

Figure 9-2-2 Location of Each Section of Alternatives and Study Route

9.2.4 Route Description except Alternative Route Sections

The route description except sections A to C is presented as follows;

(1) Erdene - Baganuur

The beginning point of the project road is Erdene sum where The Project for Road Construction utilizing Rock Asphalt under Japan's grant aid completed the asphalt pavement between Terelj Fork/ Bayan Pass and Erdene Sum.

DOR constructed 5 km long stretch from Erdene Sum in 2001 and is constructing further 9 km long stretch additionally. The route follows the existing road between Erdene Sum and Togos steppe passing Dutluur Pass. An ovoo exist on Dutluur Pass and it is necessary to move it over to roadside of project road. The pass is too narrow and cutting is required partially.

Multi shifting tracks are found in the Togos Steppe and they are gathered at the crossing point of the Togos River. The existing road connects to T-shape paved intersection in Baganuur Area.

The mining concessions for exploration is clarified in this section. Details are shown in Figure 9-2-3 and it was confirmed by Office of Geological and Mining Cadaster under Mineral Resources Authority of Mongolia.

(2) Tsenkhermandal - Western Jargaltkhaan

Tsenkhermandal Sum is located in the north of the Tsenkher River. There are two routes on both sides of the Tsenkher River up to Tsenkher Bridge. The southern route is better even though slope is steep, and traffic toward Jargaltkhaan Sum usually passes this southern route. An old mine exists in the northern route and two barrages are constructed in the river. The upper barrage is damaged and diverted water erodes the southern bank and is getting close to the road. To protect the road against the erosion would be the best solution because the road is constructed by cutting the slope. To make detour requires high cost.

There is only one route from Tsenkher Bridge towards Khamar Pass where an ovoo exist. The route is planned to pass over the ovoo. But, it is possible to plan to avoid the ovoo without increasing cutting or filling.

Six mining concessions for exploration is clarified in the surroundings of Khamar Pass and it is shown in Figure 9-2-4. It was also confirmed by Office of Geological and Mining Cadaster under Mineral Resources Authority of Mongolia. It is necessary to secure of the right-of-way before development of mining.

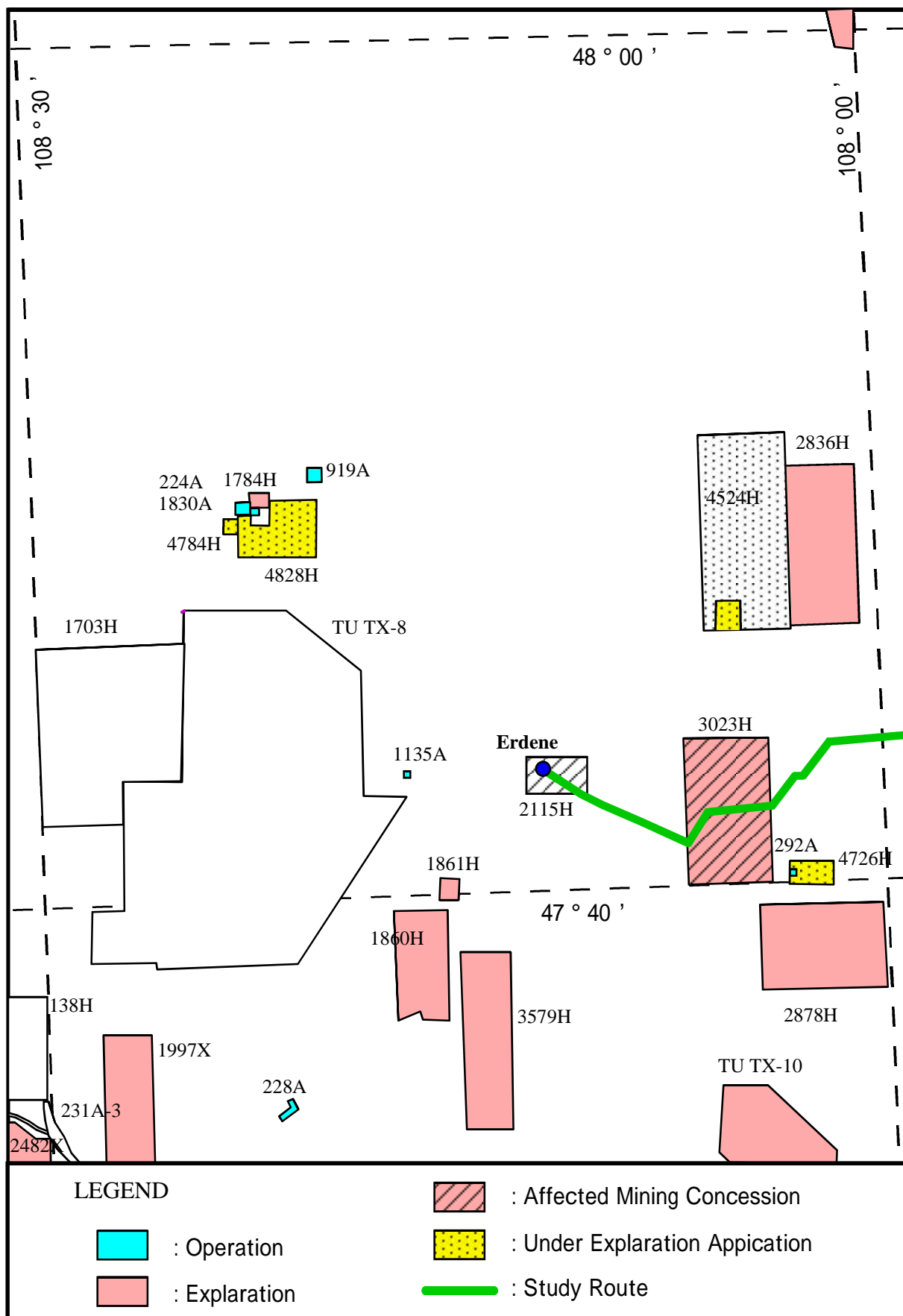
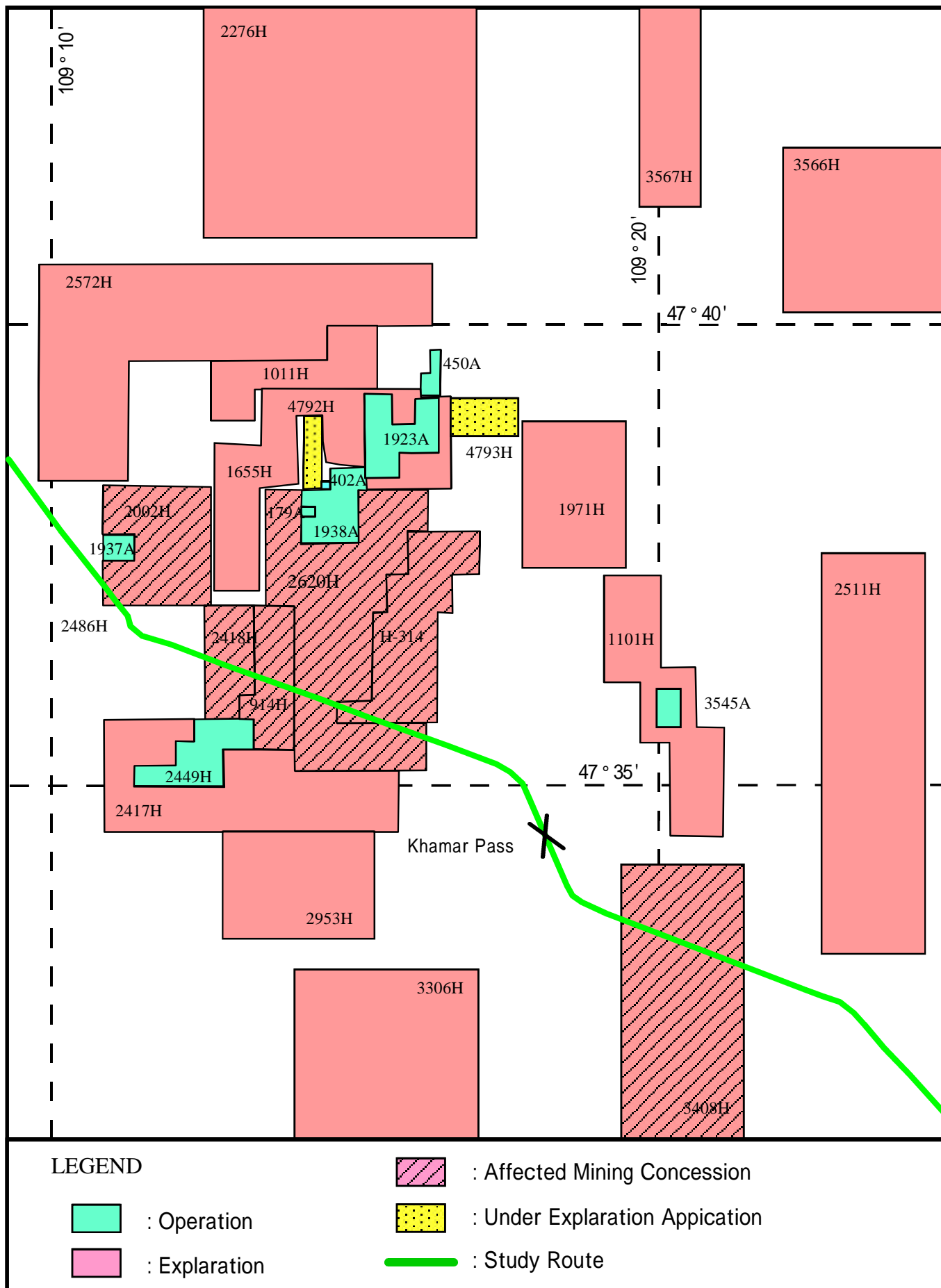


Figure 9-2-3 Location of Mining Concessions Surroundings Erdene



(3) Western Jargaltkhaan - Eastern Duut Pass

There are two routes diverging from Urt Valley and merging at the western end of Duut Pass. One is to bypass Jargaltkhaan Sum to the north of Tsagaan Lake and another is to pass Jargaltkhaan Sum. Figure 9-2-5 shows the location of each existing route.

The northern route passes the Tengeleg Steppe where the Tsagaan Lake exists surrounded by its boggy grounds, and continues to pass between the Baga khar Lake and the Ikh Khar Lake after crossing Ulaan Khudan Pass. These lakes shrivel up in the dry season. There are eroded slopes of weathered rocks at the approaching section to Duut Pass. This route is shorter and steeper than the southern route and prevails in the winter when lakes and boggy grounds are frozen.

The southern route is to pass Oont Pass to avert the Tsagaan Lake and the Ikh Khar Lake. This route is longer but flatter than the northern route. A small ovoo, which is planned to be crossed by the route, exist at the top of the pass. It is possible to plan the route to keep distance from the ovoo.

The northern route is superior to the southern at the aspect of road length. However, structures or countermeasures to cope with soft soil will be required because of its terrain and geological conditions, especially for the Tsagaan Lake together with its surrounding boggy grounds. It is also pointed out from environmental viewpoints that the fauna and flora pertaining to the Tsagaan Lake and its surroundings will be highly impacted.

Accordingly, the southern route was selected for the study.

(4) Eastern Duut Pass - Undurkhaan

The existing road represents the route in the stretch between the eastern end of Duut Pass and Undurkhaan city. There is no alternative route in this section.

Ovoo exist at the top of Duut Pass and Murun Pass. It is possible to plan to avert from the ovoo at Duut Pass with increasing cutting or filling. While, It is necessary to move the ovoo at Murun Pass to roadside of new road. Because, the pass is narrow and requires cutting partially.

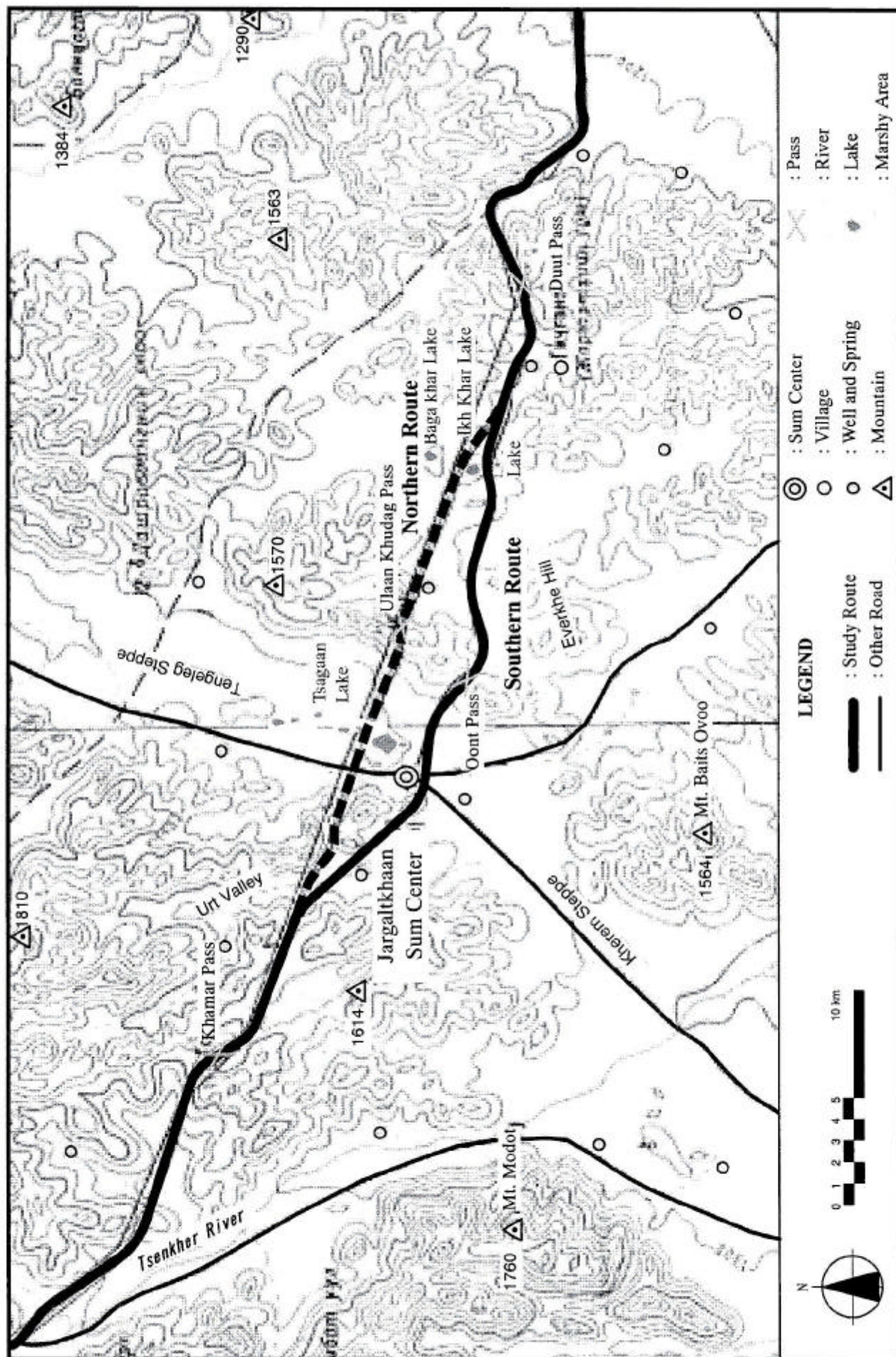


Figure 9-2-5 Location of Western Jargalkhaan - Eastern Duut Pass

9.2.5 Route Description and Evaluation in Baganuur (Section A)

(1) Background of the Study

According to the Minutes of Meeting on 7 December 2001, this study is to conclude the route selection in Section A: Baganuur (Baganuur T-shaped intersection - Kherlen River).

The following concept is adopted in general to select the route as the Millennium Road:

- a) to select the shortest route to save the construction cost as well as VOC; and
- b) to avert villages and urbanized area to keep mobility.

Through a series of discussions, the following questions on the proposal of the Interim Report were risen:

- a) Possibility to pass directly to the eastward from Baganuur T-shape intersection because Baganuur Coal Mine has led on the way; and
- b) Possibility for Baganuur Coal Mine to extend to the westward beyond the existing road.

(2) Baganuur Coal Mine

Baganuur Coal Mine located in 110 km east from Ulaanbaatar is the largest open pit coalmine in Mongolia. Mineable coal 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. 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.

There are five (5) pits. Pit No. 5 is located at the southern end of coal mine and no extension toward the south is planned. There is also no plan to extend to the westward and accordingly no possibility to destroy the existing road by expansion of exploitation.

(3) Route Description

1) General Description

The following points are taken into account to conduct the alternative route study:

- a) The alternative route refers to the existing routes.
- b) The crossing point of the Kherlen River is determined to be nearby the existing bridge.
- c) The ecosystem in Mongolia is sensitive and high priority is given.

There exist two transport means in Baganuur. The existing road encompasses Baganuur Coal Mine and Mongolian Railway operates 7 - 8 trains a day to transport 4 million tons of coal annually to Ulaanbaatar as shown in Figure 9-2-6.

The best route in Section A may go across Baganuur Coal Mine and run straightly eastward to the Kherlen River Bridge. It is shortest and suits to the same concept of the Millennium Road. However, there is no reality due to the existence of Baganuur coal mine, which is the biggest energy supplier of Ulaanbaatar and is planned to continue to operate for 60 years or more.

There are two existing routes bypassing Baganuur Coal Mine. A new town was built in the north of coalmine and an approach road to the town was constructed in 1978, followed by a railway construction to transport coal to Ulaanbaatar. However, only one route had passed the Nuga steppe toward Kherlen Bridge before Baganuur Coal Mine had been exploited. Since the northern route makes detour, through-traffic of Baganuur passes the southern route in summer, but even through-traffic of Baganuur passes the northern route in winter due to traffic safety and the frozen Kherlen River that enables vehicles to go across anywhere.

Since 7 - 8 trains are operated every day between Ulaanbaatar and Baganuur, the southern route will require an at-grade railway crossing. It is a fact that vehicles presently underpass on the riverbed at a railway bridge over the Togos River while no water exists in summer.