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CANADA

DEPARTMENT OF ENERGY, MINES AND RESOURCES

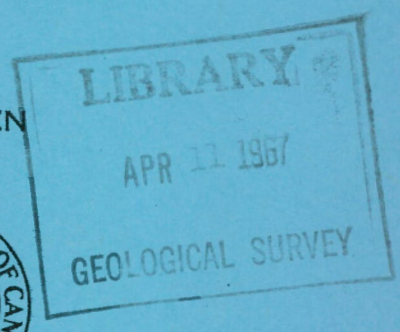
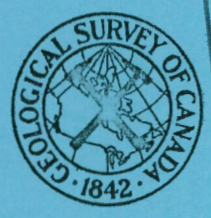
GEOLOGICAL SURVEY OF CANADA  
TOPICAL REPORT NO. 127

PACIFIC COASTAL DRAINAGE  
DAM SITE INVESTIGATION

SITE No. 37

**OTTER FALLS DAM SITE**  
**AISHIHIK RIVER**  
**(MAP AND NOTES)**

E. B. OWEN



OTTAWA  
1967

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(Map and Notes)

by

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## OTTER FALLS DAM SITE

### General Description

The examination of Otter Falls dam site was part of an investigation of the hydroelectric power potential along Aishihik River in Yukon Territory by the Water Resources Branch of the Department of Energy, Mines and Resources. The dam site is located about 18 miles north of mile 996 on the Alaska Highway and is readily accessible from Aishihik Road which passes through the site area. The site is included on National Topographic Series sheet No. 115 H (Aishihik Lake), scale 1:250,000 and on aerial photograph A 14861-89. The geology is described on Geological Survey of Canada map No. 1048A.<sup>1</sup>

Otter Falls dam site is situated at the outlet of Canyon Lake at the point where Aishihik River leaves the lake and flows southward some 20 miles to its junction with Dezadeash River. Aishihik River has its source in Aishihik Lake which, like most lakes in mountainous areas, is long and narrow and confined between fairly steep slopes. The lake is about 34 miles long and from 1 to 3 miles wide. Dropping some 23 feet from Aishihik Lake within a distance of about a mile the river enters much smaller Canyon Lake. The greatest concentration of fall occurs at Rainbow Falls about 3 miles downstream from the outlet of Canyon Lake.

The following information supplied by the Water Resources Branch indicates there is a potential head of some 427 feet in the upstream part of Aishihik River which would lend itself to development of hydroelectric power.

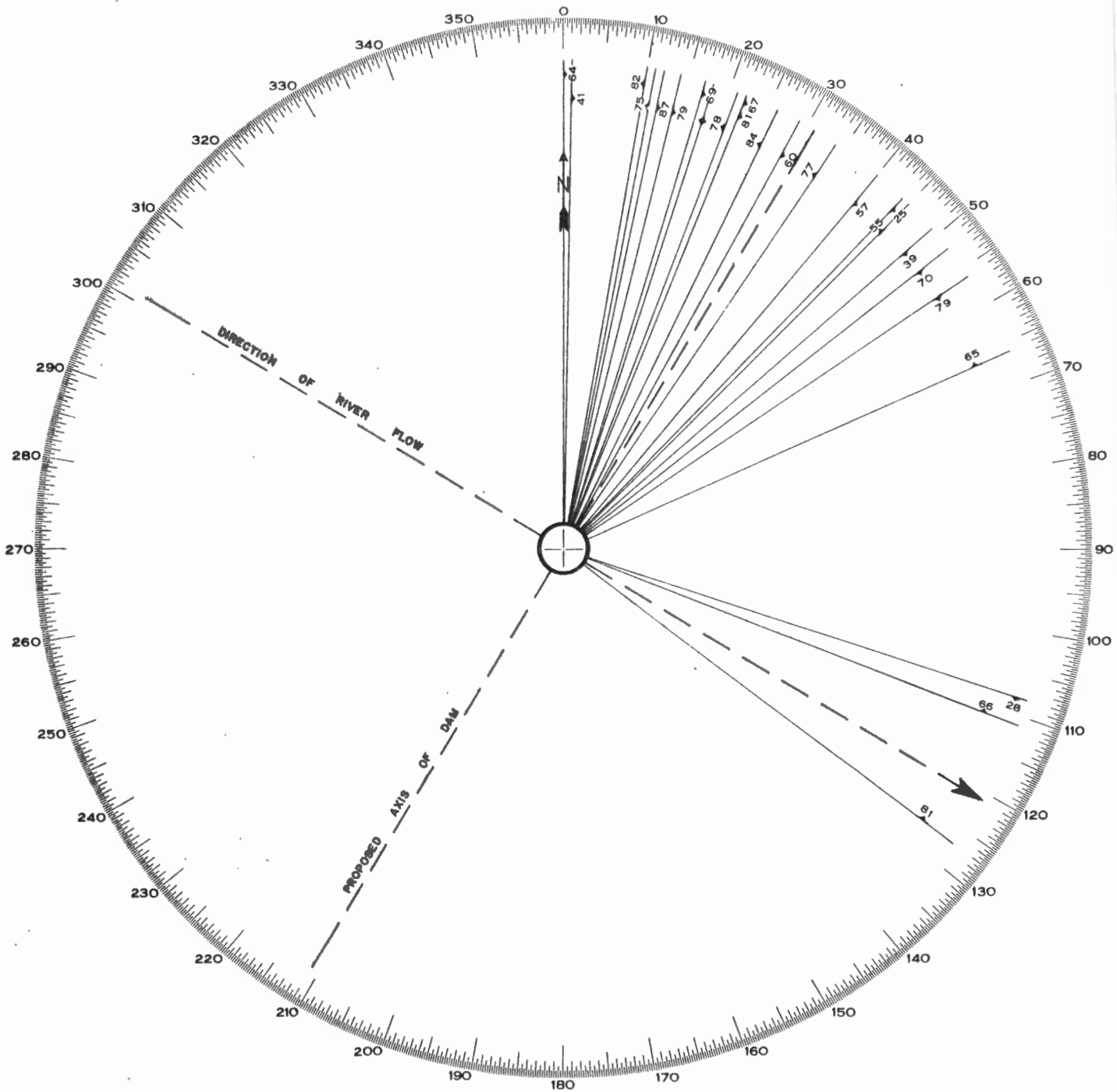
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<sup>1</sup> Geological Map of Yukon Territory; Geol. Surv., Can., map No. 1048A, 1957, scale: 1 inch to 20 miles.

Name	Elevation (feet above sea level)	Fall of Water (feet)
Aishihik Lake	2, 996	23
Canyon Lake	2, 973	35
Aishihik River below Otter Falls	2, 938	89
Aishihik River above Rainbow Falls	2, 849	280
Aishihik River below Rainbow Falls	2, 569	
Total Fall of Water:		427 feet

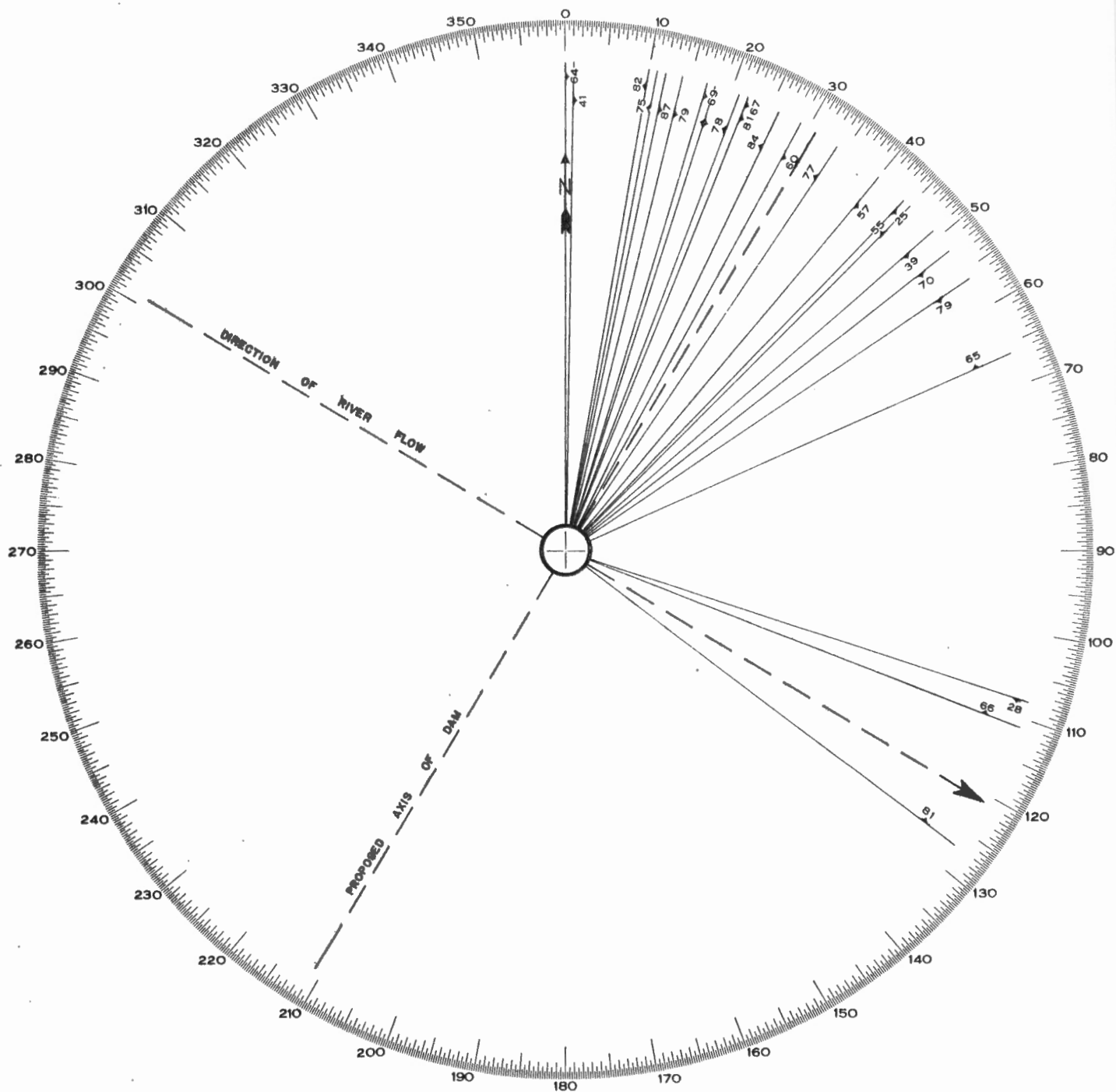
To fully develop the power potential along Aishihik River it would be necessary to construct a small storage dam at the outlet of Aishihik Lake, a diversion dam and control works at the outlet of Canyon Lake and a canal some 2.5 miles in length to carry the water from Canyon Lake to a powerhouse located at the base of Rainbow Falls.

Similar bedrock and soil types exist in all the areas where the proposed dam structures would be located. Consequently the geological conditions described in this report would hold throughout the project area.



**JOINT ROSETTE**

The above illustration presents diagrammatically the direction and dip of the jointing in bedrock exposed at Otter Falls dam site.



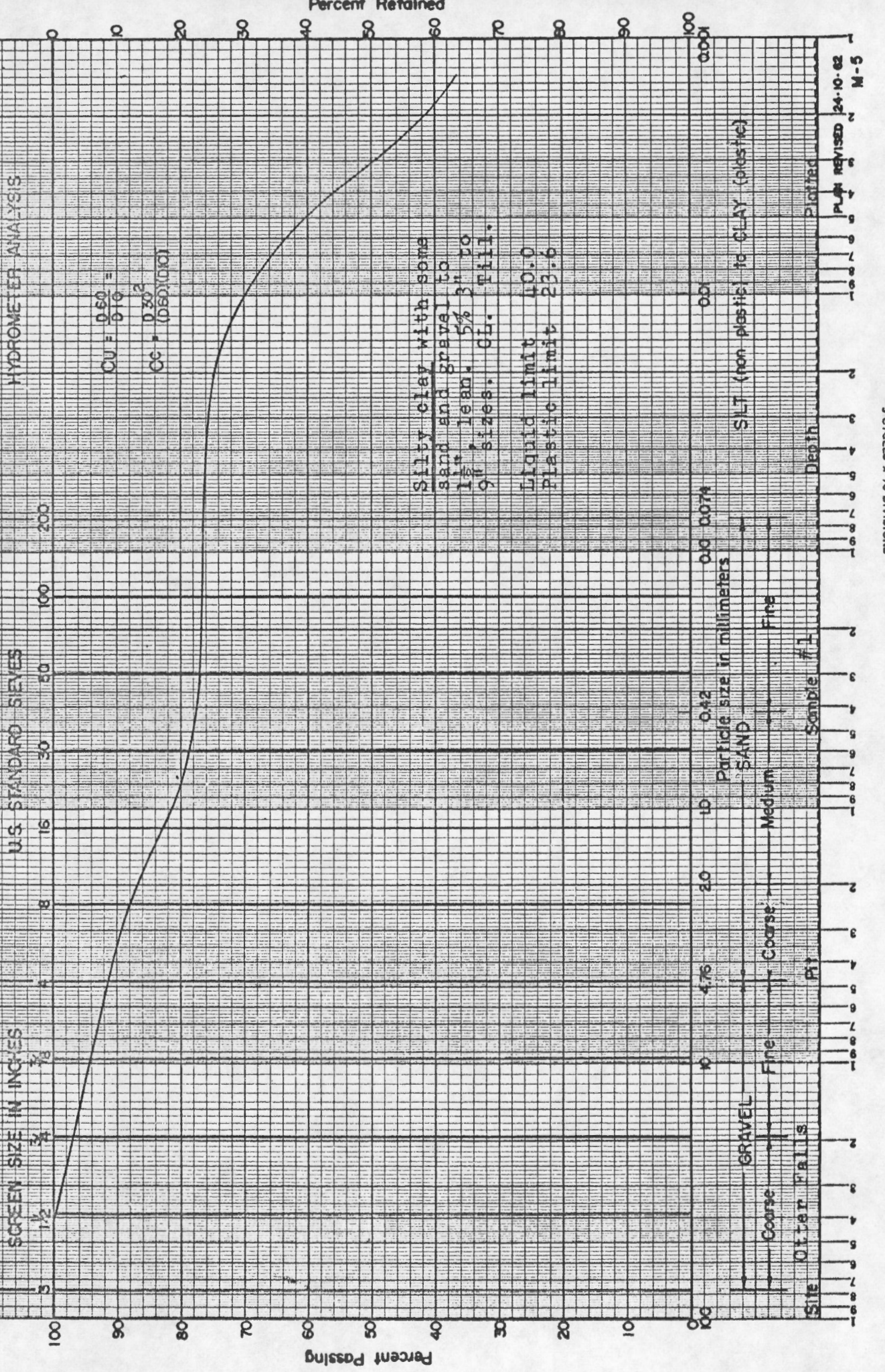
**JOINT ROSETTE**

The above illustration presents diagrammatically the direction and dip of the jointing in bedrock exposed at Otter Falls dam site.

Description of Potential Impervious Material for the following Grain Size Analysis Curves

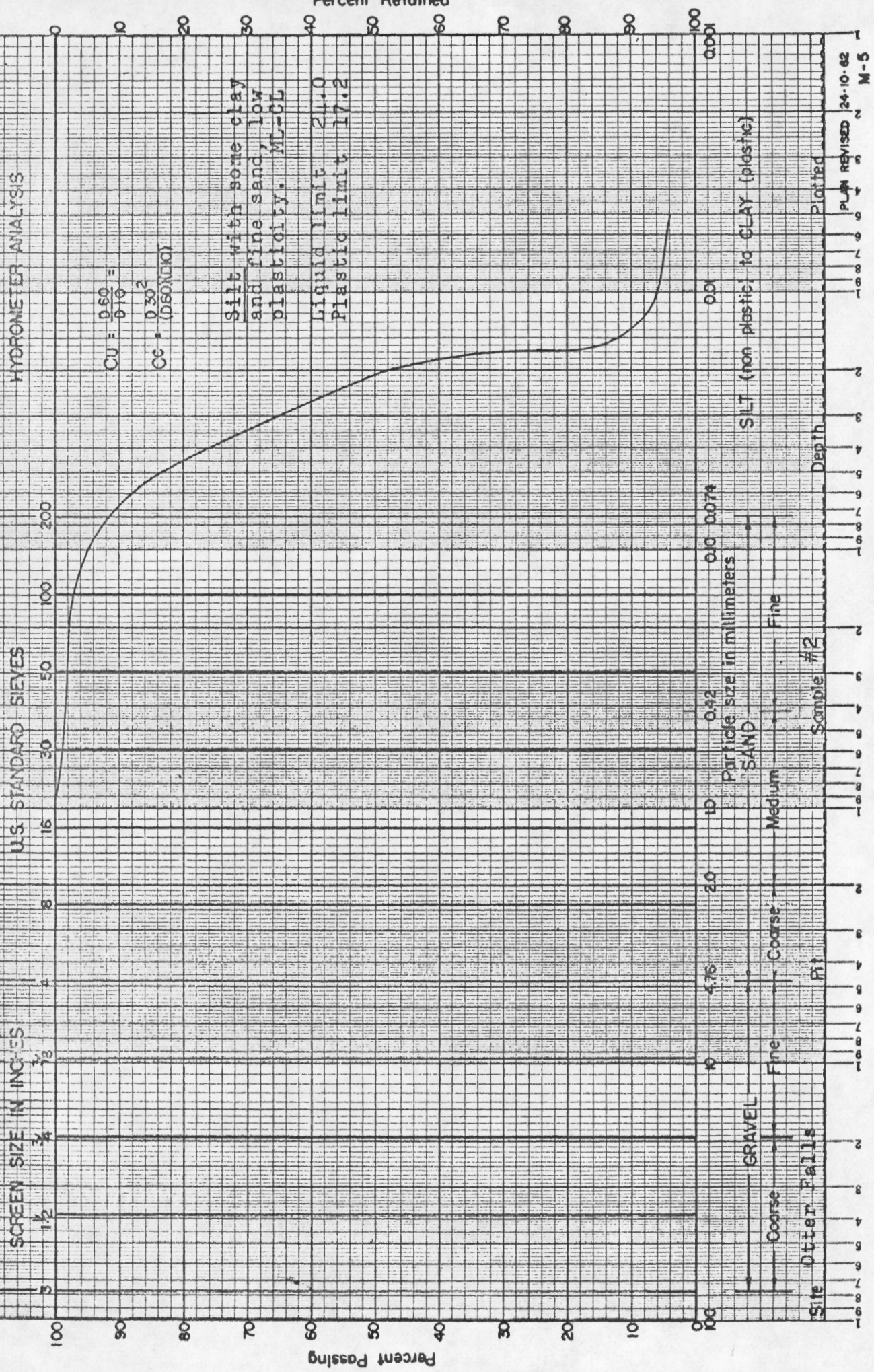
Sample Number	Location	Field Description of Material	Field Description of Overburden	Thickness of Deposit	Areal Extent (Estimated)	Remarks
1	60 feet east of Aishihik Road; one-half mile south of Otter Falls; 42 inches beneath ground surface	Till: clayey, silty, fairly dense; a few angular boulders to 9 inches	12 inches of silty clay as in sample No. 4.	Unknown	Large, probably extends across valley of Aishihik River near the dam site area	CL - classification - 40.0 LL - 23.6 This material probably forms part of the natural dam which holds back Canyon Lake
2	Cut along east side of Aishihik Road; 11 miles from Alaska Highway; 12 inches beneath ground surface	Silt; minor clay and fine-grained sand, low plasticity	None	Variable	Extensive throughout the valley of Aishihik River	ML - classification - 24.0 LL - 17.2 A glacio-lacustrine deposit as sample No. 4

WATER RESOURCES BRANCH  
GRAIN SIZE ANALYSIS





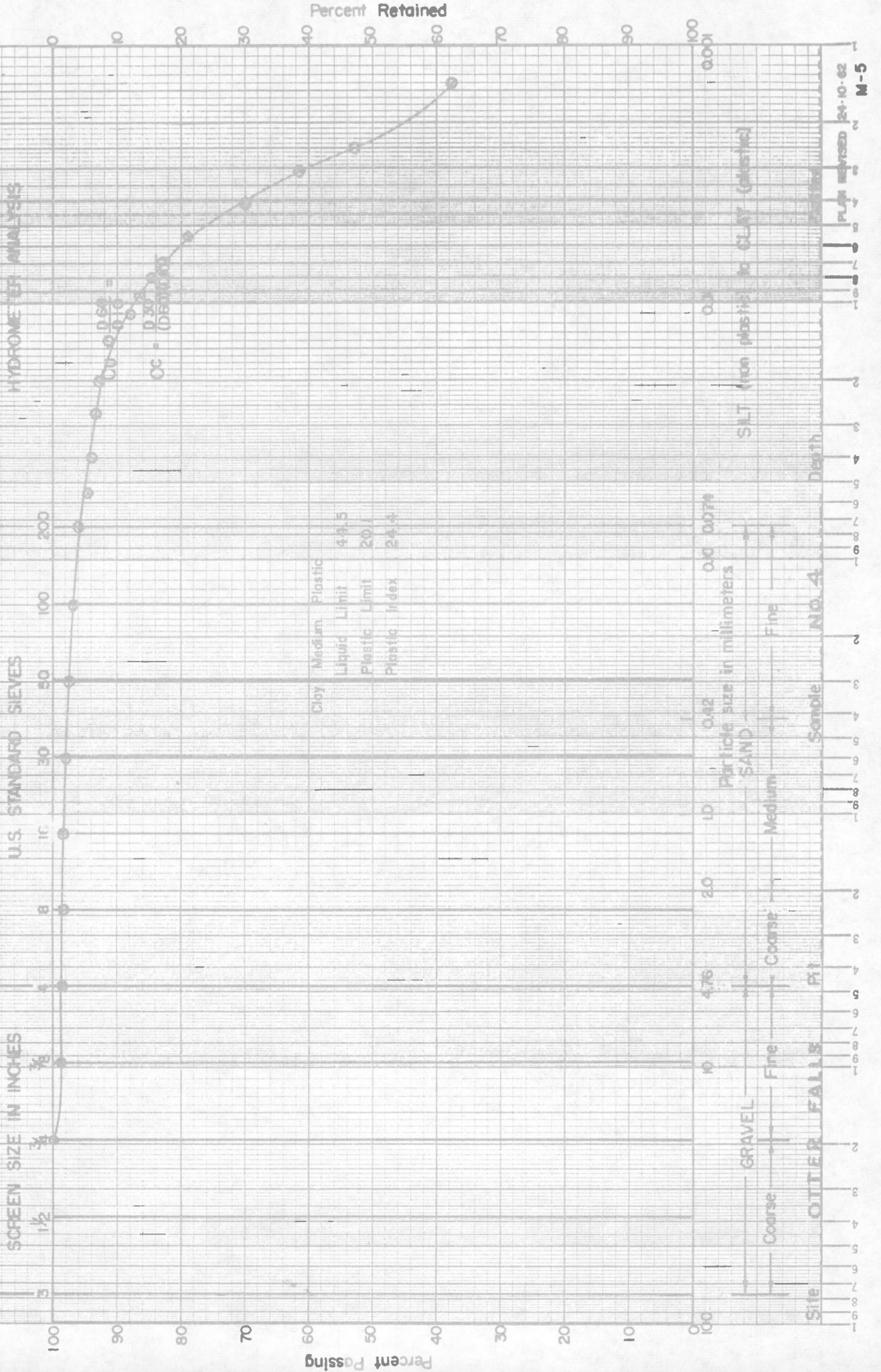
WATER RESOURCES BRANCH  
GRAIN SIZE ANALYSIS



Description of Potential Impervious Material for the following Grain Size Analysis Curve

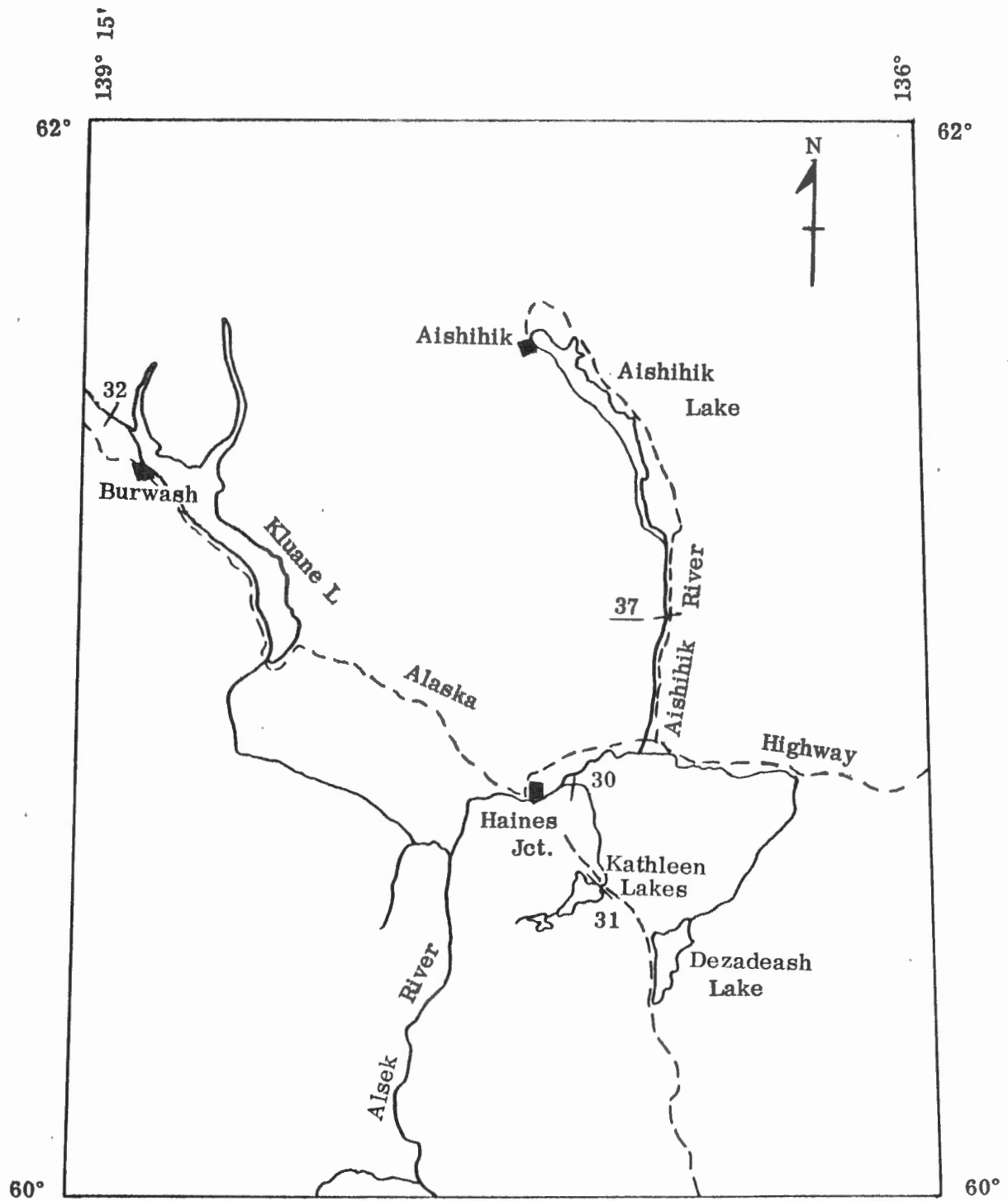
Sample Number	Location	Field Description of Material	Field Description of Overburden	Thickness of Deposit	Areal Extent (Estimated)	Remarks
4	Downstream part of dam site area; 800 feet east of Aishihik River; 30 inches beneath ground surface	Clay: silty, minor sand; low to medium plasticity	None	Variable	Extensive throughout valley of Aishihik River	CL - classification LL - 44.5 PL - 20.1 PI - 24.4 A glacio-lacustrine deposit

WATER RESOURCES BRANCH  
GRAIN SIZE ANALYSIS



Chemical Analysis of Aishihik River water at Otter Falls dam site  
(parts per million)

Location	Date	Discharge	pH	SiO <sub>2</sub>	Ca	Mg	Na	N	Fe	CO <sub>3</sub>	HCO <sub>3</sub>	SO <sub>4</sub>	Cl	F	NO <sub>3</sub>	Turbidity	Hardness as Ca CO <sub>3</sub>
Left side of river immediately downstream from Otter Falls; 12 inches beneath surface of water	June 17, 1964 <u>Temp.</u> 50° F	High	7.1	5.6	15.8	2.9	2.2	1.1	0.1	0.0	57.7	4.7	0.5	0.22	0.0	0.8	51.2



LOCATION OF PROPOSED DAM SITES  
 YUKON RIVER DRAINAGE BASIN  
 AND PACIFIC COAST DRAINAGE  
 Scale: 1 inch = 20 miles

<u>Site No.</u>	<u>Name</u>	<u>River</u>
30	Kathleen Canyon	Kathleen
31	Kathleen Lake	Kathleen
32	Kluane Canyon	Kluane
37	<u>Otter Falls</u>	<u>Aishihik</u>