

## URS Corporation

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May 6, 2001

Phillips Alaska, Inc.  
700 "G" Street  
Anchorage, Alaska 99501

Attn: Mr. Paul Fairchild, P.E.

**RE: PRELIMINARY ASSESSMENT OF THE 100-YEAR FLOODPLAIN  
WIDTH ON FISH AND JUDY CREEKS.**

A very preliminary estimate of the 100-year floodplain width on Fish Creek, and Judy Creek, has been completed. To prepare the inundation width estimate, a preliminary estimate of the 100-year flood peak discharge was prepared based on a regional regression equation developed for the Tarn Project<sup>1</sup>. The floodplain width was then estimated based on a preliminary hydraulic analysis using five cross-sections surveyed by Lounsbury & Associates. The starting water surface slope was estimated based on available U.S. Geological Survey topographic maps. Hydraulic roughness values were conservatively estimated based on my experience at other rivers on the North Slope. Based on these analyses, the following conditions are expected.

The magnitude of the 100-year flood peak discharge on Fish Creek, at Cross Section 1 (see Attachment 1), is estimated to be approximately 80,000 cubic feet per second (cfs). At Cross Section 1 the width of the 100-year floodplain is likely to be approximately 2.5 miles (see Attachment 2). Cross Section 1 is located perpendicular to the Fish Creek channel at approximately drill site "Lookout A". Note that some of the ground within the area inundated by the 100-year flood is above the peak water surface elevation (see Attachment 2). In particular, there is a significant width of high ground located adjacent to the west bank of the channel. At Cross Section 1 the 100-year flood-peak water-surface elevation is likely to be about 17 feet. The average velocity in the channel is likely to be on the order of 3 to 5 feet per second (fps) and the average velocity in the floodplain is likely to be between 1 and 2 fps.

At Cross Section 2 the width of the 100-year floodplain is likely to be approximately 1.7 miles (see Attachment 3). Cross Section 2 is located perpendicular to the Fish Creek channel between drill sites "Lookout #1" and "Sparks #4" (see Attachment 1). Note that

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<sup>1</sup> Shannon & Wilson, Inc. 1997. 1997 Spring breakup and hydrologic assessment, Tarn Access Corridor, North Slope, Alaska. Prepared for: Alaska Anvil, Inc., Anchorage, Alaska.

some of the ground on the west bank of the channel is above the 100-year flood-peak water-surface elevation. At Cross Section 2 the flood-peak water-surface elevation is likely to be about 25 feet. The average velocity in the channel and on the floodplain is likely to be similar to that at Cross Section 1.

Cross Section 3 crosses both Fish Creek and Judy Creek, near drill site "Spark #3". The 100-year flood peak discharge on Fish Creek is estimated to be approximately 47,000 cfs. The width of the flooding on Fish Creek is likely to be approximately 1.2 miles (see Attachment 1). Near Fish Creek the 100-year flood-peak water-surface elevation is likely to be about 30 feet. The average velocity in the channel is likely to be on the order of 2 to 5 fps and the average velocity in the floodplain is likely to be between 1 and 2 fps.

The 100-year flood peak discharge on Judy Creek, at Cross Section 3, is estimated to be approximately 38,000 cfs. The 100-year floodplain width on Judy Creek is likely to be approximately 1.3 miles (see Attachment 1). Near Judy Creek the 100-year flood-peak water-surface elevation is likely to be about 34 feet. The average velocity in the channel is likely to be on the order of 3 to 5 fps and the average velocity in the floodplain is likely to be between 1 and 2 fps. Note that there appears to be a significant width of high ground (more than a mile wide) between Fish and Judy Creeks on the Cross Section 3 alignment.

Cross Section 4A is located on Fish Creek, near drill site "Spark #5" (see Attachment 1). The width of the 100-year floodplain is likely to be less than 1 mile. The peak water surface elevation is likely to be on the order of 40 feet. The average velocity in the channel is likely to be on the order of 4 to 7 fps and the average velocity in the floodplain is likely to be between 1 and 3 fps.

Cross Section 4B is located on Judy Creek, approximately 4 air miles upstream from Cross Section 3 at Judy Creek (see Attachment 1). The width of the 100-year floodplain is likely to be on the order of 1 mile. The peak water surface elevation is likely to be on the order of 48 feet. The average velocity in the channel is likely to be on the order of 4 to 7 fps, and the average velocity in the floodplain is likely to be between 1 and 2 fps.

The only topographic information available between the cross sections is provided by the U.S. Geological Survey topographic maps. The topographic information presented on these maps is insufficient to estimate the location of the 100-year floodplain between the cross sections.

Phillips Alaska, Inc.  
Attn: Mr. Paul Fairchild, P.E.  
April 13, 2001  
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I trust that this will be sufficient for your purposes at this time. If you have any questions, please do not hesitate to call.

Sincerely,

**URS Corporation**

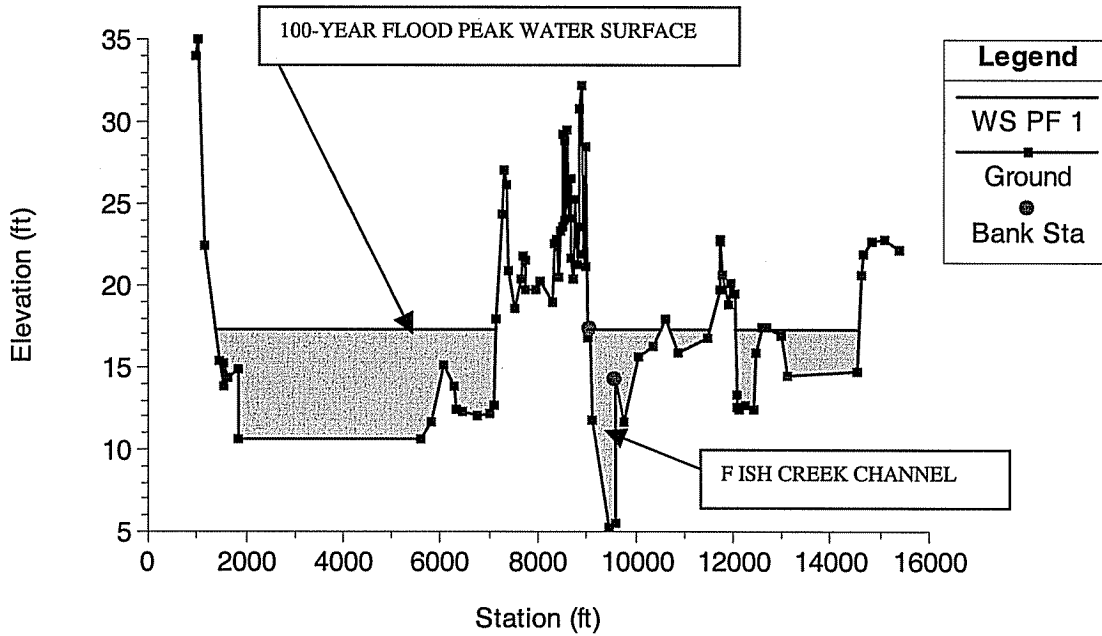
James W. Aldrich, P.H., P.E.  
Principal Hydrologist/River Engineer

cc: Caryn Rae, Phillips Alaska, Inc.

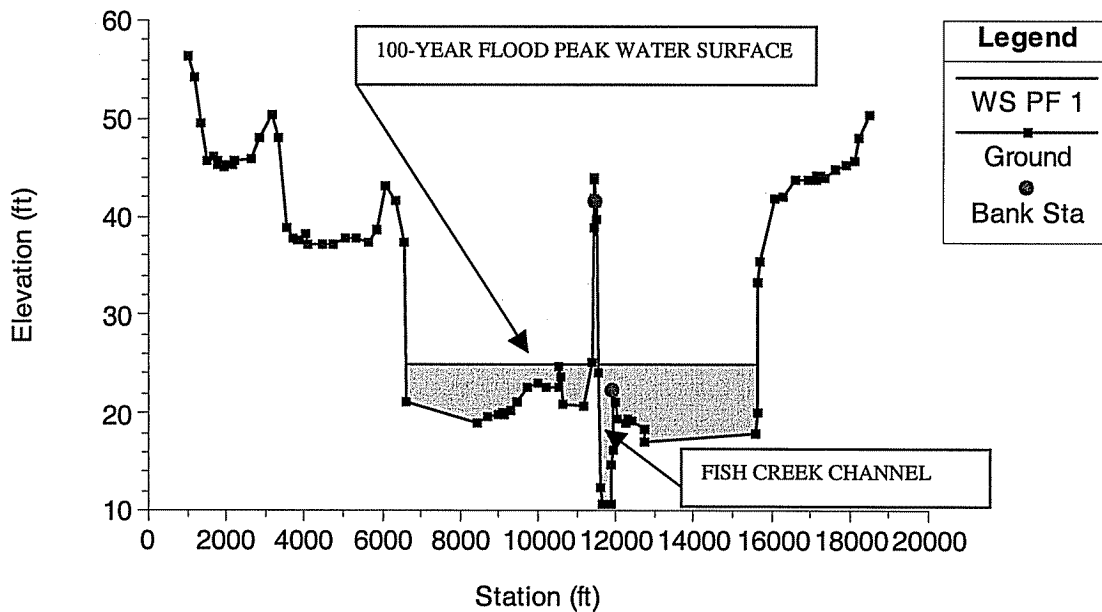
Attachment 1: Preliminary Assessment 100-year Flood Plain  
Attachment 2: Cross Sections

**ATTACHMENT 2: CROSS SECTIONS**

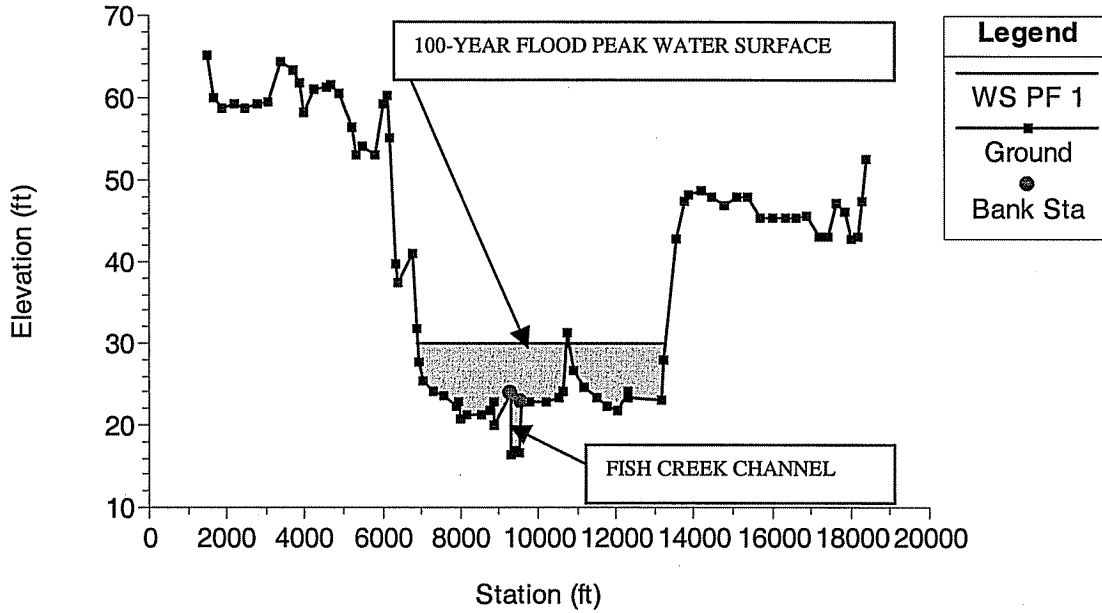
**Cross Section 1**



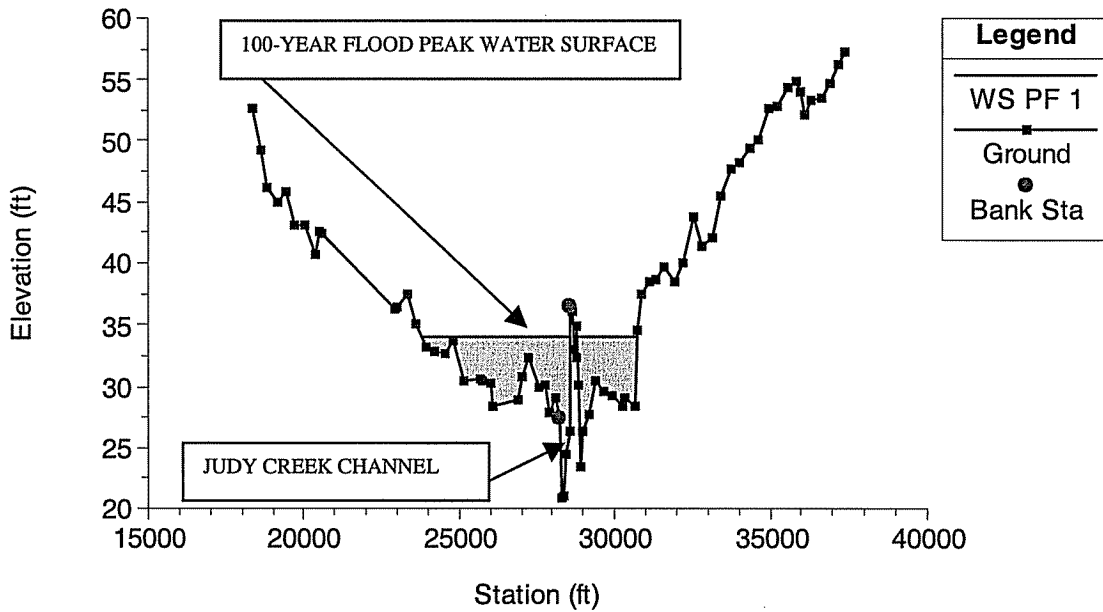
**Cross Section 2**



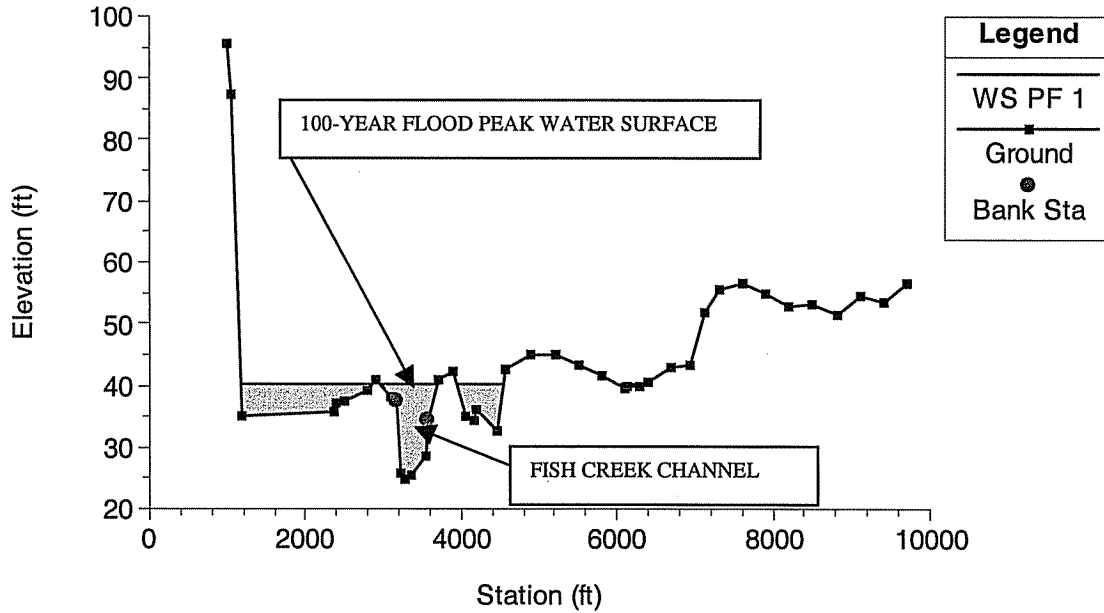
Cross Section 3 (northwest of turning point)



Cross Section 3 (southeast of turning point)



### Cross Section 4A



### Cross Section 4B

