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FRUNZE  
POWER GRID

PIR-4-60  
JANUARY 1960

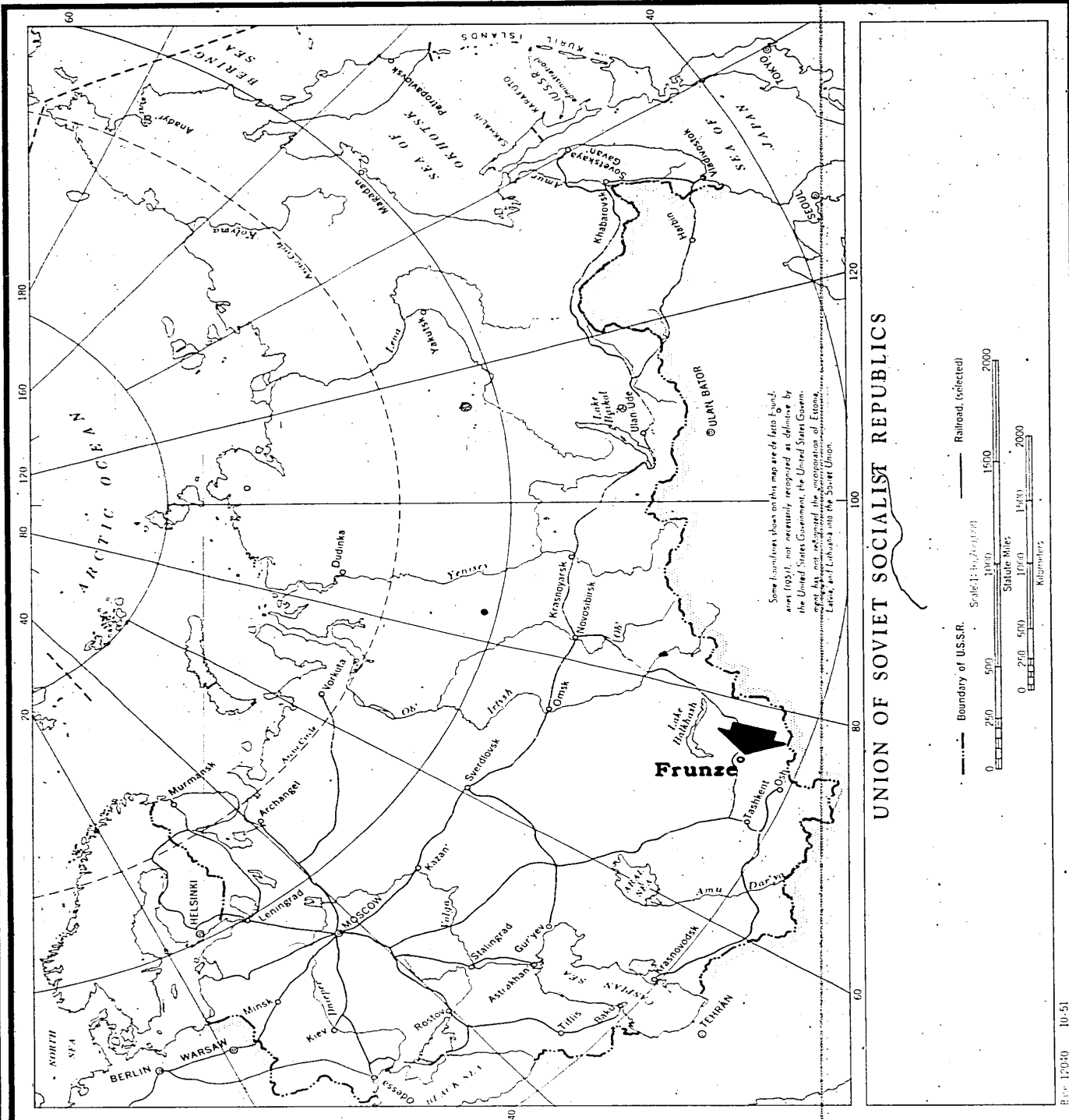
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UNION OF SOVIET SOCIALIST REPUBLICS

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Figure 1

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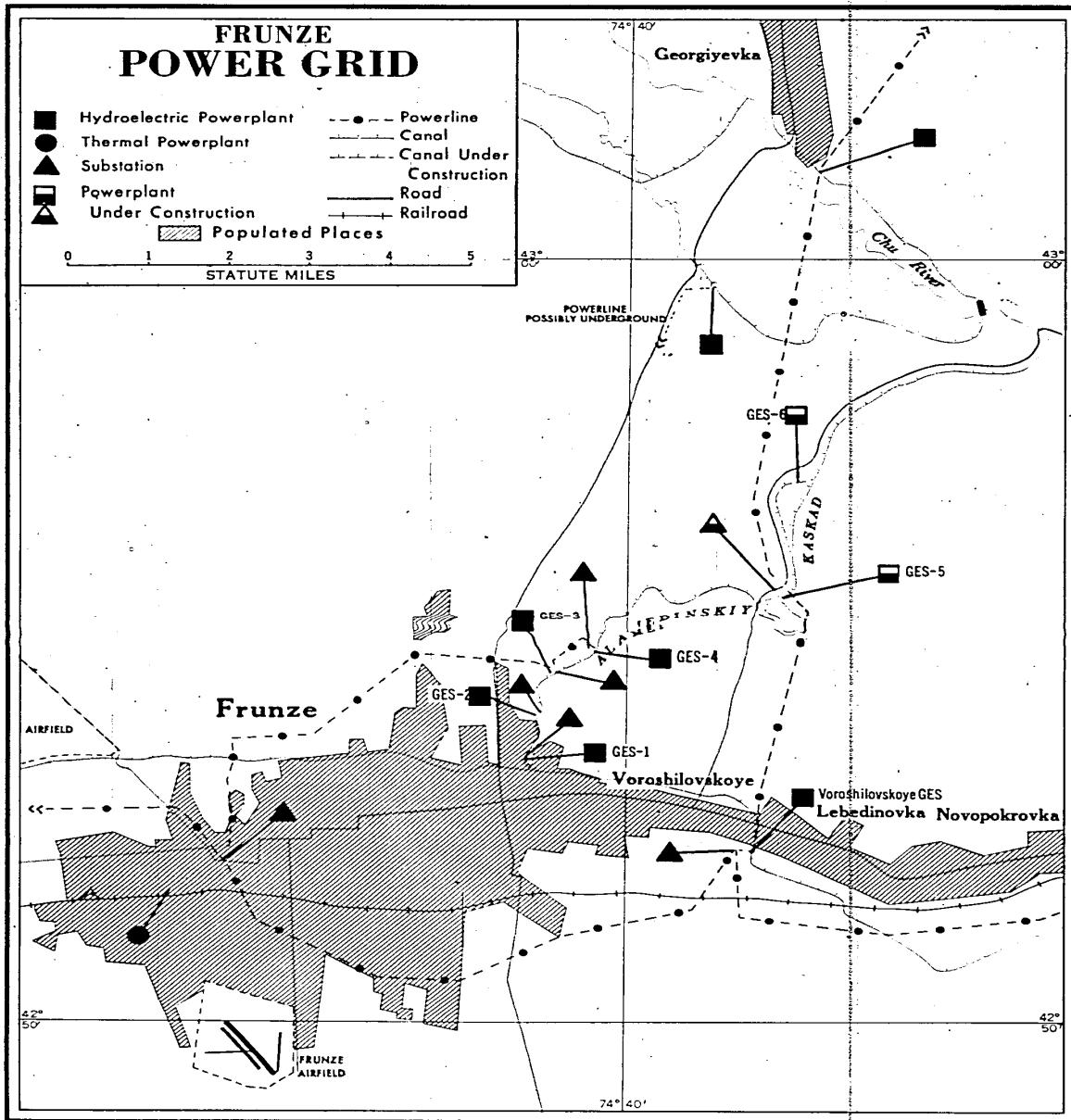


Figure 2

## I. INTRODUCTION

This study illustrates Soviet utilization of waterpower resources through a series of relatively small-capacity plants situated along a natural or artificial watercourse which has a considerable drop in elevation in a short distance. In these hydropower cascades the water is used over and over again; collectively, they provide a significant power capacity.

In the mountains of Soviet Central Asia a number of these cascades have been reportedly planned and several partially completed, including the system in the vicinity of FRUNZE (see Figure 2).

## II. DISCUSSION OF INTELLIGENCE ITEMS

### A. General

FRUNZE (42°52'N 74°36'E) is in Soviet Central Asia, about 9 statute miles south of the left bank of the Chu River. It lies at the foot of an east-west trending, steep-sloped spur of the Tien-Shan range of mountains which rise above 12,000 feet, 15 statute miles to the south.

The 2,500-foot contour passes through the center of FRUNZE, roughly following the east-west railroad alignment. The terrain slopes downward to the Chu River, which has an approximate elevation of 2,000 feet at GEORGIYEVKA (43°01'N 74°43'E), a vertical descent of 500 feet in 9 miles. This elevation differential is used to develop hydroelectric power supply for the city and its vicinity which, according to collateral Russian sources (see References), will be tied into a unified power system for Soviet Central Asia.

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Figure 3

## B. Hydroelectric Power Development

Soviet engineers have been reportedly planning a comprehensive scheme to harness the water resources of the Chu River valley, both for irrigation and for hydropower at ORTO-TOKOY (not available in TALENT material). Upstream from RYBACH'YE (42°27'N 76°12'E) a large rock and earth dam has been built to impound and regulate the seasonal flow of the headwaters of the Chu River basin. The western end of this reservoir is confirmed by TALENT material. Collateral evidence states that water is released, as required, from this reservoir through a diversion tunnel back to the Chu River, and eventually some is diverted to the Bol'shoy Chuyskiy Kanal, which parallels the left bank of the Chu River.

Three miles east of BYSTROVKA (42°48'N 75°43'E) is the first hydroelectric powerplant which utilizes the controlled water of the Chu River. Although others are reportedly planned or under construction between BYSTROVKA and FRUNZE, there is no coverage in TALENT material which might confirm the presence of any of these powerplants along this section of the Chu River valley.

In FRUNZE the Bol'shoy Chuyskiy Kanal passes through the northern perimeter of the built-up area. At the eastern limits the canal's full volume is used to operate the first cascade of nine relatively small but collectively significant hydroelectric powerplants, the Voroshilovskaya GES (see Figure 3). Just east of Alamedin River gully, which bisects the city from south to north, a distributive canal draws off a portion of the water which flows generally northeastward in the Bol'shoy Chuyskiy Kanal to the Chu River. Between the city and the river, six similar powerplants are either operating or under construction. At the time of TALENT coverage, the lowest 2 powerplants in this cascade were under construction; collateral Russian sources indicate that all 6 are now in full operation. These six powerplants form the Alamedinskiy Kaskad (cascade) and are called Alamedinskaya GES-1., GES-2, and so on, beginning at the highest elevation and proceeding downstream. The average head of the above 6 installations is about 50 feet.

Water from this distributive canal flows into the Chu River just upstream from the Chumyshskaya Dam (43°00'N 74°45'E), which



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controls the river southeast of GEORGIYEVKA (43°03'N, 74°43'E). The dam diverts water into two irrigation canals; Georgiyevskiy Kanal leads off from the right bank and Atbashinskiy Kanal from the left bank. Slightly south of GEORGIYEVKA, water in the Georgiyevskiy Kanal operates the eighth powerplant in the cascade, Georgiyevskaya GES. To the southwest of this powerplant is the ninth unit, Atbashinskaya GES, on the Atbashinskiy Kanal. The total installed capacity for the nine hydroelectric powerplants is about 45,000 kilowatts (see Figure 4).

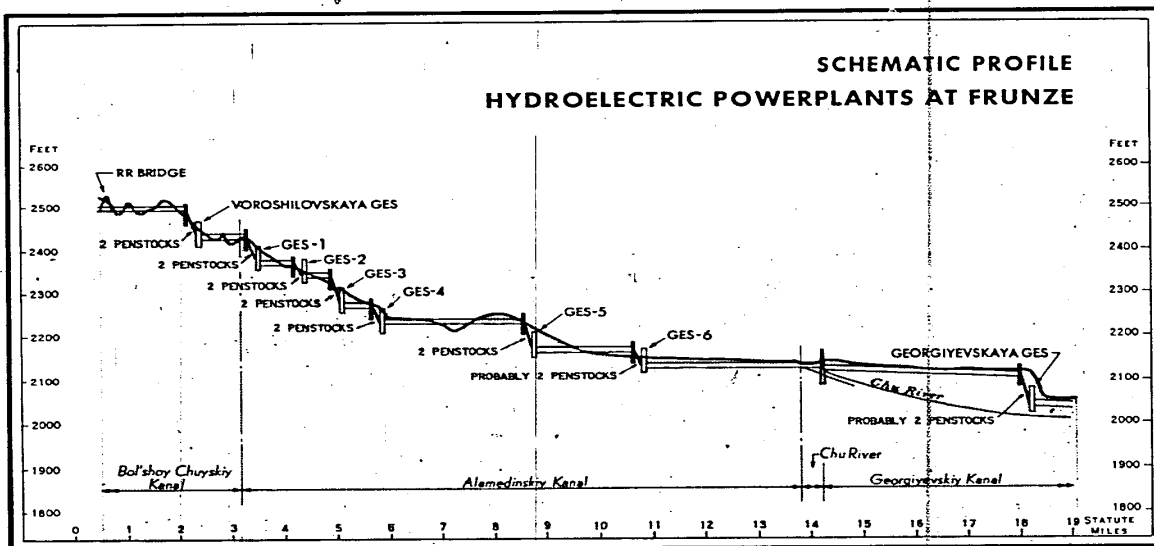


Figure 4

### C. Thermal Power

The above hydroelectric power is supplemented by an estimated supply of 26,000 kilowatts, available at the thermal powerplant attached to the Frunze Agricultural Machinery Plant and at a relatively small thermal powerplant attached to industry in DMITRIYEVKA. A similar thermal powerplant in KAGANOVICH may also feed into the system. An additional thermal plant is planned in the USSR Sixth 5-Year Plan (planned capacity unknown).

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D. Powerlines

A local power grid presently interconnects the above power-plants; its central control is a substation in the center of the built-up area of FRUNZE and just east of the thermal powerplant at the Agricultural Machinery Plant. (see Figure 5).

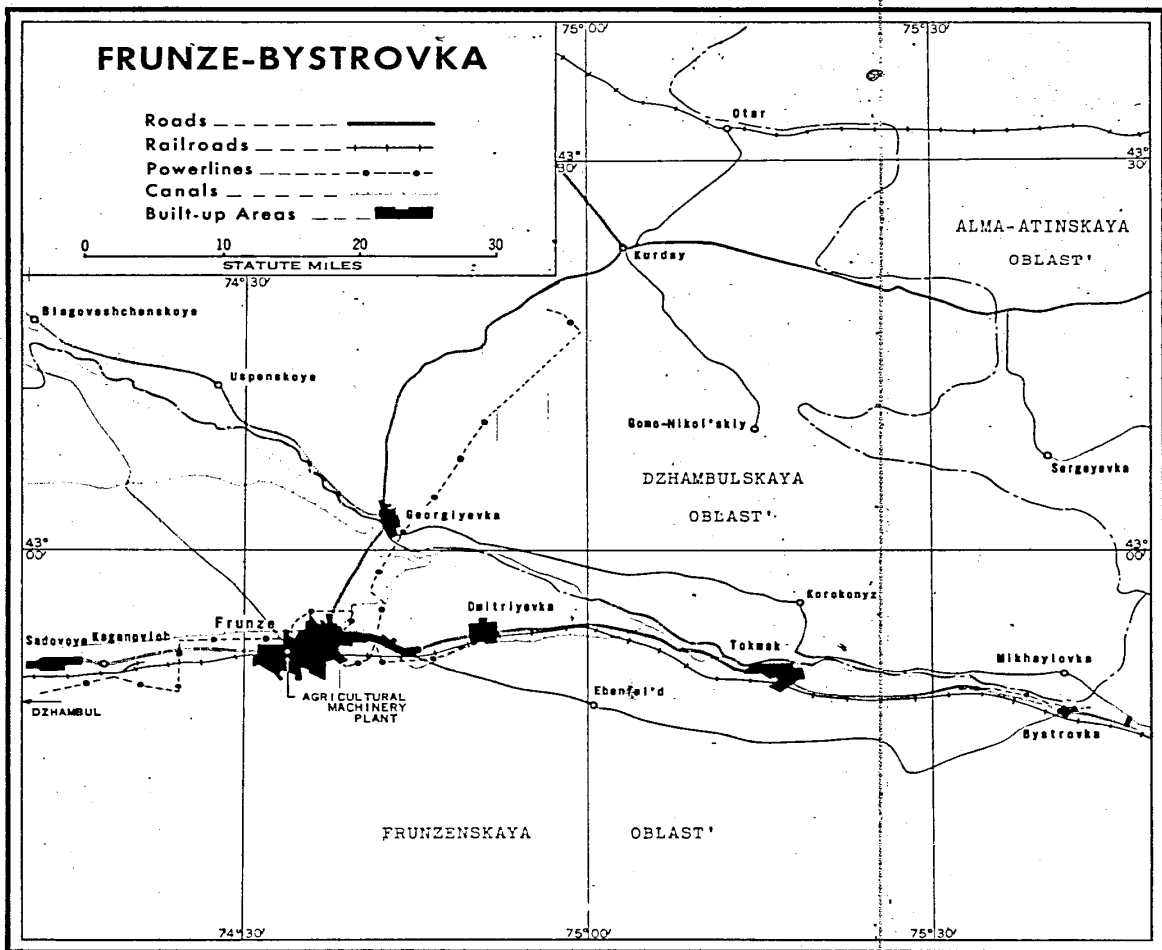


Figure 5

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An east-west powerline with a capacity of 35 or 110 kilovolts leads east to DMITRIYEVKA and west to an unknown destination (off far oblique in TALENT material) in the direction of DZHAMBUL.

Another powerline, probably 110 kilovolts, leads north from the substation and switching yard attached to Voroshilovskaya GES through GEORGIYEVKA to a new mining settlement and activity (name not available) at 43°19'N 74°30'E.

Russian planners state that a line is to be constructed between Bystrovskaya GES and FRUNZE. TALENT material shows an existing line which leads westward from this hydroelectric powerplant down the Chu River valley. In addition, lines are to be installed eventually to TASHKENT, ALMA-ATA, BALKHASH, and KARAGANDA. Eventually, FRUNZE will be a unit of the planned national grid.

### III. SUMMARY

The hydroelectric power cascades described above are an indication of industrial expansion with possible military implications (see Annex). For instance, the Chirchik-Tashkent cascade partially supplies power for the Chirchik heavy water plant. In FRUNZE industrial expansion is under way at a number of sites, although construction is insufficiently completed to identify their purposes. The significance of the mining activities to the north cannot be determined because they are in early stages of development.

IV. REFERENCES

A. Photos

<u>Mission</u>	<u>Date</u>	<u>Prints</u>	<u>Scale</u>
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25X1D



B. Maps

AMS Series N502, sheets NK 43-2, 43-5  
USATC Series 100, 1:100,000, sheet 0328-9993-1-100A (S)

C. Collateral Material

Sovetskaya Kirgiziya, 16 Jul 56, 3 Nov 57, 28 Mar 58, 30 Apr 58,  
9 May 58  
Stroitel'naya Gazeta, 2 Jul 56, 5 Mar 57, 18 Dec 57  
Gudok, 14 Dec 57

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ANNEX

ELECTRIC POWERPLANTS IN VICINITY OF FRUNZE

TALENT MATERIAL	NAME OF POWERPLANT (GEO COORD)	POWER SOURCE	ESTIMATED HEAD (IN FEET)	NUMBER OF PENSTOCKS	ESTIMATED SIZE OF POWERHOUSE (IN FEET)	ESTIMATED CAPACITY (IN KILOWATTS)	STATUS (T-TALENT) (C-COLLATERAL)
HYDROELECTRIC							
25X1D							
25X1D	YOROSHILOVSKAYA GES (42°52'N 74°42'E)	BOL'SHOY CHUYSKIY KANAL	60	2	90x65	8,300	OPERATING (T)
	ALAMEDINSKAYA GES-1 (42°54'N 74°39'E)	ALAMEDINSKIY (?) KANAL	50	2	[REDACTED]	3,750	OPERATING (T)
	ALAMEDINSKAYA GES-2 (42°54'30"N 74°39'E)	ALAMEDINSKIY (?) KANAL	50	2		4,750	OPERATING (T)
	ALAMEDINSKAYA GES-3 (42°55'N 74°39'E)	ALAMEDINSKIY (?) KANAL	50	2		3,750	OPERATING (T)
	ALAMEDINSKAYA GES-4 (42°55'30"N 74°40'E)	ALAMEDINSKIY (?) KANAL	50	2		6,400	OPERATING (T)
	ALAMEDINSKAYA GES-5 (42°56'N 74°43'E)	ALAMEDINSKIY (?) KANAL	50	2		3,900	U/C (T) OPERATING (C)
	ALAMEDINSKAYA GES-6 (42°57'N 74°43'E)	ALAMEDINSKIY (?) KANAL	50	2		3,900	U/C (T) OPERATING (C)
	GEORGIIYEVSAYA GES (43°01'N 74°43'E)	GEORGIIYEVSKIY KANAL	50	2 (PROBABLY)		5,200	PROBABLY OPERATING (T)
	ATBASHINSKAYA GES (43°00'N 74°41'E)	ATBASHINSKAYA KANAL	50	2 (PROBABLY)		5,200	OPERATING (T)
TOTAL HYDROELECTRIC CAPACITY						45,150	
THERMAL							
25X1D	FRUNZE AGRICULTURAL MACHINERY PLANT (42°52'N 74°33'E)	COAL	-	-	130x105	26,000	OPERATING (T)
	DMITRIYEVKA INDUSTRY POWERPLANT (42°54'N 74°51'E)	COAL	-	-	(FAR OBLIQUE)	n.a.	OPERATING (T)
	KAGANOVICH INDUSTRY POWERPLANT * (42°51'N 74°21'E)	COAL	-	-	(FAR OBLIQUE)	n.a.	OPERATING (T)
	FRUNZE (GRES)	n.a.	Planned in U.S.S.R. 6th 5-year Plan. No evidence of construction in Talent material.				
* May not be connected to grid.      ** Water-control reservoir.      n.a. Not available							