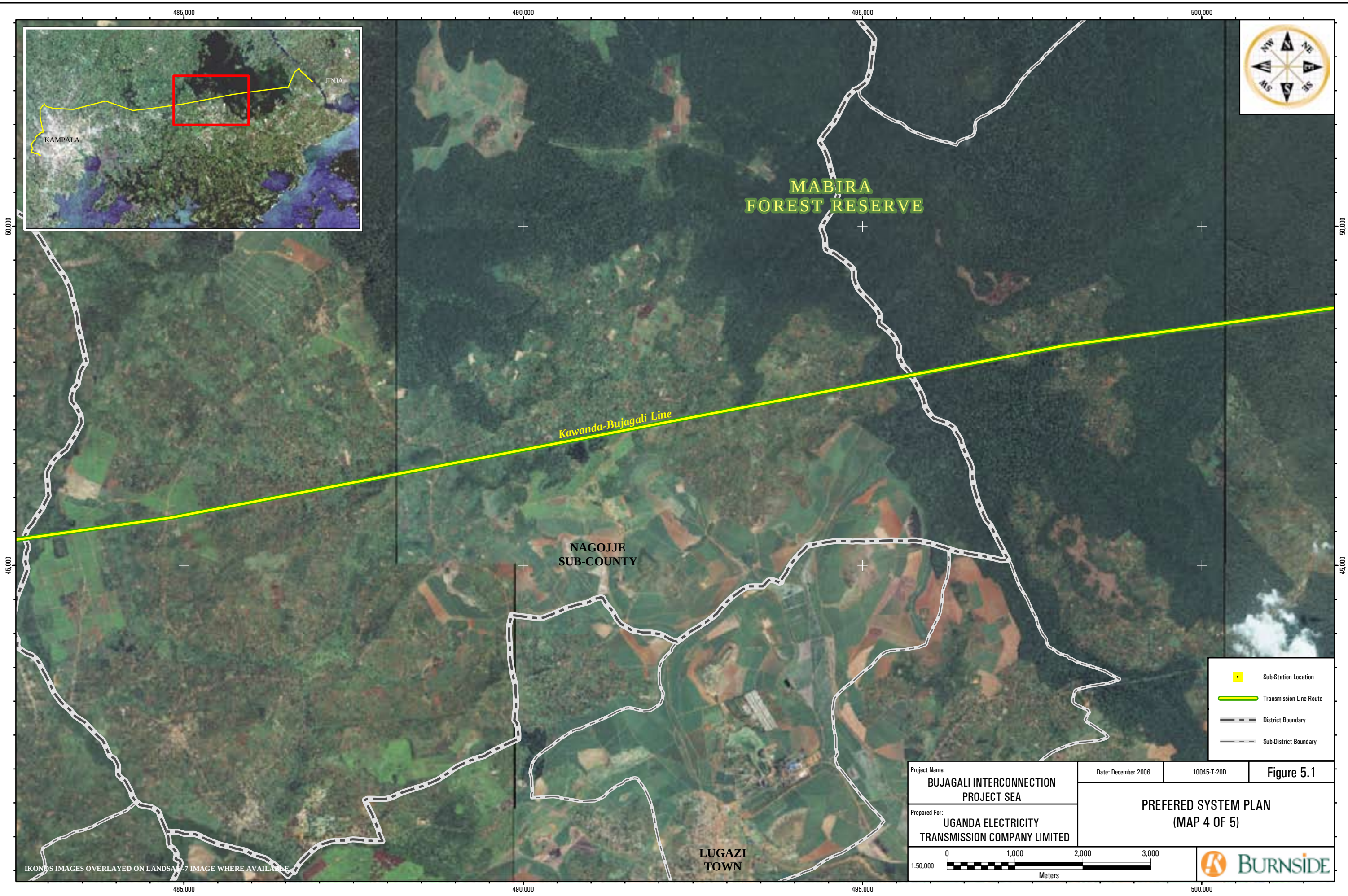


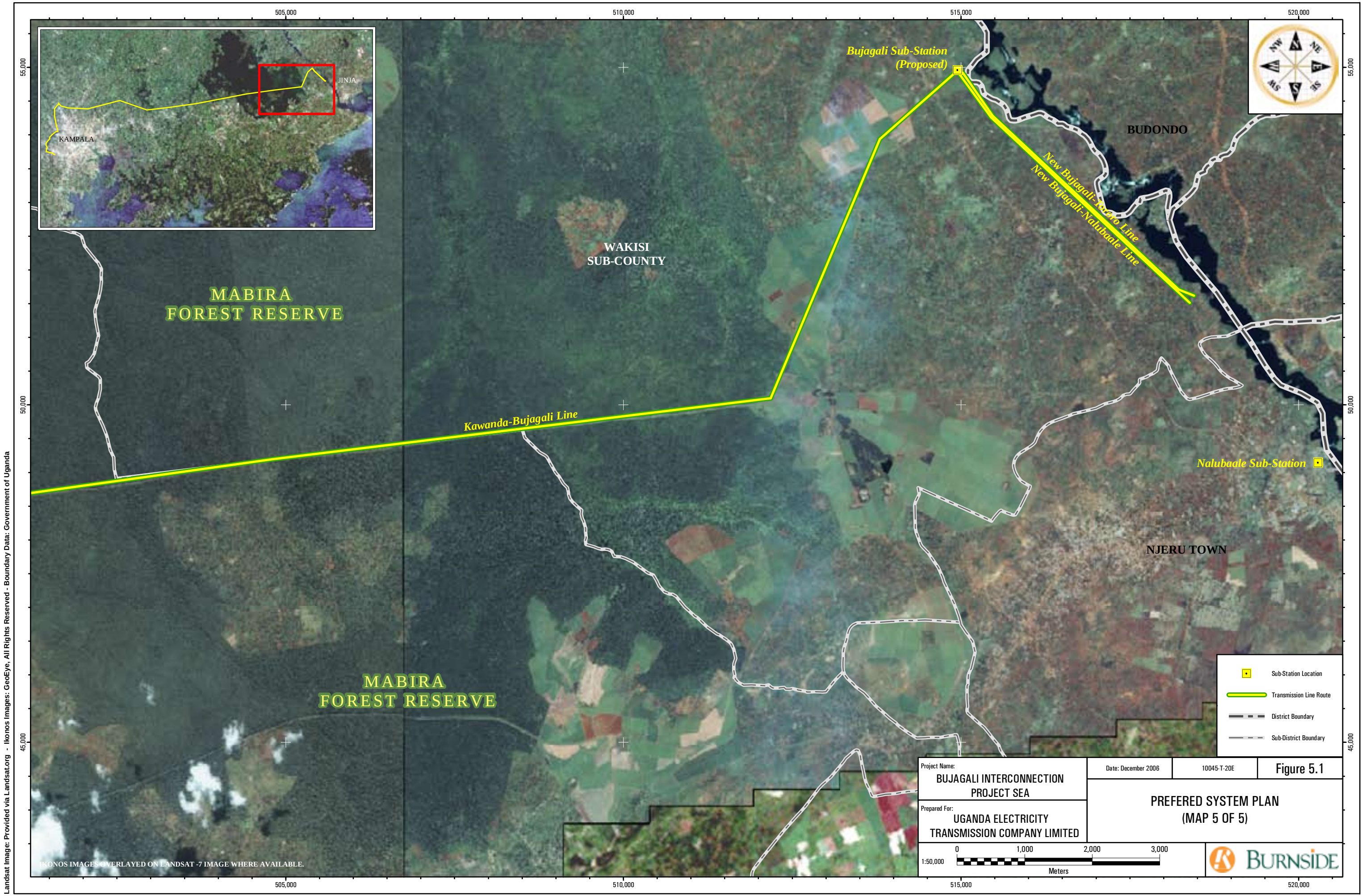




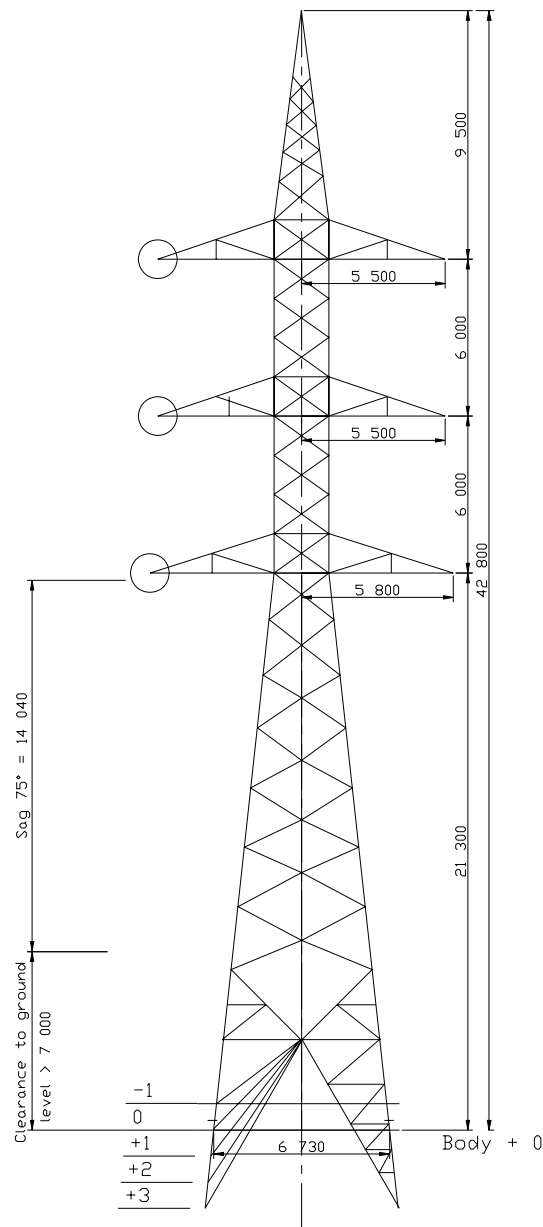
IKONOS IMAGES OVERLAYED ON LANDSAT-7 IMAGE WHERE AVAILABLE.

Landsat Image: Provided via Landsat.org - Ikonos Images: GeoEye, All Rights Reserved - Boundary Data: Government of Uganda

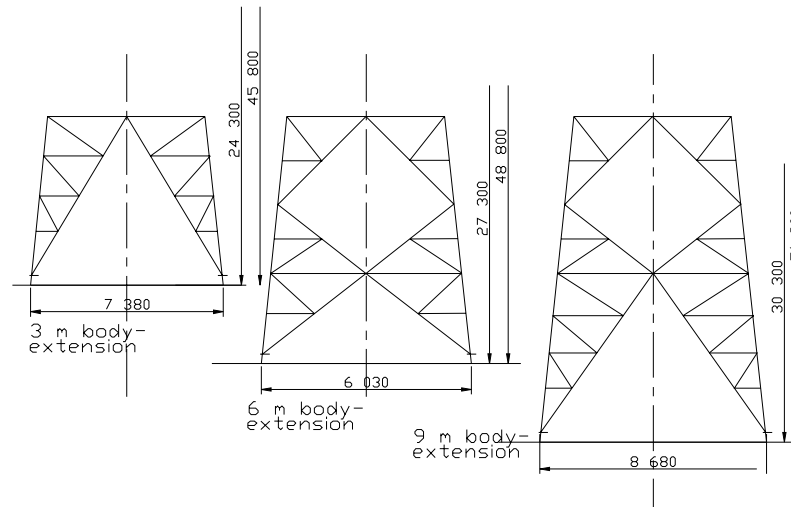




Landsat Image: Provided via LandsatOrg - Ikonos Images: GeoEye, All Rights Reserved - Boundary Data: Government of Uganda



This drawing does not represent a final design but is intended to be an indication of the overall requirements



Source: Bujagali EPC Consortium, 2000

Project Name:
**BUJAGALI INTERCONNECTION
PROJECT SEA**

Prepared for:
**UGANDA ELECTRICITY
TRANSMISSION COMPANY LIMITED**

Date: December, 2006

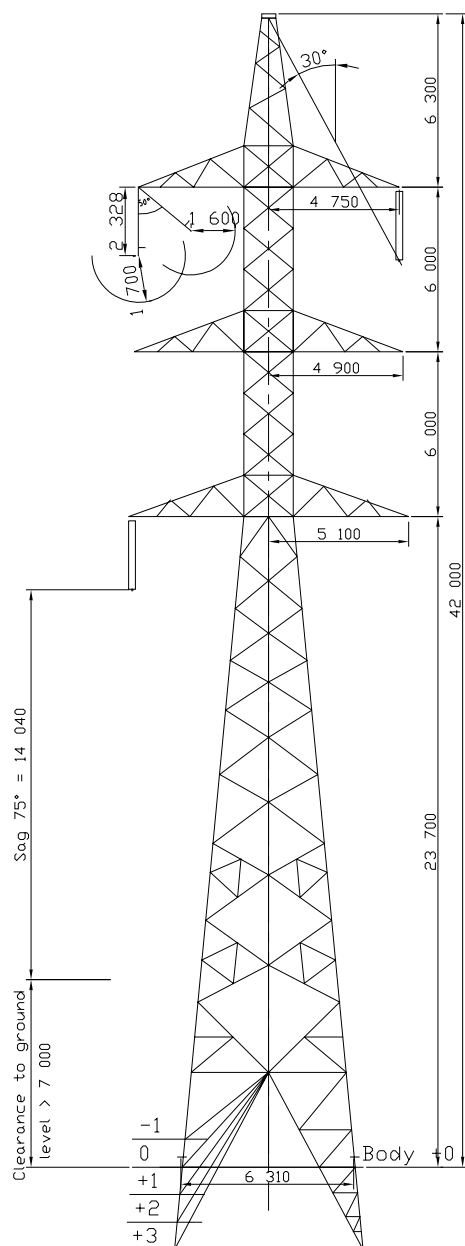
10045-T-27

Figure 5.2

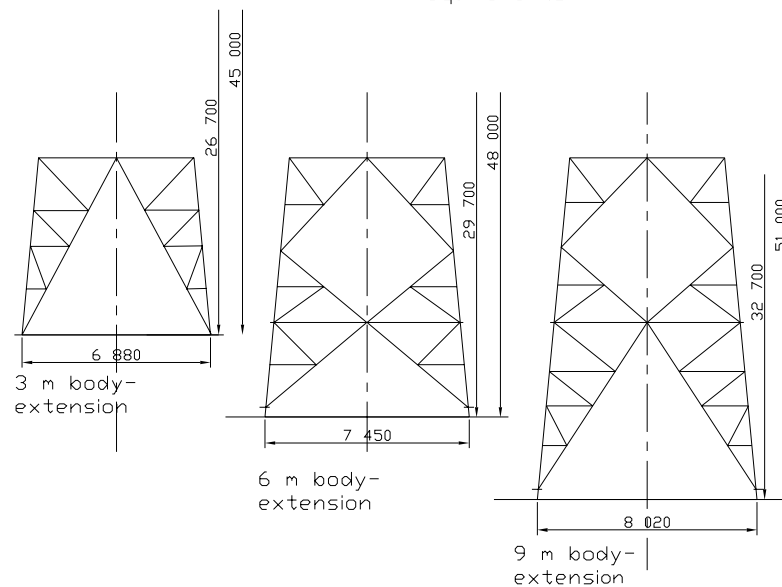
**TYPICAL DESIGN FOR 220 kV
TENSION TOWER**

Updated by:



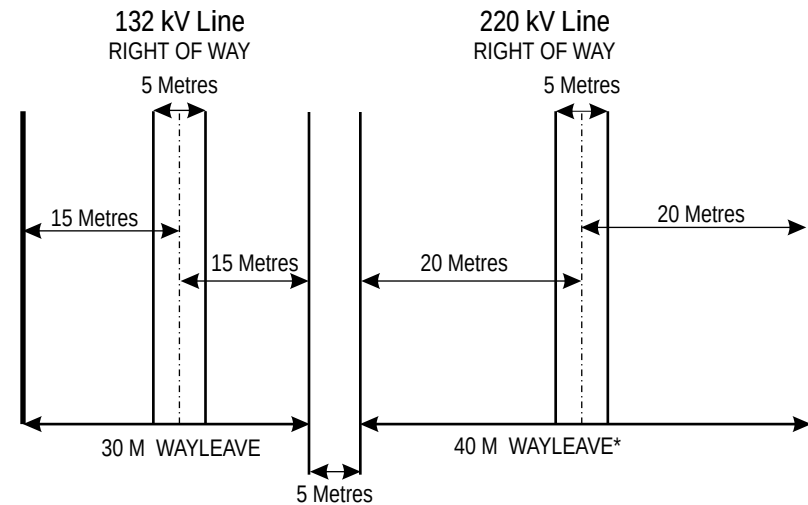
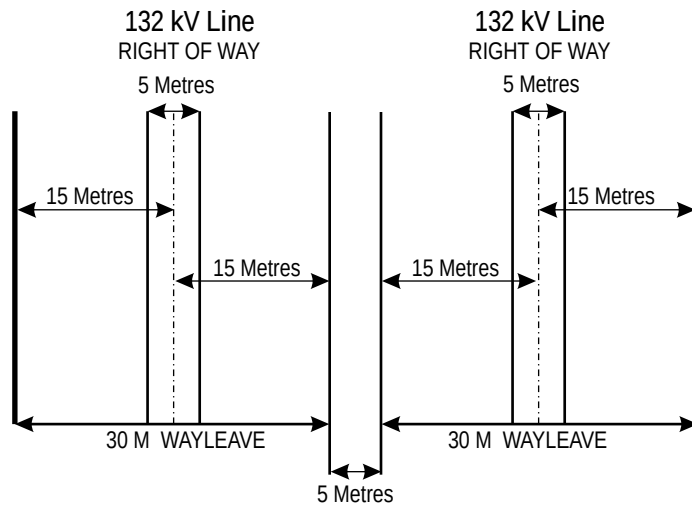
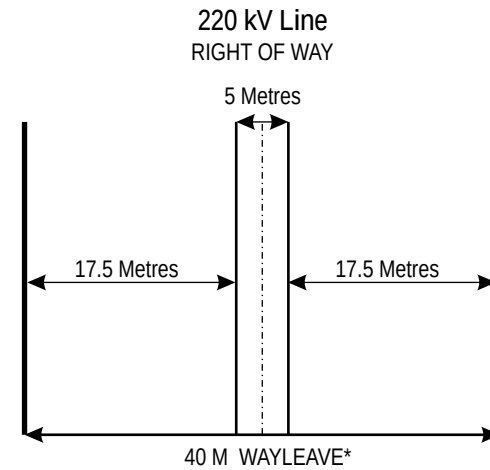
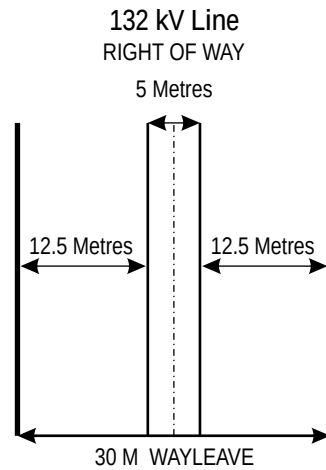


This drawing does not represent a final design but is intended to be an indication of the overall requirements



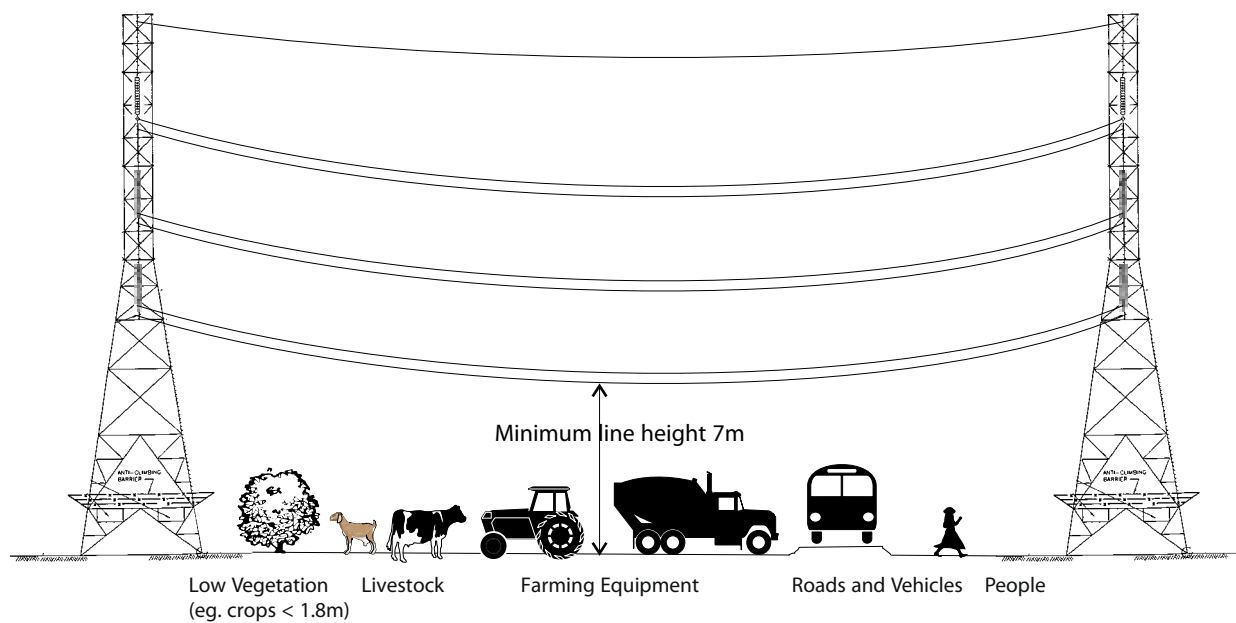
Source: Bujagali EPC Consortium, 2000

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-28	Figure 5.3
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	TYPICAL DESIGN FOR 220 kV SUSPENSION TOWER		

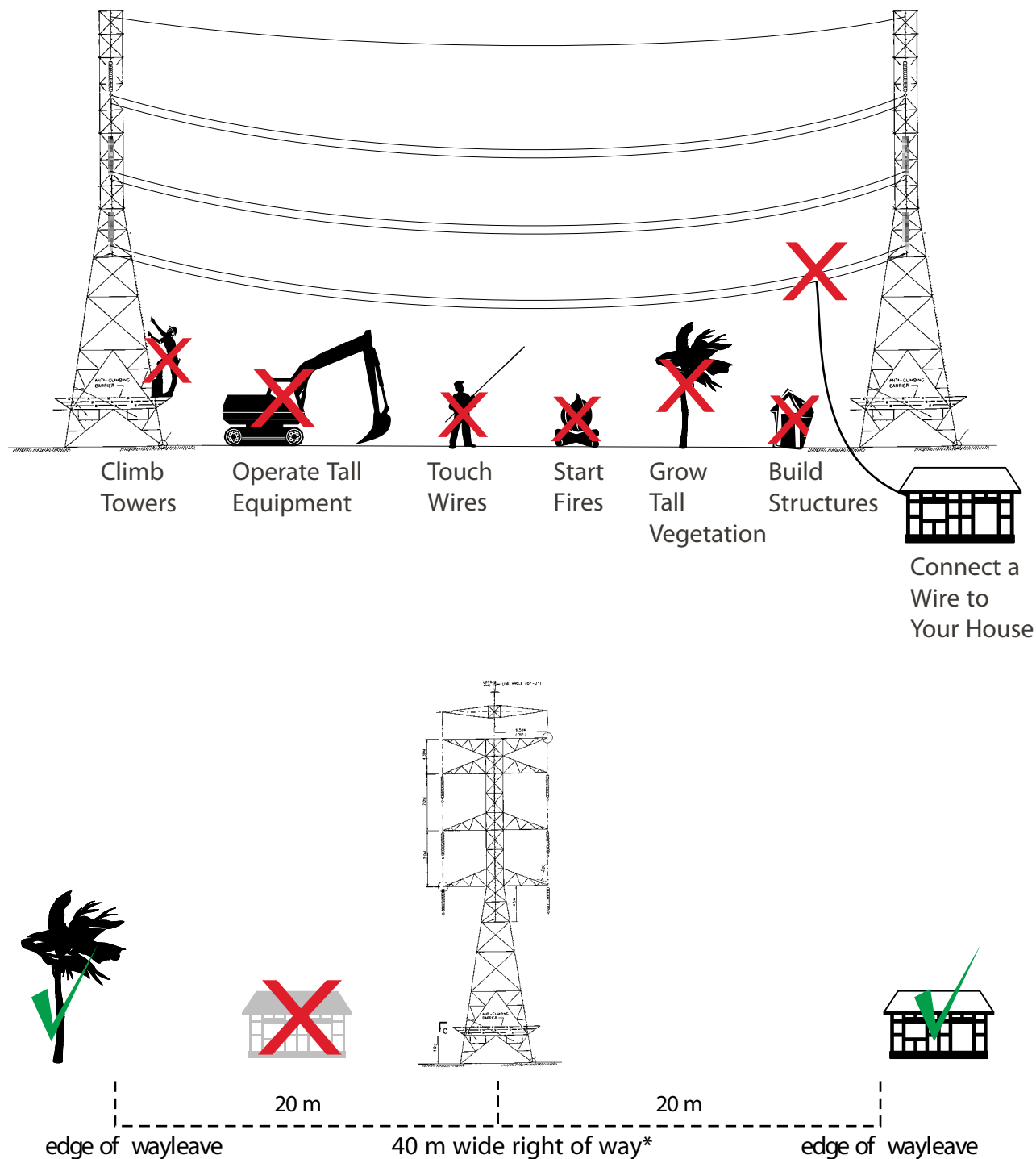


* Wayleave through Mabira, Kifu and Namyoya FR's will be limited to 35m as a mitigation measure. However, compensation will be based on a 40m wayleave.

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-21	Figure 5.4
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	R.O.W. AND WAYLEAVE REQUIRMENTS FOR 132kV AND 220kV TRANSMISSION LINES		



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-30	Figure 5.5
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	COMPATIBLE LAND USES WITHIN TRANSMISSION WAYLEAVE		

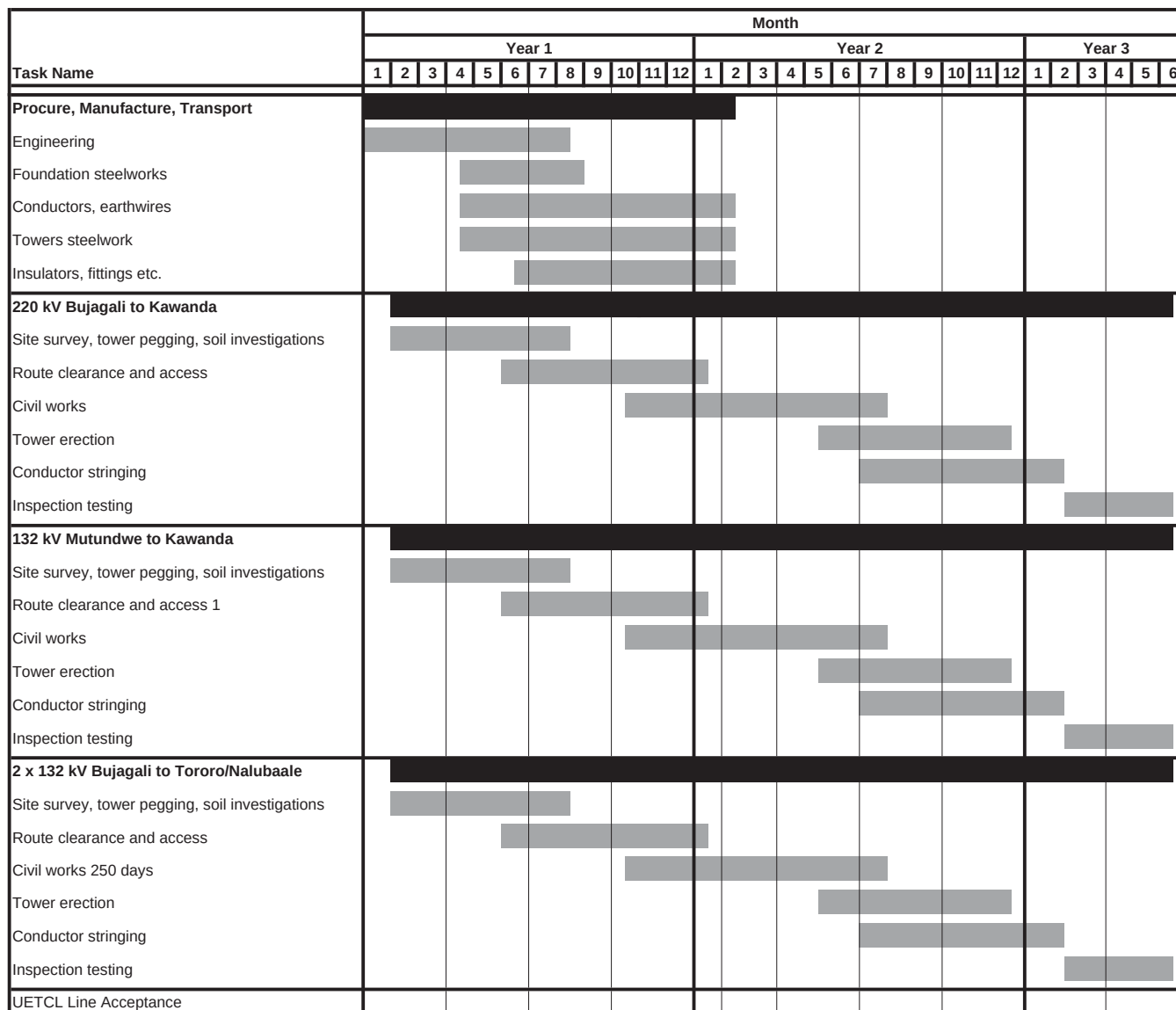


* Wayleave through Mabira, Kifu and Namyoya FR's will be limited to 35m as a mitigation measure. However, compensation will be based on a 40m wayleave.

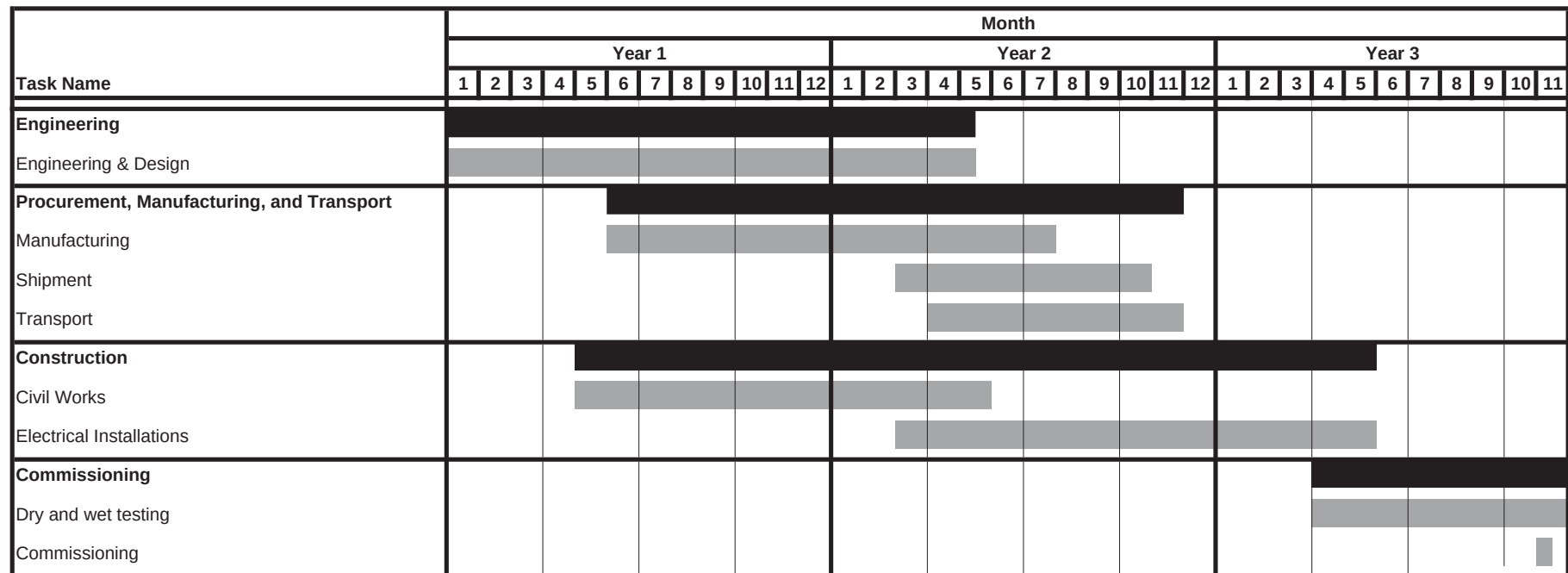
Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-31	Figure 5.6
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	INCOMPATIBLE LAND USES WITHIN TRANSMISSION WAYLEAVE		



Project Name:	Date: December, 2006	10045-T-32	FIGURE 5.7
BUJAGALI INTERCONNECTION PROJECT SEA		LAYOUT OF KAWANDA SUB-STATION	
Prepared For: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED		1:4,000	
0 100 200 Meters			



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-34	Figure 5.8
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PRELIMINARY PROGRAMME FOR BUJAGALI TRANSMISSION LINE		



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-33	Figure 5.9
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	PRELIMINARY PROGRAMME FOR KAWANDA SUBSTATION		

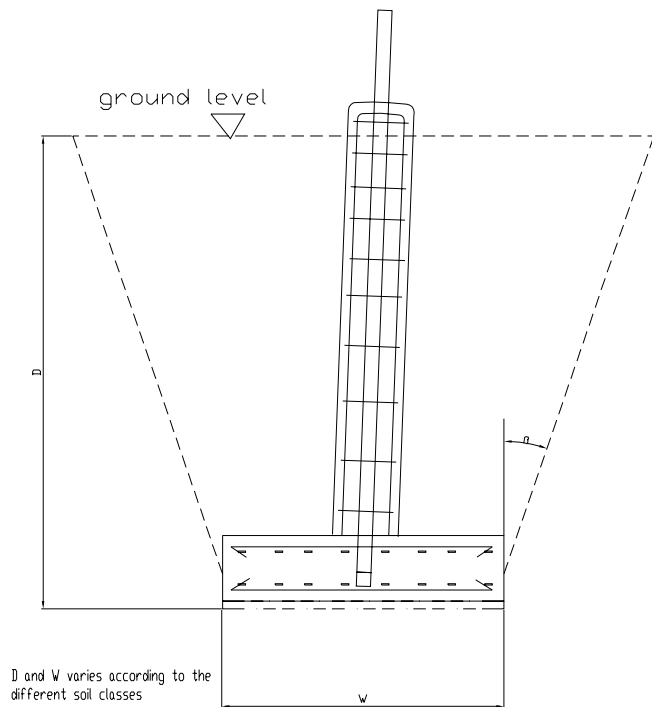


Figure 5.10 a
Typical Pad and Chimney Foundation

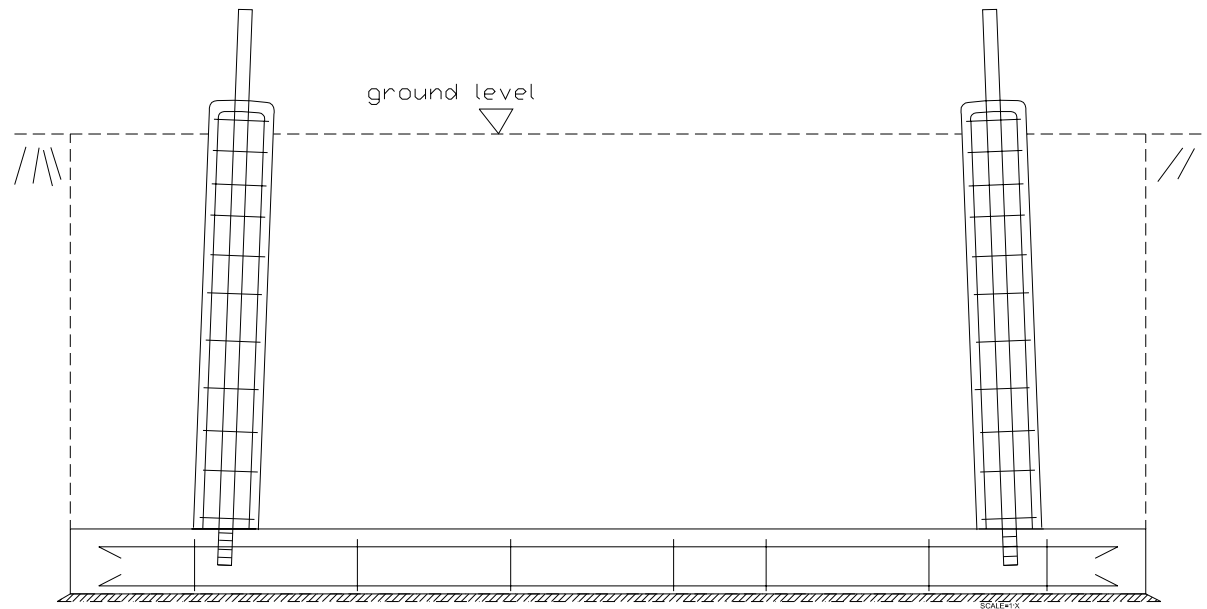


Figure 5.10b
Typical Raft Foundation

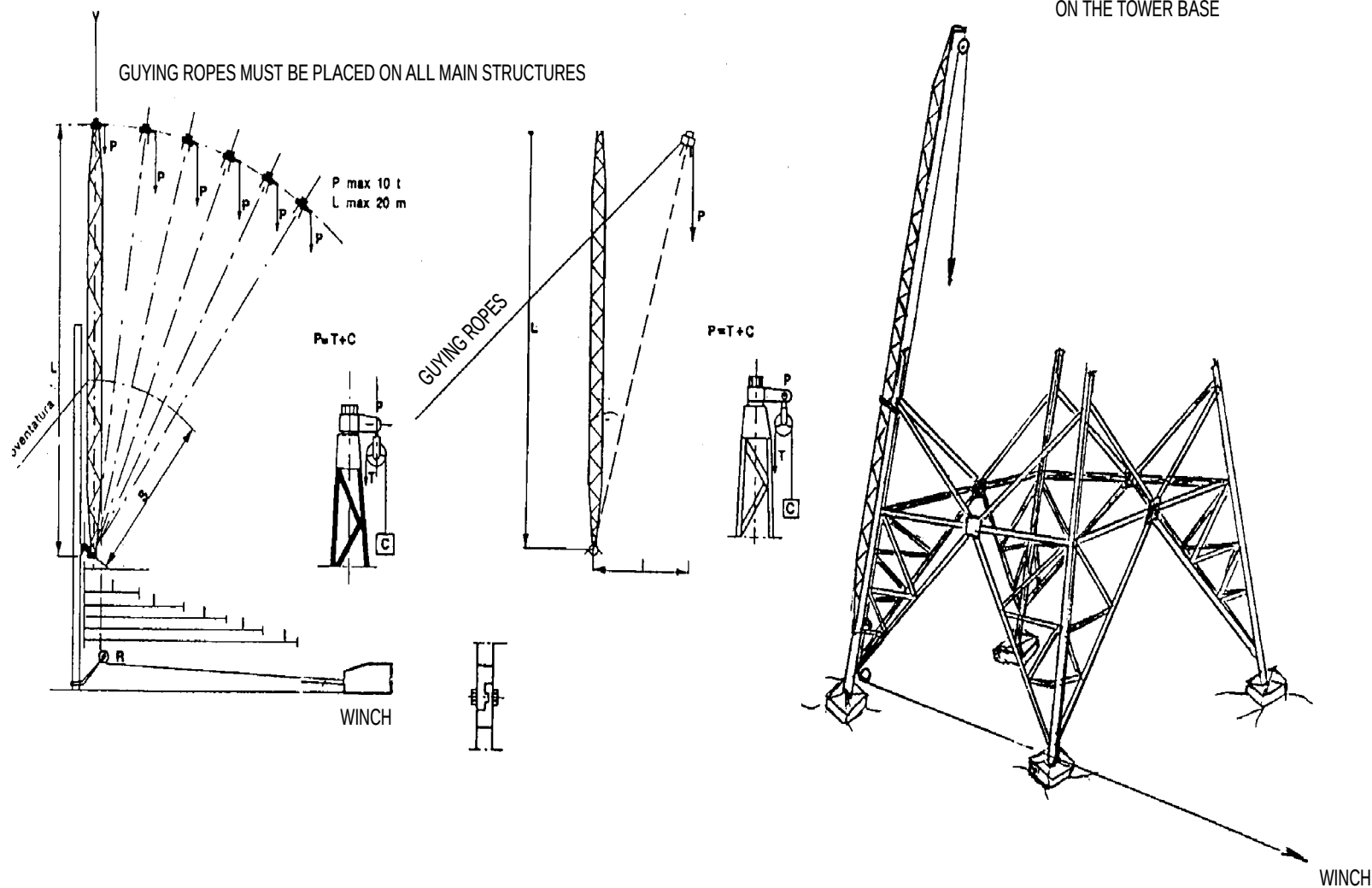
Source: Bujagali EPC Consortium, 2000

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-24	Figure 5.10
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	TRANSMISSION TOWER FOUNDATIONS		

Updated by:  **BURNSIDE**

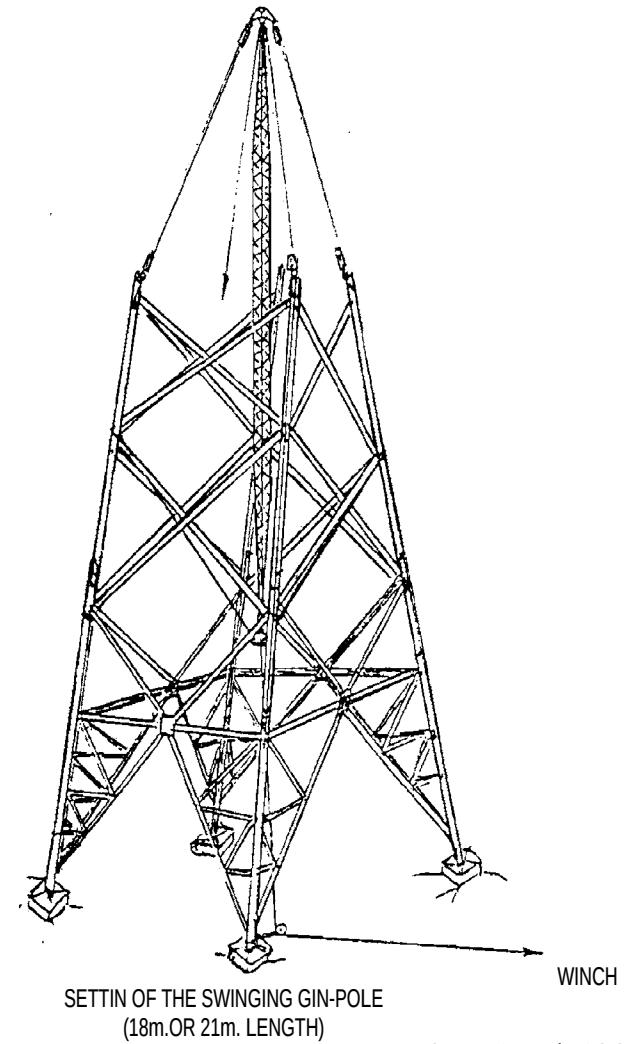
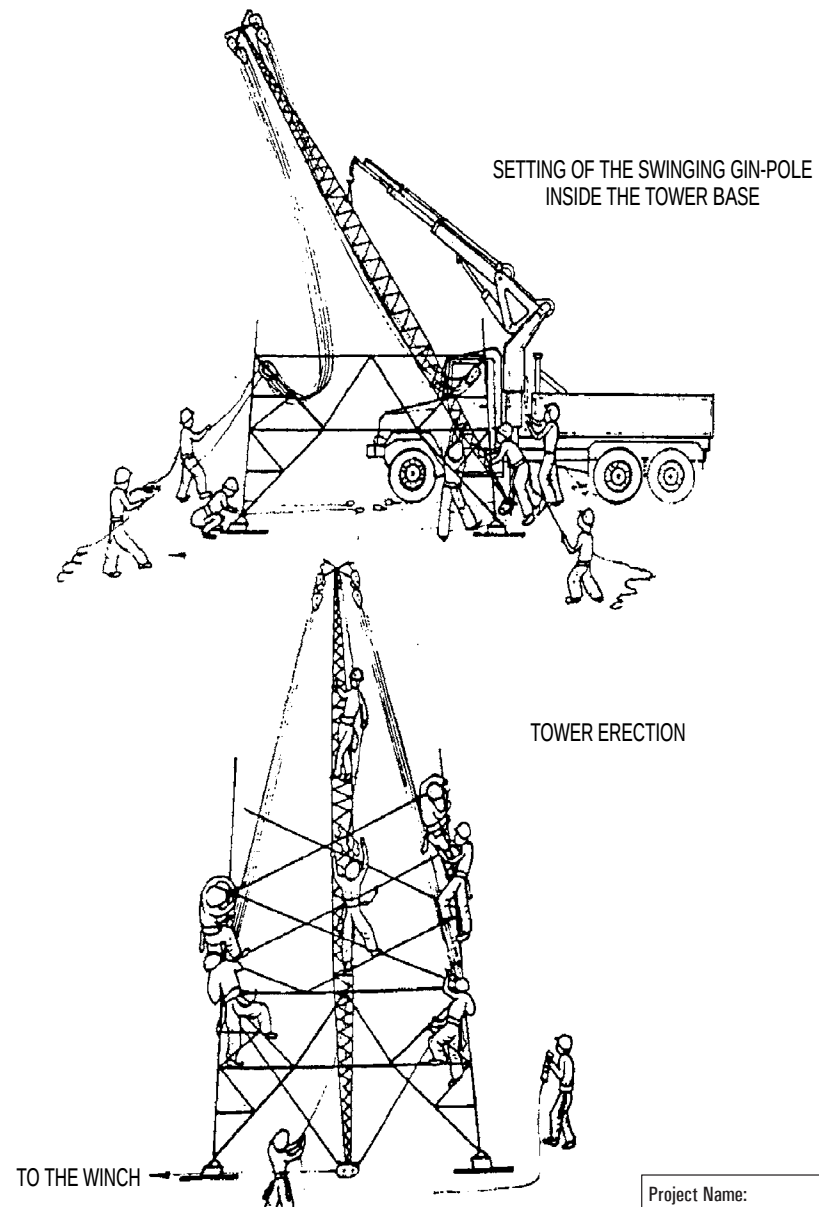
GIN-POLE WITH HIGH YIELDING RESISTANCE MADE OF ALUMINUM ALLOY

INSTALLATION OF THE GIN-POLE (8m. OR 12m. LENGTH)
ON THE TOWER BASE



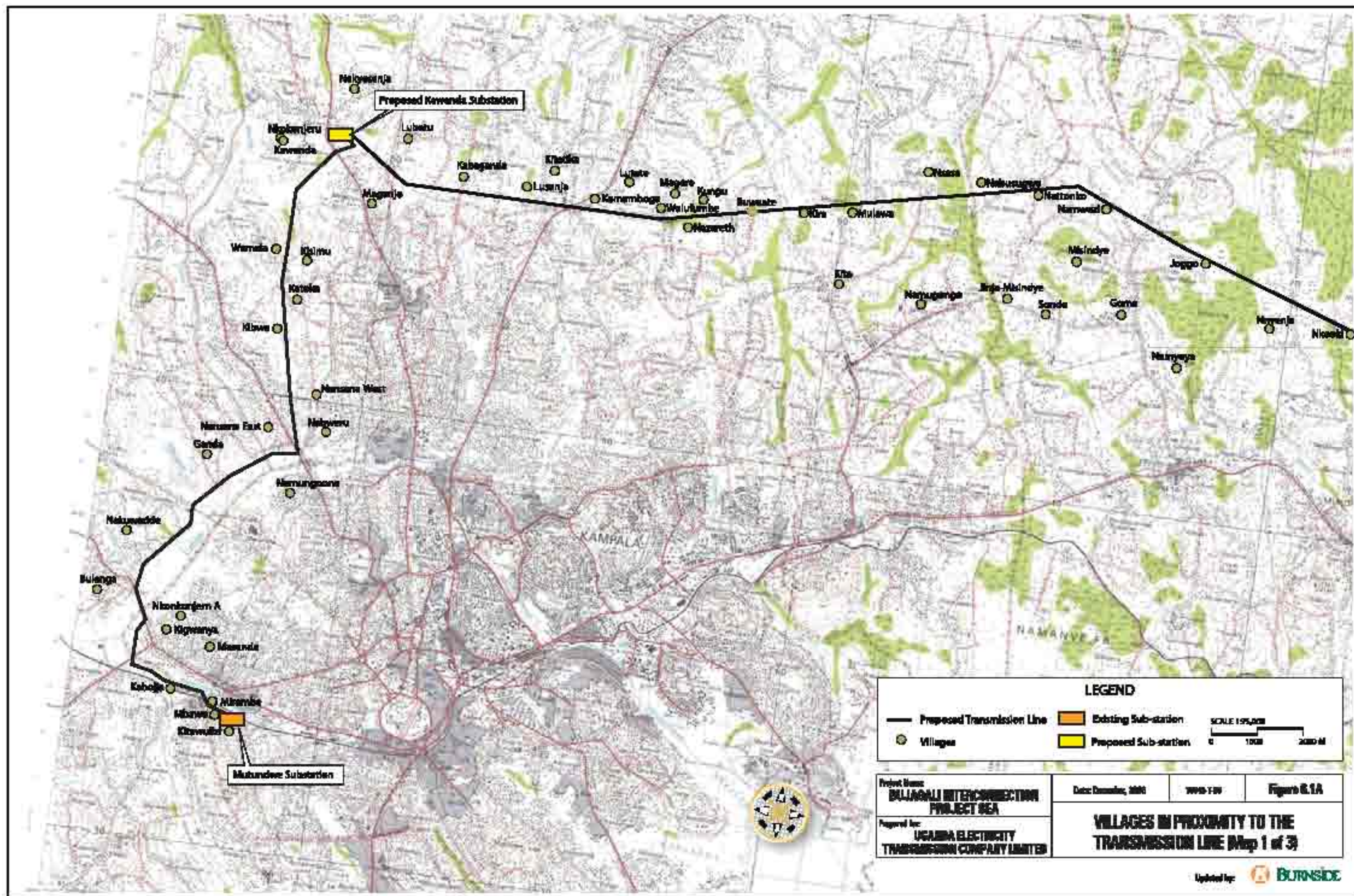
Source: Bujagali EPC Consortium, 2000

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-25	Figure 5.11
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	TOWER ERECTION WITH LATERAL GIN-POLE		

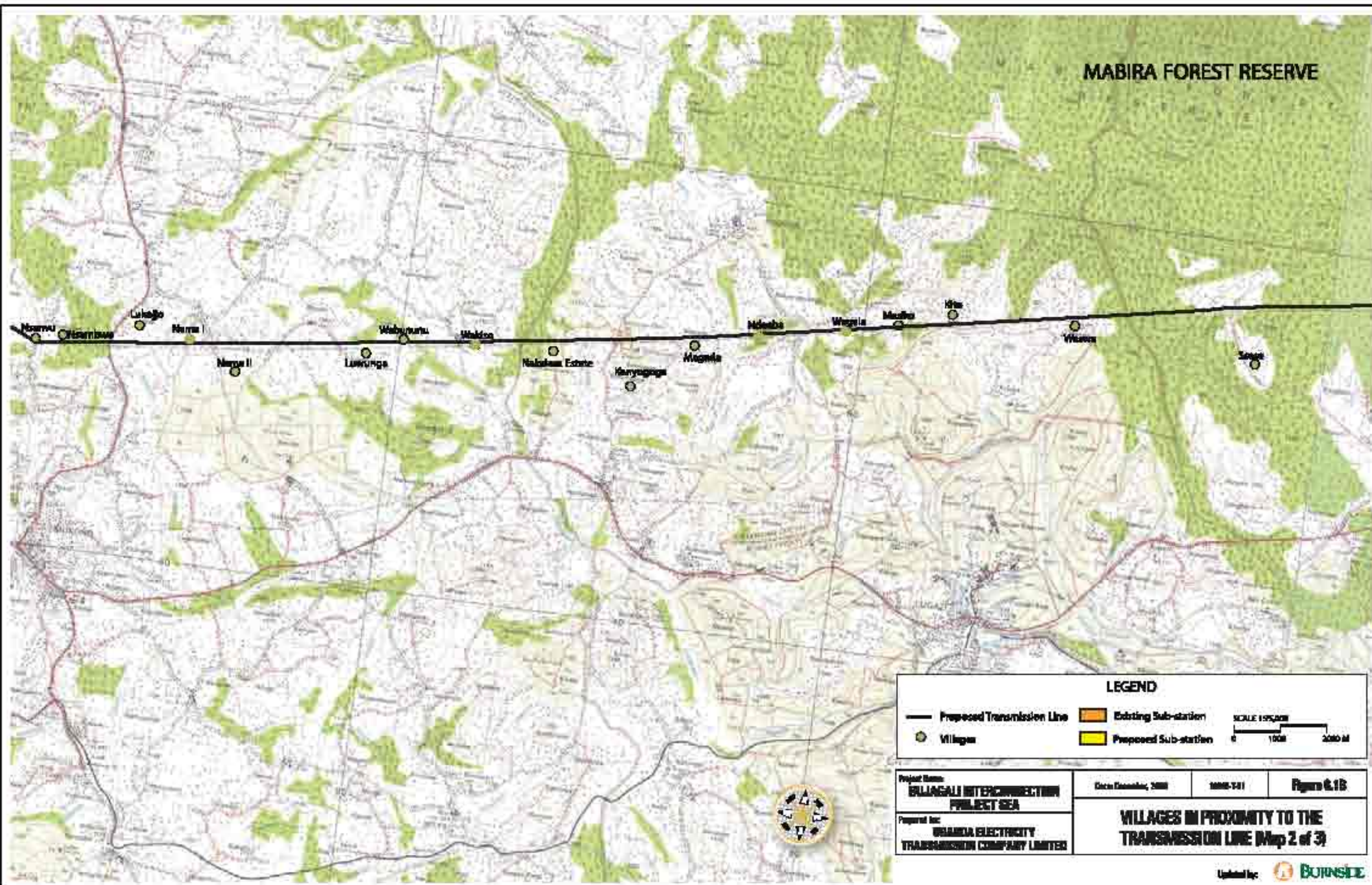


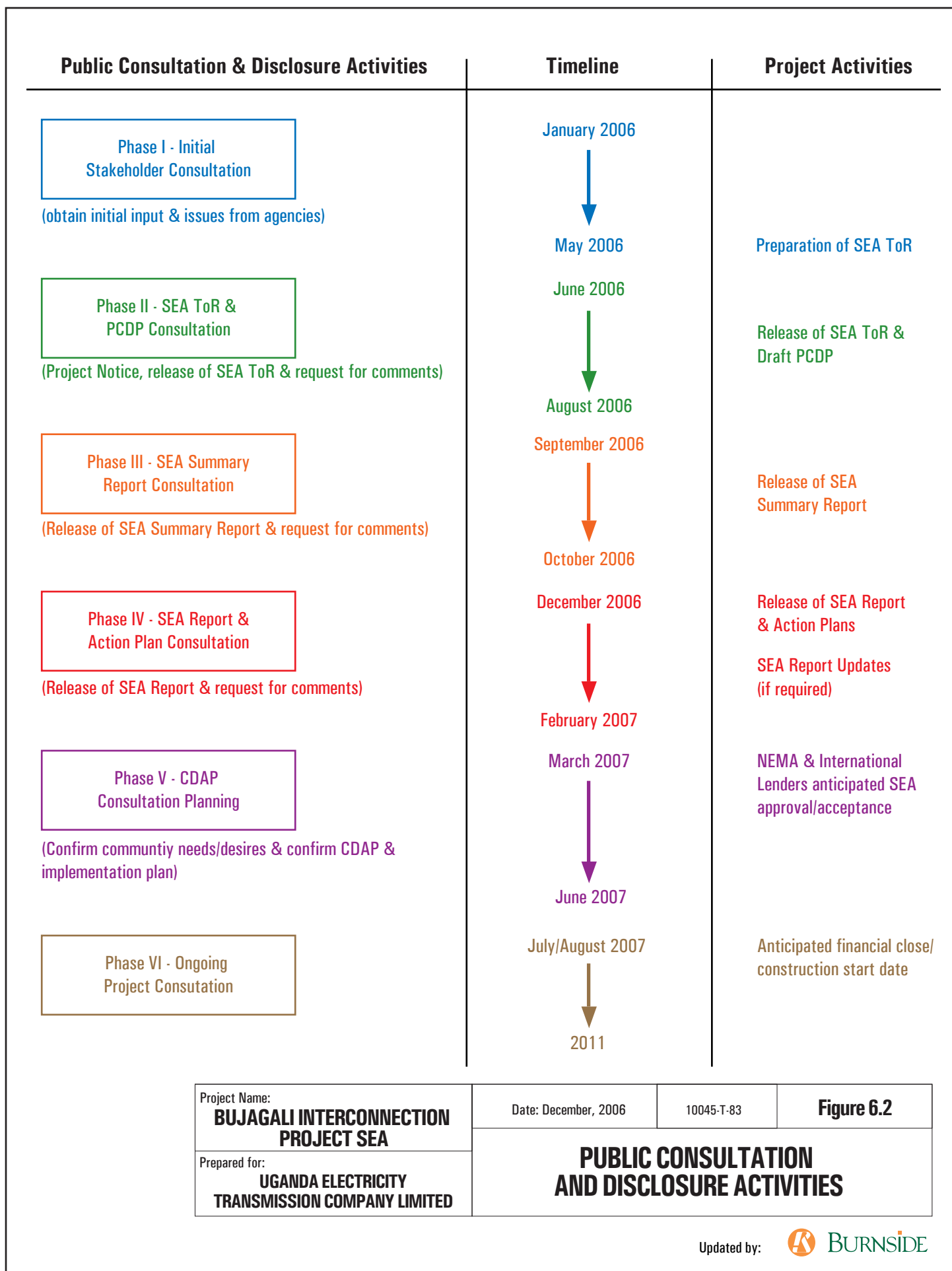
Source: Bujagali EPC Consortium, 2000

Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-26	Figure 5.12
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	TOWER ERECTION WITH SWINGING GIN-POLE		



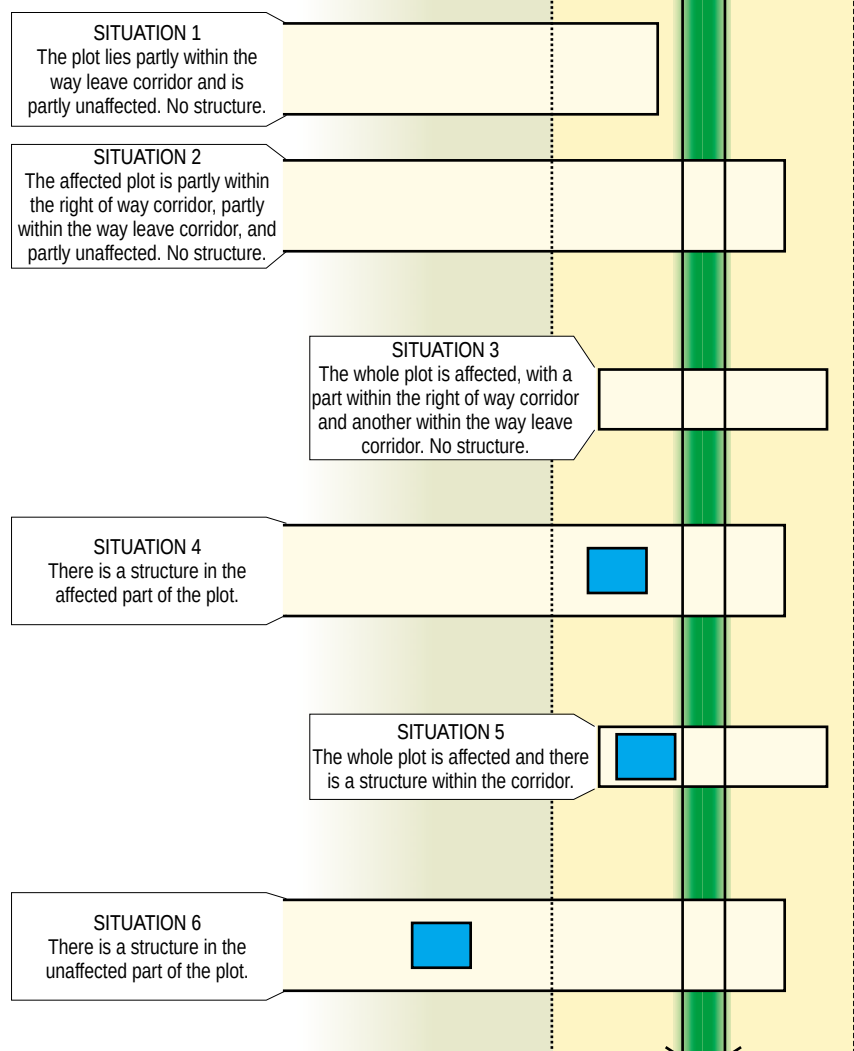
MABIRA FOREST RESERVE





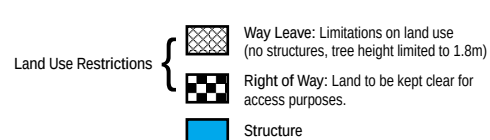
OWNERSHIP SITUATIONS

→ STRATEGIES FOR COMPENSATION

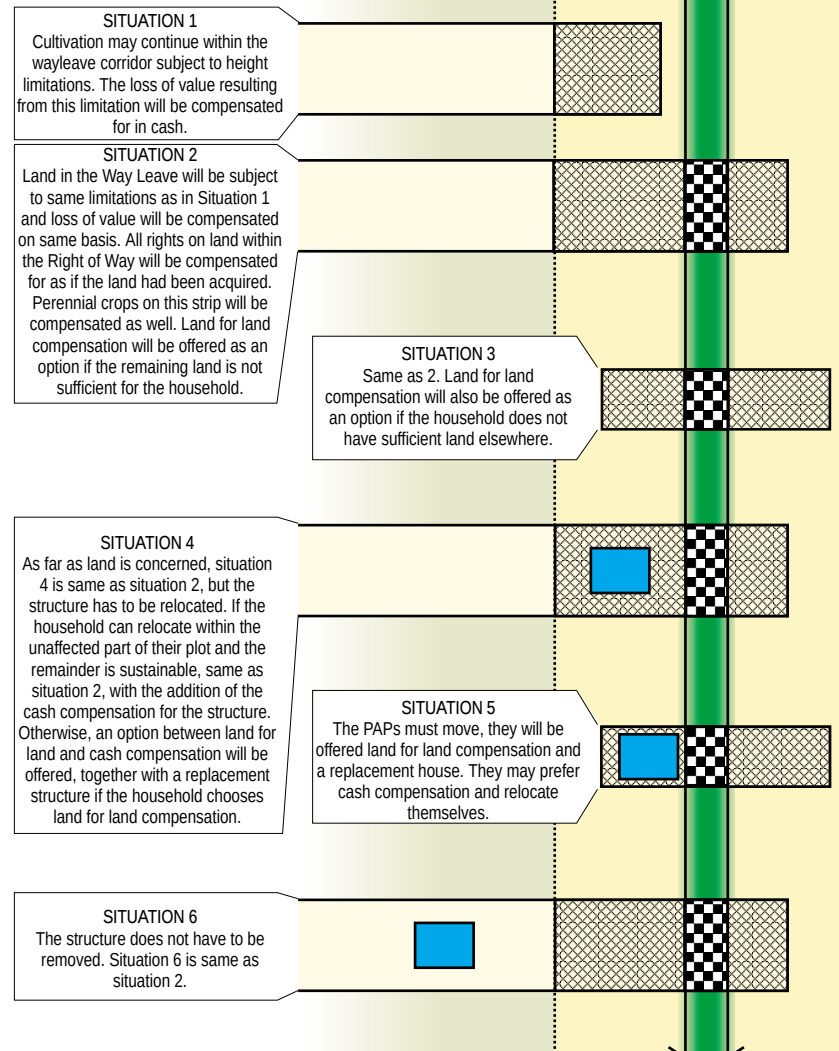


RIGHT OF WAY

WAYLEAVE



PAP's = Project Affected Persons



RIGHT OF WAY

WAYLEAVE

Project Name:
**BUJAGALI INTERCONNECTION
PROJECT SEA**

Prepared for:
**UGANDA ELECTRICITY
TRANSMISSION COMPANY LIMITED**

Date: December, 2006

10045-T-36

Figure 7.1

**RANGE OF OWNERSHIP SITUATIONS
ENCOUNTERED AND STRATEGIES
FOR COMPENSATION**

Updated by:

BURNSIDE

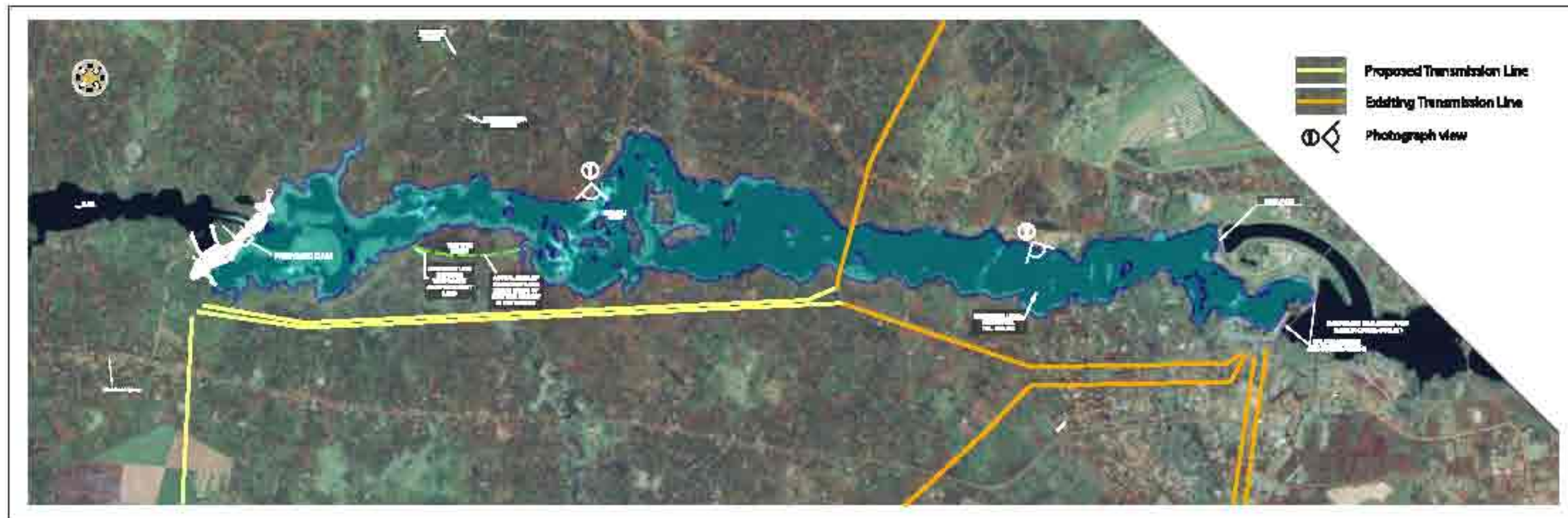


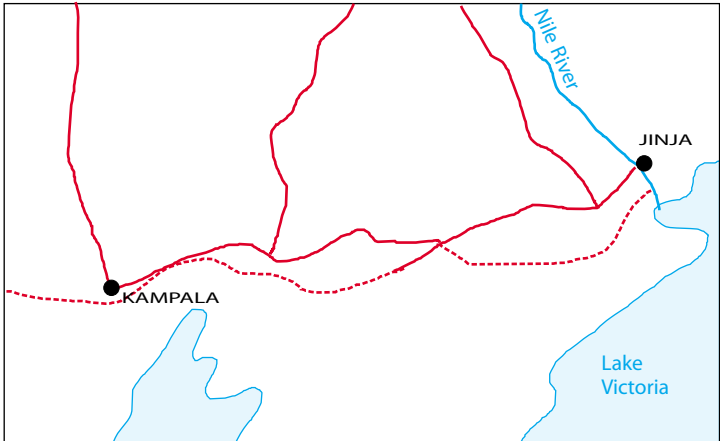
Photo 1: View of West Bank of Nile from Bujagali Picnic Site



Photo 2: View of West Bank of Nile from Nile Resort

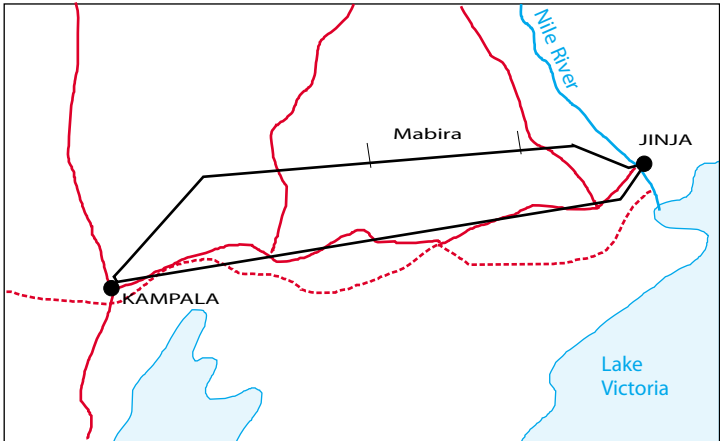
Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2020	NOV-21-20	Figure 7.2
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	EXISTING VIEWS OF WEST BANK FROM BUJAGALI PICNIC SITE AND NILE RESORT		

PRE-1954



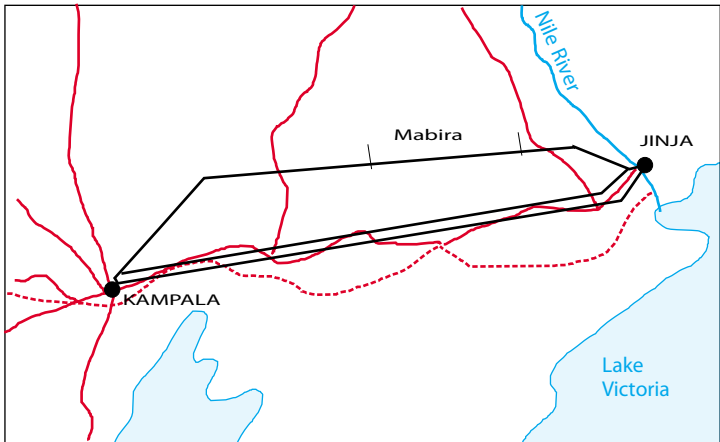
- Main road constructed between Kampala and Jinja
- Rural settlements scattered throughout area
- Mabira, Kifu & Namyoya Forest Reserves gazetted
- Railway built between Kampala and Jinja

1950s



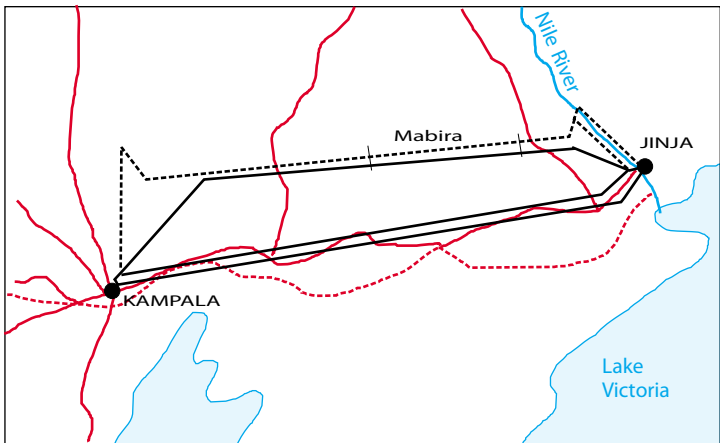
- Owen Falls Hydropower station constructed
- 132 kV transmission line constructed from Owen Falls dam to Kampala North substation, known as “northern line”. Line goes through Mabira, Kifu and Namyoya Forest Reserves.
- 66 kV line built from Owen Falls to Lugogo. Line crosses the main Kampala-Jinja Highway 5 times
- Land use intensifies as population increases.

PRESENT



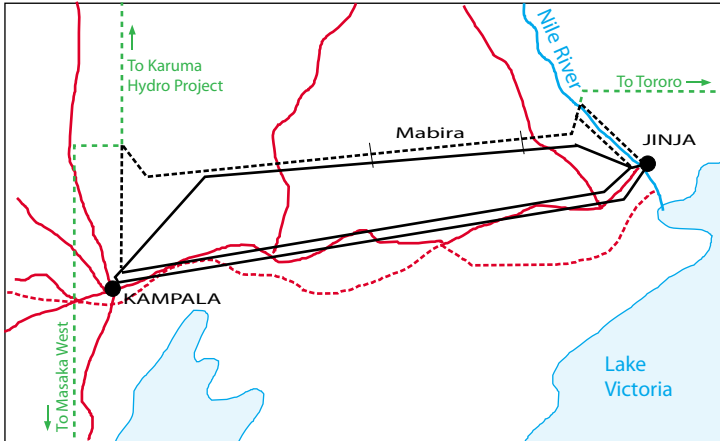
- 66 kV line is downgraded to 33 kV between Mukono and Lugogo substation, and is decommissioned entirely between Mukono and Lugazi.
- 132 kV “DANIDA” line completed, running north of 66 kV line, from Owen Falls substation to Kampala North substation. DANIDA line varies from 50 m to several km from the existing 66 kV line. No public consultation known to have been carried out prior to line being constructed. Ongoing issues associated with compensation.
- 3 transmission substations (Kampala North, Mutundwe and Lugogo) are saturated and cannot receive additional power or lines.
- Permanent buildings are sited within wayleave of DANIDA and 66/33 kV lines. Segments of “northern line” wayleave through Mabira Forest Reserve have regenerated and are inaccessible by vehicle.
- Land use intensified, with much of the region under small-scale farms or large farm estates.

BUJAGALI PROPOSAL

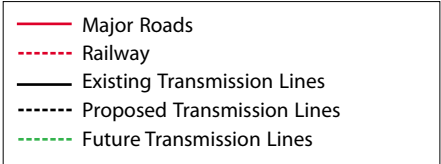


- New substations to be built at Bujagali and Kawanda
- 220 kV line to be built between Bujagali and Kawanda substation, for total distance of 70.4 km. 39.6 km will run parallel to, and immediately north of, the existing 132 kV “northern” line, including 18.0 km that will go through Mabira Forest Reserve. Wayleave will be expanded from current 30 m to 70 m (65m in forest reserves.) Wayleave assumed to be maintained by UEB. Extensive portions of wayleave routinely become inaccessible due to fast-growing vegetation.
- 132 kV line to be built between Mutundwe and Kawanda substations for 17.4 km. Entire section will be through greenfield. Transmission line to run along western and southern edges of Lubigi Swamp.
- Transmission line to run parallel to railway for 1.8 km.
- 2x132 kV lines to run parallel to each other from Bujagali substation to Tororo line interface, for 4.9 km.

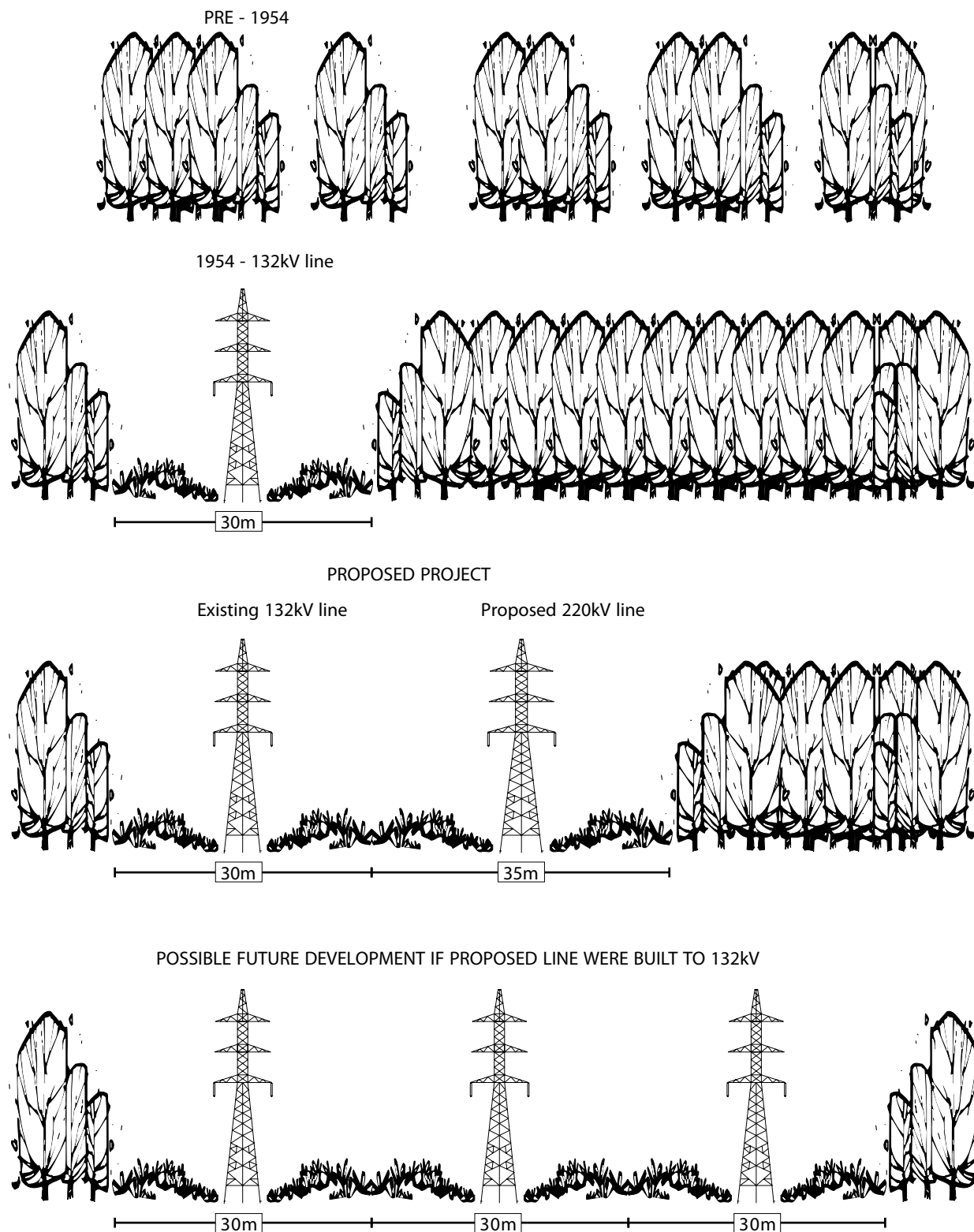
FUTURE



- Additional 220 kV transmission lines developed between Kawanda and Masaka West, Kawanda and Karuma and Bujagali and Tororo.
- Operation of Bujagali to Kawanda transmission line switched from 132 kV to 220 kV.

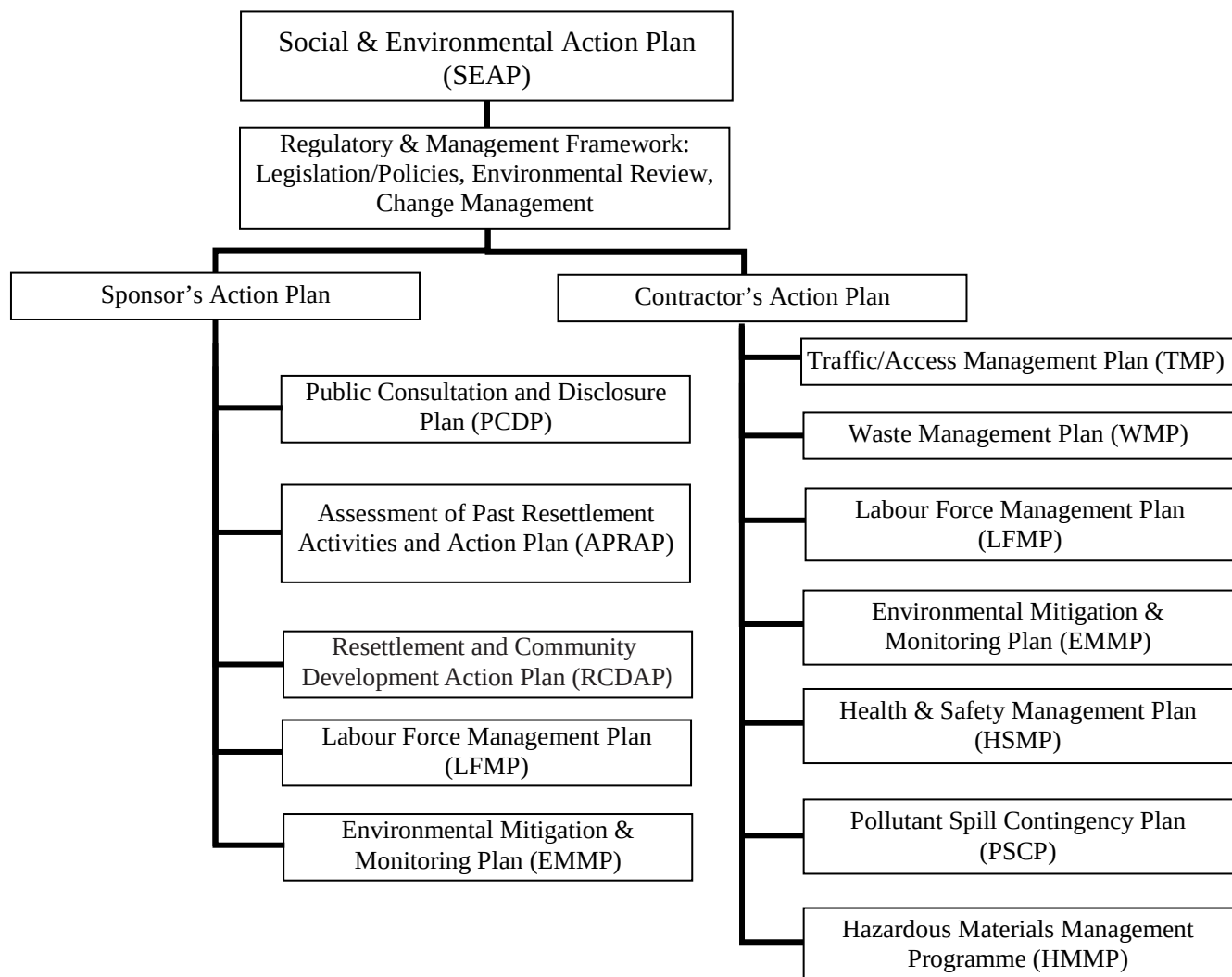


Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-38	Figure 7.3
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SCHEMATIC OF CUMULATIVE EFFECTS & PROPOSED TRANSMISSION LINES WITHIN STUDY AREA		

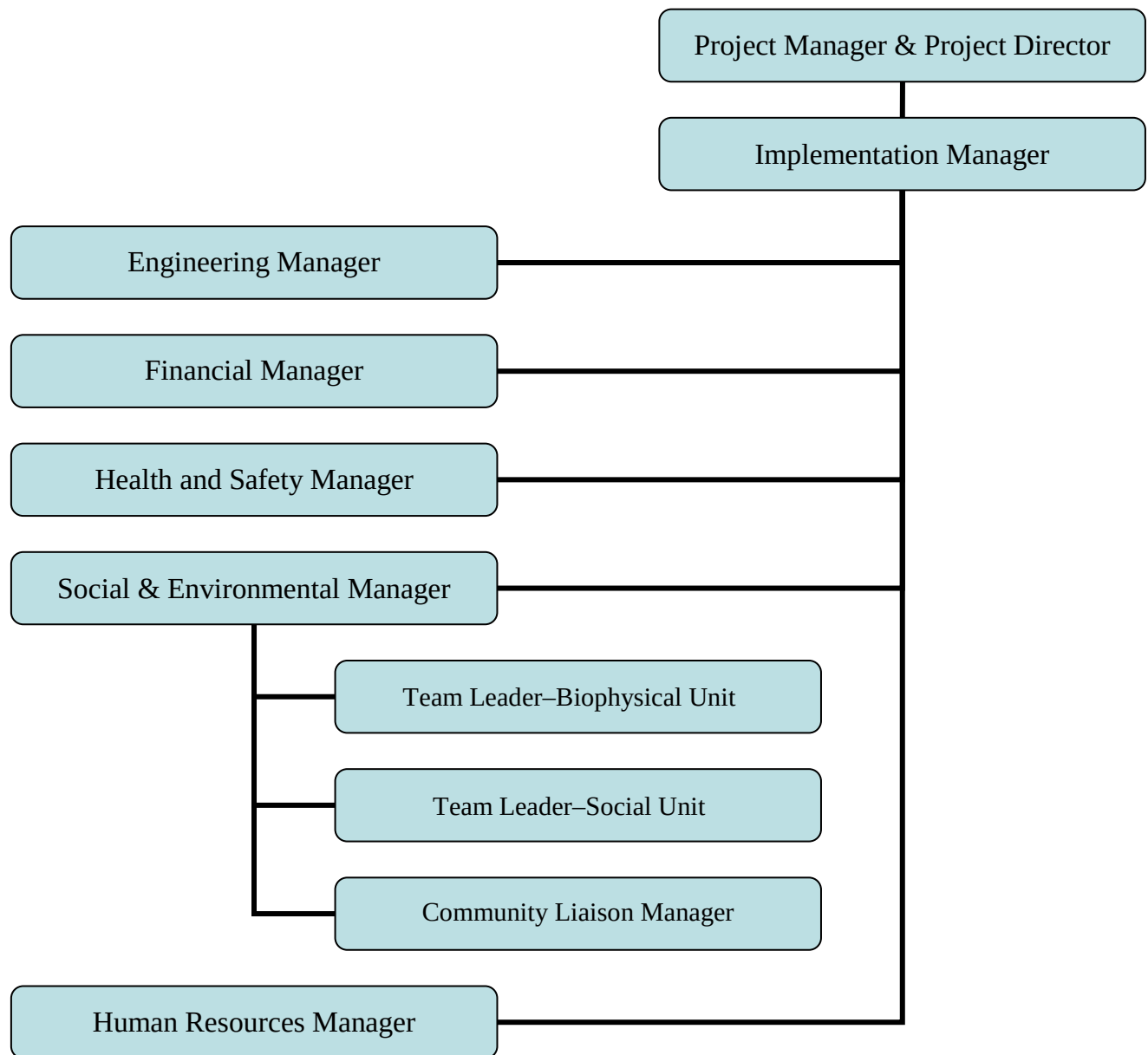


By building the proposed transmission line (220kV rather than 132kV), the need to build a third 132kV line (with resultant wayleave of 90m) in the future is avoided.

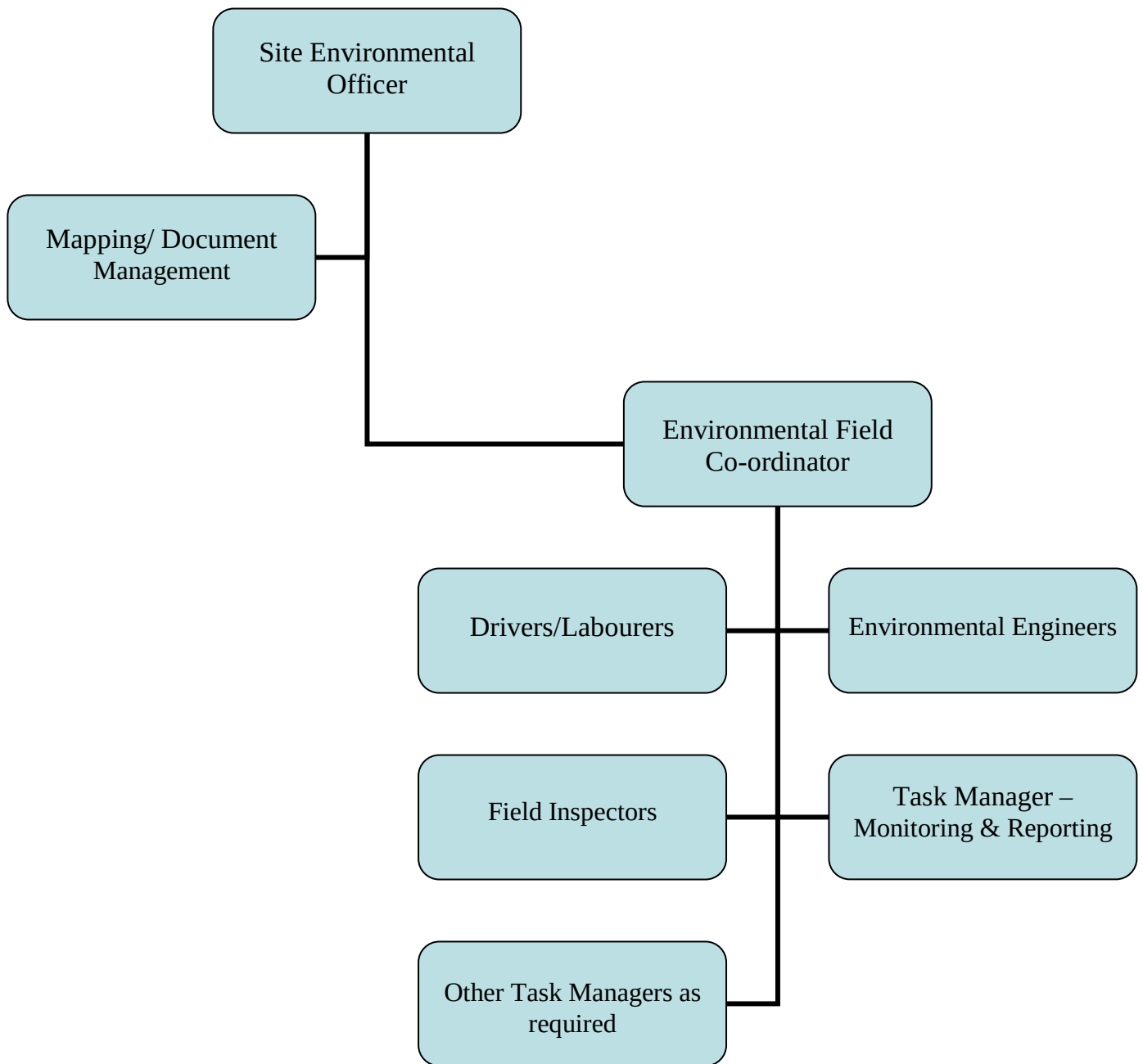
Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-39	Figure 7.4
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SCHEMATIC OF CUMULATIVE EFFECTS OF TRANSMISSION LINE WITHIN STUDY AREA FOREST RESERVES		



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-41	Figure 8.1
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SEAP COMPONENT PLANS		



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-42	Figure 8.2
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	SPONSOR'S IMPLEMENTATION TEAM STRUCTURE (INDICATIVE)		



Project Name: BUJAGALI INTERCONNECTION PROJECT SEA	Date: December, 2006	10045-T-54	Figure 8.3
Prepared for: UGANDA ELECTRICITY TRANSMISSION COMPANY LIMITED	EPC CONTRACTOR'S ENVIRONMENTAL TEAM STRUCTURE (INDICATIVE)		