

## B-6. Maps of Baganuur

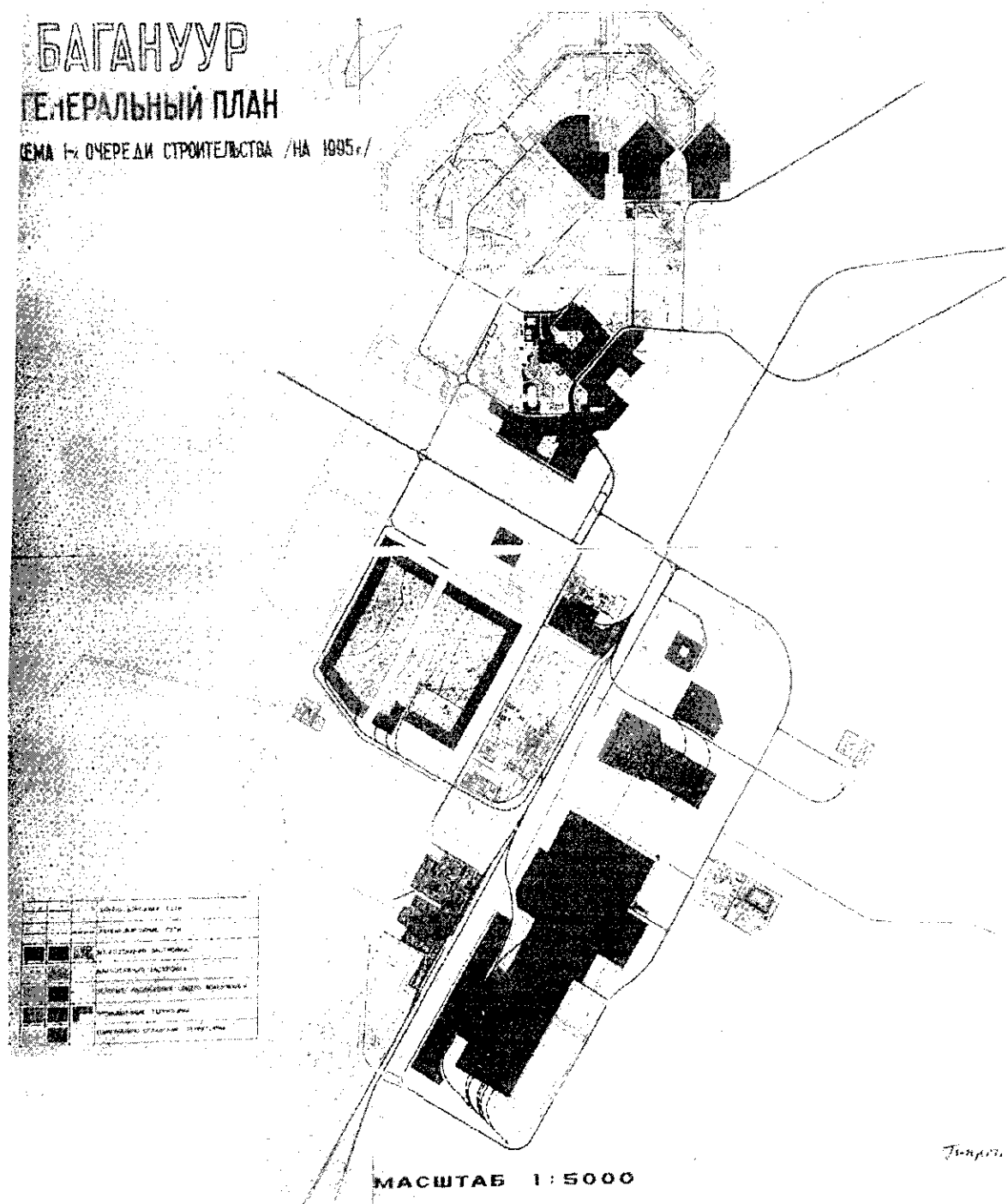
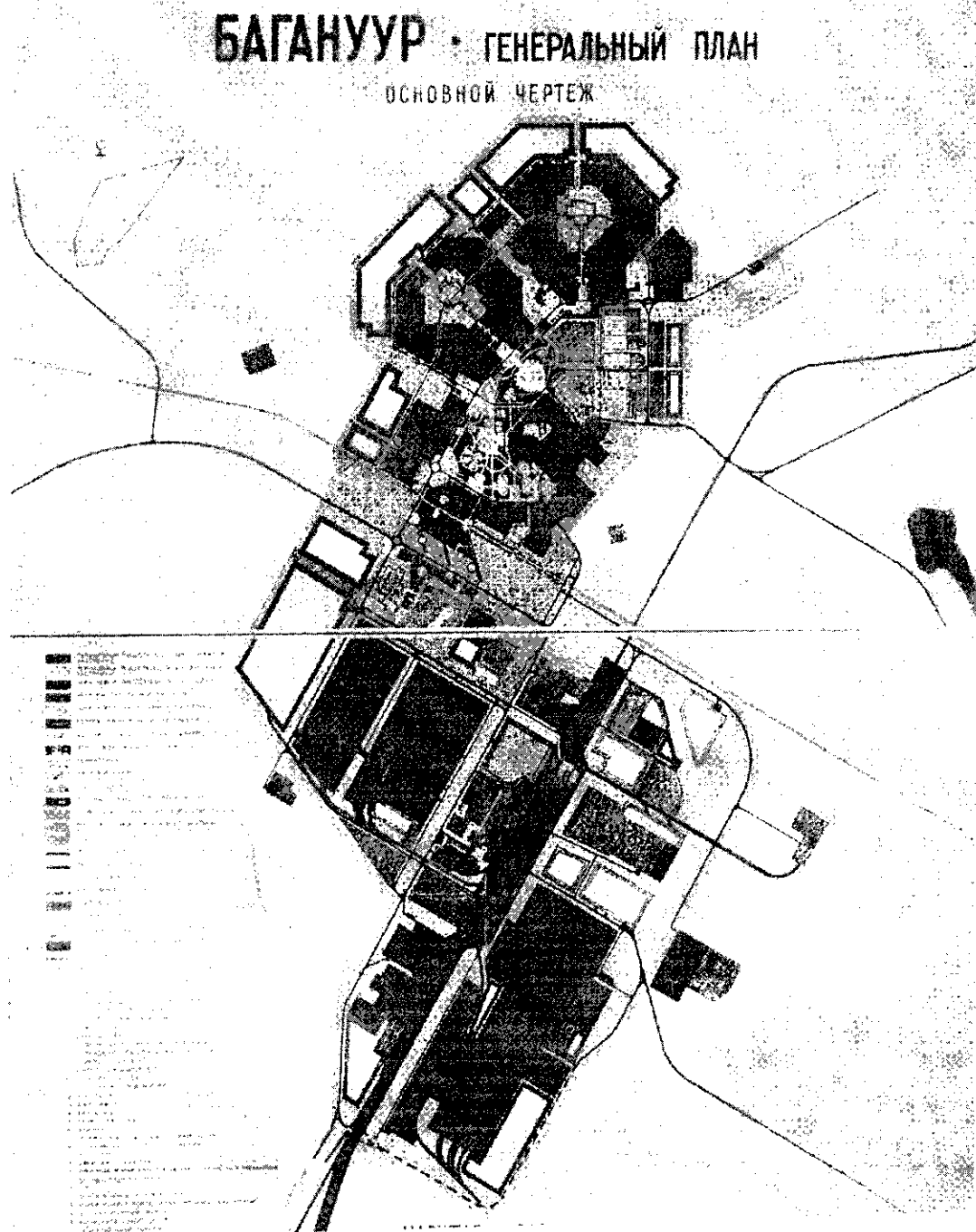


Figure B-2 Master Plan of Baganuur City (Target Year 1995)



**Figure B-3 Master Plan of Baganuur City (Target Year 2040)**



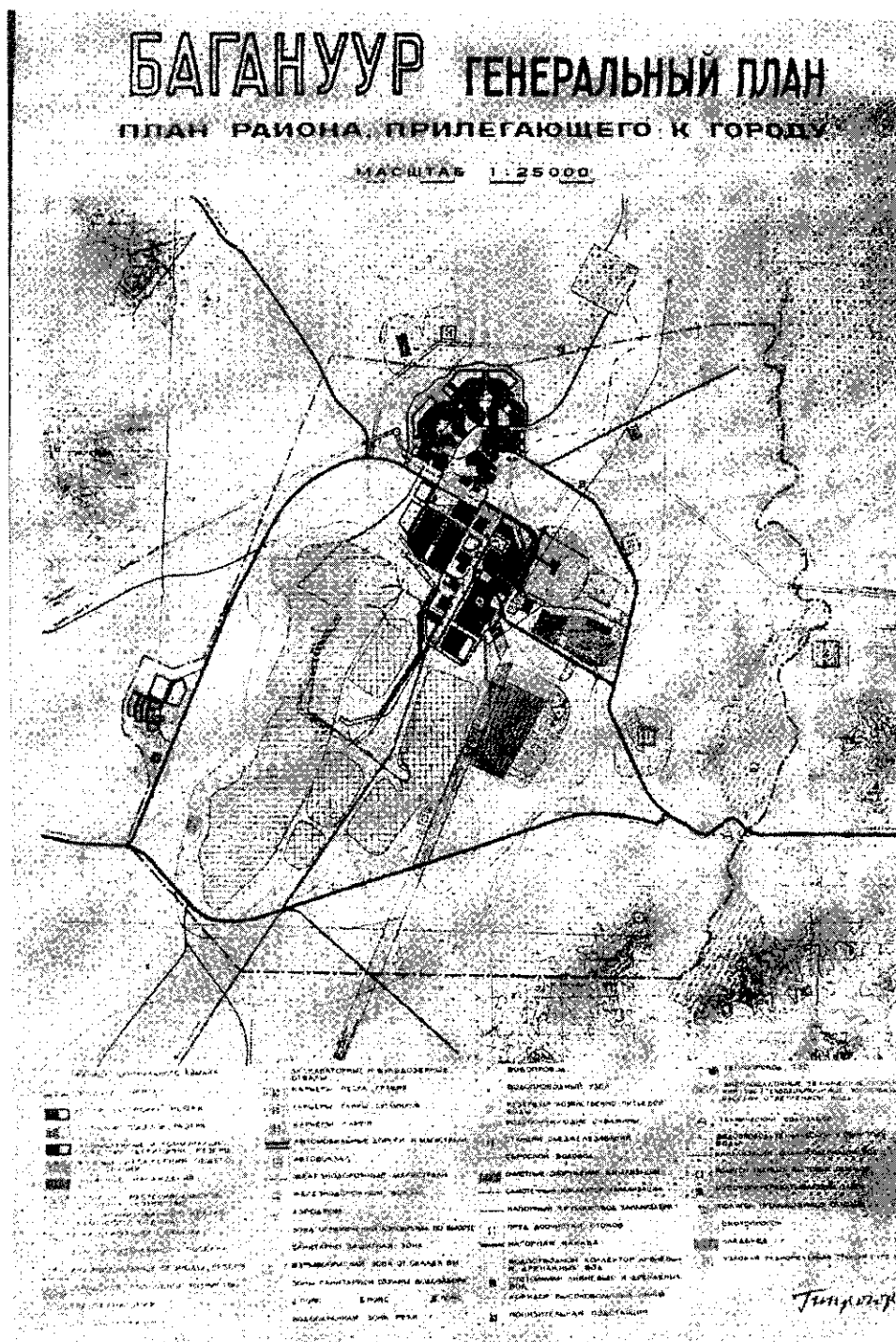
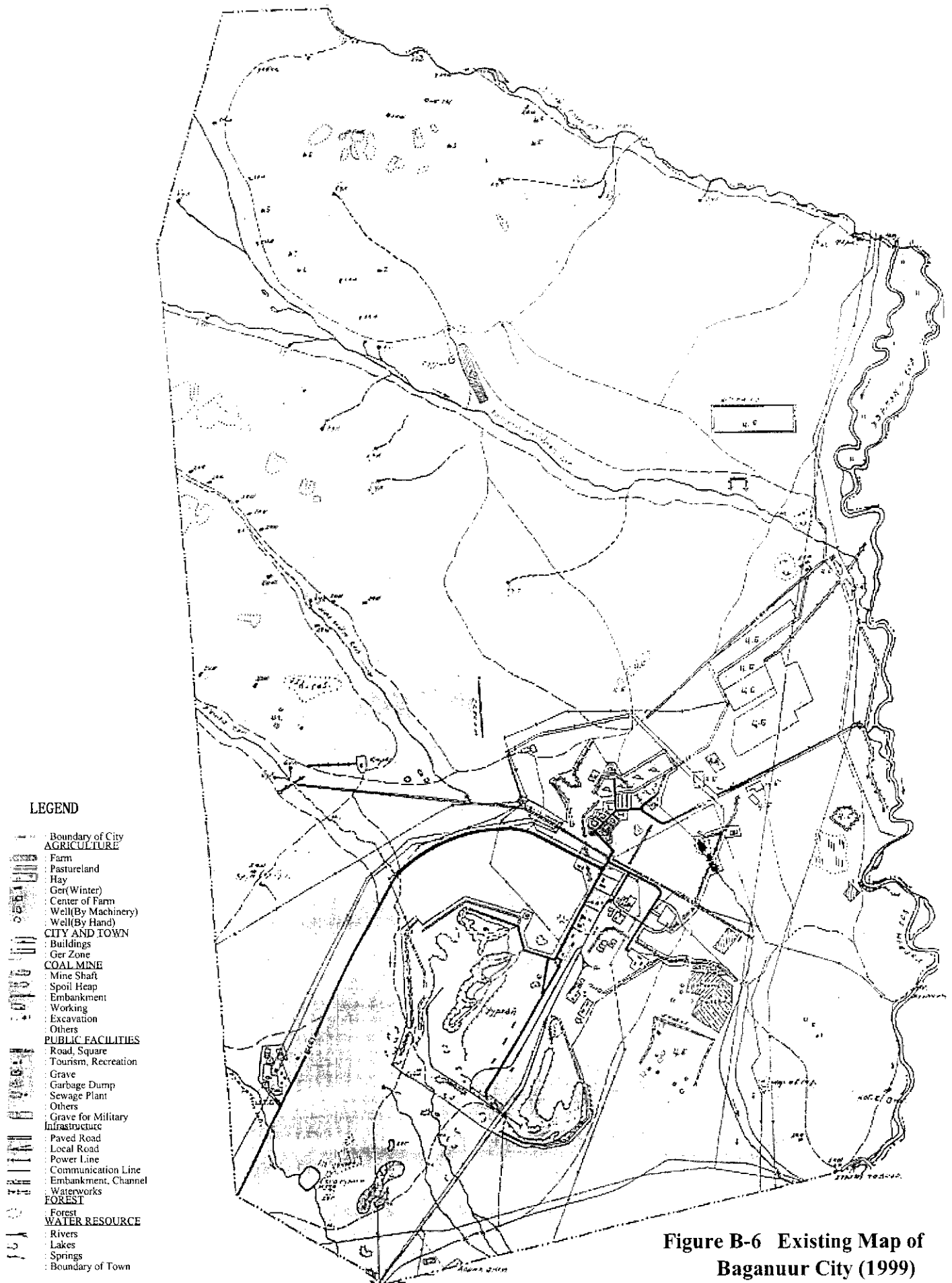
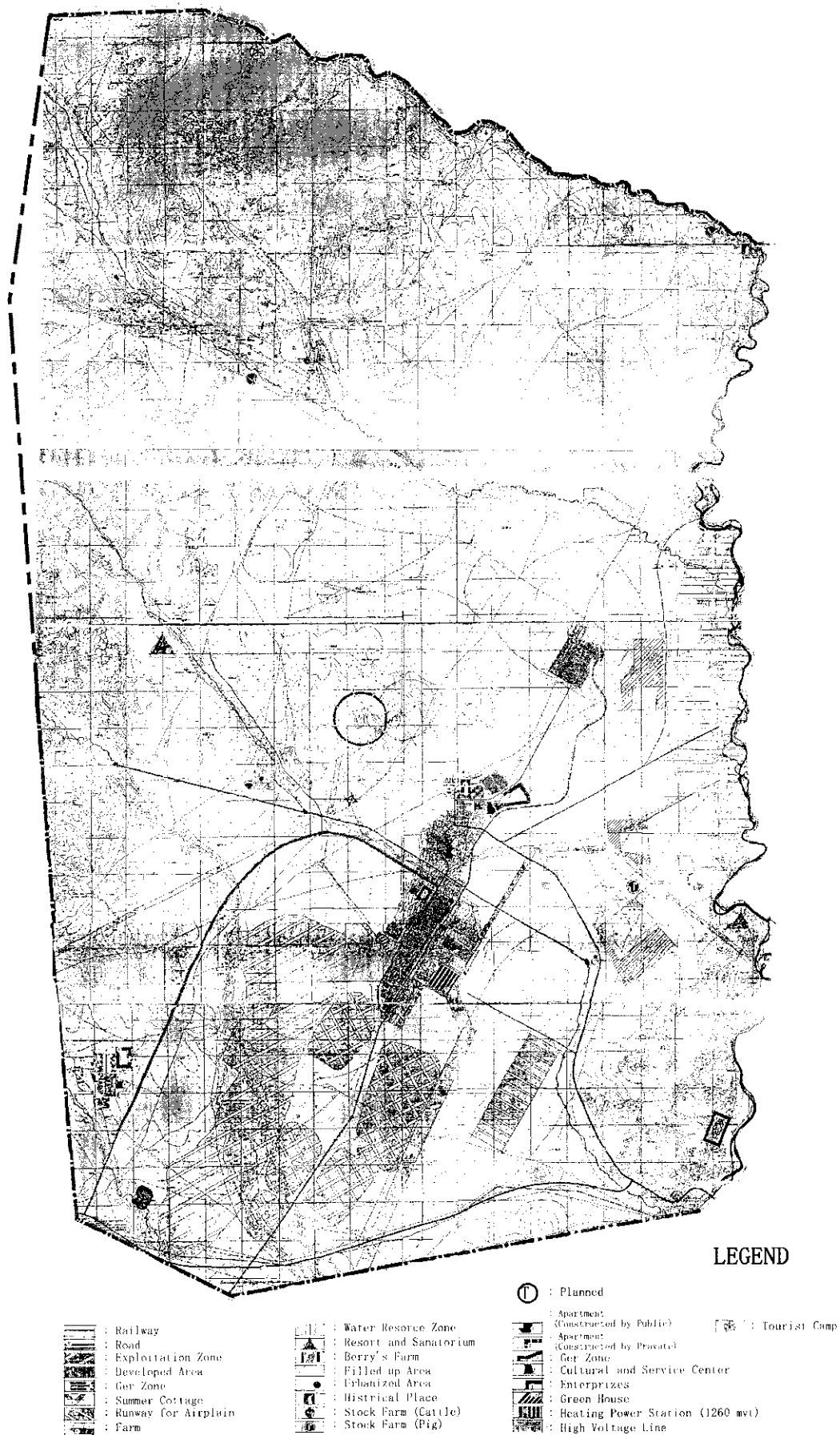


Figure B-5 Landuse Plan Surrounding Baganuur City



**Figure B-6 Existing Map of Baganuur City (1999)**



**Figure B-7 Landuse Plan of Baganuur District (1999)**

B-7. Map of Undurkhaan

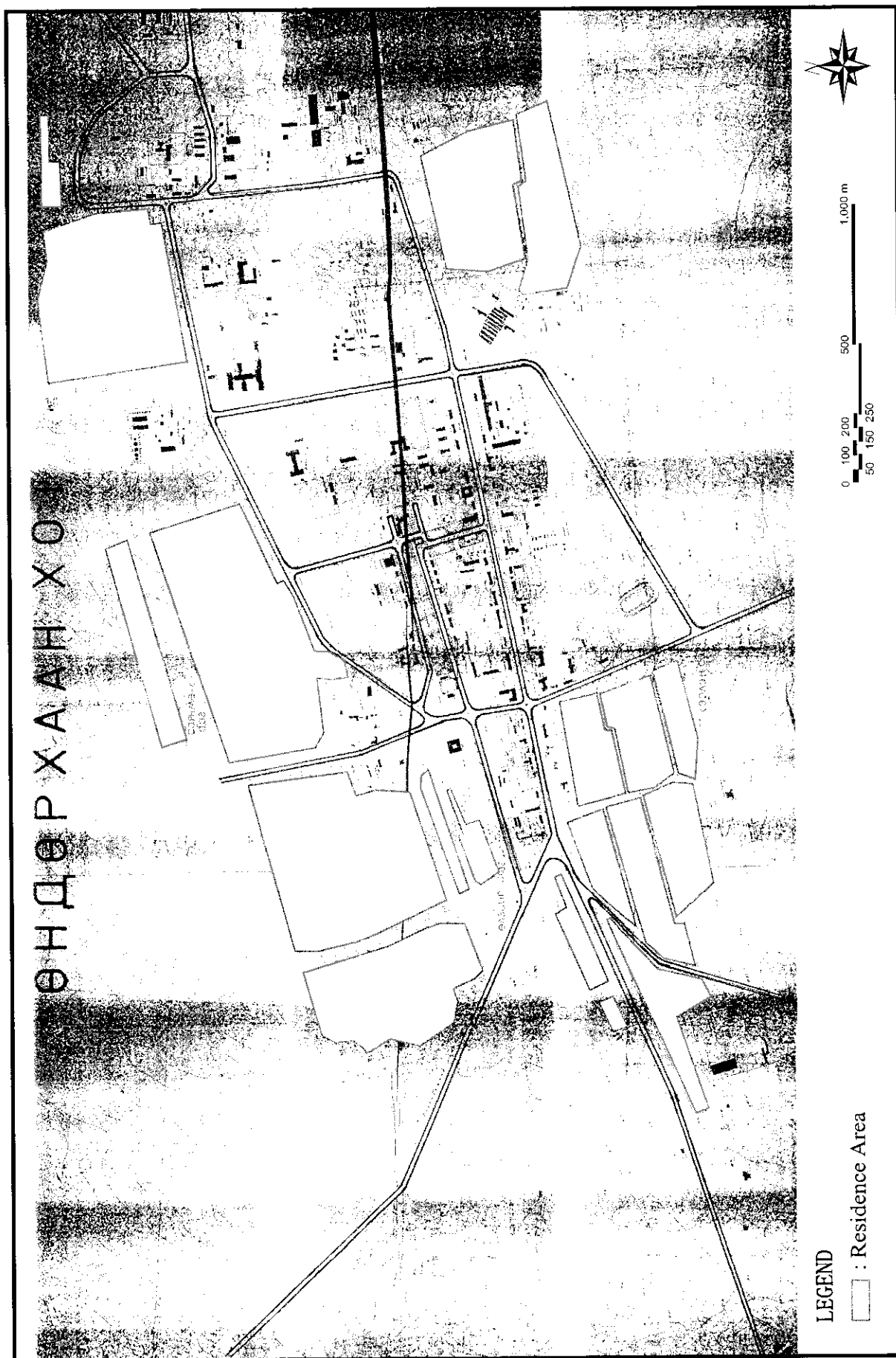


Figure B-8 Undurkhaan City Map

## B-8 Mining Concession Surrounding Study Route

**Table B-45 Coordinate List of Mining Concession**

No.	Resistration No.	Status (Resource)	Ownership	Area (ha)	Coordinate	
					East	North
1	914 H	Exploration			109° 11' 20"	47° 37' 00"
					109° 14' 00"	47° 37' 00"
					109° 14' 00"	47° 35' 00"
					109° 11' 20"	47° 35' 00"
2	1011 H	Exploration	Dabl Invest Campany	2320	109° 17' 45"	47° 37' 20"
					109° 21' 00"	47° 37' 20"
					109° 21' 00"	47° 34' 10"
					109° 17' 45"	47° 34' 10"
3	1085 H	Exploration		96	109° 13' 30"	47° 47' 10"
					109° 13' 00"	47° 47' 10"
					109° 13' 00"	47° 46' 20"
					109° 13' 30"	47° 46' 20"
4	1101 H	Exploration			109° 17' 45"	47° 37' 20"
					109° 21' 00"	47° 37' 20"
					109° 21' 00"	47° 34' 10"
					109° 17' 45"	47° 34' 10"
5	1279 H	Exploration 1998.7.2		3173	107° 59' 00"	47° 46' 00"
					107° 59' 00"	47° 50' 90"
					107° 57' 00"	47° 50' 90"
					107° 57' 00"	47° 46' 00"
6	1299 H	Exploration 1998.7.24		712	109° 14' 05"	47° 48' 00"
					109° 15' 30"	47° 48' 00"
					109° 15' 30"	47° 46' 30"
					109° 14' 05"	47° 46' 30"
7	1371 A	Operation 1998.10.9	"Baganuur" Campany	1445	108° 16' 04"	47° 40' 24"
					108° 16' 04"	47° 41' 10"
					108° 16' 34"	47° 41' 10"
					108° 16' 34"	47° 41' 35"
					108° 17' 21"	47° 41' 35"
					108° 17' 21"	47° 41' 48"
					108° 18' 00"	47° 41' 48"
					108° 18' 00"	47° 42' 58"
					108° 17' 33"	47° 42' 58"
					108° 17' 33"	47° 44' 05"
					108° 18' 10"	47° 44' 05"
					108° 18' 10"	47° 45' 40"
					108° 19' 17"	47° 45' 40"
					108° 19' 17"	47° 45' 10"
					108° 19' 46"	47° 45' 10"
					108° 19' 46"	47° 44' 23"
					108° 19' 05"	47° 44' 23"
					108° 19' 05"	47° 43' 50"



No.	Resistration No.	Status (Resource)	Ownership	Area (ha)	Coordinate	
					East	North
7	1371 A	Operation 1998.10.9	"Baganuur" Campany	1445	To be contened	To be contened
					108° 18' 38"	47° 43' 50"
					108° 18' 38"	47° 43' 08"
					108° 18' 56"	47° 43' 08"
					108° 18' 56"	47° 42' 45"
					108° 18' 35"	47° 42' 45"
					108° 18' 35"	47° 41' 25"
					108° 18' 00"	47° 41' 25"
					108° 18' 00"	47° 40' 57"
					108° 17' 30"	47° 40' 57"
					108° 17' 30"	47° 40' 38"
					108° 17' 02"	47° 40' 38"
					108° 17' 02"	47° 40' 24"
8	1487 H	Exploration		3130	108° 00' 00"	47° 45' 30"
					108° 09' 00"	47° 45' 30"
					108° 09' 00"	47° 44' 00"
					108° 00' 00"	47° 44' 00"
9	1540 H	Exploration		25	109° 03' 03"	47° 49' 40"
					109° 03' 24"	47° 49' 40"
					109° 03' 24"	47° 49' 22"
					109° 03' 03"	47° 49' 22"
10	1655 H	Exploration		300	110° 00' 54"	47° 23' 21"
					110° 00' 54"	47° 23' 37"
					110° 01' 23"	47° 23' 37"
					110° 00' 54"	47° 23' 21"
					110° 00' 54"	47° 23' 21"
					110° 00' 54"	47° 23' 37"
					110° 01' 23"	47° 23' 37"
					110° 01' 23"	47° 23' 21"
					110° 01' 23"	47° 23' 21"
					110° 00' 54"	47° 23' 21"
					110° 01' 23"	47° 23' 37"
11	1709 H	Exploration 1999.6.23		2437	107° 53' 00"	47° 43' 30"
					107° 56' 00"	47° 43' 30"
					107° 56' 00"	47° 40' 00"
					107° 53' 00"	47° 40' 00"
12	1739 H	Exploration 1999.7.9		174	107° 56' 40"	47° 40' 00"
					107° 56' 40"	47° 40' 30"
					107° 58' 10"	47° 40' 30"
					107° 58' 10"	47° 40' 00"
13	1920 H	Exploration 1999.11.1		210	110° 00' 57"	47° 22' 55"
					110° 00' 57"	47° 23' 21"
					110° 01' 23"	47° 23' 21"
					110° 01' 23"	47° 22' 55"
					110° 01' 43"	47° 22' 55"
					110° 01' 43"	47° 23' 46"
					110° 00' 26"	47° 23' 46"
					110° 00' 26"	47° 22' 55"

No.	Resistration No.	Status (Resource)	Ownership	Area (ha)	Coordinate	
					East	North
14	1925 H	Exploration		41	110° 00' 43" 110° 01' 26" 110° 01' 26" 110° 00' 43"	47° 22' 55" 47° 22' 55" 47° 22' 40" 47° 22' 40"
15	1937 A	Operation 1999.11.15		32	109° 10' 50" 109° 11' 20" 109° 11' 20" 109° 10' 50"	47° 37' 47" 47° 37' 47" 47° 37' 30" 47° 37' 30"
16	1938 H	Operation (Gold) 1999.11.15		153		
17	1971 H	Exploration		612	109° 17' 45" 109° 19' 25" 109° 19' 25" 109° 17' 45"	47° 39' 00" 47° 39' 00" 47° 37' 25" 47° 37' 25"
18	2002 H	Exploration		508	109° 10' 50" 109° 12' 35" 109° 12' 35" 109° 10' 50" 109° 10' 50" 109° 11' 20" 109° 11' 20" 109° 10' 50"	47° 38' 20" 47° 38' 20" 47° 37' 00" 47° 37' 00" 47° 37' 30" 47° 37' 30" 47° 37' 47" 47° 37' 47"
19	2115 H	Exploration		386	107° 47' 30" 107° 49' 30" 107° 49' 30" 107° 47' 30"	47° 42' 20" 47° 42' 20" 47° 43' 10" 47° 43' 10"
20	2152 H	Exploration		30	110° 00' 54" 110° 00' 54" 110° 01' 23" 110° 01' 23"	47° 23' 21" 47° 23' 37" 47° 23' 37" 47° 23' 21"
21	2276 H	Exploration		3130	109° 12' 30" 109° 17' 00" 109° 17' 00" 109° 12' 30"	47° 44' 00" 47° 44' 00" 47° 41' 00" 47° 41' 00"
22	2323 H	Exploration		1622	108° 09' 00" 108° 11' 00" 108° 11' 00" 108° 09' 00"	47° 48' 00" 47° 48' 00" 47° 44' 30" 47° 44' 30"
23	2378 H	Exploration		1625	108° 01' 30" 108° 05' 30" 108° 05' 30" 108° 01' 30"	47° 41' 45" 47° 41' 45" 47° 40' 00" 47° 40' 00"
24	2387 H	Exploration		694	109° 01' 10" 109° 02' 10" 109° 02' 10" 109° 01' 10"	47° 47' 30" 47° 47' 30" 47° 44' 30" 47° 44' 30"

No.	Resistration No.	Status (Resource)	Ownership	Area (ha)	Coordinate	
					East	North
26	2418 H	Exploration		927	109° 12' 30"	47° 37' 00"
					109° 13' 20"	47° 37' 00"
					109° 13' 20"	47° 36' 00"
					109° 13' 05"	47° 36' 00"
					109° 13' 05"	47° 35' 45"
					109° 12' 30"	47° 35' 45"
27	2449 A	Operation		203	110° 00' 54"	47° 23' 21"
					110° 00' 54"	47° 23' 37"
					110° 01' 23"	47° 23' 37"
					110° 01' 23"	47° 23' 21"
28	2486 H	Exploration		935	109° 10' 00"	47° 38' 20"
					109° 10' 50"	47° 38' 20"
					109° 10' 50"	47° 37' 00"
					109° 12' 30"	47° 37' 00"
					109° 12' 30"	47° 35' 50"
					109° 10' 00"	47° 35' 50"
29	2510 H	Exploration		451	109° 21' 00"	47° 34' 10"
					109° 21' 00"	47° 35' 20"
					109° 22' 40"	47° 35' 20"
					109° 22' 40"	47° 34' 10"
30	2511 H	Exploration		1678	109° 22' 40"	47° 33' 10"
					109° 22' 40"	47° 37' 30"
					109° 24' 20"	47° 37' 30"
					109° 24' 20"	47° 33' 10"
31	2572 H	Exploration		1863	109° 11' 15"	47° 38' 20"
					109° 11' 15"	47° 39' 40"
					109° 14' 30"	47° 39' 40"
					109° 14' 30"	47° 40' 00"
					109° 16' 15"	47° 40' 00"
					109° 16' 15"	47° 40' 41"
					109° 09' 45"	47° 40' 41"
					109° 09' 45"	47° 38' 20"
32	2620 H	Exploration		1183	109° 14' 00"	47° 35' 10"
					109° 14' 00"	47° 37' 00"
					109° 13' 30"	47° 37' 00"
					109° 13' 30"	47° 38' 15"
					109° 14' 05"	47° 38' 15"
					109° 14' 05"	47° 37' 40"
					109° 15' 00"	47° 37' 40"
					109° 15' 00"	47° 38' 15"
					109° 16' 10"	47° 38' 15"
					109° 16' 10"	47° 37' 48"
					109° 15' 52"	47° 37' 48"
					109° 15' 52"	47° 37' 20"
					109° 15' 30"	47° 37' 20"
					109° 15' 30"	47° 36' 55"
					109° 15' 15"	47° 36' 55"
					109° 15' 15"	47° 35' 57"
					109° 14' 41"	47° 35' 57"
					109° 14' 41"	47° 35' 42"
					109° 16' 10"	47° 35' 42"
					109° 16' 10"	47° 35' 10"

No.	Resistration No.	Status (Resource)	Ownership	Area (ha)	Coordinate	
					East	North
34	2886 H	Exploration 2001.1.15		848	109° 11' 40" 109° 13' 10" 109° 13' 10" 109° 11' 40"	47° 49' 40" 47° 49' 40" 47° 47' 50" 47° 47' 50"
35	2953 H	Exploration 2001.2.8		678	110° 00' 54" 110° 00' 54" 110° 01' 23" 110° 01' 23"	47° 34' 30" 47° 34' 30" 47° 33' 20" 47° 33' 20"
36	2962 H	Exploration 2001.2.12		82	110° 00' 54" 110° 00' 54" 110° 01' 23" 110° 01' 23"	47° 23' 21" 47° 23' 37" 47° 23' 37" 47° 23' 21"
37	2964 H	Exploration 2001.2.13		5558	109° 26' 00" 109° 26' 00" 109° 32' 00" 109° 32' 00"	47° 44' 00" 47° 48' 00" 47° 48' 00" 47° 44' 00"
38	3023 H	Exploration 2001.2.28		2437	107° 53' 00" 107° 56' 00" 107° 56' 00" 107° 53' 00"	47° 43' 30" 47° 43' 30" 47° 40' 00" 47° 40' 00"
39	3059 A	Operation 2001.3.12		766	109° 03' 03" 109° 05' 50" 109° 05' 50" 109° 03' 24" 109° 03' 24" 109° 03' 03"	47° 51' 00" 47° 51' 00" 47° 50' 20" 47° 50' 20" 47° 46' 10" 47° 46' 10"
40	A - 134	Operation				
41	A - 202	Operation				
42	A - 224	Operation				
43	A - 292	Operation 1997.9.30		162		
44	TU TH - 32			1612	108° 03' 54" 108° 06' 50" 108° 06' 50" 108° 03' 54"	47° 49' 10" 47° 47' 00" 47° 47' 00" 47° 47' 00"

## **B-9 Report of Mining in Baganuur**

Study on Comprehensive Coal Development and utilization in Mongolia

Final Report (Part II : Master Plan Study, Main Report) November 1995 by The Institute of Energy Economics, Japan (IEEJ) ,

JICA / Ministry of Energy, Geology and Mining (MEGM) Mongolia

### **2 Coal Supply and Demand Forecast**

#### **2.3 Supply capability of coal**

##### **2.3.1 Present status of coal mining activities at existing coal mines**

###### **1) Baganuur coal mine**

Baganuur coal mine located in 110 km east from Ulaanbaatar is the largest open pit coal mine in Mongolia. Minalable reserves are in excess of 500 million tons up to 200 meters in depth and geological reserves are more than 700 million tons up to 350 meters in depth. There are three minable coal seams from 2.4 to 97.8 meters of thickness. The designed production capacity is six million tons per annum, but, actual production is 3.7 million tons per annum at present. The coal production actually peaked in 1988 at 4.06 million tons and has largely decreased to a level of 2.85 million tons in 1993 due to lack of maintenance parts caused by the economic disruption. Coal quality is lignite with 3,870 kcal/kg of calorific value, 31 % of moisture content, 12.1 % of ash content, and 0.4 % of sulphur content. Coal such as lignite easily causes spontaneous combustion. In 1993, Baganuur mine supplied 69 thousand tons of coal to No.2, 325 thousand tons to No.3, 1.72 million tons to No.4 power plant in Ulaanbaatar, 147 thousand tons to the heat boilers in the CES area, and the rest 500 thousand tons of coal to factories and residential area through Nuurs Company. Coal is transported by two units of M62 type diesel locomotives with an output of 2000 PS that haul 30 wagons on railway from Baganuur to Ulaanbaatar for 201 km. Capacity of each wagon is 65 tons, and as regards transportation capacity between Baganuur and Bagakhangai, about four million tons of coal per annum can be transported to Ulaanbaatar by rail.

## B-10 Cost Estimate in Alternative Route Study

**Table B-46 Cost Estimate in Alternative Study (Section A: Baganuur)**

■ **Alternative A-1**

Length: 25.576 km

Unit: US\$

Items		Cost	Remark
1.	Road	3,440,637	
	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat t=0.05	972,471	
1.1			
1.2	Graded crushed stone base t=0.15	301,771	
1.3	Natural material for subbase t=0.20	454,741	
	Non-frost fill for Upper Roadbed including Subgrade Preparation	1,490,249	
1.4			
1.5	Ordinary fill for Lower Roadbed	0	
1.6	Removal and Replacement for ground soil	57,565	
1.7	Ancillary 5.0%	163,840	
2.	Bridge and Structures	1,153,438	
2.1	Bridge	950,664	3 Bridges over Togos and Khutsaa River
2.2	Box Type D (1 @ 2.5 x 2.5)	0	
2.3	Type E (2 @ 2.5 x 2.5)	52,270	
2.4	Type F (3 @ 2.5 x 2.5)	0	
2.5	Pipe Type A (D1,000 @ 1)	69,870	
2.6	Type B (D1,500 @ 1)	40,062	
2.7	Type C (D1,500 @ 2)	40,573	
3.	General 10.0%	459,408	
4.	Total	5,053,483	

■ **Alternative A-2**

Length: 29.136 km (Total)

16.570 km (Existing Asphalt Road with Reconstruction L = 891.635 m)

2.091 km (Existing DBST Road)

10.475 km (Earth Road)

Unit: US\$

Items		Cost	Remark
1.	Road	2,276,293	
	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat t=0.05	398,973	New construction for earth road section
1.1			
1.2	Graded crushed stone base t=0.15	123,807	
1.3	Natural material for subbase t=0.20	186,565	
	Non-frost fill for Upper Roadbed including Subgrade Preparation	642,171	
1.4			
1.5	Ordinary fill for Lower Roadbed	115,821	
1.6	Removal and Replacement for ground soil	20,868	
1.7	Overlay of existing Asphalt paved road	596,136	AC road section
1.8	AC pavement for reconstruction section	54,181	
1.9	Rehabilitation of existing DBST paved road	29,377	DBST road section
1.10	Ancillary 5.0%	108,395	
2.	Bridge and Structures	346,300	
2.1	Bridge	252,217	2 Bridges over Khujirt and Khutsaa River
2.2	Box Type D (1 @ 2.5 x 2.5)	0	
2.3	Type E (2 @ 2.5 x 2.5)	0	
2.4	Type F (3 @ 2.5 x 2.5)	0	
2.5	Pipe Type A (D1,000 @ 1)	42,997	
2.6	Type B (D1,500 @ 1)	24,037	
2.7	Type C (D1,500 @ 2)	27,049	
3.	General 10.0%	262,259	
4.	Total	2,884,852	

**Table B-47 Cost Estimate in Alternative Study (Section B: Kherlen East)****■ Alternative B-1****Length: 30.634 km****Unit: US\$**

Items		Cost	Remark
1.	Road	4,179,481	
1.1	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat t=0.05	1,128,784	
1.2	Graded crushed stone base t=0.15	350,277	
1.3	Natural material for subbase t=0.20	527,835	
1.4	Non-frost fill for Upper Roadbed including Subgrade Preparation	1,816,846	
1.5	Ordinary fill for Lower Roadbed	135,847	
1.6	Removal and Replacement for ground soil	20,868	
1.7	Ancillary 5.0%	199,023	
2.	Bridge and Structures	425,463	
2.1	Bridge	0	
2.2	Box Type D (1 @ 2.5 x 2.5)	73,066	
2.3	Type E (2 @ 2.5 x 2.5)	52,270	
2.4	Type F (3 @ 2.5 x 2.5)	34,003	
2.5	Pipe Type A (D1,000 @ 1)	112,867	
2.6	Type B (D1,500 @ 1)	72,111	
2.7	Type C (D1,500 @ 2)	81,146	
3.	General 10.0%	460,494	
4.	Total	5,065,439	

**■ Alternative B-2****Length: 32.798 km****Unit: US\$**

Items		Cost	Remark
1.	Road	4,932,075	
1.1	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat t=0.05	1,242,385	
1.2	Graded crushed stone base t=0.15	385,529	
1.3	Natural material for subbase t=0.20	580,957	
1.4	Non-frost fill for Upper Roadbed including Subgrade Preparation	1,999,694	
1.5	Ordinary fill for Lower Roadbed	455,971	
1.6	Removal and Replacement for ground soil	32,678	
1.7	Ancillary 5.0%	234,861	
2.	Bridge and Structures	555,891	
2.1	Bridge	116,408	
2.2	Box Type D (1 @ 2.5 x 2.5)	36,533	
2.3	Type E (2 @ 2.5 x 2.5)	104,540	
2.4	Type F (3 @ 2.5 x 2.5)	0	
2.5	Pipe Type A (D1,000 @ 1)	123,616	
2.6	Type B (D1,500 @ 1)	80,124	
2.7	Type C (D1,500 @ 2)	94,671	
3.	General 10.0%	548,797	
4.	Total	6,036,763	

**Table B-48 Cost Estimate in Alternative Study (Section C: Tsenkhermandal West)**

■ **Alternative C-1**

**Length: 19.518 km**

**Unit: US\$**

Items		Cost	Remark
1.	Road	3,206,642	
	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat	t=0.05	742,119
1.1			
1.2	Graded crushed stone base	t=0.15	230,290
1.3	Natural material for subbase	t=0.20	347,025
	Non-frost fill for Upper Roadbed including Subgrade Preparation		1,194,486
1.4			
1.5	Ordinary fill for Lower Roadbed		497,409
1.6	Removal and Replacement for ground soil		42,616
1.7	Ancillary	5.0%	152,697
2.	Bridge and Structures	235,651	
2.1	Bridge		0
2.2	Box Type D (1 @ 2.5 x 2.5)		18,266
2.3	Type E (2 @ 2.5 x 2.5)		104,540
2.4	Type F (3 @ 2.5 x 2.5)		0
2.5	Pipe Type A (D1,000 @ 1)		53,746
2.6	Type B (D1,500 @ 1)		32,049
2.7	Type C (D1,500 @ 2)		27,049
3.	General	10.0%	344,229
4.	Total		3,786,522

■ **Alternative C-2**

**Length: 21.221 km**

**Unit: US\$**

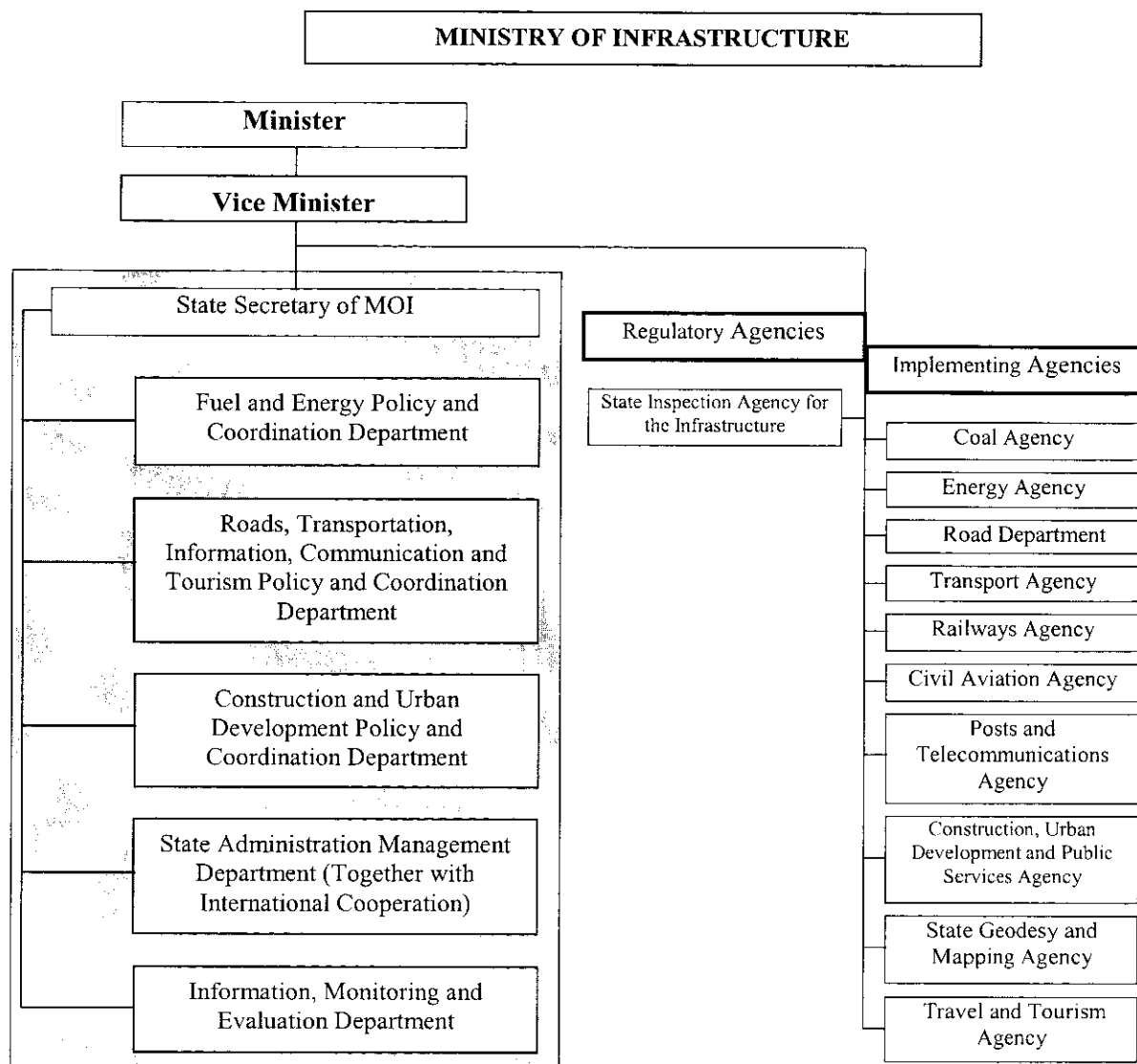
Items		Cost	Remark
1.	Road	3,870,835	
	Asphalt concrete surfacing using 16 mm nominal sized aggregate including prime coat	t=0.05	806,879
1.1			
1.2	Graded crushed stone base	t=0.15	250,386
1.3	Natural material for subbase	t=0.20	377,308
	Non-frost fill for Upper Roadbed including Subgrade Preparation		1,298,721
1.4			
1.5	Ordinary fill for Lower Roadbed		834,794
1.6	Removal and Replacement for ground soil		118,420
1.7	Ancillary	5.0%	184,325
2.	Bridge and Structures	365,301	
2.1	Bridge		116,408
2.2	Box Type D (1 @ 2.5 x 2.5)		18,266
2.3	Type E (2 @ 2.5 x 2.5)		78,405
2.4	Type F (3 @ 2.5 x 2.5)		34,003
2.5	Pipe Type A (D1,000 @ 1)		59,121
2.6	Type B (D1,500 @ 1)		32,049
2.7	Type C (D1,500 @ 2)		27,049
3.	General	10.0%	423,614
4.	Total		4,659,750



## B-11. Organization

**Table B-49 Scheme of State Administrative Organs**

Framework of matters responsible for and jurisdiction	Government Regulating Agencies	Government Implementing Agencies
Under the jurisdiction of the Prime Minister	1. General Intelligence Department	1. Radio and TV Authority
	2. State Property Committee	2. MONTSAME Information Agency
Under the jurisdiction of the Government Administration Department		3. Academy of Management
		4. State and Government Service Bureau
Under the jurisdiction of the Minister of Finance and Economy	3. General Taxation Department	
	4. Customs General Department	
	5. Financial Auditing Department	
Under the jurisdiction of the Minister for Foreign Affairs		5. Bureau of Service to the Diplomatic Missions
Under the jurisdiction of the Minister of Justice and Internal Affairs	6. General Department of Police	6. State Center for Civil Registration and Information
	7. Border Troops Department	7. Court Decision Execution Department
		8. National Archive
		9. Intellectual Property Department
		10. Fire Fighting Department
		11. Bureau of Immovable Property Registration
Under the jurisdiction of the Minister of Nature and Environment		12. Hydro, Meteorology and Environment Institute
		13. Land Management Agency
		14. Nature and Environment Protection Office
Under the jurisdiction of the Minister of Defense	8. General Staff of Military Forces 9. Civil Defense Department	
Under the jurisdiction of the Minister of Education, Culture and Science	10. State Inspection Department of Education, Culture and Science	
Under the jurisdiction of the Minister of Infrastructure	11. State Inspection Department of Infrastructure	15. Energy Agency 16. Coal Agency 17. Civil Aviation Agency 18. Post and Telecommunication Agency 19. Travel and Tourism Agency 20. Road Department 21. Auto Transport Agency 22. Construction, Urban Development and Public Service Agency 23. Geodesy and Mapping Agency 24. Railways Agency
Under the jurisdiction of the Minister of Social Welfare and Labour	12. State Inspection Office for Labour and Social Welfare	25. State Social Insurance General Office
		26. Labour Regulation Bureau
		27. Social Care Department
Under the jurisdiction of the Minister of Industry and Trade	13. State Inspection Office for Industry and Trade	28. Department of Minerals
	14. National Center for Standardization and Metrology	29. Petroleum Authority
		30. Foreign Trade and Foreign Investment Department
Under the jurisdiction of the Minister of Food and Agriculture	15. State Inspection Office for Food-staff Security and Agriculture	31. State Resources Department 32. State Veterinary Department



**Figure B-9 Organization of Ministry of Infrastructure**

**B-12. ADB Maintenance Cost**
**Table B-50 Bill of quantities**

Periodic maintenance of Ulaanbaatar-Darkhan road section

Description	Unit	Estimated quantity	Unit rate (US\$)
Clearing, grubbing and removing debris	Ha	81.5	2,817.63
Common excavation (excluding hard rock) and storing for reuse or disposal by spoiling of excavated materials	m <sup>3</sup>	218,500	2.34
Excavation in hard rock and storing for reuse or disposal by spoiling of excavated materials	m <sup>3</sup>	24,200	16.33
Embankment construction (including refilling excavations where needed) using compacted suitable fill involving re-use of suitable fill materials obtained from road excavations	m <sup>3</sup>	64,250	2.13
Embankment construction using compacted suitable fill obtained from borrow areas (including refilling excavations	m <sup>3</sup>	130,350	2.13
fill	m <sup>3</sup>	64,900	3.19
Pavement excavation of existing bituminous road surface and storing materials for reuse or disposal by spoiling	m <sup>3</sup>	41,300	3.54
Providing grassing on earth slopes	m <sup>2</sup>	18,000	3.71
Providing topsoiling and grassing on earth slopes	m <sup>2</sup>	2,000	5.12
Cold mining existing bituminous pavement surface and storing milled material for reuse or disposal by spoiling	m <sup>2</sup>	288,000	0.55
Providing improved subgrade for pavement using compacted selected non-frost fill	m <sup>3</sup>	108,000	3.19
Providing graded granular subbase	m <sup>3</sup>	92,200	7.33
Providing graded crushed aggregate base	m <sup>3</sup>	116,600	13.49
Sealing cracks 6 to 15 mm wide in existing bituminous pavement, using slurry seal	m	102,000	2.18
Patching cracks more than 15 mm wide in existing bituminous pavement, using bituminous premix material	m <sup>2</sup>	7,100	4.76
Patching damaged areas in existing bituminous pavement including at pavement edges			
a) Type 1 Patching	m <sup>2</sup>	51,300	6.77
b) Type 2 Patching	m <sup>2</sup>	12,500	11.00
c) Type 3 Patching	m <sup>2</sup>	6,200	11.99
Providing prime coat on non-bituminous surface or milled existing bituminous surface	m <sup>2</sup>	641,200	0.36
Providing tack coat on existing bituminous surface	m <sup>2</sup>	64,100	0.18
Providing bituminous seal coat on existing bituminous surface using surface treatment	m <sup>2</sup>	624,000	2.95
Providing asphalt concrete binder course	m <sup>3</sup>	9,330	82.22
Providing asphalt concrete surfacing course	m <sup>3</sup>	27,080	87.85
Providing granular shoulders	m <sup>3</sup>	102,900	5.87
Providing lining to drains at selected locations	m <sup>2</sup>	4,300	7.35
underlay	m <sup>3</sup>	4,300	44.79
Providing gravelled temporary traffic diversion: at road locations approved by the Engineer	km	30	5,611.27
Providing kilometer posts at selected locations	Nos	205	65.87
Providing pavement marking with paint including for lane / centre-line / edge/ transverse making or any other marking	m <sup>2</sup>	730	11.19
Providing sign supports at selected locations	Nos	54	78.01
Providing reflectorized signs fixed to sign supports bearing sign legends as directed	m <sup>2</sup>	81	183.44

**Table B-51 Specified materials**

Material	Unit	Price and Location	Transport	Price Delivered to Site	Remarks
Bitumen	Ton	US\$ 187.00 Ulaanbaatar	Train	US\$ 200/ton	China, Russia
Diesel	Litre	US\$ 0.18 Ulaanbaatar, Darkhan	Tank truck	US\$ 0.19/ton	Local oil station
Petrol	Litre	US\$ 0.2 Ulaanbaatar, Darkhan	Darkhan	US\$ 0.21/litre	Local oil station
Lubricants	Litre	US\$ 0.63 Ulaanbaatar, Darkhan	Darkhan	US\$ 0.65/litre	Local oil station
Cement	Ton	US\$ 51.00 Darkhan, Ex-factory	Cargo Truck	US\$ 60/ton	Bag cement
Reinforcing Steel	Ton	US\$ 235.00 Ulaanbaatar, Market	Trailer	US\$ 355/ton	Local Factory, China, Russia

**B-13. Road Budget**

**Table B-52 Income of Budget of Roads**

Year	1997			1998			1999			2000		
	Plans	Results	%	Plans	Results	%	Plans	Results	%	Plans	Results	%
1 Carry-over	4839.7	4200.1	86.7843	4999.4	4434	88.69064	4772.9	3481	72.9326	4383.5	4222	96.31573
2 Gasoline		11		53.6	53.6	100						
3 State Budget		40		2481.6	1102.4	44.42295	4069.1	2341.7	57.54835	5578.6	3672.3	65.82834
4 Others		52.4			307			600.6			47.4	
Total	4839.7	4303.5	88.9208	7534.6	5897	78.2656	8842	6423.3	72.64533	9962.1	7941.7	79.71914

**Table B-53 List of Budget for Road and Bridge (1999 years)**

No	Project Name and Location	Length	Construction Period	Construction Cost	Budget (1999)	Component		Completion (1999)	
						Road Fund	State	Length	Quarter
I	Paved Roads								
1	Elsen tasarkhai~Kharkhorin	31.6km	1998~1999	2462.6	1400	1200	200	31.6km	3
2	Zamin Uud	3.2km	1996~2000	228.9	57	57			
3	Erdene - Baganuur	37.5km	1999~2000	2625	149.7	0	149.7		
II	Gravel Road and Rehabilitation of Bridge								
1	Uvurkhangai~Bayankhongor (Taats, Arts, Teel Bridges, Garid)	20.6km	1995~2000	1890	250	0	250		
III	Concrete Bridges								
1	Zavkhan Bridge, Govi Altai Taishir	222m	1995~1999	451	234.5	234.5		222m	3
2	Orkhon Bridge, Arkhangai Ulziit	171m	1996~2000	571.3	237	199.6	37.4	171m	4
3	Ulz Bridge, Khentii Norovlin	77.8m	1996~1999	436.2	251	251		77.8m	3
4	Ider Bridge, Khuvsgul Galt	162.9m	2000~2001	280	20	20			
5	Kharaa Bridge, Selenge Zuunkharaa	170m	1993~2000	510	131.3	131.3			
6	Terkh Bridge, Arkhangai Tsakhir	217.5m	1996~1999	436.5	239.8	239.8		217.5m	3
7	Tes Bridge, Zavkhan Bayantes	144.9m	1995~2000	440.1	220		220		
8	Sagsai Bridge, Bayan-Ulgii	90m	1998~1999	224	161.9	161.9		90m	4
9	Eg Bridge, Bulgan Teshig	289.3m	1994~2000	1137.2	212.9	0	212.9		
10	Gashuun Bridge, Uvs	150m	1999~2000	277.6	100	0	100		
11	Zulegt Bridge, Khuvsgul Ikh Uul	54m	1996~1999	237.1	146.6	146.6		54m	3
IV	Wooden Bridge								
1	Ulz Bridge, Dornod Ereentsav	87.8m	1999~1999	70	70	0	70	87.8m	4
1	Darkhan - Erdenet Road by Kuwait Fund	184km	1996~2000	5084	1568.3	1538.9	29.4		
V	Maintenance		1999~2000	1400	1400	1000	400		
VI	Undertakings by Load Project								
	Repayment (Darkhan - Erdenet Road Project by Kuwait Fund)		1999~1999	230	172	172			
2	UB - Darkhan - Altanbulag Road Widening and Rehabilitation (including Orkhon, Burgaltai Concrete Bridges)	312km	1997~2000	5330	2199.1		2199.1		
3	Kharkhorin - Tsetserleg - Tosontsengel Low Cost Road	80 km	1997~1999	1104.7	488		488		
	Total				8842	4772.9	4069.1		

**Table B-54 List of Budget for Road and Bridge (2000 years)**

No	Project Name and Location	Length	Construction Period	Construction Cost	Budget (2001)	Component		(mln tgr)	
						Road Fund	State	Completion (2000)	
								Length	Quarter
I	Paved Roads								
1	Erdene - Baganuur	37.5km	1999~2001	2626	150	60			
II	Concrete Bridges								
1	Orkhon Bridge, Arkhangai Ulziit	171m	1996~2000	571.3	237	199.6	37.4	171m	4
2	Ider Bridge, Khuvsgul Galt	162.9m	2000~2001	280	20	20			
3	Kharaa Bridge, Selenge Zuunkharaa	170m	1993~2000	588	158				
4	Tes Bridge, Zavkhan Bayantes	144.9m	1995~2001	440.1	149.1	149.1		144.9m	2
5	Eg Bridge, Bulgan Teshig	289.3m	1994~2001	1137.2	564.9	564.9		289.3m	3
6	Gashuun Bridge, Uvs	72m	1999~2000	269.4	269.4	230	39.4	72m	4
7	Terkh Bridge, Arkhangai Tsakhir	217.5m	1996~2000	436.5	110.5	60.5	50	217.5m	3
8	Ulz, Khentii Norovlin	77.8m	1996~2000	436.2	151	78.8	72.2	77.8m	3
III	Wooden Bridge								
1	Ulz Bridge, Dornod Ereentsav	87.8m	1999~2000	70	55	55		87.8m	3
IV	Maintenance		1999~2000	1400	1400	1000	400		
V	Undertakings by Loan Project								
1	Darkhan – Erdenet Road by Kuwait Fund	184km	1996~2001 年	6213.2	2575.7	872.8	1702.9		
2	UB - Darkhan - Altanbulag Road by ADB	312km	1997~2000 年	6102	1796	629.5	1166.5	312km	3
3	Kharkhorin - Tsetserleg - Tosontsengel by WB	80 km	1997~2000	1104.7	380		380	80 km	3
4	Nalaikh - Maanit - Choir Road by ADB	200km	2000~2003	9000.0	106		106		
5	Erdenesant – Arvaikheer Road Rehabilitation	211 km	2000~2003	4070	303.7		303.7		
	Shortage in 1999		1999		1659.8	587	1072.8		
	Total				9962.1	4383.5	5578.6		
Budget for Road Fund			2000	2590.6	2590.6	2590.6			
For Ulaanbaatar			2000	1100	1100	1100			

(mln tg)

**Table B-55 List of Budget for Road and Bridge (2001 years)**

No	Project Name and Location	Length	Construction Period	Construction Cost	Budget (2001)	Component		Completion (2001)	
						Road Fund	State	Length	Quarter
I	Paved Roads								
1	Erdene - Baganuur	37.5km	1999~2004	5250.0	560	560			
II	Bridges								
1	Tes Bridge, Zavkhan Bayantes	144.9m	1995~2001	440.1	149.1	149.1		144.9m	2
2	Eg Bridge, Bulgan Teshig	289.3m	1994~2001	1137.2	564.9	564.9		289.3m	3
3	Selenge Zuunburen	168m	2001~2002	341.7	35.8	35.8			
4	Orkhon Bridge, Arkhangai Ulziit	170m	1996~2001	571.3	64.2	64.2		71m	3
III	Maintenance		2001~2001	2045.8	2045.8	2045.8			
IV	Undertakings by Load Project								
1	Darkhan – Erdenet Road by Kuwait Fund	184km	1996~2001	6213.2	2900.0		2900.0	184km	3
2	Nalaikh - Maanit - Choir Road by ADB	200km	2000~2004	9000.0	1482.0		1482.0		
3	By WB:								
	A/ Erdenesant – Arvaikheer Road Rehabilitation	211km	2001~2003	1507.4	461.2	350.8	110.4		
	B/ Tsetserleg - Tosontsengel Low Cost Road	129.5km	2001~2002	1076.7	556.8		556.8		
	C/ Drawings, Topographic Survey, Project Management Expense and VAT of Equipment		2001~2001	556.8	556.8	205.9	305.9		
4	Tsetserleg - Tosontsengel Low Cost Road by WB	3km	1997~2001	1140.7	231.9	231.9		3km	2
5	Repayment (UB - Darkhan - Altanbulag Road by ADB, Kharkhorin - Tosontsengel by WB and Darkhan - Erdenet by Kuwait Fund)		2001~2001	391.5	391.5	391.5			
	Total				10,000	4599.9	5400.1		

(mln tg)



## **B-14. Justification of Lane and Shoulder Width**

### **(1) Functions of Shoulder**

Major functions and advantages of shoulder are as follows:

- Space is provided for stopping free of the traffic lane because of mechanical difficulty, a flat tire, or other emergency.
- The sense of openness created by shoulders of adequate width contributes much to driving ease and freedom from strain.
- Sight distance is improved in cut sections, thereby improving safety.
- Some types of shoulders enhance the aesthetics of the highway.
- Highway capacity is improved; uniform speed is encouraged.
- Space is provided for maintenance operations such as snow removal and storage.
- Lateral clearance is provided for signs and guardrails.
- Storm water can be discharged farther from the traveled way, and seepage adjacent to the traveled way can be minimized. This may directly reduce pavement breakup.
- Structural support is given to the pavement.
- Space is provided for pedestrian and bicycle use.

### **(2) Classification of Shoulder**

Generally, shoulder width is divided into three types considering required functions.

- i) it is possible all kind of vehicles stops on shoulder safely.
- ii) it is possible passenger cars stops on shoulder safety and stopping vehicles rarely prevent driving vehicle.
- iii) Minimum space is ensured to drive safety.

These are selected considering required functions, ensured classification, design speed and capacity.

### **(3) Relationship between Capacity and Traffic Volume**

AASHTO define width of shoulder in combination with width of traveled way by design traffic volume for rural arterial road as Table B-56:

**Table B-56 Combination with Shoulder and Traveled Way Widths  
for Rural Arterials**

	Design Speed (km/h)	ADT Under 400	ADT 400-1500	ADT 1500-2000	DHV Over 200
Width of Traveled Way (m)	60	6.6	6.6	6.6	7.2
	80	6.6	6.6	6.6	7.2
	100	7.2	7.2	7.2	7.2
	120	7.2	7.2	7.2	7.2
Width of Shoulder (m)	All Speeds	1.2	1.8	1.8	2.4

High design speed requires wide width of roadway. While, relationship between traveled way and shoulder widths and adjustment factor of capacity in Japan is shown as Tables B-57 and B-58 respectively:

**Table B-57 Adjustment Factor for Narrow Lanes**

Lane Width (m)	Over 3.25	3.00	2.75	2.50
Adjustment Factor	1.00	0.94	0.88	0.82

**Table B-58 Adjustment Factor for Restricted Shoulder Width**

Shoulder Width (cm)	Adjustment Factor	
	Shortage One Side	Shortage Both Side
Over 0.75	1.00	1.00
0.50	0.98	0.95
0.25	0.95	0.91
0.00	0.93	0.86

And, relationship between roadway width and adjustment factor of capacity in AASHTO is shown as Table B-59:

**Table B-59 Adjustment Factor for the Combined effect of Narrow Lanes  
and Restricted Shoulder Width**

Shoulder Width (m)	Adjustment Factor			
	Shortage Both Side			
	Lane Width (m)			
	3.6	3.3	3.0	2.7
Over 1.8	1.00	0.93	0.84	0.70
1.5	0.96	0.89	0.81	0.68
1.2	0.92	0.85	0.77	0.65
0.6	0.81	0.75	0.68	0.57
0.0	0.70	0.65	0.58	0.49

#### (4) Recommendation of Shoulder in the study

Shoulder widths of 1.0 m to 3.6 m are generally used in highway through the world.

The regulated standard lane width in Asian Highway Standard was 3.0 m (Class-II, flat and rolling terrain), and 2.0 m (Class-II, mountainous and steep). In other countries, the regulated standard lane width in the Japanese standard was 2.50 m to 1.75 m, and rural arterial road in U.S.A apply a 2.4 m width to 1.2m.

In Mongolia, shoulder width ranging from 1.5 m to 2.5 m is regulated as Conventional Highway Class-III, and shoulder width in recent projects shows a tendency to apply 1.5 m.

On the other hand, traffic volume in 2015 between Erdene and Baganuur in the study was forecasted 1,417 vehicles per day. Comparing with Table B-90, necessary roadway width is 10.8 m in case of design speed of 100 km/h. Roadway width in recent projects is short by 0.8 m. And also roadway width is short by 0.2 m in the case of design speed lower than 80 km/h.

But, this matter is discussed with the viewpoint of capacity. Above adjustment factors are used in unit of pcu per hour in both standard. Basic capacity is expressed as 2,500 and 2,800 pcu per hour in Japanese Standard and AASHTO respectively. Traffic capacity is calculated on condition that lane width is 3.5 m and shoulder width is 1.5 m. By the result, capacity is 2,500 pcu per hour in Japanese Standard. When adjustment factor is adopted in 0.89, capacity is 2,492 per hour in AASHTO. While, traffic volume is expressed in 1,986 pcu per hour in same section. It is obvious that traffic capacity is enough for traffic volume in 2015.

Therefore, considering the functions of the shoulder together with economical, service level and functions as the "Millennium Road", 1.5 m shoulder width is recommended in the Study.

## **B-15. Climbing Lanes for Two-Lane Highways**

### **1. General**

Freedom and safety of operation on two-lane highways, besides being governed by the extent and frequency of passing sections, and adversely affected by heavily loaded vehicle traffic operating on grades of sufficient length to result in speeds that could impede following vehicles.

A highway section with a climbing lane is not considered a three-lane highway, but a two-lane highway with an extra lane for vehicles moving slowly uphill so that other vehicles using the normal lane to the right of the centerline are not retarded.

### **2. Calculations**

#### **(1) Formulation**

To provide climbing lane or not is judged by following formula in the viewpoint of capacity in the case of two-lane highways.

$$C_c = C_B \times \gamma_L \times \gamma_C \times \gamma_I \times \gamma_T \times \gamma_B$$

where :  $C_c$  = capacity in both directions for prevailing roadway and traffic conditions on grades, in pcu.

$C_B$  = basic capacity for two-lane highways, in 2,500 pcu/hour.

$\gamma_L$  = adjustment factor for narrow lanes width.

$\gamma_C$  = adjustment factor for restricted shoulder width.

$\gamma_I$  = adjustment factor for roadside condition.

$\gamma_T$  = adjustment factor for the presence of heavy vehicles in the traffic stream.

$\gamma_B$  = adjustment factor for the presence of motorbikes and bicycles in the traffic stream.

#### **(2) Adjustment Factor for Narrow Lanes Width**

The following equation is used for the calculation of the adjustment factor.

$$\gamma_L = 0.24 \times W_L + 0.22$$

where :  $W_L$  = lane width.  $2.5\text{m} \leq W_L < 3.25\text{m}$

(3) Adjustment Factor for Restricted Shoulder Width

The adjustment factor is expressed as Table B-60.

**Table B-60 Adjustment Factor for Restricted Shoulder Width**

Shoulder Width (One Side) $W_C$ (m)	Adjustment Factor ( $\gamma_c$ )	
	Shortage One Side	Shortage Both Side
Over 0.75	1.00	1.00
0.50	0.98	0.95
0.25	0.95	0.91
0.00	0.93	0.86

(4) Adjustment Factor for Roadside Condition

Degree of influence by stopping and parking on roadside and urbanization of roadside reflect in the adjustment factor.

When influence by stopping and parking is little, the adjustment factor is expressed as Table B-61.

**Table B-61 Adjustment Factor for Roadside Condition  
(Little Influence by Stopping and Parking)**

Urbanization Degree	Adjustment Factor
Rural Area	0.95 ~ 1.00
Some Urbanized Area	0.90 ~ 0.95
Urbanized Area	0.85 ~ 0.90

(5) Adjustment Factor for the Presence of Heavy Vehicles in the Traffic Stream

Degree of influence by heavy vehicles on grades reflects in the adjustment factor, which is expressed as following equation.

$$\gamma_T = \frac{100}{(100 \cdot P_T) + E_T \times P_T}$$

where :  $E_T$  = passenger car equivalents for specific grade.

$P_T$  = proportion of heavy vehicles in the traffic stream.

$E_T$  was defined in Chapter 3 shown as Table B-62.

**Table B-62 Passenger car equivalents for specific grade**

Vehicle Type	Mountainous
Medium Bus	5.0
Large Bus	6.0
Small Single Truck	5.0
Medium Single Truck	6.0
Truck with Trailer	8.0

**(6) Adjustment Factor for the Presence of Motorbikes and Bicycles in the Traffic Stream**

Degree of influence by motorbikes and bicycles on grades reflects in the adjustment factor, which is expressed as following equation.

$$\gamma_B = \frac{100}{100 + \alpha \times P_M + \beta \times P_B}$$

where :  $P_M$  = proportion of motorbikes in the traffic stream.

$P_B$  = proportion of bicycles in the traffic stream.

$\alpha$  = passenger car equivalents of motorbikes for specific grade

$\beta$  = passenger car equivalents of bicycles for specific grade

**(7) Calculation and Judgment****1) Conditions**

Traffic features are described in Chapter 3 in 2015 in the Study as shown in Table B-63.

**Table B-63 Traffic Feature in 2015**

Sections	Vehicle Type (Vehicle/Day)					Total		Heavy Vehicles
	Car	Bus	Small Truck	Medium Truck	Large Truck	(vpd)	(pcu/day)	(vpd)
Erdene - Baganuur	716	325	33	250	93	1,417	1,986	701
HVR	PHR		Volume			PCE		
( $P_T$ )			(PCU/hour)			(E <sub>T</sub> )		
49.5 %	9.0 %		179			5.8		

Road conditions are described in Chapter 7 in the Study as shown in below.

- Lane Width : 3.5 m
- Shoulder Width : 1.5 m
- Urbanization degree : rural area

2) Calculation

The result of calculation is shown in Table B-64

**Table B-64                      Result of Capacity on Grades**

$\gamma_L$	$\gamma_C$	$\gamma_I$	$\gamma_T$	$\gamma_B$	Cc
1.00	1.00	1.00	0.30	1.00	750 puc/hour

It is not necessary to provide climbing lanes because traffic demand is less than capacity on grades in 2015.

## B-16 Design for Required Number of Parking Lots

### (1) Design Traffic Volume

Traffic volume in the section between Baganuur and Jargaltkhaan is largest among the proposed locations of road station. Therefore, required number of parking lots is discussed with, based on the traffic volume in this section as shown in Table B-65.

**Table B-65 Traffic Volume between Baganuur and Jargaltkhaan in 2015**

	Car	Bus	Small Truck	Medium Truck	Large Truck	Total
Traffic Volume (vpd)	640	256	41	317	98	1,352

Design traffic volume is expressed in vehicle per day in consideration of monthly variation and weekly variation. Monthly and weekly variation factor is applied in 1.4 and 1.8, which are referred for at 4 checkpoint stations near Ulaanbaatar. Design traffic volume is calculated as shown in Table B-66.

**Table B-66 Design Traffic Volume**

	Car	Bus	Small Truck	Medium Truck	Large Truck	Total
Design Traffic Volume (vpd)	1,613	645	103	799	247	3,407

### (2) Required Number of Parking Lots

Required number of parking lots is calculated by following formulation.

$$N_p = V_d \times \gamma_U \times \gamma_H / \gamma_N$$

where :  $N_p$  = required number of parking lots.

$V_d$  = design traffic volume.

$\gamma_U$  = utilization rate of parking.

$\gamma_H$  = peak hourly rate.

$\gamma_N$  = usable number of vehicle per lot per hour.

$$\gamma_N = 60 / \gamma_T$$

$\gamma_T$  = parking time, in minute.

Utilization rate of parking is adopted in 12 %, which is applied in Japan usually. Peak hourly rate is selected in 9 % as maximum rate because the ratio of peak volume to 24 hours traffic volume was observed to ranges between 7 % and 9 % in the traffic count survey of the study. And, average parking time is presumed as 20 minutes, which is applied in Japan widely. Then, usable number of vehicle is estimated as 3.



The result of calculation is shown in Table B-67.

**Table B-67      Result of Required Number of Parking Lots**

	Car	Bus	Small Truck	Medium Truck	Large Truck	Total
Required Number of Parking Lots	6	2	0	3	1	12

From the result, minimum required number of parking lots for passenger car, large vehicle are 6 and 6 respectively. Therefore, to provide 10 for passenger car, 4 for large vehicle and 2 for trailer respectively is planned.

**B-17. Received Official Letters**

Organization	Description
1) Mongolian Railways:	Crossing Point
2) Ulaanbaatar City Governors Office:	Drinking Water Resources
3) Ministry of Infrastructure:	Coordinates of End Points of Baganuur Mine
4) Ministry of Infrastructure:	Baganuur mine operation boundary
5) Ministry of Infrastructure:	Alternative Study of Section A (Baganuur)
6) Ulaanbaatar City Governors Office:	Existing Paved Road in Baganuur



# УЛААНБААТАР ТӨМӨР ЗАМЫН ХЭРЭГ ЭРХЛЭХ ГАЗАР

200 Л. оны 07  
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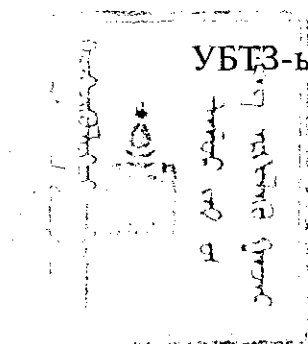
Дугаар: 3/476

Улаанбаатар хот-35  
Утас: 94-48-05

## МОНГОЛ УЛСЫН ЗАСГИЙН ГАЗРЫН ХЭРЭГЖҮҮЛЭГЧ АГЕНТЛАГ АВТО ЗАМЫН ГАЗРЫН ДАРГА ТАНАА

Санал хүргүүлэх тухай

Японы олон улсын хамтын ажиллагааны агентлаг /ЖАЙКА/ -ийн судалгааны хэсгийн санал болгосон Багануур орчмын замын трассын хувилбаруудыг хоёр тал хамтран үзлээ. 2,3,4-р төмөр замын автозамтай огтлолцсон цэгүүдийг Монголын төмөр зам зөвшөөрч байна. 1-р цэгийн хувьд Гүнгалуут зөрлөгийн урьдчилан анхааруулах дохионы бүсэд, сэтэрхий газар байрласнаас үзэгдэлт муутай, ойролцоо байрлалтай хиймэл төхөөрөмжийн дунд оршиж байгаа тул галт тэрэгний хөдөлгөөний аюулгүй байдлын шаардлагыг хангахгүй байна. Йимээс тус цэгийг Багахангай – Багануур хоорондын замын 78 км 5 пк –ээс урагш шилжүүлж газар сонгож судалгааны ажилдаа тусгахыг санал болгож байна.



УБТЗ-ын ерөнхий инженер

Ж.Нямаа

From: J.Nyamaa, Chief Engineer,  
Ulaanbaatar Railway Headquarters

To: General Director of the Department of Roads  
(Mongolian Government Implementing Agency)

Date: July 25, 2001

Ref. No.: 3/476

Subject: Submission of a proposal

The two sides have carried out a joint inspection of the two options of the road routes nearby Baganuur proposed by the JICA Study Team. The Mongolian Railways agree with the points 2, 3 and 4 where the road crosses the railway. As for the point 1, it does not meet the train traffic security requirements due to its location in the range of the function of the Gungaluut siding signal and in the cut place with bad vision as well as nearby the bridges located not far from each other.

Therefore, we propose to shift this point 1 to the south of 78 km Picket 5 of the Bagakhangai-Baganuur railway section.



# УЛААНБААТАР ХОТЫН ЗАХИРАГЧИЙН АЖЛЫН АЛБА

2007 оны 8  
сарын өдөр 03

№ 1/1021

Улаанбаатар-46  
Утас: 315347  
Факс: 976-11-329402

ЖАЙКА – ГИЙН СУДАЛГААНЫ ХЭСГИЙН АХЛАГЧ  
НОЁН КЭНЖИ МАРУОКА ТАНАА

Танай 705R 36663 МИ  
02 тоотын хариу

Багануур хотын цэвэр усны эх үүсвэр Хэрлэн голын дагуу байрладаг бөгөөд энэ нь хотоос зүүн хойт чиглэлд 7 км–т оршдог. Иймд хотын цэвэр усны эх үүсвэр байрладаг орчноос авто замыг тойруулж гаргах шаардлагатай.

ХОТЫН ЕРӨНХИЙ МЕНЕЖЕР  Т.БАДАМЖУНАЙ

Ulaanbaatar City Governor's Office

Date: August 3, 2001

Ref. No.: 1/1021

**To: Mr. Kenji MARUOKA**

JICA Study Team Leader

Subject: Answer to your letter Ref. No. 705R 36663 MI02

The Baguunur city drinking water resources are located along the Kherlen River and stretches for 7 kms to the north-east of the city. Therefore, it is necessary to detour the road to avoid the vicinity of the drinking water resources.

Signed: T.Badamjunai  
City General Manager

# МОНГОЛ УЛСЫН ДЭД БҮТЦИЙН ЯАМ

2001 оны 08. .  
сарын 09-ны өдөр

№ 1/2472

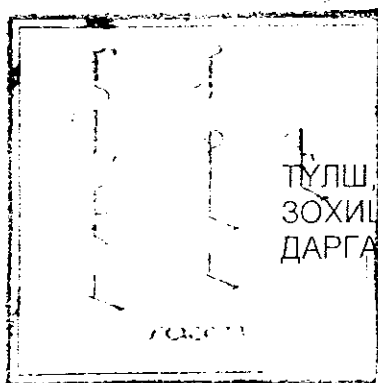
Улаанбаатар-210646  
Утас: 310603  
Факс: 976-11-310612

“РСГ” КОМПАНИД

Төгсгөлийн цэгийн  
координат хүргүүлэх тухай

Багануурын нүүрсний уурхайн Уулын 5 дугаар хэсгийн ахилтын  
төгсгөлийн цэгийн координатыг хавсралтаар хүргүүлэв.

Энэ цэгээс цааш тус хэсэг ахилт хийхгүй болно. Хэрвээ план зураг дээр  
дээрх цэгүүдийг тэмдэглүүлэх бол уурхайн мэргэжилтнүүдтэй харилцах  
шаардлагатай.



ТҮЛШ, ЭРЧИМ ХҮННИЙ БОДЛОГО,  
ЗОХИЦУУЛАЛТЫН ГАЗРЫН  
ДАРГА

Ц.СҮХБААТАР



**"БАГАНУУР" ХУВЬЦААТ КОМПАНИ**  
**"BAGANUUR" JOINT STOCK COMPANY**

2001 оны 08 сарын 09 өдөр

№ 2/436

Багануур  
 Утас: 21130  
 Факс: (976-1) 0311214

**МОНГОЛ УЛСЫН ДЭД БҮТЦИЙН ЯАМНЫ**  
**ТҮЛШ ЭРЧИМ ХҮЧНИЙ БОДЛОГО**  
**ЗОХИЦУУЛАЛТЫН ГАЗРЫН ДАРГА**  
**Ц. СҮХБААТАР ТАНАА**

1/2446 тоот албан бичгийн хариу

Уулын 5-р хэсгийн төгсгөлийн цэгийн координат

Д.Д	Х	У
1	296800	285000
2.	294000	287000
3.	295800	289000



ТЭГТҮҮН ДЭД ЗАХИРАЛ

О. ЦОГХҮҮ



**From: Ministry of Infrastructure of Mongolia**

Date: August 9, 2001

Ref. No.: 1/2472

**To: PCI Company**

Subject: Submission of coordinates of end points

Please find attached the coordinates of the end points of the excavations on the mine's 5<sup>th</sup> field of the Baganuur mine.

No excavations will be made on the field further than these points. If marking of these points on the plan is required then it will be necessary to contact with the specialists of the mine.

Signed: Ts. Sukhbaatar  
Director  
Fuel and Energy Policy and Coordination Department

From: “Baganuur” Joint Stock Company

Date: August 9, 2001

Ref. No.: 2/436

To: Ts.Sukhbaatar, Director, Fuel and Energy Policy and Coordination  
Department, Ministry of Infrastructure

Subject: Answer to Letter No. 1/2446

Coordinates of the end points of the mine’s 5<sup>th</sup> field

No.	X	Y
1	296800	285000
2	294000	287000
3	295800	289000

Signed: O.Tsogkhuu  
First Deputy Director



**МОНГОЛ УЛСЫН  
ДЭД БҮТЦИЙН ЯАМ**

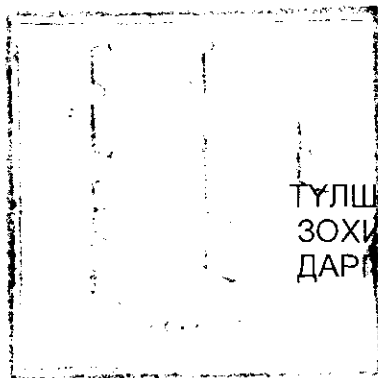
210646 Улаанбаатар хот, Чингэлтэй дүүрэг,  
Нэгдсэн үндэстний гудамж 5/1, Засгийн газрын II байр,  
Утас: 31-06-03, Факс: 31-06-12  
E-mail: webmaster@mid.pmis.gov.mn

2001. 12. 13 № 1/3871  
танай \_\_\_\_\_-ны № \_\_\_\_\_-т

**Багануурын уурхайн ашиглалтын  
хүрээний тухай**

Зүүн чиглэлийн автозамын судалгааны хүрээнд хамрагдсан Багануур дүүргийн уурхайн одоо байгаа хатуу хучилттай авто зам нь тус дүүргийн хэтийн хөгжлийн ерөнхий төлөвлөгөөний дагуу Багануурын нүүрсний ордыг цаашид ашиглах хэтийн чиглэлтэй уялдуулан баригдсан бөгөөд “Багануур” ХК-ны уурхайн ашиглалтын хүрээнээс гадна оршиж байгаа болно.

Багануур дүүргийн иргэдийн нийгэм, эдийн засгийн хөгжилд ач холбогдол бүхий чиглэлийг сонгож байгааг зарчмын хувьд дэмжиж байна.



ТҮЛШ, ЭРЧИМ ХҮЧНИЙ БОДЛОГО,  
ЗОХИЦУУЛАЛТЫН ГАЗРЫН  
ДАРГА

Ц. СУХБААТАР

Ministry of Infrastructure Development

Date: December 13, 2001

Ref. No. 1/3871

To: PCI Company

About Baganuur mine operation boundary

Existing paved road encompassing coal mine in Baganuur district and covered by the Feasibility Study for Construction of Eastern Arterial Road was constructed in accordance with the master plan for the future development of the district and considering future expansion of Baganuur coal mine and this road is located out of the operation area of the mine.

We agree in principle with the selected route significant for the socioeconomic development of the Baganuur district.

Director of Fuel and Energy

Policy Coordination Department

Ts. SUKHBAATAR



МОНГОЛ УЛСЫН  
ДЭД БҮТЦИЙН ЯАМ

210646 Улаанбаатар хот, Чингэлтэй дүүрэг,  
Нэгдсэн үндэстний гудамж 5/1, Засгийн газрын II байр  
Утас: 31-06-03, Факс: 31-06-12  
E-mail: webmaster@mid.pmis.gov.mn

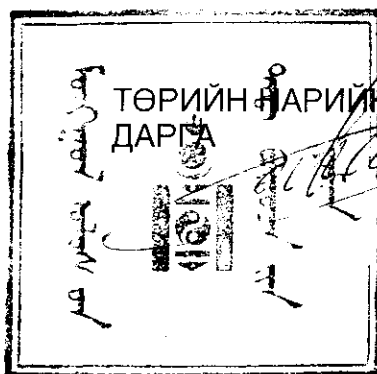
2001 12.15 № 43926

танай \_\_\_\_\_-ны № \_\_\_\_\_-т

“РСІ” КОМПАНИД

Зүүн чиглэлийн авто замын Техник эдийн засгийн үндэслэл боловсруулах судалгааны дунд шатны тайланг Удирдлагын хорооны хурлаар хэлэлцэх үеэр судалгааны хэсэгт нэмж хийлгэхээр өгсөн даалгавар биелсэн гэж үзээд А-2 хувилбар буюу Багануур дүүргийн одоо байгаа хатуу хучилттай авто замыг үргэлжлүүлэн хийх сонголтыг зөвшөөрсөн болохыг үүгээр мэдэгдэж байна.

Иймд та бүхэн дараагийн шатны судалгааны ажлыг үргэлжлүүлэн хийх нь зүйтэй болно.



Ц.ЦЭНГЭЛ

20 12 15

Ministry of Infrastructure Development

Date: December 19, 2001

Ref. No. 1/3926

To: PCI Company

This is to inform that additional task given to the Study Team during discussion of Interim Report of the Feasibility Study for Construction of Eastern Arterial Road by the Steering Committee meeting, have been implemented and that we accept A-2 route which passes through existing paved road in Baganuur district.

Therefore, you are requested to start next stage study.

State Secretary

Ts. TSENGEL



**УЛААНБААТАР ХОТЫН  
ЗАХИРАГЧИЙН АЖЛЫН АЛБА**

210646 Улаанбаатар хот, Чингэлтэй дүүрэг,  
Бага тойруу 15, Утас: 31-53-47, Факс: 32-94-02  
E-mail: UBGVRNR\_WR\_DV@mongolnet.mn

2002.01.24 № 1/89  
танай \_\_\_\_\_-ны № \_\_\_\_\_-т

**АВТО ЗАМЫН ГАЗАРТ**

Зүүн чиглэлийн гол зам барих Техник Эдийн засгийн үндэслэл боловсруулах судалгааны хэсэг энэхүү гол замын нэг хэсэг нь байхаар сонгосон Багануур дүүргийн одоо байгаа хатуу хучилттай зам нь тус дүүргийн хэтийн хөгжлийн ерөнхий төлөвлөгөөний дагуу баригдсан тул техник, эдийн засгийн хувьд ашигтай, дүүргийн нийгэм, эдийн засгийн хөгжилд ач холбогдол бүхий чиглэлийг сонгож байгааг зарчмын хувьд дэмжиж байна.

ХОТЫН ЕРӨНХИЙ МЕНЕЖЕР

*[Signature]*  
Т.БАДАМЖУНАЙ

03 0000

Ulaanbaatar City Mayor's Office

Date: January 24, 2002

Ref. No. 1/89

To: Department of Roads

We agree in principle with the selection of the existing paved road in the Baganuur district as a route section of the Eastern Arterial road since this existing paved road was constructed considering the master plan for the future development of the district and it is technically and economically profitable and, significant for the socioeconomic development of the district.

City General Manager

T. BADAMJUNAI