

BSDMS Summary Report

2 Knik River at Old Glenn Highway near Palmer, AK

Site Location:

Site ID: 2

Site Name: Knik River at Old Glenn Highway near Palmer, AK

County: Palmer

Nearest City: Palmer

State: AK

Latitude: 615000

Longitude: 1483000

USGS Station ID:

Route Number: Old Glenn Highway

Route Class: Unknown

Service Level: Mainline

Route Direction: NA

Highway Mile Point: 39

Stream Name: Knik River

River Mile:

Contact:
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Resources Division
218 E Street, Skyline Building
Anchorage, AK 99501

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75
Scour at Selected Bridge Sites in
Alaska
By Vernon W. Norman
November 1975

Site Description:

This site is located at bridge 539 where it crosses the Knik River at mile 39 on the original Glenn Highway about 7 miles south of Palmer, Alaska. The bridge opening is 2000 ft long. The Knik River is a braided glacial stream. It drains an area of approximately 1200 square miles, over half of which consists of glaciers. The braided channel narrows from 3 miles wide at the terminus of Knik Glacier to less than 0.5 miles at the bridge. In the vicinity of the bridge, the streambed consists of sand and gravel and some cobbles. Daily discharges have been determined at this site since October 1959. The average flow during the period October 1959 to October 1965 was 6,960 cfs. For a number of years, annual peaks were caused by the breakout of a glacier-dammed lake, Lake George. Scour during the 1966 breakout is reported herein. As of the time of this report (Nov 1975), no breakout had occurred since 1966 because the Knik Glacier, which caused the annual ice dam, began to retreat. A description of the Lake George breakout and the possibility of its recurrence is given by Post and Mayo (1971). The fifth pier from the left bank was instrumented with four fixed transducers, and depths to the streambed below each transducer were recorded by fathometer. For more information on some of the methods and purpose of this study, see the location description for the Susitna River at Sunshine, AK.

Elevation Reference

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Datum: Gage

MSL (ft): 30.2

Description of Reference Elevation:

Stream Data

Drainage Area (sq mi):	1200	Floodplain Width:	Unknown
Slope in Vicinity(ft/ft):	0.00069	Natural Levees:	Unknown
Flow Impact:	Straight	Apparent Incision:	Unknown
Channel Evolution	Unknown	Channel Boundary:	Alluvial
Armoring:	Partial	Banks Tree Cover:	High
Debris Frequency:	Unknown	Sinuosity:	Sinuous
Debris Effect:	Unknown	Braiding:	Generally
Stream Size:	Wide	Anabranching:	Generally
Flow Habit:	Perennial	Bars:	Wide
Bed Material:	Gravel	Stream Width Variability:	Wider
Valley Setting:	Unknown		

Roughness Data

Manning's n Values

	Left Overbank	Channel	Right Overbank
High:			
Typical			
Low:			

Bed Material

Measurement Number	Yr	Mo	Dy	Sampler	D95 (mm)	D84 (mm)	D50 (mm)	D16 (mm)	SP	Shape	Cohesion
1	1965	7	9	BM-54	26	7	1	0.14	2.65		Unknown

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2	1965	7	11	BM-54	47	15	2.5	0.42	2.65	Unknown
3	1965	7	12	BM-54	10	5	1.5	0.48	2.65	Unknown
4	1965	7	12	BM-54	17	6	1	0.18	2.65	Unknown

Bed Material Comments

Measurement No: 1

Only the D90=13 and D50=1 were reported with the data. The D95, D84, and D16 were computed from the provided data. The D84 was interpolated from the D90 and D50 using a log-probability interpolation. Sigma was computed as D84/D50. D95 and D16 were computed from the equation $D50 * \text{Sigma}^{\text{(standard normal deviate of 95 or 16)}}$.

Measurement No: 2

Only the D90=25 and D50=2.5 were reported with the data. The D95, D84, and D16 were computed from the provided data. The D84 was interpolated from the D90 and D50 using a log-probability interpolation. Sigma was computed as D84/D50. D95 and D16 were computed from the equation $D50 * \text{Sigma}^{\text{(standard normal deviate of 95 or 16)}}$.

Measurement No: 3

Only the D90=6.5 and D50=1.5 were reported with the data. The D95, D84, and D16 were computed from the provided data. The D84 was interpolated from the D90 and D50 using a log-probability interpolation. Sigma was computed as D84/D50. D95 and D16 were computed from the equation $D50 * \text{Sigma}^{\text{(standard normal deviate of 95 or 16)}}$.

Measurement No: 4

Only the D90=9 and D50=1 were reported with the data. The D95, D84, and D16 were computed from the provided data. The D84 was interpolated from the D90 and D50 using a log-probability interpolation. Sigma was computed as D84/D50. D95 and D16 were computed from the equation $D50 * \text{Sigma}^{\text{(standard normal deviate of 95 or 16)}}$.

Bridge Data

Structure No: 539

Length(ft): 1500

Width(ft):

Number of Spans: 7

Vertical Configuration: Unknown

Low Chord Elev (ft):

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Upper Chord Elev (ft):

Overtopping Elev (ft):

Skew (degrees): 0

Guide Banks: None

Waterway Classification: Main

Year Built:

Avg Daily Traffic:

Plans on File: No

Parallel Bridges No

Upstream/Downstream: N/A

Continuous Abutment: No

Distance Between Centerlines:

Distance Between Pier Faces:

Bridge Description:

The principal structure of this bridge is 1,500 ft long. It is supported by six 6-ft-wide piers with pointed noses, spaced 250 ft apart. A 500-ft approach on wooden pilings extends from the right bank to the bridge. All piers are approximately aligned with the flow.

Abutment Data

Left Station: 0

Right Station: 0

Left Skew (deg): 0

Right Skew (deg) 0

Left Abutment Length (ft):

Right Abutment Length (ft)

Left Abutment to Channel Bank (ft):

Right Abutment to Channel Bank (ft):

Left Abutment Protection:

Right Abutment Protection

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Contracted Opening Type: Unknown

Embankment Skew (deg): 0

Embankment Slope (ft/ft):

Abutment Slope (ft/ft)

Wingwalls: No

Wingwall Angle (deg): 0

Pier Data

Pier ID	Bridge			PierType	# Of Piles	Pile Spacing(ft)
	Station(ft)	Alignment	Highway Station			
1	250	0	0	Single	0	
2	500	0	0	Single	0	
3	750	0	0	Single	0	
4	1000	0	0	Single	0	
5	1250	0	0	Single	0	
6	1500	0	0	Single	0	

Pier ID	Pier				Protection	Foundation
	Width(ft)	Pier Shape	Shape Factor	Length(ft)		
1	6	Sharp		29	Riprap	Poured
2	6	Sharp		29	Riprap	Poured
3	6	Sharp		29	Riprap	Poured
4	6	Sharp		29	Riprap	Poured
5	6	Sharp		29	Riprap	Poured
6	6	Sharp		29	Unknown	Poured

Pier ID	Top	Bottom	Foot or Pile	Cap Shape	File Tip
	Elevation(ft)	Elevation(ft)	Cap Width(ft)		Elevation(ft)
1				Square-Rounded	
2				Square-Rounded	
3				Square-Rounded	

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4		Square-Rounded
5	6	Square-Rounded
6		Square-Rounded

Pier Description

Pier ID 1

Pier ID 2

Pier ID 3

Pier ID 4

Pier ID 5

The pier is founded on a concrete-filled caisson.

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ContractionScour

Stage and Discharge Data

Peak Discharge			Flow (cfs)	Qacc	Peak Stage			Stage (ft)	Water Temp (C)	Return Period(yr)	
year	mo	dy			year	mo	dy				
1965	7	9	0	9220	none	1965	7	9	0	7.2	10.5
1965	3	23	0	500	none	1965	3	23	0	5.8	
1965	7	11	0	226000	none	1965	7	11	0	20.9	4

Hydrograph

Hydrograph Number	Year	Month	Day	Hr	Min	Sec	Stage(ft)	Discharge (cfs)
1	1965	7	9	12	0	0	7	
1	1965	7	9	16	0	0	7.3	
1	1965	7	9	19	10	0	8	
1	1965	7	9	0	0	0	7	
1	1965	7	10	0	0	0	9.5	
1	1965	7	11	10	0	0	20.8	
1	1965	7	11	16	0	0	21.2	
1	1965	7	12	0	0	0	20	
1	1965	7	12	12	0	0	16	
1	1965	7	13	0	0	0	14	
1	1965	7	14	0	0	0	11.3	

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1	1965	7	15	0	0	0	10.7	
1	1965	7	16	12	0	0	9.8	
2	1965	7	9	16	50	0		10000
2	1965	7	9	0	0	0		7000
2	1965	7	10	0	0	0		20000
2	1965	7	10	6	0	0		40000
2	1965	7	10	18	0	0		100000
2	1965	7	11	8	0	0		220000
2	1965	7	11	16	0	0		233000
2	1965	7	11	18	0	0		220000
2	1965	7	12	12	0	0		100000
2	1965	7	13	0	0	0		70000
2	1965	7	13	12	0	0		47000
2	1965	7	14	12	0	0		30200
2	1965	7	16	12	0	0		20600

Supporting Files
