5.0 ANALYSIS OF ALTERNATIVES FOR TECHNOLOGY AND PROJECT SITE

5.1 Analysis of Alternative Technology

The selection of the proper steam generator technology is a critical step in the basic design of a new power project. The fuel to be fired and the steam cycle to be adopted govern the type of steam generator needed to satisfy the requirements of the project.

5.1.1 Alternatives for Boiler Technology

The following are the general options for selection of boiler technology:

- For easy to burn fuels, such as bituminous coals - suspension firing of the pulverized fuel in horizontal, wall-mounted burners is the configuration of choice;
- For low volatile, low reactivity fuels, such as anthracite and petroleum cokes, the down-fired arch furnace is the choice adopted world-wide;
- Another option for difficult fuels, as well as for waste fuels, which cannot be properly burned with suspension firing, is the circulating fluidized bed (CFB) boiler. Also the flywheel of circulating solids in the CFB boiler allows a wide range of fuels to be fired in the same unit; and
- In the proposed project, coal will be the main fuel.

5.1.2 Alternatives for Boiler Parameters

Two options, sub-critical and supercritical parameters were examined related to power generation of thermal power plants.

Super critical Boilers have high steam parameters and higher efficiency. The major benefit of adopting higher steam cycle is increased generation due to higher efficiency and reduction in emissions of SPM, CO_2, SO_2, and NOx.

Hence, in view of the above, super critical parameters are considered for the proposed boiler configuration.

5.2 Analysis of Alternative Sites for Location of Power Plant

3 probable locations were assessed for site selection and the details are provided in **Table-5.1**.

- Site#1: near Toria, Lalitpur District
- Site#2: near Bijari , Lalitpur District
- Site#3: near Bhucha, Lalitpur District

TABLE-5.1
SITE SELECTION CRITERIA

Sr.No.	Particulars	Toria	Bijari	Mirchwara	Bucha
1	Location				
	Latitude	24º46'4.6" N	24º51'30.42" N	24º47'0.65" N	24º33'30.56" N
	Longitude	78º20'0.5" E	78º40'28.46" E	78º38'0.74" E	78º22'28" E
2	Near by villages	Toria and Jaiwara	Kailguan, Bangara, Kakdarai	Buraugaon, Mirchwara	Panchampur, Munguva, Banauli
3	Area tentatively ear marked (ha)	467	681	545	1431
4	Type of land	Barren with pathches of cultivated land	Irrigated land	Barren with small patches of cultivated land with no irrigation facility	Irrigated land
5	Requirement of eviction	Minimal	Maximum	No villages fall in the plot	Minimal
6	Forest land	None in plot area; thorny forest area is located adjacent to the plot	None	None	None
7	Water intake location and distance from plot	6-km from Rajghat Dam	57-km from Rajghat Dam	50-km from Rajghat Dam	12-km from Rajghat Dam
8	Construction water intake location and distance from plot	6-km from Rajghat Dam	7-km from Utari Dam	1-km from Utari Dam on Utari river 9-km from Sajnam Dam	12-km from Rajghat Dam
9	Soil condition	Sandy top soil with rocky strata below	Alluvial soil	Sandy top soil with rocky strata below	Sandy soil
10	Seismic/cyclonic activity history	None Zone-II	None Zone-II	None Zone-II	None Zone-II
11	Industries around	None	None	None	None
12	Local infrastructure	Dailwara Railway station	Lalitpur Railway Station	Lalitpur Railway station Lalitpur – Singrauli line is under construction 0.5-km from site	Dailwara Railway Station
13	EHV sub station	24-km-UPPCL substation	50-km-UPPCL substation	35-km-UPPCL substation	55-km-UPPCL substation
14	Mode of coal transportation	By rail to site 4-5-km	By rail to site 7-8-km	By rail Lalitpur-Singrauli line is under construction – 0.5-kms from site	By rail to site-1-2-km

Sr.No.	Particulars	Toria	Bijari	Mirchwara	Bucha
15	Ash pond location	To be located suitably	To be located suitable	To be located suitably	To be located suitable
16	Flora/Fauna	No protected flora and fauna	No protected fauna with thick forests	No protected fauna with thick forests	No protected fauna with thick forests
17	Ease to acquisition	Can be acquired	Partly difficult	Can be acquired	Difficult
18	Road/Rail access	NH-26, 22-km	NH-26, 36-km	NH-26, 20-km	NH-26, 30-km

Conclusion: *Though all identified sites fulfill the essential environmental criteria, Mirchwara site is found to be more suitable.*

After evaluation, the site near Mirchwar and Burogaon villages, in Lalitpur district, having major favorable features along with good environmental features has been identified for the proposed project.

The proposed project site has the following advantages:

- Road connectivity is 20-km;
- Nearest national high way (NH-26) is at about 20-km from the selected site;
- Nearest rail way station (Lalitpur and Singrouli line which is under construction) is at about 0.5-km;
- Source of Water is Rajghat dam (up streams of Betwa canal) flowing at a distance of 50-km from the selected site. As per the feasibility study conducted, it is concluded that sufficient water is available in the river.
- This site contains mostly Barren land with small patches of cultivated land;
- No National Parks, Wildlife sanctuaries in 10-km radius;
- Availability of required plain land; and
- 100% private land

Alternate sites are shown in **Figure-5.1 to Figure-5.4.**

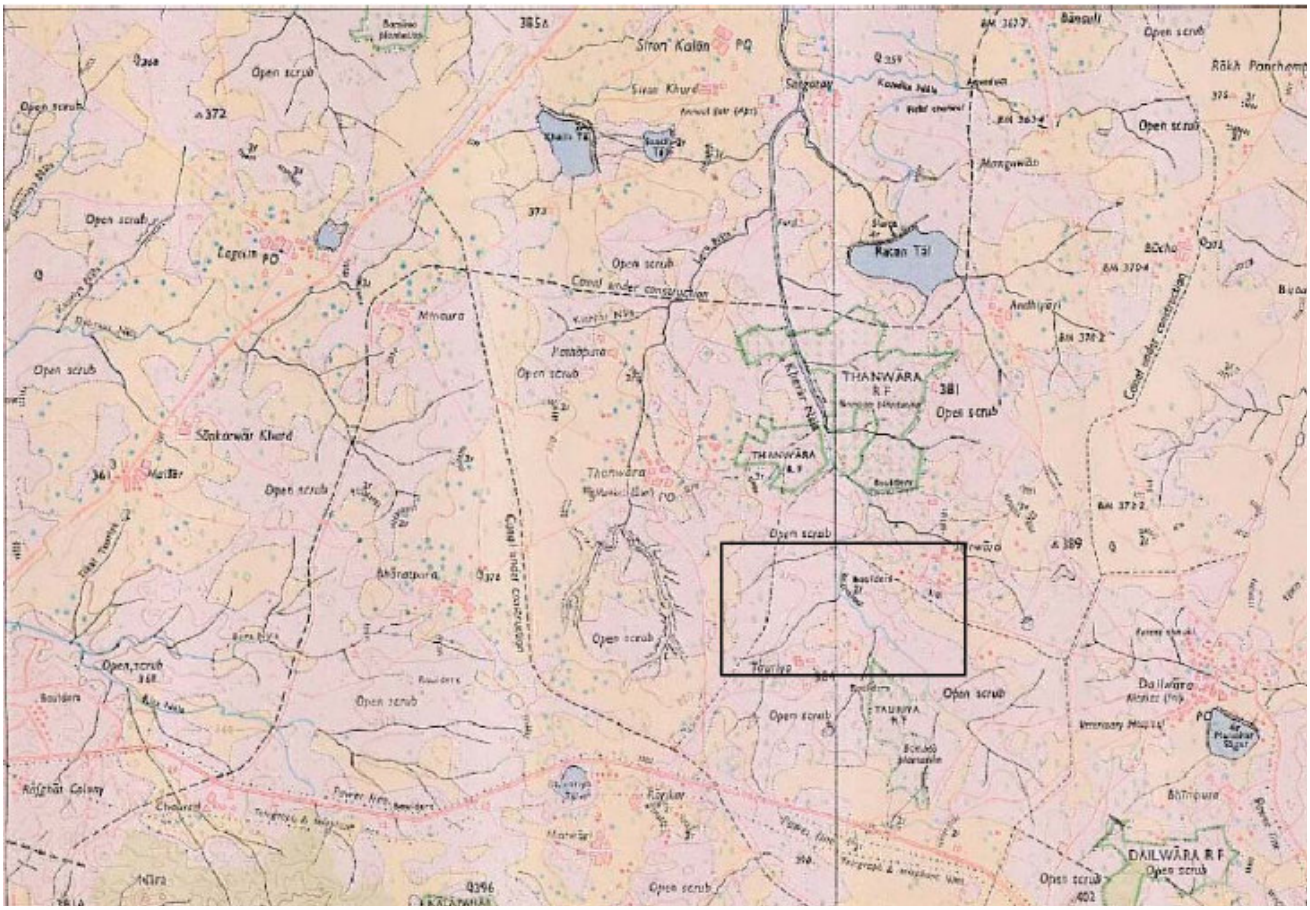

FIGURE-5.1
TORIA SITE MAP

FIGURE-5.2
BIJARI SITE MAP

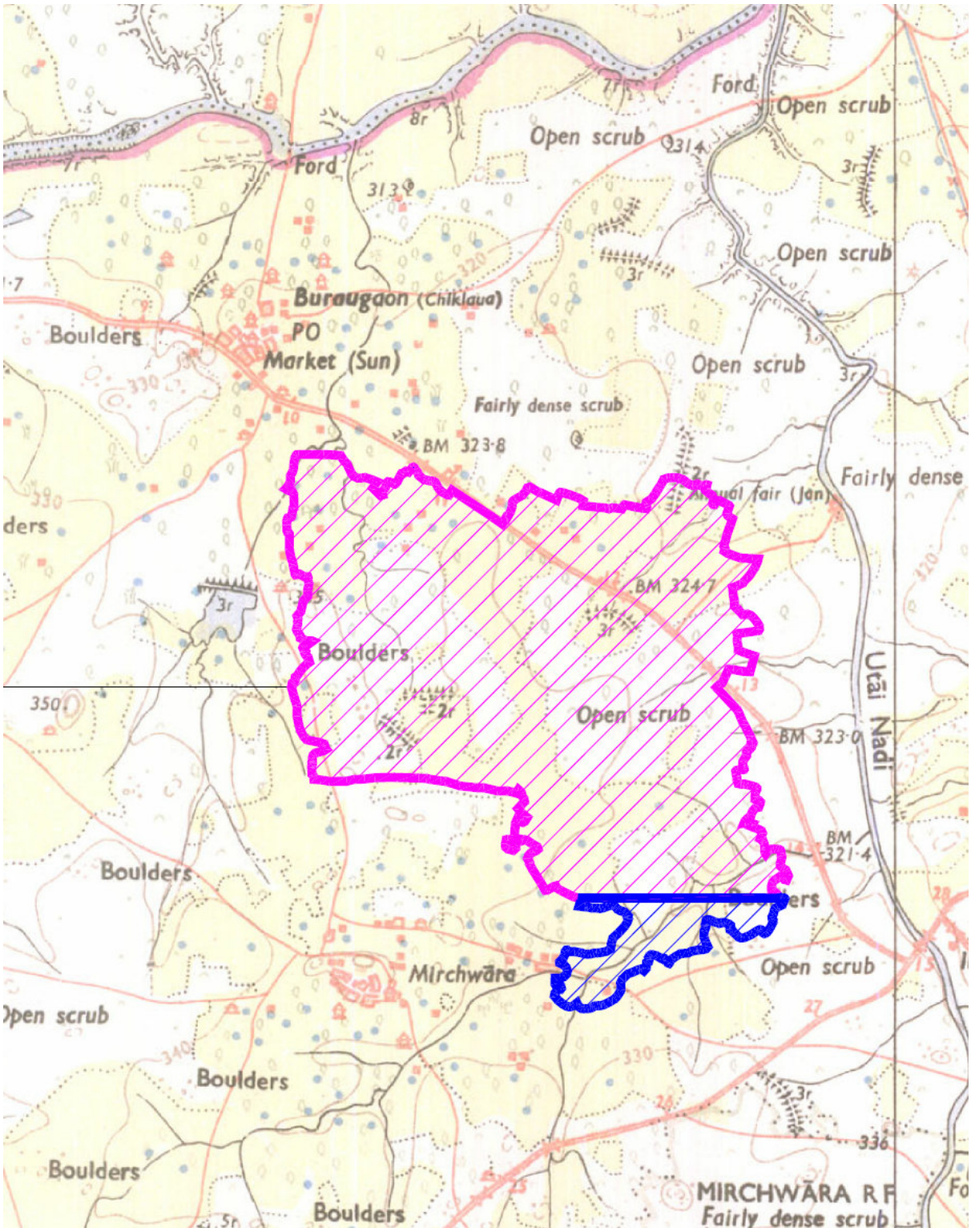

FIGURE-5.3
MIRCHWARA SITE MAP

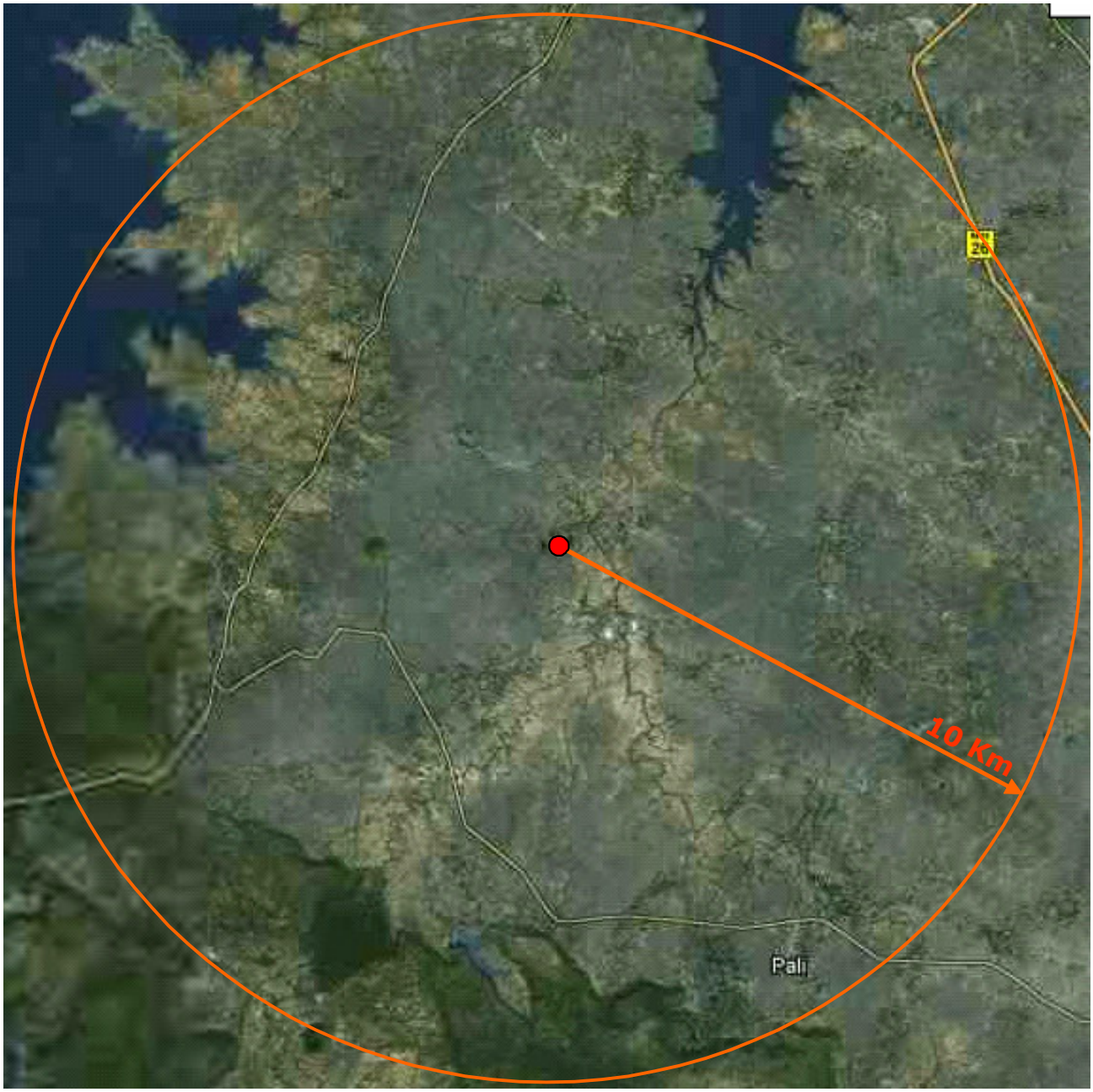

FIGURE-5.4
BUCHA SITE MAP