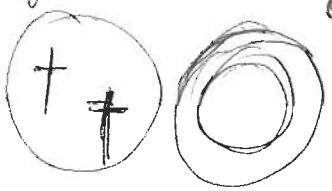
BADGER/RUSHY POND

HYDROTECHNICAL STUDY

WINTER MONITORING DATA

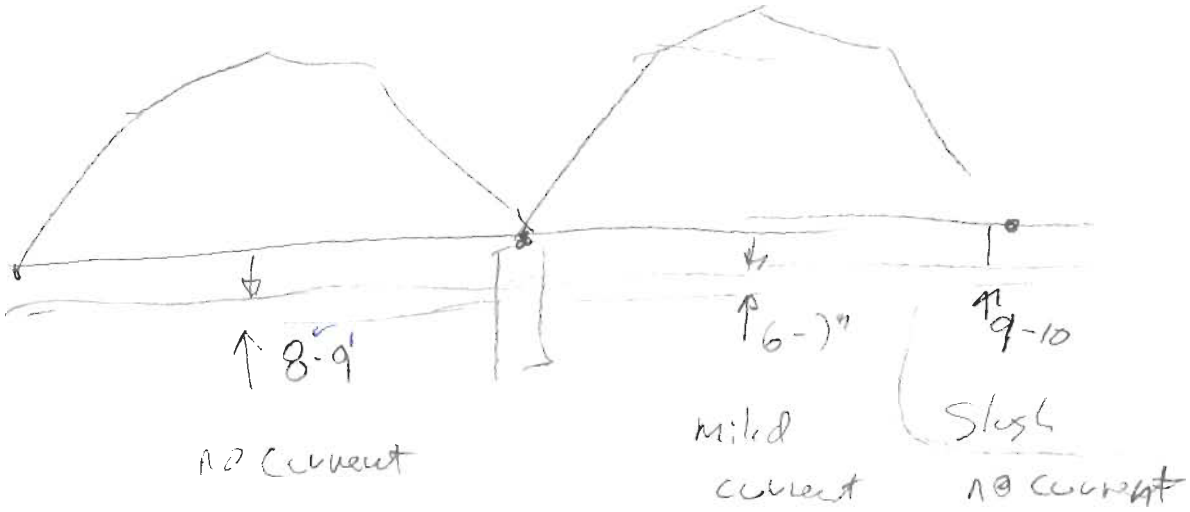
100,000 < last night

1. $CaCl_2$ → 45 kg.
1. kg ~ 45 kg



1. 100,000 tonight
2. 100,000.

486 - R41



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Water Levels within the Town of Badger have reduced by 8 cm (3in) throughout the day. The ice cover immediately upstream of the Town remained stable throughout the day. The production of new ice is predicted to be low - moderate over night.

Feb 10/03 (PM)

Mail Message Novell.

From: Ken Rollings
To: Ali Khan, Robert Picco
Date: Tuesday - February 18, 2003 3:35 PM
Subject: Ice generated since Feb 14/03

FYI....

Feb 14 - 1.300,000 m^3
Feb 15 - 1.000,000 m^3
Feb 16 - 500,000 m^3
Feb 17 - 200,000 m^3

Feb 18 - Forecasted 400,000 m^3 - conservative estimate - will probably be less.

Totals are 8 am to 8 am and are attributed to the first day.
So... since the peak, 1.7 MCM of ice was generated (Feb 15 - 17) upstream of Badger.

KEN

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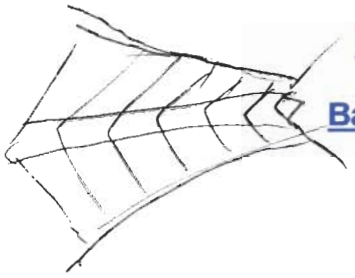

Retour au BureauMétéo

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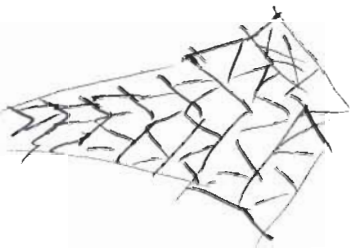
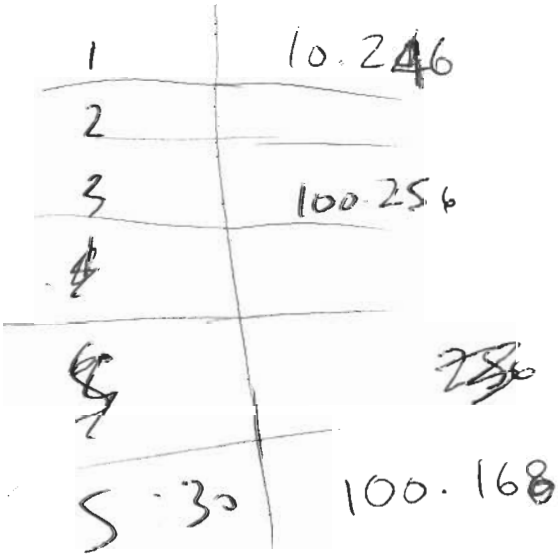


Tonight Wed Thu Fri Sat

-16 -16 -12 -16 -12

-10 -6 -10 -4



7:30 100.251 .320 8cm / 3.14

FAX # 539 5145

Attn R. Picco.

P 1 of 3

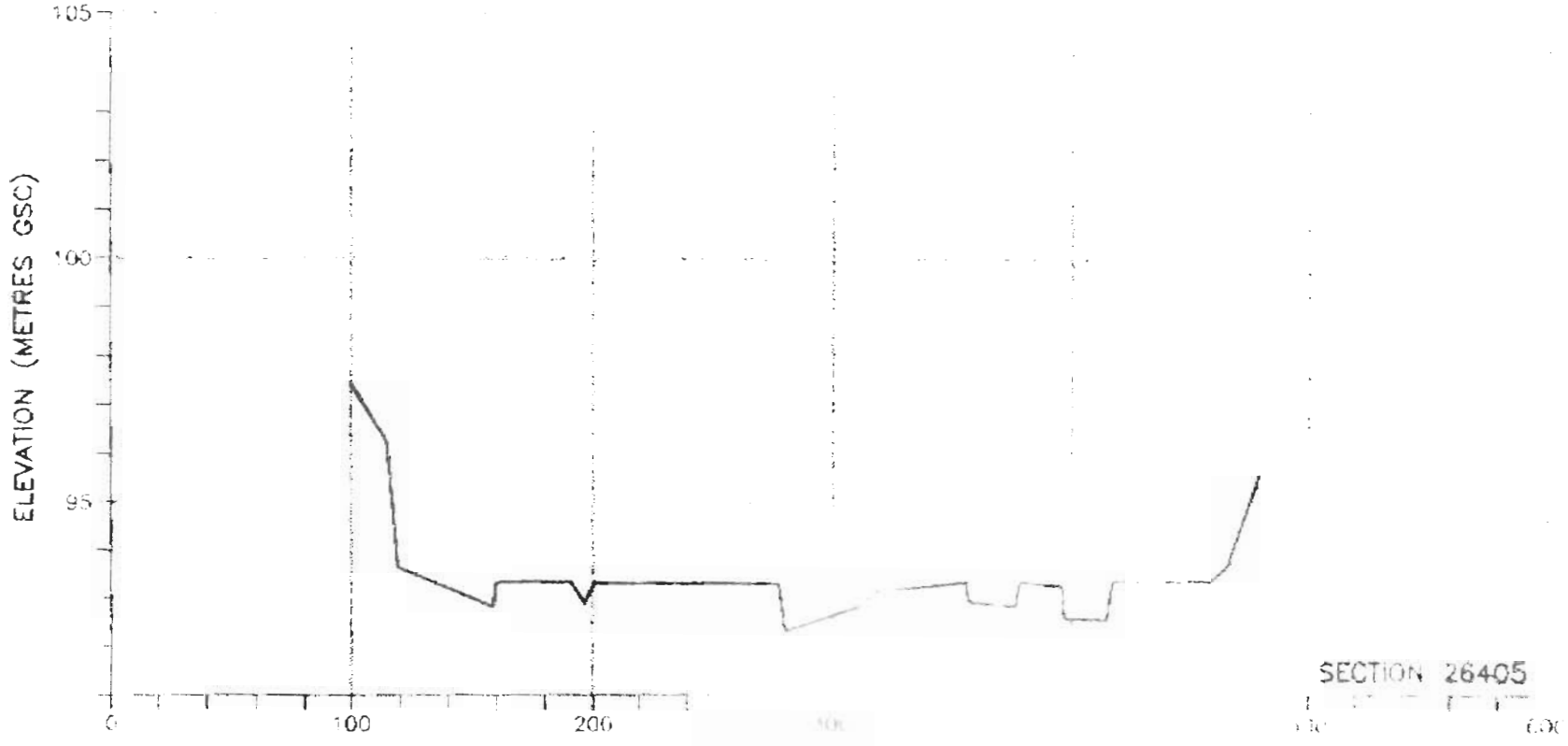
EXPLOITS RIVER - CROSS SECTIONS
BADGER CUT TO BADGER ROUGH WATERS

SECTION 27090

ELEVATION (METRES GSC)

600
500
400
100
0

EXPLOITS RIVER - CROSS SECTIONS
BADGER CHUTE TO BADGER ROUGH WATERS



for the final report could you reduce the size of these sheets

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site A Observer E. Gill Date Jan. 20/84 Time 9:20 AM

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where 2 small patches between North bank and Three Mile Island upstream of site A.

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 50 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 15 cm.

Comments

There is flat ice along both the North bank and South bank running out about 10 m from the shores. Between this area are the sheet ice and blocks (jam) upstream and downstream as far as is visible. There is no evidence of over bank flow which is hard to determine because of the large amounts of snow. The open patches of water are located, one at 20 m upstream of East tip of Three Mile Island and the North Bank and the second one is about 80 m upstream of East tip of Three Mile Island at about 15 m from the Island.

See Pictures 1-10, 11, 12, 13.

where are these pictures?

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site A Observer E. Gill Date Feb. 4/84 Time 10:00 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where 80-90 m upstream of tip of Three Mile Island at 20 m from Island. Width of open patch = 1 m.

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 35 cm Ice Quality: Competent

Snow Cover: Yes (wet) Approximate Depth 11 cm.

Comments

There is sheet ice (naturally frozen) at 0-10 m from both river banks and block (jam) in between this. It is hard to determine because of snow cover. There is no visible signs of sheer walls or overbank flow and the ends of the ice jam are not visible. There are two wet spots on the ice, one at 0-2 m from North bank about 3 m long at 30 m downstream of reference line and one at 60 m downstream of East tip of Three Mile Island at 5 m from South bank (20 m long by 5 m wide).

See Pictures 6-1, 2, 3.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site A Observer E. Gill Date Feb. 22/84 Time 4:45 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 54 cm Ice Quality: Competent
As measured March 5/84

Snow Cover: No Approximate Depth 11 cm.

Comments

The ice has leveled off completely since my last visit to this site, probably due to previous rainfalls. There is a sheer wall visible at 14 m from the north bank going upstream and downstream as far as I can see. There is no overbank flow or water on the ice in this area.

See Pictures 12-7, and 1-8 to 4-8.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site A Observer E. Gill Date Mar. 5/84 Time 2:10 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 54.3 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 2.5 cm.

Comments

The top of the ice is flat due to previous rain falls. No overbank flow, sheer walls visible, or wet spots on the ice. There is no sign of blocks (jam).

See pictures 12-12, 1-13, 2-13.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site A Observer E. Gill Date Mar. 21/84 Time 5:47 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 62 cm Ice Quality: Competent

Snow Cover: No Approximate Depth _____ cm.

Comments

There is about 2 cm of slush over the ice surface as it was very mild today. There is no overbank flow and the old sheer walls are visible as noted on the previous ice observations taken at this site. The ice surface is flat because of previous rain and snow falls. The water temperature was +0.25°C.

See pictures 16-6, 16-7, 16-8.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site B Observer E. Gill Date Jan. 20/84 Time 1:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 10 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 10 cm.

Comments

There is one small patch of open water about 30 m downstream of site B and there are several other small patches about 100 m downstream of site B all near centre of the river in the area of Gull Rocks. Sheet Ice and blocks (jam) are in areas at 100 m North bank of Exploits to the South bank 30 m upstream and downstream of the West tip of Gull Rocks and between an area 30 m from North bank right to South bank 30 m upstream of Gull Rocks on upstream and between centre of river and south bank downstream of East tip of Gull Rocks. No overbank flow present.

See Pictures 1-14, 15, 16, 17.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site B Observer E. Gill Date Feb. 4/84 Time 10:45 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 28 cm Ice Quality: Competent

Snow Cover: Yes (wet) Approximate Depth 7 cm.

Comments

There are three patchs of open water, one at 100 m downstream from reference line at bottom of Gull Rocks near centre ôf river at 3 m long by 1 m wide with a wet patch on ice going 10 m upstream of this open patch. Also one at 200 m downstream at 30 m from North bank at 20 m long by 2 m wide. The ice jam is located between Gull Rocks and South bank upstream and downstream and the other areas are naturally frozen sheet ice. The ice elevation in the centre of river appears to be 1 foot lower than our established elevation but the block (jam) appears to be at the same elevation as established.

See Pictures 6-4, 5, 6.

Sheet No. 3

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site B Observer E. Gill Date Feb. 22/84 Time 5:22 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat Ice

Ice Thickness: Not measured cm Ice Quality: Competent

Snow Cover: No Approximate Depth _____ cm.

Comments

There is an open patch of water at 125 m downstream from reference line at the bottom of Gull Rocks near the centre of the river at 6 m long by 1 m wide. The ice surface is completely flat due to previous rain. There is no overbank flow, sheer walls or water on the ice. There is rafted ice around Gull Rocks. There is no sign of blocks (jam) but it is evident from looking at the river banks that the ice has settled in the river. In the centre of the river the ice is 0.3 m lower than our regular location for taking ice elevations.

See Pictures 5-8 to 7-8.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site C Observer E. Gill Date Jan 19/84 Time 12:45 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 60 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 5 cm.

Comments

The ice jam is located in an area between 180 m from mouth of Junction Brook to 10 m from West bank of river. Upstream and downstream ends not visible. No overbank flow and no presence of sheer walls that could be seen because of snow on ice.

See Pictures 1-6, 7, 8.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site C (cross-section 4) Observer E. Gill Date Jan. 27/84 Time 2:20 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream of reference line.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 42 cm Ice Quality: Competent

Snow Cover: No Approximate Depth _____ cm.

Comments

Ends of ice jam not visible but it is in an area between 180 m from mouth of Junction Brook to the West bank of the river. There are two sheer walls present which tie together 60 m upstream and downstream of reference line. Pictures were taken to show this. They are located in the area between 150 m to 180 m from mouth of Junction Brook and 150 m from the mouth. The flat ice appears to be frozen wet snow. There is no presence of overbank flow.

See pictures 4-5, 6, 7, 8, 9.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site C (Cross-section 4) Observer E. Gill Date Feb. 28/84 Time 9:50 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 58 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 6 cm.

Comments

There is an open channel which runs from the mouth of Badger Brook on downstream as far as I can see. The channel is approximately 105 m wide and is located at 5 to 110 m from the East river bank. The channel runs inside the 3 small islands upstream of this section line and outside against the islands at a width of 15 m. The top of the ice is mostly flat except for random spots of the old blocks (jam). The snow cover was patchy over the ice surface as the snow was drifting. There is a rather big crack at 2.5 cm wide in the ice at 10 m from the West bank. There is no overbank flow or signs of sheer walls. The ice is rafted up at 5 to 20 m from the West bank from the reference line on downstream.

See pictures 1-12 to 6-12.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site C (Cross-Section 4) Observer E. Gill Date Mar. 21/84 Time 10:00 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream except as noted

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 61 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 5 cm.

Comments

There is an open channel at 5 to 110 m from the East bank running from the mouth of Badger Brook on downstream as far as I could see. The channel runs inside and outside (15 m) the small islands located just upstream of Site C. The top of the ice is flat and covered with snow. There is no signs of sheer walls or overbank flow. There are some patches of rafted ice just downstream along the West bank and some old blocks (jam) downstream of the reference line. The elevation of the water in the channel was approximately 96.07 m. The temperature of the water was at +0.5°C.

See pictures 15-1 to 15-6.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site D Observer E. Gill Date Jan. 19/84 Time 3:45 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where 3 m x 2 m patch approximately 75 m from East bank 15 m upstream of site D.

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Approximately 7.5 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 5 cm.

Comments

The entire width of the river at this site shows the presence of an ice jam and the locations of the upstream and downstream ends are not visible. There is no indication of overbank flow or sheer walls at this site.

See picture 1-9.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site D (cross-section 3) Observer E. Gill Date Jan. 30/84 Time 1:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream of reference line.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 41.6 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 15 cm.

Comments

There is no visible ends of the ice jam upstream or downstream. There is no presence of sheer walls or overbank flow. Again it is difficult to determine because of the snow cover.

See pictures 4-10, 11, 12.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site D, (Cross-Section 3) Observer E. Gill Date Feb. 23/84 Time 11:19 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat and rafted ice

Ice Thickness: 49 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 2 mm.

Comments

There is an open channel at 40 m wide which runs from Badger Brook to 250 m downstream of Site D, running tight to the East bank. Because of previous rain the ice is mostly flat except for some rafted patches upstream and downstream of the section line. The ice has rafted up along the river banks at approximately 0 to 2 m from East side of the river and 0 to 5 m from West side of the river. There is no sign of sheer walls or water on the ice in this area.

See pictures 8-8 to 12-8.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site E Observer E. Gill Date Jan. 24/84 Time 12:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 25 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 25 cm.

Comments

The ice jam is visible upstream and downstream as far as I can see. The ice appears to be rafted up at 2 to 15 m from the East bank about 10 m upstream and downstream to about a metre above the average ice elevation. There is no presence of overbank flows or sheer walls. It was difficult to determine ice conditions here because of the snow cover. The snow was drifted up behind the protruding ice blocks as I could see.

See Picture 2-10.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site E (cross-section 2) Observer E. Gill Date Jan. 30/84 Time 4:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 20.6 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 43 cm.

Comments

There are no visible ends of the ice jam upstream or downstream. There is no presence of sheer walls or overbank flow. As on January 24, there are higher jams of ice. (Rafted ice on the East side of the river approximately 2 to 15 m from the river bank 10 m upstream and downstream). Because of the snow cover it is hard to determine the conditions.

See pictures 4-13, 14, 15.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site E, (Cross-Section 2) Observer E. Gill Date Mar. 7/84 Time 3:45 P.M.

Staff Gauge (if applicable) _____ m at _____h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where In channel area upstream and downstream

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 25 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 12 cm.

Comments

There is an open channel running upstream and downstream of reference line at 35 to 80 m from the East river bank. Estimated ice elevation is 90.04 m (Geodetic) in channel area. The ice is competent but it is deteriorating in the channel area, as pieces are breaking off from the sides. There is no evidence of blocks (jam) but there is rafted ice along both river banks at 4 to 15 m from East bank and about 0 to 5 m from West bank. There is no overbank flow or water on the ice.

See pictures 11-14 to 15-14.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site F Observer E. Gill Date Jan. 24/84 Time 3:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See note below

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Upstream and downstream on entire river

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 50 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 30 cm.

Comments

The open water is in an area 30 m downstream of site F (between a small rock (island) which is about 30 m from West bank to the West bank) and goes down to the transmission line. There are also some open patches of water downstream of the transmission line randomly located. There is no visible end of the ice jam upstream but the ice gets fairly flat at 120 m upstream of the transmission line and then on downstream. There is rafted ice about 2 m out from both river banks upstream and downstream. Because of snow it is hard to determine ice conditions.

See pictures 3-1, 2, 3, 4, 5.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site F (cross-section 1) Observer E. Gill Date Feb. 3/84 Time 11:00 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 15 (average) cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 35.2 (average) cm.

Comments

There are two patches of open water, one at 60 to 80 m downstream of reference line to within 100 m of transmission line between small island and West bank at 5 m wide and one at 150 m downstream of transmission line at 5 - 10 m from East bank at 60 m long. There are some wet patches in centre of river at 120 m upstream of transmission line that have frozen over. At this point and on downstream the ice is flat and appears to have frozen naturally. There is rafted ice along both river banks at 2 to 10 m from banks upstream and downstream. There is approximately 5 cm of water on the ice under the snow. There is no overbank flow or presence of sheer walls.

See pictures 5-8, 9, 10, 11, 12, 13, 14.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site F, (Cross-Section 1) Observer E. Gill Date Mar. 7/84 Time 11:50 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where See notes below

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat and rafted ice

Ice Thickness: 25 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 20 cm.

Comments

From the point of land (chute) on East bank of river downstream of Site F there are blocks (jam) at 20 m from the East bank to 80 m from the West bank. This ends at approximately 150 m downstream of this point of land. There are areas of rafted ice between West bank and 80 m from this bank, as well as some randomly located around the river. Below the area of blocks (jam) is mostly flat ice and there is a channel of open water that runs into the East bank in a small cove just downstream of the chute. The channel is approximately 5 m wide on the average. Below this channel there is solid competent ice. There is also an open patch of water at approximately 125 m downstream of the point of land (chute) at 10 m long by 2 m wide. At 10 m downstream of the chute the main channel ends. It is approximately 30 m wide in this area. At Site F, (Cross-section 1) there are blocks (jam) downstream and upstream of the reference line

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site F, (Cross-Section 1) Observer E. Gill Date Mar. 7/84 Time 11:50 A.M.

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at 65 m to 130 m from the East bank; upstream for 150 m and downstream to the chute. There is a small channel of open water running between 65 to 80 m from the East bank. There is rafted ice located randomly around the river and some along both East and West banks at 0 to 5 m from the banks. There is no moving ice in this area. There is also an open patch of water at 10 m downstream of reference line 2 m wide at 130 m from East bank. From 150 m to 250 m upsteam of the reference line the width of the blocks (jam) is 100 m located near centre of the river. From 250 m on upstream the river is open with approximately an 80 m wide channel with the rest being shore ice along the river banks. In places there are small amounts of water on the shore ice. There is also a channel filled with blocks (jam) going from 250 m upsteam of the reference line downstream towards the West bank in the direction of the small island located just out from the West bank. The blocks (jam) are shifting continuously but are not moving any great distances. Upsteam of the blocks (jam) there are small blocks and sheets of ice floating downstream towards the blocked ice. The ice elevation at Site F was 86.42 m (Geodetic).

See pictures 1-14 to 10-14.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Jan. 23/84 Time 12:00 Noon

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Centre of river near rock area upstream of site G

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 40 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 55 cm.

Comments

When using survey rod to measure ice thickness we found that below the ice level there was a lot of slob ice as we could feel it with the rod. There appears to be rafted ice at 15 m from the shore line on both sides of the river upstream and downstream. It is approximately 61 cm above the ice elevation. There is no presence of overbank flow or sheer walls as far as I can tell because of snow cover.

See pictures 2-1, 2, 3, 4.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Feb. 3/84 Time 4:35 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Centre of river near rock outcrop upstream of site G.

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other (naturally frozen)

Ice Thickness: 43 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 44 cm.

Comments

There is rafted ice on both sides of the river at 10-20 m from river banks upstream and downstream at about 61 cm higher than the ice elevation we recorded. There were no ice jams visible, or overbank flow, or sheer walls. It is hard to determine because of the snow cover.

See pictures 5-15, 16, 17, 18.

Sheet No. 3

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Feb. 22/84 Time 3:10 P.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire Brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice (naturally frozen

Ice Thickness: Didn't measure cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 30 cm.

Comments

There is open water upstream of the reference line near an outcrop of rocks at the centre of the river. It is a snake-like channel at approximately 4 m wide which swings toward the South bank as it goes upstream. The stationary ice appears to be naturally frozen ice and there are a lot of wet patches all over the ice that have recently frozen over. There are no visible sheer walls or over bank flow. There is rafted ice at 10 to 20 m from both river banks.

See pictures 8-7 to 11-7.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Feb. 29/84 Time 4:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: 30 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 28 cm.

Comments

Upon arrival at this site I noticed there was extensive changes to the ice. From 30 to 38 m from the North bank at 100 m downstream of the reference line and on upstream of the reference line to the rock outcrop located at the centre of the river there is one big wet spot on top of the ice. At 150 m upstream of the reference line to the rock outcrop there are numerous open patches of water within the wet spot I have indicated as well as some outside taking on a snake like appearence. At 30 m upstream of the reference line to 20 m downstream of the line there is a big patch of open water at 30 to 38 m from North bank. Just downstream of this open patch there are small patches of water within the wet

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Feb. 29/84 Time 4:30 P.M.

area indicated. Also there are blocks of ice (1 m wide x 1 m long x 0.3 m thick) pushed upon the ice just below the open patch of water. The measured ice thickness breaks down as follows:

frozen slush = 25 cm
solid ice = 5 cm
snow = 28 cm

There is slob ice underneath the ice as I could feel it with the ice auger. The slob ice was stationary. These ice measurements were taken at 30 m from the North river bank.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Mar. 21/84 Time 1:20 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream except as noted

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: Did not measure cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth (along the banks) 15 cm.

Comments

At 300 m upstream of the reference line there is an open channel approximately 3 m wide. It travels in a snake-like fashion on upstream around the rock outcrop near the centre of the river and goes towards the South bank on upstream as far as I could see. Between 30 m upstream and 30 m downstream of the reference line there is an open channel at 40 to 50 m from the North bank. Between 30 m to 60 m downstream of the reference line the channel continues at 40 m from the North bank but it is only 2 m wide and it goes on downstream from there. There are wet spots on both sides of the channel at one meter wide on the North side and 10 m wide on the South side. Between the two open channels, at 30 to 300 m upstream of the reference line, there are wet patches on the ice near the centre of the river and some between the North bank and the centre of the river. Note that Tom Joe Brook is open and it was open previous to this date but I failed to record it.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G Observer E. Gill Date Mar. 21/84 Time 1:20 P.M.

At the open patch of water 30 m downstream of the reference line there appears to be some sort of ice jam as the water is flowing over the ice. It only flows like this for a couple of meters and then back into the open channel. I feel that the water has flowed over the ice in this area and on downstream and this is what has made the small open channel which runs on downstream past Site G-1. There is no overbank flow or blocks (jam) in this area but there is rafted ice along the North side of the river upstream and downstream of the reference line, as noted on previous site observations, as well as along the South side of the river. The water elevation in the open channel was estimated at 994.79 m (referred to TBM G-assumed elevation 998.848 m).

See pictures 15-7, 15-8, 15-9

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G-1 Observer E. Gill Date Mar. 5/84 Time 10:02 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Upstream at site G as recorded on Feb. 29/84.

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: 47 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 20 (Patchy) cm.

Comments

The open water at site G1 is the same as indicated except that the snow has covered the large wet spot and the small open patches of water are not visible, but the large one is still open. There is rafted ice along both river banks at 0 to 4 m from the banks. There is no water on the ice or sheer walls visible. The snow is drifted up over the ice surface in patches.

Note: From reference line G to G1 it is 233 m, following the river bank.

See Pictures 7-12 to 11-12.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site G-1 Observer E. Gill Date Mar. 21/84 Time 2:05 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where Just upstream and downstream of Site G1 in open channel

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream except as noted

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: (Hole 1) 64 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth (Drifts) Average 20 cm.

Comments

There is an open channel which goes from the reference line on downstream as far as I could see and upstream to site G at 134 to 137 m from the North bank. The ice is wet along the channel at 20 m on each side of the channel. The channel swings towards the South bank as it goes downstream from Site G1. There are wet patches located randomly over the ice surface and there is rafted ice along both banks at 0 to 2 m from the banks. Snow is drifted up in various places over the ice surface. The temperature of the water was at +0.5°C.

See pictures 15-10, 15-11, 15-12.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H Observer E. Gill Date Jan. 23/84 Time 3:15 P.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: Yes Where Exploits River side of wooden culvert (small patch)

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Exploits River, both sides of T.C.H. at North Angle.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other (or naturally frozen ice)

Ice Thickness: 5 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 15 cm.

Comments

The only other note is that the ice thickness was measured at inlet of culvert and is undoubtly much thicker the further away you go from the inlet or outlet of the culvert.

See pictures 2-5, 6, 7.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H Observer E. Gill Date Feb. 27/84 Time 2:39 P.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Both sides of Trans Canada Highway

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: 5 cm Ice Quality: Competent but deteriorating

Snow Cover: Yes Approximate Depth 5 cm.

Comments

There is one open patch of water 8 m wide x 2 m long on North side of Trans Canada Highway and one at 12 m wide x 50 m long on the South side of the Trans Canada Highway. The ice is deteriorating in the open patch areas and the snow is slushy in these areas. There is no overbank flow, sheer walls or ice jams. There is water on the ice between 50 and 60 m from the South bank of the Trans Canada Highway just outside the open water area.

See pictures 8-11 to 10-11.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H Observer E. Gill Date Mar. 22/84 Time 4:22 P.M.

Staff Gauge (if applicable) Ice elevation 69.95 m as Mar. 21/84 1645 h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Both sides of the Trans Canada Highway

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: Channel area -5 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth cm.

Comments

There is a small patch of open water on the North side of the Trans Canada Highway at 5 wide by 1.5 m long by the culvert and an open patch on the South side of the Trans Canada Highway at 3 m wide by 50 m long at the culvert. The ice is mostly covered with water as it is mild today. There is no overbank flow, sheer walls or ice jams. The water temperature was +0.5°C.

See pictures 18-9, 18-10.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H Observer J. Loder Jr. Date Apr. 4/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Where _____

Moving Ice: Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Approximate Depth _____ cm.

Comments

The Exploits River is still completely ice covered except for a small patch of open water (2 m x 30 m) located near the south end of the culvert crossing the Trans Canada Highway.

Sheet No. 5

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H Observer E. Gill Date Apr. 21/84 Time _____

Staff Gauge (if applicable) _____ m as _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth _____ cm.

Comments

A patch of open water 20 m 40 m exists near the mouth of the culvert on the south side of the Trans Canada Highway.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H-1 Observer E. Gill Date Feb. 27/84 Time 4:50 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Small patch (10 m long x 1 m wide) at 150 m upstream of reference line at 300 m from the North bank

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: 45 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 8 cm.
(Todays accumulation)

Comments

There are no sheer walls or overbank flow. There is slush on top of the ice and a lot of patches of water that have recently frozen over but are not completely solid. It appears from the cracks along the river bank that the ice has settled in the river.

See pictures 11-11, 12-11.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site H-1 Observer E. Gill Date Mar. 21/84 Time 3:15 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 24 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth (Patches) 5 cm.

Comments

There is water covering about 70% of the ice surface. Also there appears to be a channel in the making at 290 m from the North bank to 10 m from the South bank, upstream and downstream. There is a lot of slush covering the ice in this area. There are also some small patches of open water along the North bank. There is rafted ice along both banks at 0 to 2 m from the banks. There are no sheer walls or ice jams visible. The water temperature was +0.5°C. The top elevation of an ice scar on the North bank was 75.80 m Geodetic.

See pictures 16-1 to 16-5.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site I, Cross-Section 5) Observer E. Gill Date Feb. 2/84 Time 2:40 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Sheet ice (naturally frozen)

Ice Thickness: 44.1 (average) cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 15 cm.

Comments

There are no ice jams in this area. Also there is no visible sheer walls or water on top of the ice.

See pictures 5-5, 6, 7.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site I, (Cross-Section 5) Observer E. Gill Date Feb. 27/84 Time 2:00 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: Didn't measure cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 7 cm.

Comments

There is a 2 m wide channel between the outer tip of the Exploits Bank (main river) to 100 m back from this outer tip between the downstream tip of Aspen Island and the Exploits River bank at 5 m from the bank. There is no overbank flow, sheer walls, ice jams or water on the ice in this area.

See pictures 4-11 to 7-11.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Cross-section 6 Observer E. Gill Date Feb. 24/84 Time 11:00 A.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where In open channel area upstream and downstream

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other Frazil

Stationary Ice: Yes Where Entire Brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Approximate Depth _____ cm.

Comments

There is an open channel which runs from the mouth of Badger Brook on downstream as far as I can see. The channel is tight to the East river bank running inside the 3 small islands and it is also running outside the islands for a width of approximately 15 m. The ice surface is mostly flat due to previous rain although there are some old blocks (jam) located at 0 to 20 m downstream of reference line at 30 m from West bank to 30 m of West bank of small islands, and 0 to 200 m upstream of reference line at 20 m wide at the centre of the river. Also there is rafted ice along the West river bank at 20 m upstream of reference line and on upstream at 0 to 15 m from the West bank. This is part of the blocks (jam) that was here previously. There is no overbank flow, sheer walls or water on the ice. The blocks (jam) is about 0.5 m above the measured elevation of the ice at this time. The ice is cracking a lot as I can hear it and it seems to be deteriorating in the open channel area.

See pictures 11-9, 12-9, 1-10, 2-10 and 3-10.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Cross-Section 7 Observer E. Gill Date Feb. 22/84 Time 12:15 P.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 42 cm Ice Quality: Competent

Snow Cover: No Approximate Depth _____ cm.

Comments

The top surface of the ice is completely flat because of previous rain. There is no overbank flow and it appears that the ice has sagged 1 m according to the river banks. There are small patches of water that have not long frozen over at 2 to 4 m from the North bank upstream and downstream. There is presence of an old sheer wall at 11 m from the North bank upstream and downstream and one at 35 m from the South Bank upstream and downstream but it tapers to the bank at 150 m downstream of the reference line.

See Pictures 1-7 to 7-7.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Cross-section 31 Observer E. Gill Date Feb. 23/84 Time 3:45 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire River upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat and rafter ice

Ice Thickness: 48 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 2 mm.

Comments

There is an open channel which runs from the mouth of Badger Brook to 250 m downstream of Site D, at 0 to 60 m from the East river bank. The ice surface is completely smooth due to previous rain but there are a lot of patches of rafted ice near the centre of the river and some from the centre of the river to the West bank between reference line and point of land on East river bank downstream. As well, there are scattered rafted patches, all probably in rock areas. The rafted ice near the centre of the river follows a line going from 150 m downstream of reference line to 250 m upstream tapering away near centre and tying in to West bank respectively. There appears to be some ice rafted up along both river banks (overbank flow). There is no indication of blocks (jam) or water on the ice. The rafted ice in the main river area is at the same elevation as for Hole Number 2.

See pictures 1-9 to 5-9.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Cross-section 32 Observer E. Gill Date Feb. 24/84 Time 10:00 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat Ice

Ice Thickness: 45.5 cm Ice Quality: Competent

Snow Cover: No Approximate Depth _____ cm.

Comments

There is an open channel at approximately 90 m wide running from the mouth of Badger Brook to 250 m downstream of Site D. The channel runs tight to the East River Bank. The top surface is completely flat due to previous rain. There is rafted ice at various spots downstream of reference line but the ice is mostly flat upstream. The rafted ice is approximately 0.5 m above the measured ice elevations and is probably a result of rocks under the ice. There is no indication of overbank flow, sheer walls, or blocks (jam). The ice is doing a lot of cracking this morning and I have noticed recent cracks.

See pictures 6-9 to 10-9.

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer E. Gill Date Jan. 23/84 Time 4:30 P.M.

Staff Gauge (if applicable) 97.510 m at 16:30h
(ice elevation)

ICE CONDITIONS

Open Water: Where _____

Moving Ice: Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Approximate Depth _____ cm.

Comments

No ice observations recorded.

See picture 2-8.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer E. Gill Date Feb. 1/84 Time 9:45 A.M.

Staff Gauge (if applicable) 97.586 m at 0945 h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where Downstream of bridge in open patches

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Upstream and downstream entire brook

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen ice

Ice Thickness: 7.6 cm Ice Quality: Competent but deteriorating

Snow Cover: Yes Approximate Depth 10 cm.

Comments

There are 4 patches of open water. One runs from centre of bridge to 25 m downstream between centre abutment and North bank at 3 m wide, one between 3 and 4 m from North bank and between 1 to 5 m downstream of bridge, one between centre abutment and South bank at 1 m wide under bridge to 5 m wide at 15 m downstream of bridge and also one at 10 to 11 m downstream of bridge at 4 to 5 m from South bank. There is no overbank flow. There is water flowing over the ice below the open patches I have described. Also there are wet patches at 0-2 m from both banks upstream of bridge.

See pictures 4-20, 21, 22.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer E. Gill Date Feb. 24/84 Time 2:40 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Entire Brook upstream and downstream

Moving Ice: Yes Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other Frazil

Stationary Ice: Yes Where 75 m downstream of bridge at 20 m from the South Bank

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Nil cm Ice Quality: Nil

Snow Cover: No Approximate Depth _____ cm.

Comments

There is shore ice along both river banks at 0 to 5 m from North banks downstream of the bridge and at 0 to 2 m from the South bank upstream of the bridge.

See pictures 6-10 to 7-10.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date Mar. 14/84 Time _____

Staff Gauge (if applicable) 97.28 m at ____h

ICE CONDITIONS

Open Water: Yes Where See notes below.

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

Open water channel is one half the brook's width with shore fast ice on both banks of one quarter brook's width each.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer E. Gill Date Mar. 22/84 Time 1:10 P.M.

Staff Gauge (if applicable) Water elevation 97.13 m at 1310 h

ICE CONDITIONS

Open Water: Yes Where Entire brook upstream and downstream

Moving Ice: Yes Where Upstream of new Badger Brook Bridge (small amount)

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Shore ice (naturally frozen)

Ice Thickness: 5 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth cm.

Comments

At 10 to 50 m downstream of the new bridge at 0 to 10 m from the West bank there is shore ice and from 50 m on downstream there is also shore ice at 0-2 m from the West bank. On the East side of the river there is only one small patch of shore ice upstream of the bridge. There is no shore ice on the West side but on the East side there is some at 0-1 m from the bank. There is no overbank flow, sheer walls, or water on the ice. The temperature of the water was +2°C but note that this temperature was taken in shallow water which may be affected by the sun's rays.

See pictures 18-4, 18-5.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date Apr. 4/84 Time _____

Staff Gauge (if applicable) 96.90 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date Apr. 12/84 Time _____

Staff Gauge (if applicable) 97.05 m at ____h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date Apr. 18/84 Time _____

Staff Gauge (if applicable) 96.82 m at _____h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer E. Gill Date Apr. 21/84 Time _____

Staff Gauge (if applicable) 97.05 m at ____h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

Sheet No. 10

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date Apr. 25/84 Time _____

Staff Gauge (if applicable) 96.90 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

Sheet No. 11

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Badger Brook Bridge Observer J. Loder Jr. Date May 2/84 Time _____

Staff Gauge (if applicable) 97.36 m at ____h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free.

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer E. Gill Date Jan. 23/84 Time 4:55 P.M.

Staff Gauge (if applicable) 98.174 m at 1655 h

ICE CONDITIONS

Open Water: Where

Moving Ice: Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Where

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other

Ice Thickness: cm Ice Quality:

Snow Cover: Approximate Depth cm.

Comments

No ice observations noted.

The ice elevation given above is near the guage but the actual ice level at the centre of the bank is approximately 0.5 metres lower.

See picture 2-9.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer E. Gill Date Feb. 1/84 Time 4:50 P.M.

Staff Gauge (if applicable) 98.174 m at 1650 h

ICE CONDITIONS

Open Water: No Where

Moving Ice: No. Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen ice

Ice Thickness: 30 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 8 cm.

Comments

There is no overbank flow, sheer walls or water on top of ice in this area. The ice elevation given above is for the ice level by the guage but near the centre of the bank the ice is approximately 0.5 metres lower than the guage reading.

See pictures 5-1, 2, 3, 4.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer E. Gill Date Feb. 24/84 Time 2:15 P.M.

Staff Gauge (if applicable) 97.94 m at 1415 h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire Brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: Didn't measure cm Ice Quality: competent

Snow Cover: No Approximate Depth _____ cm.

Comments

The ice is at the elevation shown above near the abutments but sags near the centre of the brook to an elevation of approximately 97.48 m.

See pictures 4-10 to 5-10.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date Feb. 24/84 Time 2:15 P.M.

Staff Gauge (if applicable) 98.10 m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Bank to bank, upstream and downstream of bridge

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ cm.

Comments

The ice was sagged in the centre of the brook to approximate elevation of 97.64 m.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer E. Gill Date Mar. 22/84 Time 11:49 A.M.

Staff Gauge (if applicable) Ice elevation 97.95 m at 11:49 h

ICE CONDITIONS

Open Water: Yes Where A small 0.5 m x 0.5 m patch at 3 m downstream of the bridge near the centre of the Brook

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire Brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice covered with water

Ice Thickness: 55 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth cm.

Comments

There are no overbank flow or sheer walls or ice jams. The temperature of the water was +0.5°C. The ice was 0.3 m lower near the centre of the Brook than the elevation above.

See pictures 18-1, 18-2, 18-3.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date Apr. 4/84 Time 11:49 A.M.

Staff Gauge (if applicable) Ice elevation 98.02 m at ____ h

ICE CONDITIONS

Open Water: Yes Where ____

Moving Ice: No Where ____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other ____

Stationary Ice: Yes Where Bank to bank

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other ____

Ice Thickness: Not measured cm Ice Quality: See notes

Snow Cover: No Approximate Depth ____ cm.

Comments

At the centre of the brook the top of the ice has sagged to elevation 97.41 metres.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date Apr. 12/84 Time _____

Staff Gauge (if applicable) Ice elevation 97.87 m at _____ h

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: Deteriorating

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

Ice elevation at the centre of the brook is 97.57.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date Apr. 18/84 Time _____

Staff Gauge (if applicable) 97.79 m at _____ h Ice elevation

ICE CONDITIONS

Open Water: Yes Where Small patches upstream and downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: Deteriorating

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer E. Gill Date Apr. 21/84 Time _____

Staff Gauge (if applicable) Ice elevation 97.79 m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below.

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

Upstream of the bridge there are numerous small open patches of water in the ice cover. To a point 150 metres downstream of the bridge the brook is open except for ice two metres wide along both banks. From this point to the mouth, the brook is ice covered with several open water patches.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date Apr. 25/84 Time _____

Staff Gauge (if applicable) 97.56 m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below.

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

The brook is ice free except for ice on both banks.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Little Red Indian Brook Bridge Observer J. Loder Jr. Date May 2/84 Time _____

Staff Gauge (if applicable) 97.56 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer E. Gill Date Jan. 26/84 Time 8:45 A.M.

Staff Gauge (if applicable) 69.746 m at 0845 h (Top of ice)

ICE CONDITIONS

Open Water: Yes Where Approximately 4 m downstream of Rushy Pond Bridge near centre of brook

Moving Ice: No. Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other

Ice Thickness: 5 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 5 cm.

Comments

There is evidence that the ice has deteriorated as indicated by the open water, as yesterday this area was not open. There is an average of 1 to 2 cm of water on most of the ice surface, as it rained most of yesterday.

See pictures 3-9, 10.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer E. Gill Date Feb. 3/84 Time 3:00 P.M.

Staff Gauge (if applicable) 69.806 m at 1500 h

ICE CONDITIONS

Open Water: Where _____

Moving Ice: Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Approximate Depth _____ cm.

Comments

No ice observations noted.

Staff guage readings taken to show rise in ice level.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer E. Gill Date Feb. 24/84 Time 3:45 P.M.

Ice elevation
Staff Gauge (if applicable) 69.87 m at 1545 h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire Brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: Estimate 5 cm Ice Quality: Competent but deteriorated

Snow Cover: Yes Approximate Depth 3 mm.

Comments

There is an open patch of water at 5 to 10 m downstream of the bridge, the full width of the Brook. From upstream edge of the bridge to 5 m downstream of the bridge, the water has not long frozen over in this area. There is also a small open channel running from 10 to 40 m downstream of the bridge near the centre of the river. It appears this area is starting to refreeze. Other than these areas, the ice is competent but has deteriorated since my last visit. There is also an open patch of water under the C.N.R. bridge.

See pictures 11-10, 12-10.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date Mar. 14/84 Time _____

Ice elevation
Staff Gauge (if applicable) 69.85 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Small patch immediately downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer E. Gill Date Mar. 22/84 Time 4:41 P.M.

Ice elevation
Staff Gauge (if applicable) 69.93 m at 1641 h

ICE CONDITIONS

Open Water: Yes Where A couple of small holes near log boom at 3 m downstream of bridge

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice (naturally frozen)

Ice Thickness: 5 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth cm.

Comments

There is water and slush over most of the ice surface. The ice is deteriorated and from the bridge downstream to 30 m the ice is black in appearance. The temperature of the water is at +0.5°C.

See pictures 18-11, 18-12, 18-13.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date Apr. 4/84 Time _____

Staff Gauge (if applicable) 69.81 m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below.

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ mm.

Comments

The brook is open bank to bank from the C.N. Railway bridge to a point approximately midway between the old and the new Trans Canada Highway bridges. The remainder of the brook is ice covered.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date Apr. 12/84 Time _____

Staff Gauge (if applicable) 69.80 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date Apr. 18/84 Time _____

Staff Gauge (if applicable) 67.79 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream of bridge

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

There is solid ice cover from the old Trans Canada Highway bridge to the Exploits except for an open water channel three metres wide.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer E. Gill Date Apr. 21/84 Time _____

Staff Gauge (if applicable) 70.25 m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below.

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ mm.

Comments

The brook is open from the bridge upstream to the C.N. Railway bridge. Downstream is open except for 20 metres of ice on the west side and three metres on the east side of the brook. This continues to a point 100 metres upstream of the old Trans Canada Highway bridge where the open water channel narrows to four metres wide. Downstream of the old bridge, the brook is open.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date Apr. 25/84 Time _____

Staff Gauge (if applicable) 70.65 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Rushy Pond Brook Bridge Observer J. Loder Jr. Date May 2/84 Time _____

Staff Gauge (if applicable) 70.75 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Jan. 26/84 Time 3:57 P.M.

Staff Gauge (if applicable) _____ m at _____ h

Ice elevation 75.36 m

ICE CONDITIONS

Open Water: Yes Where Small patch approximately 60 m downstream of bridge at 1 m from West bank

Moving Ice: No. Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire brook upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 15 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 7 cm.

Comments

The small open patch of water is not a result of ice deterioration but is possibly a result of ice sagging in the brook which can be seen. There is a lot of water patches on the ice and the water is about 5 cm deep.

See pictures 4-2, 3, 4.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Feb. 24/84 Time 3:20 P.M.

Staff Gauge (if applicable) 76.82 m at 1520 h

ICE CONDITIONS

Open Water: Yes Where See notes below.

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire Brook except as noted

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other

Ice Thickness: Estimate 10 cm Ice Quality: competent

Snow Cover: Yes Approximate Depth 2 mm.

Comments

The ice is at an elevation of 77.62 m on both sides of the brook, out about 5 m from both banks upstream and downstream. This ice on the downstream side of the new bridge on the East side of the brook swings toward the west bank to 30 m downstream of the bridge and goes on downstream like this. The ice is sagged in the middle of the brook to an elevation of approximately 76.02 m. This sagged ice swings to the West bank at 30 m downstream of the new bridge and goes on downstream at 2 m wide to about 100 m upstream of the CNR bridge. The ice is within 1.5 m of the bottom of the bridge. Upstream of the bridge, conditions

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Feb. 24/84 Time 3:20 P.M.

are much the same except that about 5 m upstream of the old bridge the centre of the brook is open at 3 m wide. There are pieces of ice that have cracked off from the shore ice and have settled in the centre of the brook and the water is flowing over it and then back under the ice near the old bridge. There is also a patch of water on the ice at 30 m downstream of the new bridge at 0 to 2 m from the West bank. There is overbank flow downstream of the new bridge on the East river bank. It is evident that the ice has settled in the Brook because of large cracks at 0.3 m along the river banks. Most all of the ice mentioned is small blocks that have jammed up in the brook.

See pictures 8-10, 9-10, 10-10.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date Mar. 14/84 Time _____

Staff Gauge (if applicable) 76.53 m at _____h

Ice Elevation

ICE CONDITIONS

Open Water: No Where _____

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: Yes Approximate Depth See notes below mm.

Comments

Average ice elevation was difficult to determine due to the ice jamming. Also the sagged ice sections were filled up with snow.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Mar. 22/84 Time 3:00 P.M.

Staff Gauge (if applicable) Average Ice elevation 76.92 m at 1500 h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other

Stationary Ice: Yes Where Entire Brook upstream and downstream except as noted

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: (Centre of Brook) 20 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 10 cm.

Comments

There is overbank flow (ice) on the East side of the Brook from the new bridge on downstream. There is water on the ice in the low spots upstream and downstream of the new bridge. The rafted ice is at elevation 77.42 m at 0-3 m from the East bank and 0-2 m from the West bank. On the East bank the ice swings out into the river 20 m downstream of the new bridge going to within 3 m of the West bank and goes on downstream like this. On the West side it tapers in to 0 m from the West bank at 30 m downstream of the new bridge. In the centre of the rafted ice the ice is at an elevation of 76.42 m going upstream and downstream. This low area of ice tapers into the West bank at 30 m upstream of the railway CNR bridge and the ice at elevation of approximately 77.42 m goes the full width of the brook from the CNR bridge to 30 m upstream of the CNR bridge. The ice is approximately 1 m below the CNR bridge.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Mar. 22/84 Time 3:00 P.M.

There are two patches of open water between the new and old bridge near both banks of the brook at 0.5 m wide.

Upstream of the old bridge there is rafted ice on both banks at 0-2 m as well as pieces of ice that have cracked off from the rafted ice and is tipped down in the water. There is an open channel in the brook at 100 m upstream of the old bridge at 4 m wide and there is flat ice in the channel from the old bridge to 100 m upstream. There is water running on the ice in the channel at various spots upstream of the old bridge and there are open patches of water on both sides of the ice in the main channel. The ice is deteriorated extensively. There is no moving ice in the open channel and the ice in the centre of the channel is 2 m lower than the rafted ice along the banks.

See pictures 18-6, 18-7, 18-8.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date Apr. 4/84 Time _____

Staff Gauge (if applicable) 76.63 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Small patch 30 m downstream of bridge near west bank

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Bank to bank excepted as noted above

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: Yes Approximate Depth _____ mm.

Comments

The top of the ice cover is approximately two metres below the underside of the C.N. Railway bridge. At the New Trans Canada Highway bridge the top of the ice near the centre of the brook has sagged to elevation 75.30 metres approximately.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date Apr. 12/84 Time _____

Staff Gauge (if applicable) 75.91 m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Not measured cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ mm.

Comments

Between the CN Railway bridge to a point midway to the Trans Canada Highway bridge there is an open channel approximately the width of the railway bridge. Elsewhere the brook is open bank to bank. There is ice along both banks in the area of the highway bridge at an approximate elevation of 76.92 metres with water elevation of 75.91 metres.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date Apr. 18/84 Time _____

Staff Gauge (if applicable) Ice Elevation 76.82 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Bank to bank, upstream and downstream of bridge

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ mm.

Comments

There are small patches of ice along the banks.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer E. Gill Date Apr. 21/84 Time _____

Staff Gauge (if applicable) Ice Elevation 76.82 m at 1520 h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ mm.

Comments

The brook is open, bank to bank, upstream of the bridge. Downstream of the bridge, the open water narrows to an open channel five metres wide at the west bank extending downstream to the CN Railway bridge where the brook is open, bank to bank.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date Apr. 25/84 Time _____

Staff Gauge (if applicable) 76.62 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Leech Brook Bridge Observer J. Loder Jr. Date May 2/84 Time _____

Staff Gauge (if applicable) 76.52 m at _____ h

ICE CONDITIONS

Open Water: Yes Where Brook is ice free

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: No Approximate Depth _____ mm.

Comments

Sheet No. 1

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream end of ice in Exploits River Observer E. Gill Date Jan. 31/84 Time 9:20 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where 100 m downstream of 12 Mile Falls and on downstream of Falls

Moving Ice: Yes Where 100 m downstream of 12 Mile Falls and on upstream of falls

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other See note

Stationary Ice: Yes Where 100 m downstream of 12 Mile Falls and on downstream as far as visible

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 7.5 cm Ice Quality: Competent

Snow Cover: Approximate Depth 15 cm.

Comments

In the area between the falls and 100 m downstream of the falls there appears to be slob ice frozen to the bottom of the river. In the area between 100 m downstream of falls and 160 m downstream of falls there was some water on the ice on both river banks about 5 m from shore. There is no overbank or sheer walls visible. At the area 100 m downstream of falls there is approximately a 30 m patch of freezing slob ice which runs across the width of the river in this area.

See pictures 4-16, 17, 18, 19.

Sheet No. 2

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream end of ice in Exploits River Observer E. Gill Date Feb. 4/84 Time 8:25 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See attached sheet

Moving Ice: Yes Where See attached sheet

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where At 12 Mile Falls and on downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: 10 cm Ice Quality: Competent but deteriorating and candled.

Snow Cover: Yes Approximate Depth 15 cm.

Comments

There is no water on top of the ice but the amount of water flowing over the falls appears to have increased since my last trip here. The ice jam is located abut 100 m downstream of the falls and continues on downstream. There is no overbank flow in this area.

See pictures 5-19, 20, 21, 22.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream edge of ice (12.5 road km from Red Indian Brook Bridge) Observer E. Gill Date Feb. 27/84 Time 12:20 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where A 10 m wide channel at approximately 30 m from South River Bank which ends at 200 m downstream and goes on upstream as far as I can see.

Moving Ice: Yes Where In channel area upstream and downstream (small quantities)

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other Frazil

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Appears to be naturally frozen flat ice

Ice Thickness: Estimate - 15 cm Ice Quality: Competent but deteriorating

Snow Cover: Yes Approximate Depth 3 cm.

Comments

The ice surface is mostly flat probably due to previous rain. There are wet spots on the ice that have frozen over - one at 30 m from North Bank at 5 m wide which goes upstream heading towards the centre of the river to 150 m and downstream for 200 m. There is also a wet patch that hasn't frozen which goes from the open channel straight across the river and ties into the one at 30 m from the North bank at 50 m downstream. There is also water on the ice just below the end of the open channel and it runs towards the South bank and on down river as far as I can see. There is a patch of ice in the channel area that has not

continued ....

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream edge of ice (12.5 road km from Red Indiand Brook Bridge) Observer E. Gill Date Feb. 27/84 Time 12:20 P.M.

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broken clear and water is running over this ice. This is located at 0 to 75 m from me. There is some evidence of blocks (jam) at the centre of the river in an area between 75 m downstream to 175 m downstream of my location. There are also other spots (small) located over the river area. The water flowing over the patch of ice in the channel area flows to within 10 m of the South bank and flows 5 m in over the ice on the North side of the channel. The ice has settled in the river as is evident by the cracks along the river banks. The ice appears to be rafted up along both banks at 0 to 3 m from the banks.

See pictures 1-11 to 3-11.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of up-stream edge of ice (12 Mile Falls Observer E. Gill Date Mar. 5/84 Time 3:20 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Appears to be naturally frozen flat ice

Ice Thickness: Estimate 60 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 5 cm.

Comments

The entire river upstream of 12 Mile Falls is open except for 0 to 2 m of shore ice on both river banks. From the Falls to 500 m downstream of the Falls there is an open channel at 10 to 20 m from the East bank. The rest of this area is solid ice. From 500 m downstream of the Falls to 800 m downstream there is a big sheet of ice at 80 m from the West bank to 300 m from the West bank that has water flowing on both sides at 20 to 80 m from West bank and 0 to 150 m from the East bank. From 800 m downstream of the Falls on downstream the river is completely open with 0 to 2 m of shore ice. There is no overbank flow or water on the ice. The water flowing over the falls is much higher than on previous visits to this site.

See pictures 3-13, 4-13 and 5-13.

Sheet No. 5

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream ice edge (12.5 road km from Red Indian Brook Bridge) Observer E. Gill Date Mar. 5/84 Time 4:15 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Most of the river upstream and downstream (see notes).

Moving Ice: Yes Where In the entire open water areas

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Appears to be naturally frozen flat ice

Ice Thickness: (visible) 60 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 5 cm.

Comments

Most of the ice has broken up in this area. There are 3 large sheets of ice at 60 cm (visible) thick, one located in centre of river across from me, another one downstream of this and another one further downstream (see attached sketch) near south bank. Large pieces of ice have cracked off these sheets but are still next to the sheets. There is approximately 0 to 20 m of shore ice on the South side of the river and 0 to 5 m on the North side. Upstream of my location the solid ice swings out in the river towards the South bank, leaving about a 20 m channel on the South side of the river. This occurs at 0 to 200 m upstream of my location. The shore ice is cracked along the river banks. There is rafted ice along both river banks.

See pictures 6-13 to 8-13.

Sheet No. 6

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream ice edge (10.0 road km from Red Indian Brook Bridge) Observer E. Gill Date Mar. 5/84 Time 4:40 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where See notes below

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Upstream and downsteam entire river

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: Approximately 15 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 5 cm.

Comments

There is an open channel upstream and downstream as far as I can see at 10 m to 40 m from South bank and an open patch at 60 to 100 m downstream of my location at 20 to 40 m from North Bank as well as a small open patch at 10 to 15 m downstream of where I am located at 10 to 15 m from North bank. There is ice jammed up in the channel areas, one at 30 m upstream of my location to 150 m downstream in channel area on North side of the river and one at 100 to 200 m on South side of the river downstream of my location. In the open channel area on the South side of the river there is a lot of moving ice including floes (i.e., blocks (jam) that are moving and then stopping again. Below the downstream end of the jammed ice in the channel on the South side of the river the channel at approximately 10 m wide continues on downstream near the centre of the river. There is rafted ice at 0 to 3 m from both banks at approximately 2 m above the ice level in the main river area.

See pictures 9-13 and 10-13.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream end of channel (at 6.4 road km from Red Indian Brook Bridge) Observer E. Gill Date Mar. 5/84 Time 5:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where At 6.4 road km and on upstream (see notes)

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upsteam and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: 10 cm Ice Quality: Competent

Snow Cover: Yes Approximate Depth 5 cm.

Comments

There is an open channel in the area described above. It is approximately 2 m wide at 75 m from the East bank of the river. There is also an open patch at 350 m downstream of the end of the channel at approximately 15 m long by 10 m wide. Observing the ice it appears that eventually there will be an open channel between the end of the existing open channel and the open patch downstream. The open patch is at 60 m from the West bank of the river. The ice blocks (jam) is in an area between the end of the channel and 150 m upstream of the end. From there on upstream it is flat ice probably because of previous rainfalls. Downstream from the end of the channel there is blocks (jam) and on downstream at 30 m from the West bank and into the East bank. There is flat ice at 1 to 30 m from the West bank on downstream of the end of the channel. There is rafted ice along both banks at 0 to 1 m. The ice has settled in the centre of the river as compared to that along the river banks by approximately 0.5 m.

See pictures 11-13 and 12-13.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream edge of ice (12 Mile Falls Observer E. Gill Date Mar. 22/84 Time 8:25 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: 60 cm Ice Quality: Deteriorated

Snow Cover: Yes Approximate Depth 5 cm.

Comments

From 12 Mile Falls on upstream, the river is completely open with no shore ice. The water is very high and fast going over the falls, more than there was on my last visit to this site. Between the falls and 500 m dowstream there is solid ice with a channel at 50 m wide running tight to the East bank. There is also an open spot between the falls and 150 m downstream which goes from the East bank to three quarters of the way across the river. From 500 m downstream of the falls on downstream, the river is completely open with no shore ice but there is rafted ice along the river banks. The solid ice is covered with wet patches and some have frozen over.

See pictures 16-9 to 16-12.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of up-stream ice edge (12.5 road km) from Red Indian Brook Bridge Observer E. Gill Date Mar. 22/84 Time 9:02 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Entire river upstream and downstream

Moving Ice: Yes Where Small amounts over entire river

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Naturally frozen flat ice

Ice Thickness: Did not measure cm Ice Quality: Broken along the banks, candled and deteriorated

Snow Cover: No Approximate Depth _____ cm.

Comments

The stationary ice is between the North bank and 60 m from the bank and goes upstream for 200 m where it ties in to the North bank. It also goes downstream for 60 m where it tapers in between the North bank and 30 m from the North bank bank and then goes on downstream like this as far as I can see. In these areas the ice is rafted up in places. Also there is a ridge of rafted ice along the North bank, inside the other ice I have mentioned above, at 0-2 m from the bank. At 0 to 5 m from the South bank, upstream and downstream, there is ice that appears to have been pushed upon the bank and some pieces have broken off and are tipped in the water. On the North bank at 200 m upstream and on upstream there appears to be only flat ice at 0 to 5 m from the bank. There is no water on the ice.

See pictures 17-1 to 17-3.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of up-stream ice edge (10.1 road km from Red Indian Brook bridge) Observer E. Gill Date Mar. 22/84 Time 9:38 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where Entire river upstream and downstream

Moving Ice: Yes Where Small amounts over entire river

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where See notes below

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Shore ice and rafted ice

Ice Thickness: (Shore ice) 5 cm Ice Quality: Deteriorated and candled

Snow Cover: No Approximate Depth _____ cm.

Comments

There is rafted ice along both river banks at 0 to 2 m from the North bank and 0 to 10 m from the South bank. It is approximately 3 m higher than the present water elevation. Out from this, on the North side of the river, there is naturally frozen flat ice at 2 to 5 m from the bank at the elevation of the water which goes from my observation point on downstream and upstream. It swings out into the river from 2 to 5 m and goes on upstream like this as far as I could see. At about 200 m upstream there is some rafted ice between 2 to 50 m from the North bank. There is also some blocks of ice stationary at 200 m upstream at centre of river. On the South bank there is a lot of pieces of ice that have cracked off from the ice along the banks but have not moved. Also the rafted ice along the South bank widens at 200 m downstream to 0 to 30 m from the

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of up-stream ice edge (10.1 road km from Red Indian Brook Bridge Observer E. Gill Date Mar. 22/84 Time 9:38 A.M.

South bank at approximately 1 m thick. There is a small patch with water running on the ice at 20 to 40 m downstram on the naturally frozen flat ice for a width of 0.5 m. There are no blocks (jam) visible.

See pictures 17-4 to 17-7.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of up-stream ice edge (5.6 road km from Red Indian Brook Bridge Observer E. Gill Date Mar. 22/84 Time 10:36 A.M.

Staff Gauge (if applicable) _____ m at ____h

ICE CONDITIONS

Open Water: Yes Where A channel at 50 m wide on the West side of the centre of the river running upstream and downstream

Moving Ice: Yes Where In channel area upstream and downstream

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where The rest of the river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: (Channel area) -10 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth _____ cm.

Comments

The open channel swings to within 30 m of the West bank at approximately 400 m downstream. There is flat ice on either of the channel and it is covered with wet patches, as it is mild today. There is also some old blocks that were part of previous ice jams. There is no overbank flow, but the ice is rafted up along the banks on both sides of the river. The ice near the centre is 1 m lower than the rafted ice along the banks. Also the moving ice was breaking off from the sides of the channel as I watched.

See pictures 17-8, 17-9.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Location of upstream ice edge (300 m upstream of the upstream tip of Three Mile Island) Observer E. Gill Date Mar. 22/84 Time 11:05 A.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes Where See notes below

Moving Ice: Yes Where In channel area

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes Where Entire river upstream and downstream

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other Flat ice

Ice Thickness: (Channel area) -10 cm Ice Quality: Deteriorated

Snow Cover: No Approximate Depth _____ cm.

Comments

There is an open channel which runs downstream and ends at 300 m upstream of the upstream tip of 3 Mile Island. From 300 m upstream of the upstream tip of 3 Mile Island to 500 m upstream, the channel is blocked with ice (moving ice as above). The channel is approximately 100 m wide at 40 m from the West bank. The stationary ice on both sides of the channel is flat and is mostly covered with (melt) water. The channel was widening as I was doing my observations. Large amounts of ice were moving down the channel, some going under the blocked ice and some piling up behind it. This moving ice caused the blocked ice to pack tighter together. The jammed ice would fill in, pull ahead, fill in and so on.

See pictures 17-10, 17-11, 17-12.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Upstream ice edge Observer J. Loder Jr. Date Mar. 23/84 Time 11:30 P.M.

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

A 50 metre wide open channel now exists from 300 m upstream of Three Mile Island and ties into the existing open channel that started at the mouth of Badger Brook and continued on downstream on the Exploits River. At Badger Stadium the channel edge is 15 metres out from the river bank. At Three Mile Island, the channel exists on both sides of the island.

The channel was full of moving ice. The ice would plug, then clear and move downstream, then plug again and so on.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Upstream ice edge Observer J. Loder Jr. Date Mar. 24/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Comments

The 50 metre wide open channel from Three Mile Island to downstream of Badger was completely free of moving ice.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer _____ Date Mar. 30/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

Deputy Mayor of Badger, Bill Mayne, advised that the Exploits River, was open, bank to bank, both upstream and downstream of the Badger Stadium area, as far as he could see. No floating ice was visible. Badger Brook was also open but Red Indian Brook was still ice covered.

Roy Noseworthy of the Provincial Department of Transportation and Communications advised that Rushy Pond was still ice covered; a small patch of open water existed on both sides of the culvert crossing the Trans Canada Highway at Site H. At Aspen Brook Bridge he noted some water backing up. Also the Exploits River, in the three areas noted, was completely ice covered.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer _____ Date Apr. 2/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

Deputy Mayor of Badger, Bill Mayne, advised that the Exploits River was still open bank to bank, both upstream and downstream of the Badger Stadium area as far as he could see, with no floating ice visible. Badger Brook also remained open with Red Indian Brook still ice covered.

Sheet No. 17

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer J. Loder Jr. Date Apr. 4/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

a) Three Mile Island to Badger Chute - the river is open bank to bank with no moving ice.

b) Badger Chute to Site G - the river is open but pan ice (approximately 3 m x 3 m) is located randomly in the river.

c) Site G to Aspen Brook - the river is open with approximately 10 metres of shore ice along both banks. Estimated thickness of this ice is 0.6 to 1.0 metres. Pieces of this ice were breaking off and floating downstream.

d) At Site H-1 the river is completely ice covered upstream and downstream as far as was visible.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer J. Loder Jr. Date Apr. 12/84 Time _____

Staff Gauge (if applicable) _____ m at _____h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

The Exploits River is open from Three Mile Island to an area below Site H-1 from bank to bank - the actual ice edge was not determined. At Site H, a 10 metre wide open water channel could be seen running between Aspen Island and the west river bank and on downstream.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer J. Loder Jr. Date Apr. 18/84 Time _____

Staff Gauge (if applicable) _____ m at _____h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

The Exploits River is open from Twelve Mile Falls to the Red Cliff overpass, bank to bank. Below Red Cliff overpass there is solid ice cover with an open water channel approximately 30 metres wide. At Site H the river is still ice covered but extensively deteriorated.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer J. Loder Jr. Date Apr. 21/84 Time _____

Staff Gauge (if applicable) _____ m at _____ h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

At Site H-1 the river is open water except for small amounts of ice along both banks. At Site H, an open channel was visible in the river.

BADGER/RUSHY POND HYDROTECHNICAL STUDY
EXPLOITS RIVER

Site Exploits River Observer J. Loder Jr. Date May 2/84 Time _____

Staff Gauge (if applicable) _____ m at _____h

ICE CONDITIONS

Open Water: Yes/No Where _____

Moving Ice: Yes/No Where _____

What Kind: Slush/Pancakes/Large Sheets/Floes/Small Blocks/Other _____

Stationary Ice: Yes/No Where _____

What Kind: Pancake Ice/Sheet Ice/Blocks (Jam)/Other _____

Ice Thickness: _____ cm Ice Quality: _____

Snow Cover: Yes/No Approximate Depth _____ cm.

Ice Conditions

No ice noted on the Exploits River except that which was left on the shores.

WINTER FIELD MEASUREMENTS

Cross-Section A

March 05, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	2	53	99.12	2.35 (River bottom)	96.77	40
				2.00	97.12	70
				1.50	97.62	84
				1.00	98.12	84
				0.60	98.52	70
2	3	55	99.12	2.10 (River bottom)	97.02	5
				2.00	97.12	0
				1.50	97.62	0
				1.00	98.12	0
				0.60	98.52	0
3	2.5	55	99.12	1.70 (River bottom)	97.42	1
				1.50	97.62	4
				1.00	98.12	0
				0.60	98.52	0

Note: Elevations are referred to TBM "A" - 104.135 Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section A

March 21, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	55	99.20	2.55 (River bottom)	96.65	16
				2.50	96.70	45
				2.00	97.20	78
				1.50	97.70	84
				1.00	98.20	84
				0.60	98.60	70
2	0	65	99.20	2.20 (River bottom)	97.00	17
				2.00	97.20	38
				1.50	97.70	1
				1.00	98.20	0
				0.70	98.50	0
3	0	65	99.20	1.90 (River bottom)	97.30	5
				1.50	97.70	3
				1.00	98.20	0
				0.70	98.50	0

Note: Elevations are referred to TBM "A" - 104.135 Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 4

January 27, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	53	96.43	1.25 (River bottom)	95.18	10
				0.50	95.93	25
2	0	43	96.43	1.50 (River bottom)	94.93	5
				1.00	95.43	55
				0.50	95.93	55
3	0	32	96.43	1.45 (River bottom)	94.98	15
				1.00	95.43	80
				0.50	95.93	80
4	0	32	96.43	1.80 (River bottom)	94.63	15
				1.00	95.43	80
				0.50	95.93	75
5	0	46	96.43	1.95 (River bottom)	94.48	10
				1.80	94.63	7
				1.50	94.93	30
				1.00	95.43	25
				0.50	95.93	30
6	0	39	96.43	1.65 (River bottom)	94.78	5
				1.00	95.43	40
				0.50	95.93	40
7	0	37	96.43	1.65 (River bottom)	94.78	5
				1.30	95.13	40
				0.80	95.63	20
				0.50	95.93	30
8	0	50	96.43	2.00 (River bottom)	94.43	15
				1.70	94.73	0
				0.70	95.73	0

WINTER FIELD MEASUREMENTS

Cross-Section 4

January 27, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
9	0	40	96.43	2.60 (River bottom)	93.83	30
				2.00	94.43	20
				1.60	94.83	15
				1.00	95.43	7
				0.50	95.93	12
10	0	40	96.43	2.30 (River bottom)	94.13	0
				2.00	94.43	0
				1.50	94.93	0
				1.00	95.43	0
				0.50	95.93	0
11	0	46	96.43	2.20 (River bottom)	94.23	0
				2.00	94.43	0
				1.50	94.93	0
				1.00	95.43	0
				0.50	95.93	0
12	0	46	96.43	2.05 (River bottom)	94.38	10
				1.75	94.68	2
				1.70	94.73	0
				1.00	95.43	0
				0.50	95.93	0

Note: Elevations are referred to TBM "C" - 99.603 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 4

February 28, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
5	6	48	96.26	1.70 (River bottom)	94.56	21
				1.50	94.76	62
				1.00	95.26	80
				0.70	95.56	82
8	6	64	96.26	1.75 (River bottom)	94.51	23
				1.50	94.76	2
				1.00	95.26	0
				0.70	95.56	0
9	6	58	96.26	2.35 (River bottom)	93.91	15
				2.00	94.26	72
				1.50	94.76	56
				1.00	95.26	0
				0.70	95.56	0
11	6	63	96.26	1.85 (River bottom)	94.41	1
				1.50	94.76	0
				1.00	95.26	0
				0.70	95.56	0

Note: Elevations are referred to TBM "C" - 99.603 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 4

March 21, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
8	5	65	96.17	1.65 (River bottom)	94.52	36
				1.50	94.67	0
				1.00	95.17	1
				0.70	95.47	0
9	5	59	96.17	2.30 (River bottom)	93.87	36
				2.00	94.17	80
				1.50	94.67	78
				1.00	95.17	60
				0.80	95.37	18
11	6	59	96.17	1.85 (River bottom)	94.32	6
				1.50	94.67	0
				1.00	95.17	0
				0.70	95.47	0

Note: Elevations are referred to TBM "C" - 99.603 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 3

January 30, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	15	45	94.41	3.90 (River bottom)	90.51	60
				3.50	90.91	104
				3.00	91.41	110
				2.50	91.91	58
				2.00	92.41	20
				1.50	92.91	5
				1.00	93.41	30
				0.70	93.71	10
2	13	33	94.41	3.85 (River bottom)	90.56	70
				3.00	91.41	110
				2.50	91.91	80
				2.00	92.41	95
				1.50	92.91	120
				1.00	93.41	110
				0.70	93.71	90
3	15	45	94.41	3.55 (River bottom)	90.86	50
				3.00	91.41	50
				2.50	91.91	50
				2.00	92.41	50 → 0
				1.50	92.91	0
				1.00	93.41	0
				0.70	93.71	0
4	15	37	94.41	3.50 (River bottom)	90.91	40
				3.00	91.41	90
				2.50	91.91	70
				2.00	92.41	0
				1.50	92.91	0
				1.00	93.41	0
				0.70	93.71	0

WINTER FIELD MEASUREMENTS

Cross-Section 3

January 30, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
5	15	45	94.41	3.40 (River bottom)	91.01	35
				3.00	91.41	80
				2.50	91.91	70
				2.00	92.41	60
				1.50	92.91	3
				1.00	93.41	0
				0.70	93.71	0
6	15	40	94.41	3.50 (River bottom)	90.91	45
				3.00	91.41	65
				2.50	91.91	50
				2.00	92.41	10
				1.50	92.91	5
				1.00	93.41	10
				0.50	93.91	10
7	15	43	94.41	3.50 (River bottom)	90.91	10
				3.00	91.41	60
				2.50	91.91	50
				2.00	92.41	30
				1.50	92.91	10
				1.00	93.41	0
				0.50	93.91	0
8	15	45	94.41	3.30 (River bottom)	91.11	35
				3.00	91.41	80
				2.50	91.91	80
				2.00	92.41	50
				1.85	92.56	35
				1.50	92.91	2
				1.00	93.41	0
				0.50	93.91	0

Note: Elevations are referred to TBM "3" - 96.565 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 3

February 23, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
3	0.2	50	93.30	2.35 (River bottom)	90.95	40
				2.00	91.30	130
				1.50	91.80	0
				1.00	92.30	0
				0.60	92.70	0
4	0.2	48	93.30	2.35 (River bottom)	90.95	0
				2.00	91.30	0
				1.50	91.80	0
				1.00	92.30	0
				0.60	92.70	0
7	0.2	50	93.30	2.20 (River bottom)	91.10	32
				2.00	91.30	50
				1.50	91.80	45
				1.00	92.30	1
				0.60	92.70	0

Note: Elevations are referred to TBM "3" - 96.565 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 2

January 30, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	46	17	92.19	4.50	87.69	67
				4.00	88.19	73
				3.50	88.69	73
				3.20	88.99	50
				3.00	89.19	15
				2.50	89.69	7
				2.00	90.19	5
				1.50	90.69	2
				1.00	91.19	3
				0.50	91.69	2
2	45	35	92.19	4.50 (River bottom)	87.69	16
				4.00	88.19	120
				3.50	88.69	100
				3.00	89.19	25
				2.50	89.69	10
				2.00	90.19	4
				1.50	90.69	0
				1.00	91.19	2
				0.50	91.69	2
3	45	35	92.19	4.50	87.69	100
				4.00	88.19	88
				3.50	88.69	7
				3.00	89.19	2
				2.50	89.69	0
				2.00	90.19	0
				1.50	90.69	2
				1.00	91.19	0
				0.50	91.69	2
4	40	11	92.19	4.50	87.69	50
				4.00	88.19	56
				3.50	88.69	55
				3.00	89.19	3
				2.50	89.69	3
				2.00	90.19	5
				1.50	90.69	2
				1.00	91.19	4
				0.50	91.69	2

WINTER FIELD MEASUREMENTS

Cross-Section 2

January 30, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
5	38	11	92.19	4.50	87.69	25
				4.00	88.19	80
				3.50	88.69	80
				3.00	89.19	70
				2.50	89.69	5
				2.00	90.19	6
				1.50	90.69	8
				1.00	91.19	4
				0.50	91.69	7
6	43	20	92.19	4.50	87.69	50
				4.00	88.19	100
				3.50	88.69	100
				3.00	89.19	80
				2.50	89.69	10
				2.00	90.19	5
				1.50	90.69	5
				1.00	91.19	8
				0.50	91.69	5
7	45	15	92.19	4.40	87.79	35
				4.00	88.19	10
				3.50	88.69	15
				3.00	89.19	15
				2.50	89.69	6
				2.00	90.19	0
				1.50	90.69	0
				1.00	91.19	5
				0.50	91.69	5
				0.30	91.89	3

Note: Elevations are referred to TBM "E" - 96.860 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 1

February 03, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	48	15	86.89	2.90 (River bottom)	83.99	0 → 100
				2.50	84.39	0 → 300
				2.00	84.89	0 → 50
				1.50	85.39	0
				1.00	85.89	0
				0.50	86.39	0
2	33	10	86.89	3.10 (River bottom)	83.79	0
				2.50	84.39	0
				2.00	84.89	0
				1.50	85.39	0
				1.00	85.89	0
				0.50	86.39	0
3	30	30	86.89	3.00 (River bottom)	83.89	0 → 75
				2.50	84.39	100 → 200
				2.00	84.89	0 → 100
				1.50	85.39	0
				1.00	85.89	0
				0.50	86.39	0
4	30	5	86.89	No readings taken		

Note: Elevations are referred to TBM "F" - 91.244 m Geodetic

WINTER FIELD MEASUREMENTS

Cross-Section G-1

March 05, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	10	49	78.67	2.45 (River bottom)	76.22	3
				2.00	76.67	2
				1.50	77.17	0
				1.00	77.67	0
				0.60	78.07	0
2	0	54	78.67	3.40 (River bottom)	75.27	50
				3.00	75.67	110
				2.50	76.17	110
				2.00	76.67	134
				1.50	77.17	140
				1.00	77.67	132
				0.60	78.07	100
3	20	38	78.67	3.20 (River bottom)	75.47	0
				3.10	75.57	0
				3.00	75.67	0
				2.50	76.17	0
				2.00	76.67	0
				1.50	77.17	0
				1.00	77.67	0
				0.50	78.17	0

Note: Elevations are referred to TBM "G" - 82.936 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section G-1

March 21, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	64	78.79	2.55 (River bottom)	76.24	0
				2.50	76.29	17
				2.00	76.79	0
				1.50	77.29	0
				1.00	77.79	0
				0.70	78.09	0

Note: Elevations are referred to TBM "G" - 82.936 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section H-1

February 27, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	40	45	71.67	1.10 (River bottom)	70.57	0
				1.00	70.67	0
				0.60	71.07	0

Note: Elevations are referred to TBM "HA" - 75.379 m Geodetic.
Auger hole is located 260 m out from the north river bank.

WINTER FIELD MEASUREMENTS

Cross-Section H-1

March 21, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	33	24	71.83	1.10 (River bottom) 0.70	70.73 71.13	0 1

Note: Elevations are referred to TBM "HA" - 75.379 m Geodetic.
Auger hole is located 260 m out from the north river bank.

WINTER FIELD MEASUREMENTS

Cross-Section 5

February 02, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	18	49	69.53	1.00 (River bottom)	68.53	0
				0.50	69.03	0
2	16	49	69.53	1.00 (River bottom)	68.53	0
				0.50	69.03	0
3	16	46	69.53	1.00 (River bottom)	68.53	0
				0.50	69.03	2
4				No Hole Drilled		
5	14	22	69.53	1.70 (River bottom)	67.83	0
				1.50	68.03	0
				1.00	68.53	7
				0.50	69.03	8
6	13	42	69.53	2.90 (River bottom)	66.63	5
				2.50	67.03	12
				2.00	67.53	12
				1.00	68.53	16
				0.50	69.03	15
7	14	44	69.53	3.20 (River bottom)	66.33	30
				3.00	66.53	30
				2.50	67.03	30
				2.00	67.53	28
				1.50	68.03	22
				1.00	68.53	25
				0.50	69.03	24
8	14	47	69.53	2.70 (River bottom)	66.83	4
				2.50	67.03	10
				2.00	67.53	15
				1.50	68.03	16
				1.00	68.53	16
				0.50	69.03	16

WINTER FIELD MEASUREMENTS

Cross-Section 5

February 02, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
9	15	46	69.53	2.40 (River bottom)	67.13	10
				2.00	67.53	30
				1.50	68.03	32
				1.00	68.53	22
				0.50	69.03	14
10	14	46	69.53	1.95 (River bottom)	67.58	4
				1.50	68.03	9
				1.00	68.53	10
				0.50	69.03	7
11	13	46	69.53	2.25 (River bottom)	67.28	25
				2.00	67.53	31
				1.50	68.03	22
				1.00	68.53	19
				0.50	69.03	13
12	13	42	69.53	2.65 (River bottom)	66.88	10
				2.00	67.53	20
				1.50	68.03	20
				1.00	68.53	20
				0.50	69.03	17
13	16	42	69.53	2.95 (River bottom)	66.58	5
				2.50	68.03	19
				2.00	67.53	22
				1.50	68.03	22
				1.00	68.53	21
				0.50	69.03	12
14	17	46	69.53	2.70 (River bottom)	66.83	11
				2.50	67.03	16
				2.00	67.53	21
				1.50	68.03	23
				1.00	68.53	30
				0.50	69.03	25

WINTER FIELD MEASUREMENTS

Cross-Section 5

February 02, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
15	15	46	69.53	3.30 (River bottom)	66.23	3
				3.00	66.53	18
				2.50	67.03	25
				2.00	67.53	25
				1.50	68.03	25
				1.00	68.53	28
				0.50	69.03	20
16	18	46	69.53	2.65 (River bottom)	66.88	10
				2.55	66.98	13
				2.50	67.03	15
				2.00	67.53	23
				1.50	68.03	26
				1.00	68.53	29
				0.50	69.03	23
17	15	44	69.53	3.00 (River bottom)	66.53	4
				2.50	67.03	24
				2.00	67.53	24
				1.50	68.03	26
				1.00	68.53	25
				0.50	69.03	20
18	14	46	69.53	2.80 (River bottom)	66.73	0
				2.50	67.03	0
				2.00	67.53	0
				1.50	68.03	10
				1.00	68.53	25
				0.50	69.03	25

Note: Elevations are referred to TBM "I-1" - 72.118 m Geodetic.

WINTER FIELD MEASUREMENTS

Cross-Section 6

February 24, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	51	96.59	1.95 (River bottom)	94.64	25
				1.50	95.09	80
				1.00	95.59	80
				0.60	95.99	68
2	0	52	96.59	2.50 (River bottom)	94.09	0
				2.00	94.59	100
				1.50	95.09	97
				1.00	95.59	99
				0.60	95.99	70
3	0	56	96.59	1.90 (River bottom)	94.69	10
				1.50	95.09	66
				1.00	95.59	0
				0.60	95.99	0
4	0	38	96.59	1.65 (River bottom)	94.94	35
				1.50	95.09	70
				1.00	95.59	120
				0.60	95.99	120

Note: Elevations are referred to TBM "6" - 99.286 m Geodetic

WINTER FIELD MEASUREMENTS

Cross-Section 7

February 22, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	40	97.30	1.70 (River bottom)	95.60	18
				1.50	95.80	18
				1.00	96.30	0
				0.50	96.80	0
2	0	38	97.30	2.50 (River bottom)	94.80	0
				2.30	95.00	46
				2.00	95.30	64
				1.50	95.80	89
				1.00	96.30	89
				0.50	96.80	80
3	0	45	97.30	2.25 (River bottom)	95.05	0
				2.00	95.30	0
				1.50	95.80	0
				1.00	96.30	0
				0.50	96.80	0
4	0	44	97.30	2.70 (River bottom)	94.60	7
				2.50	94.80	15
				2.00	95.30	22
				1.50	95.80	26
				1.00	96.30	0
				0.50	96.80	0

Note: Elevations are referred to TBM "7" - 101.840 m Geodetic

WINTER FIELD MEASUREMENTS

Cross-Section 31

February 23, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0.15	46	94.52	1.35 (River bottom)	93.17	10
				1.00	93.52	41
				0.60	93.92	42
2	0.15	46	94.86	1.95 (River bottom)	92.91	2
				1.50	93.36	2
				1.00	93.86	1
				0.60	94.26	0
3	0.15	53	94.46	2.35 (River bottom)	92.11	5
				2.00	92.46	71
				1.50	92.96	33
				1.00	93.46	1
				0.60	93.96	0

Note: Elevations are referred to TBM "31" - 97.221 m Geodetic

WINTER FIELD MEASUREMENTS

Cross-Section 32

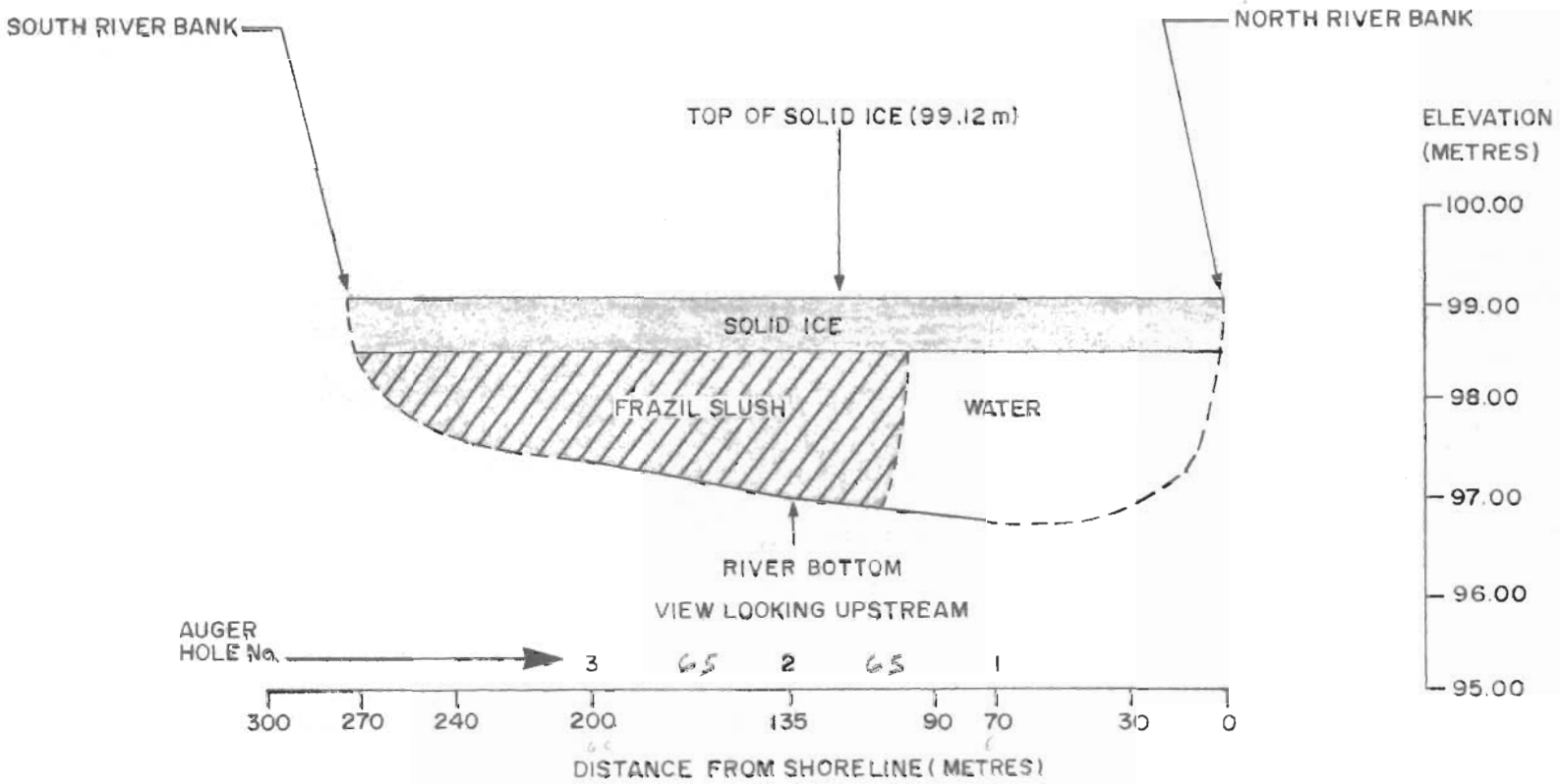
February 24, 1984

Auger Hole Number	Depth of Snow cover (cm)	Ice Thickness (cm)	Top of Ice Elevation (m)	Depth Current Reading Taken (m)	Elevation Current Reading Taken (m)	Measured Current Speed (cm/sec)
1	0	42	95.38	1.85 (River bottom)	93.53	23
				1.50	93.88	57
				1.00	94.38	0
				0.60	94.78	0
2	0	51	95.55	1.70 (River bottom)	93.85	1
				1.50	94.05	1
				1.00	94.55	0
				0.60	94.95	0
3	0	47	95.76	1.00 (River bottom)	94.76	0
				0.60	95.16	0
4	0	54	95.36	1.40 (River bottom)	93.96	7
				1.00	94.36	30
				0.60	94.76	19

Note: Elevations are referred to TBM "32" - 99.500 m Geodetic

NOTES:

ELEVATIONS ARE REFERRED TO TBM "A" - 104.135 m GEODETIC.

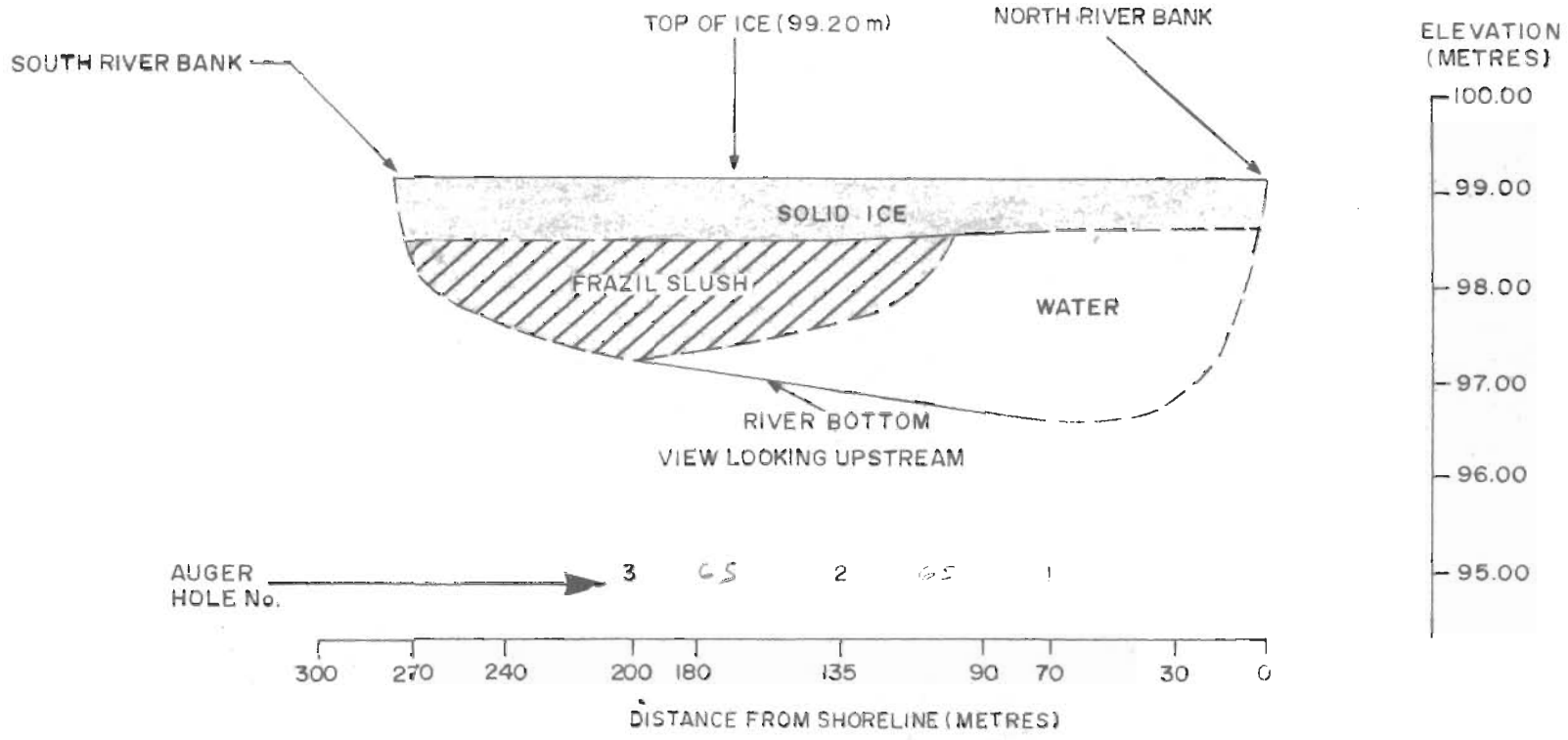


CANADA - NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION A, MARCH 5, 1984

NOTES:

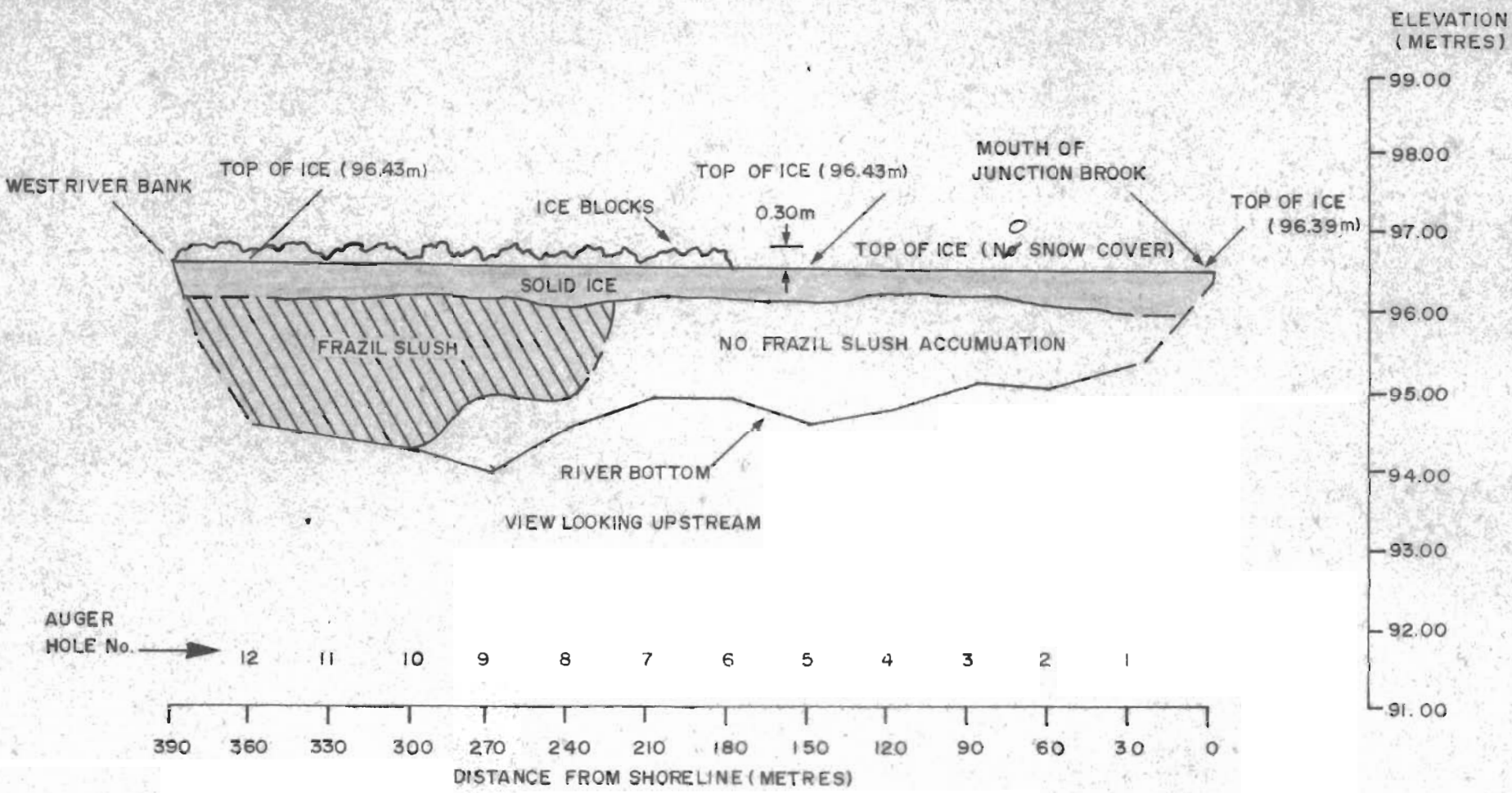
ELEVATIONS ARE REFERRED TO TBM "A" 104.135m GEODETIC.



CANADA - NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION A, MARCH 21, 1984

NOTE:
ELEVATIONS ARE REFERRED TO TBM "C" 99.603 m GEODETIC.



CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

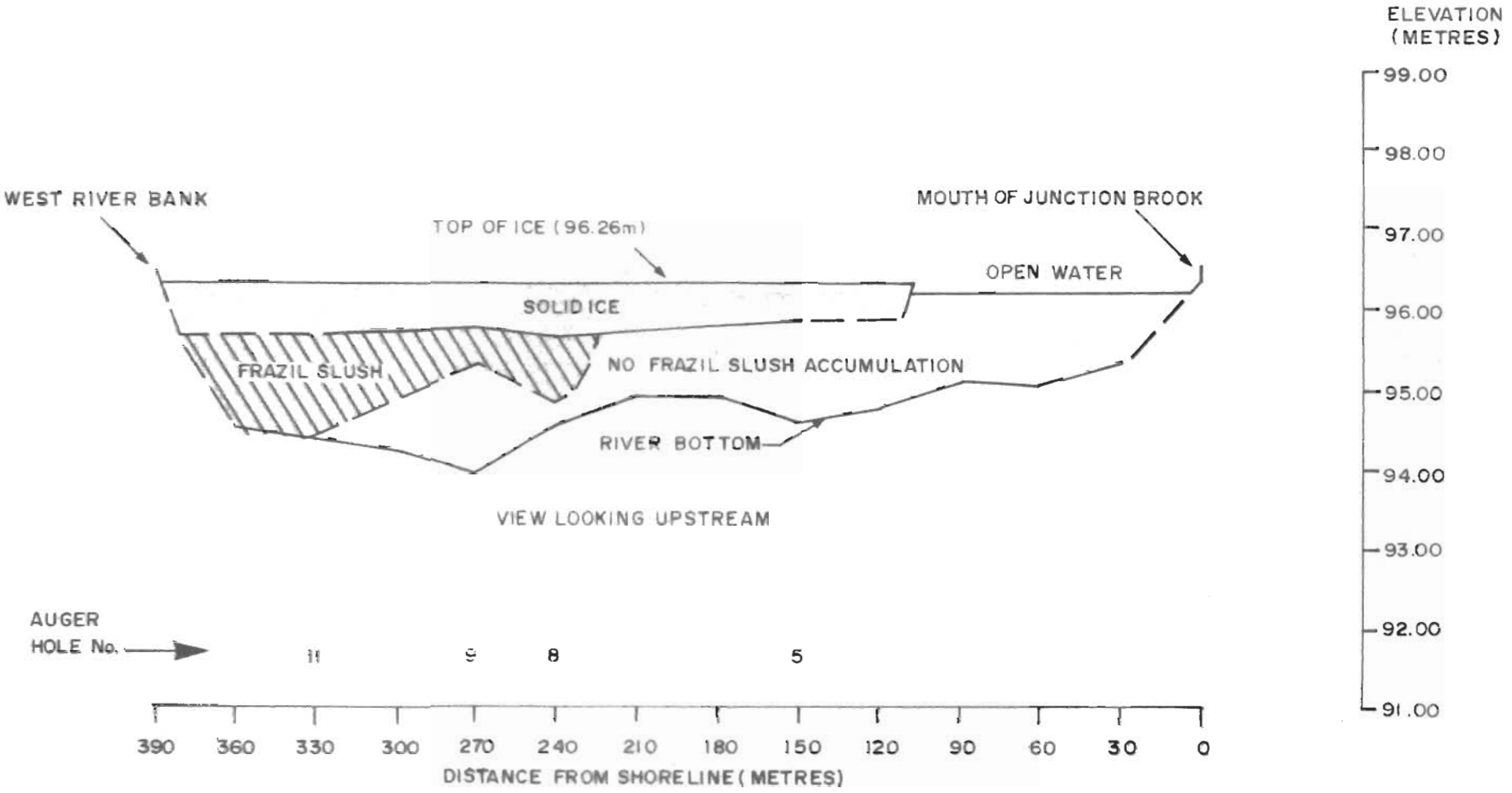
FIGURE

CROSS-SECTION 4, JAN. 27, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "C" 99.608m GEODETIC.

SNOW IN PATCHES 6cm DEEP OVER ICE SURFACE



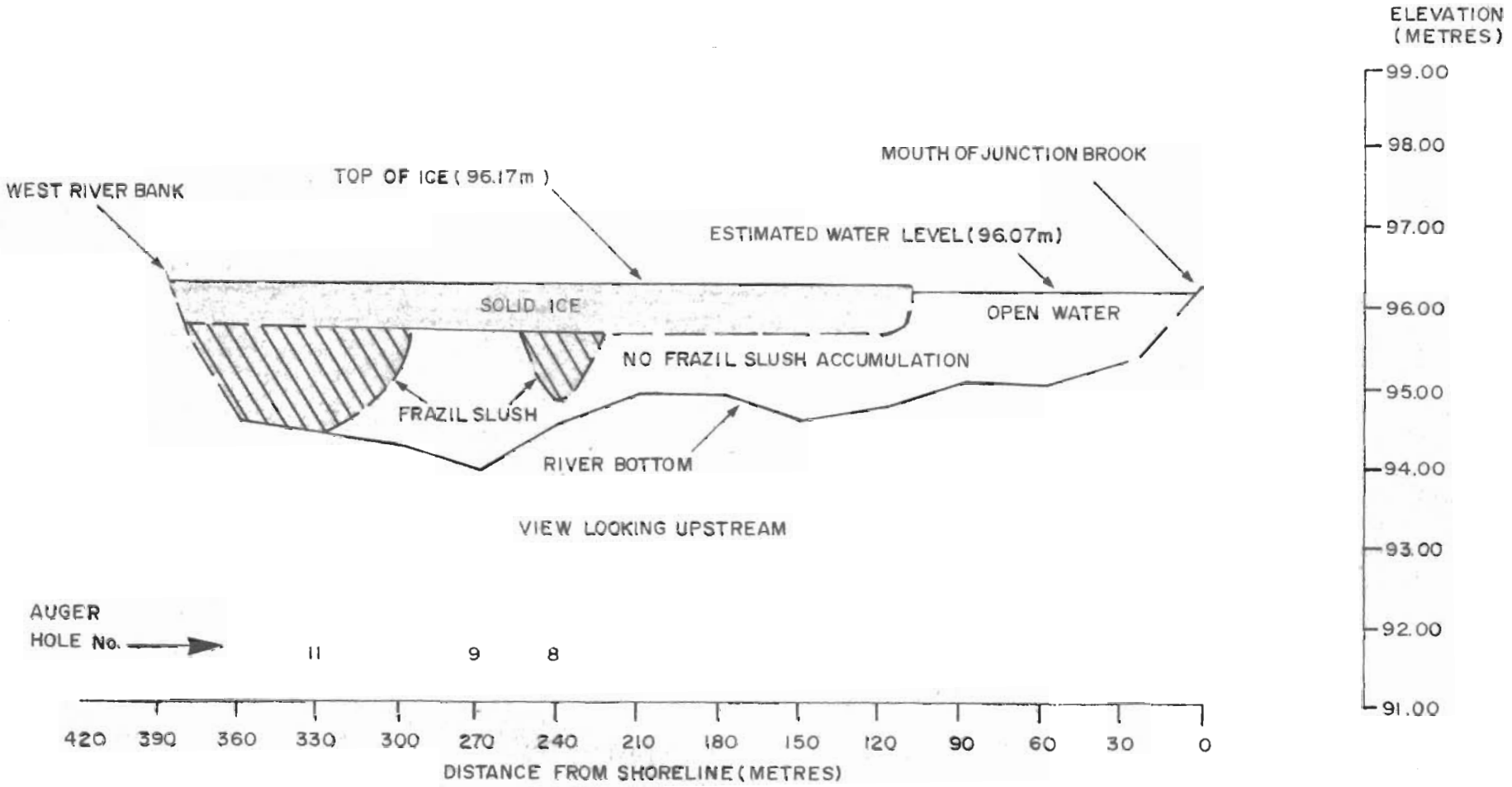
CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 4, FEB. 28, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "C" 99.603m GEODETIC.

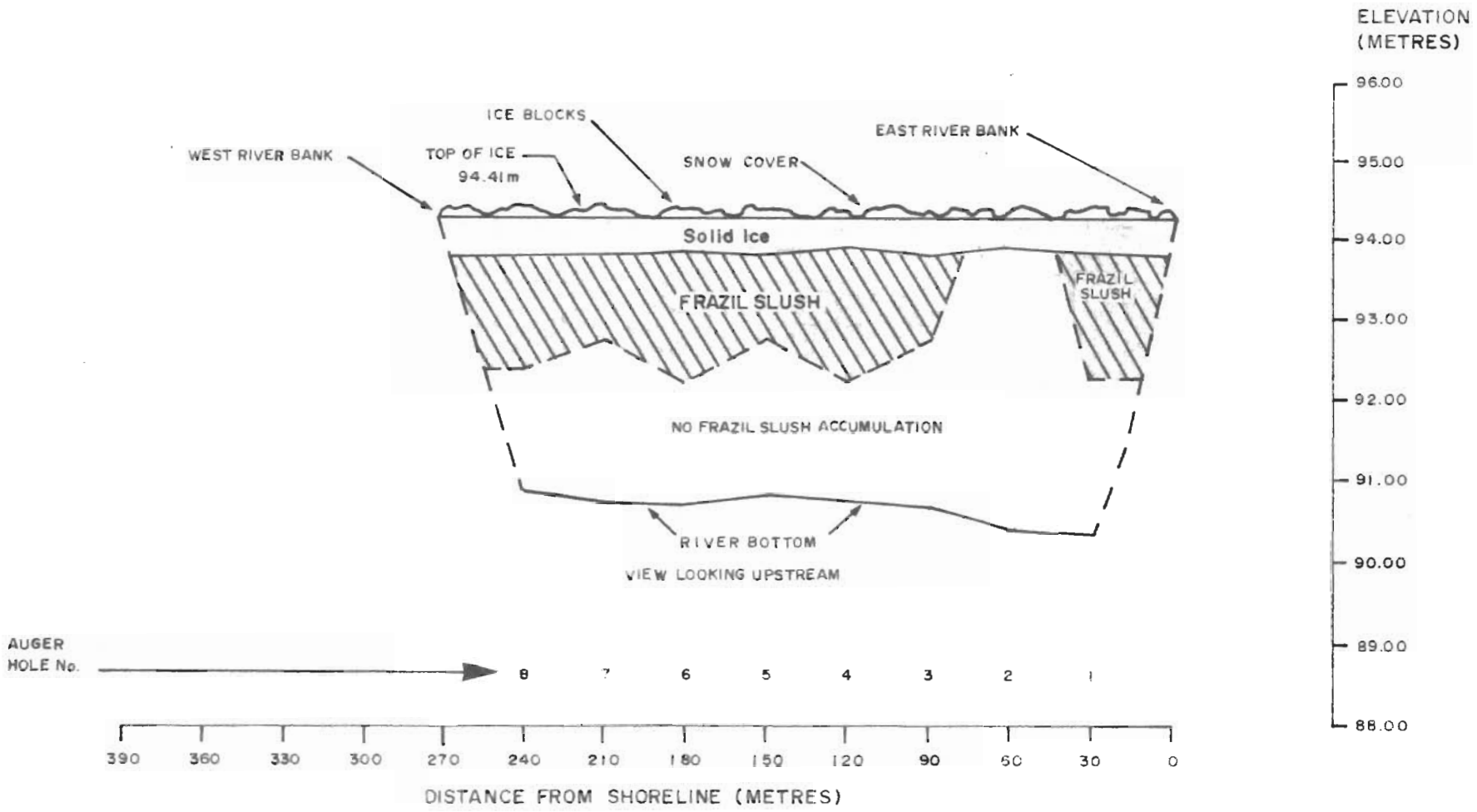
AVERAGE SNOW COVER OVER ICE SURFACE WAS 5.00cm.



CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 4, MARCH 21, 1984

NOTES:
ELEVATIONS ARE REFERRED TO TBM "B" 96.565m GEODETIC.

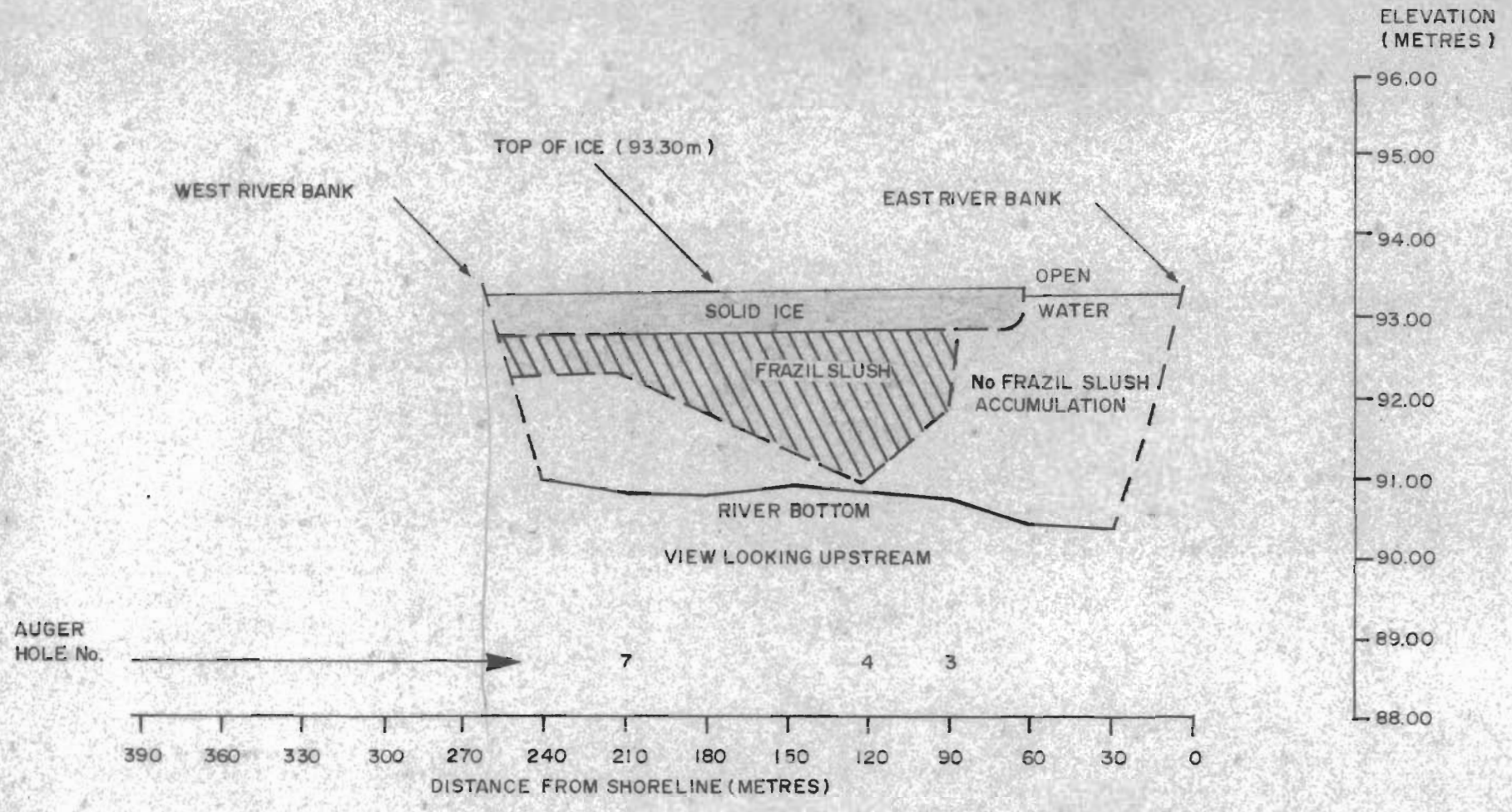


CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 3, JAN. 30, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "3" 96.565 GEODETIC.

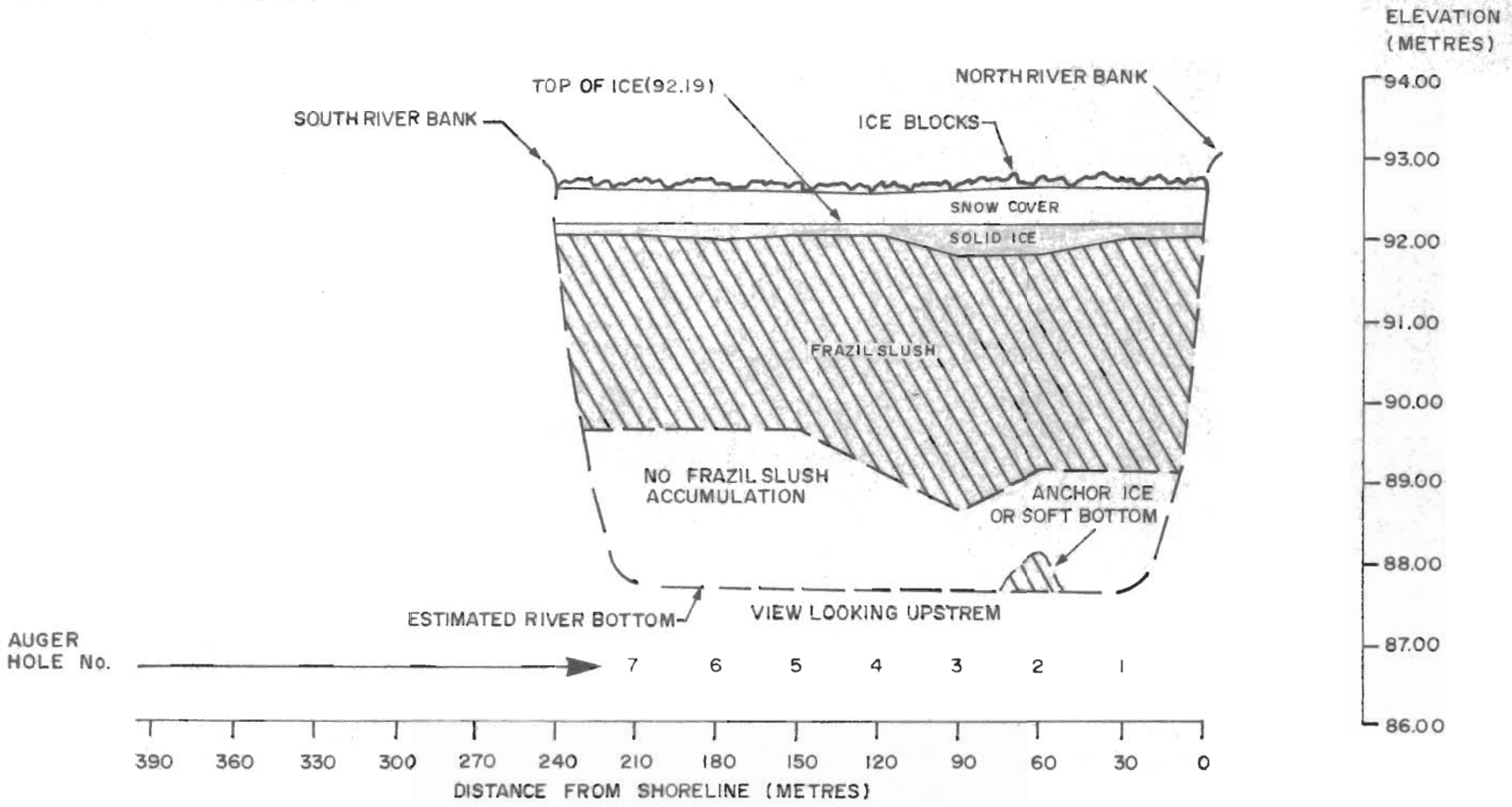


CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE

CROSS-SECTION 3, FEB. 23, 1984

NOTES:
ELEVATIONS ARE REFERRED TO TBM "E" 99.860m GEODETIC.
UNABLE TO TOUCH BOTTOM FROM THE TOP OF THE ICE USING A 4 METER LONG SURVEY ROD.



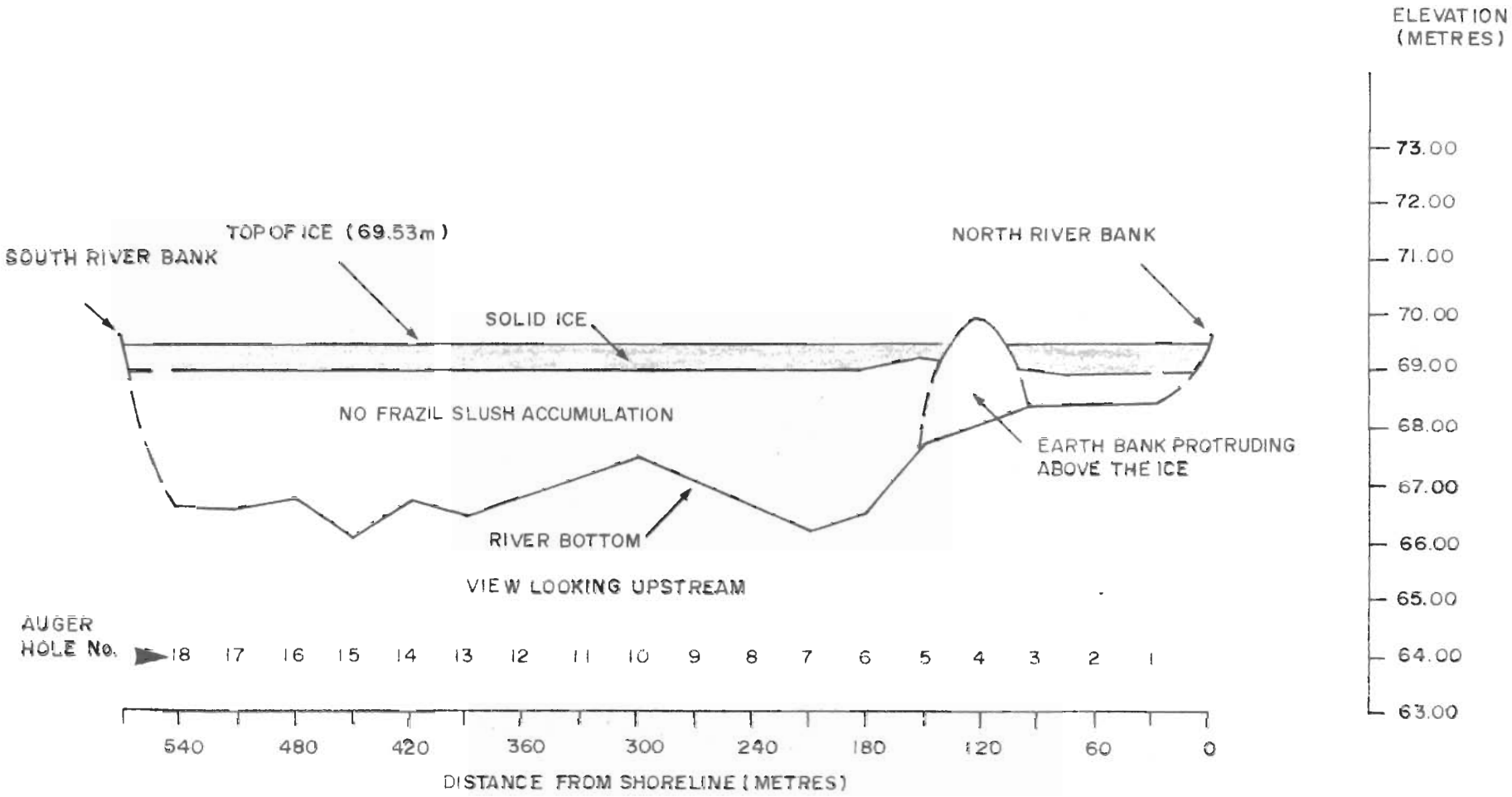
CANADA–NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 2, JAN. 30, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "1-1" 72.118m GEODETIC.

HOLES 1, 2 & 3 ARE BEHIND AN EARTH BANK WHICH BLOCKS THEM FROM THE MAIN FLOW OF THE RIVER.

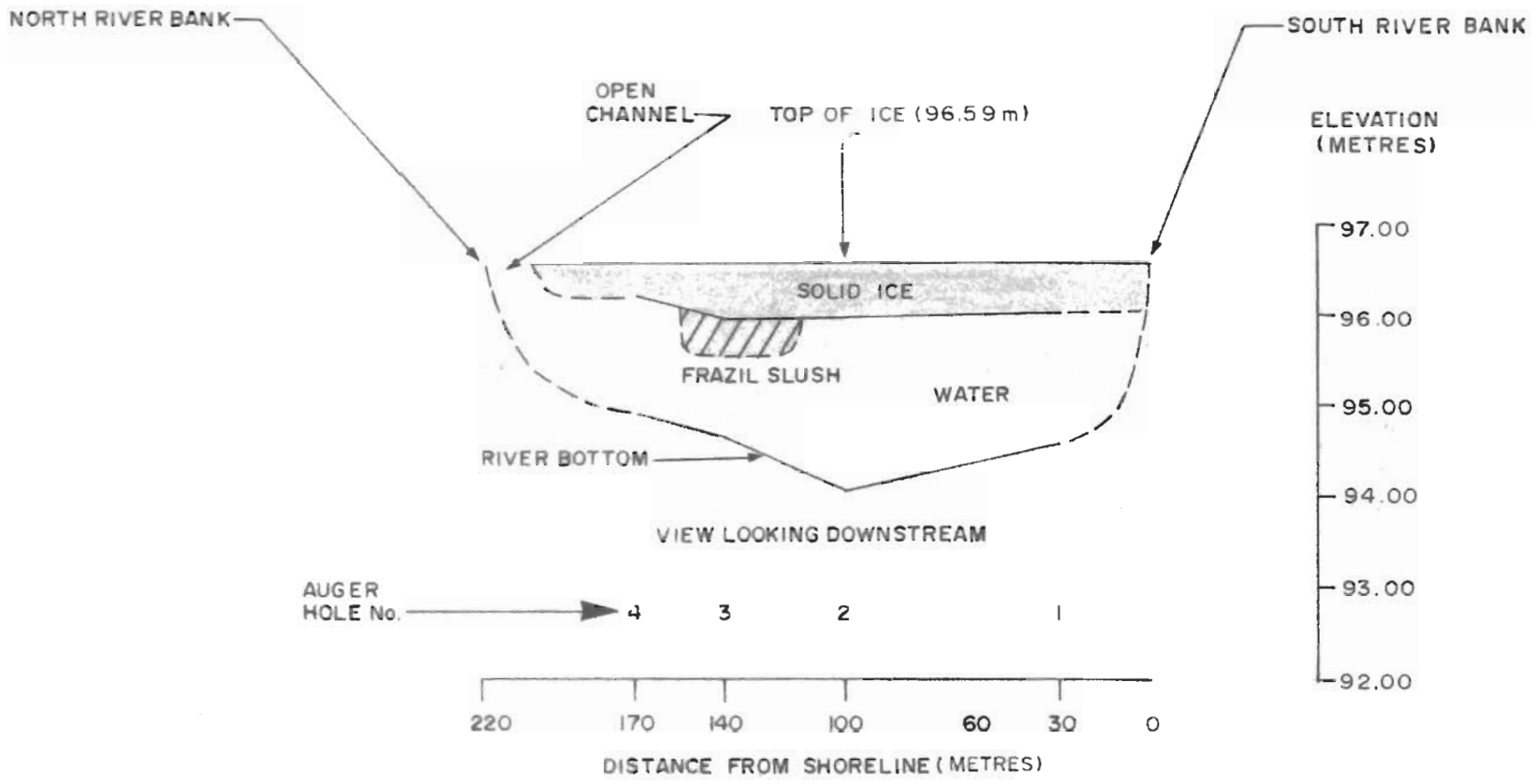


CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 5, FEB. 2, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "6" 99.286 m GEODETIC.

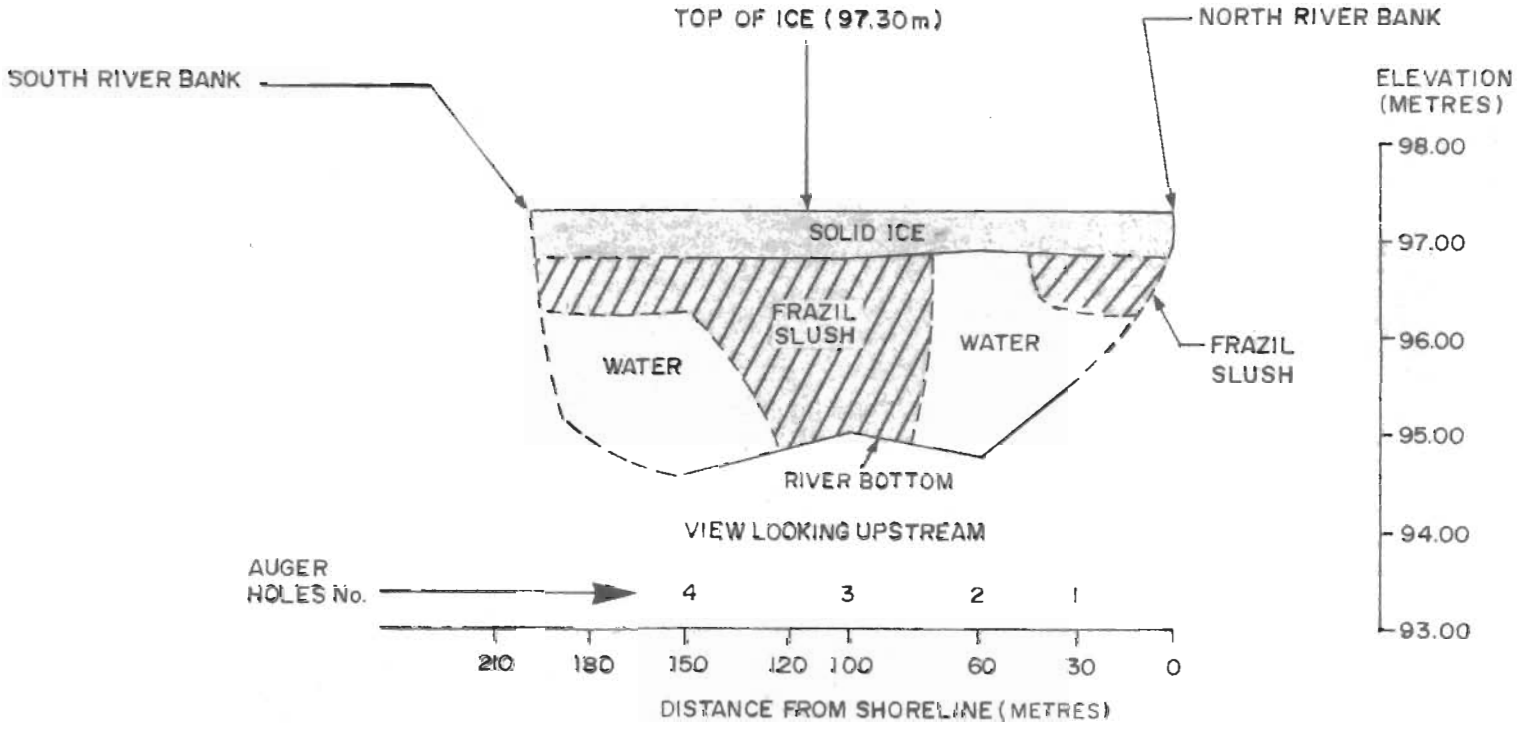


CANADA–NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 6, FEB. 24, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM. 7 – 101.840m GEODETIC.



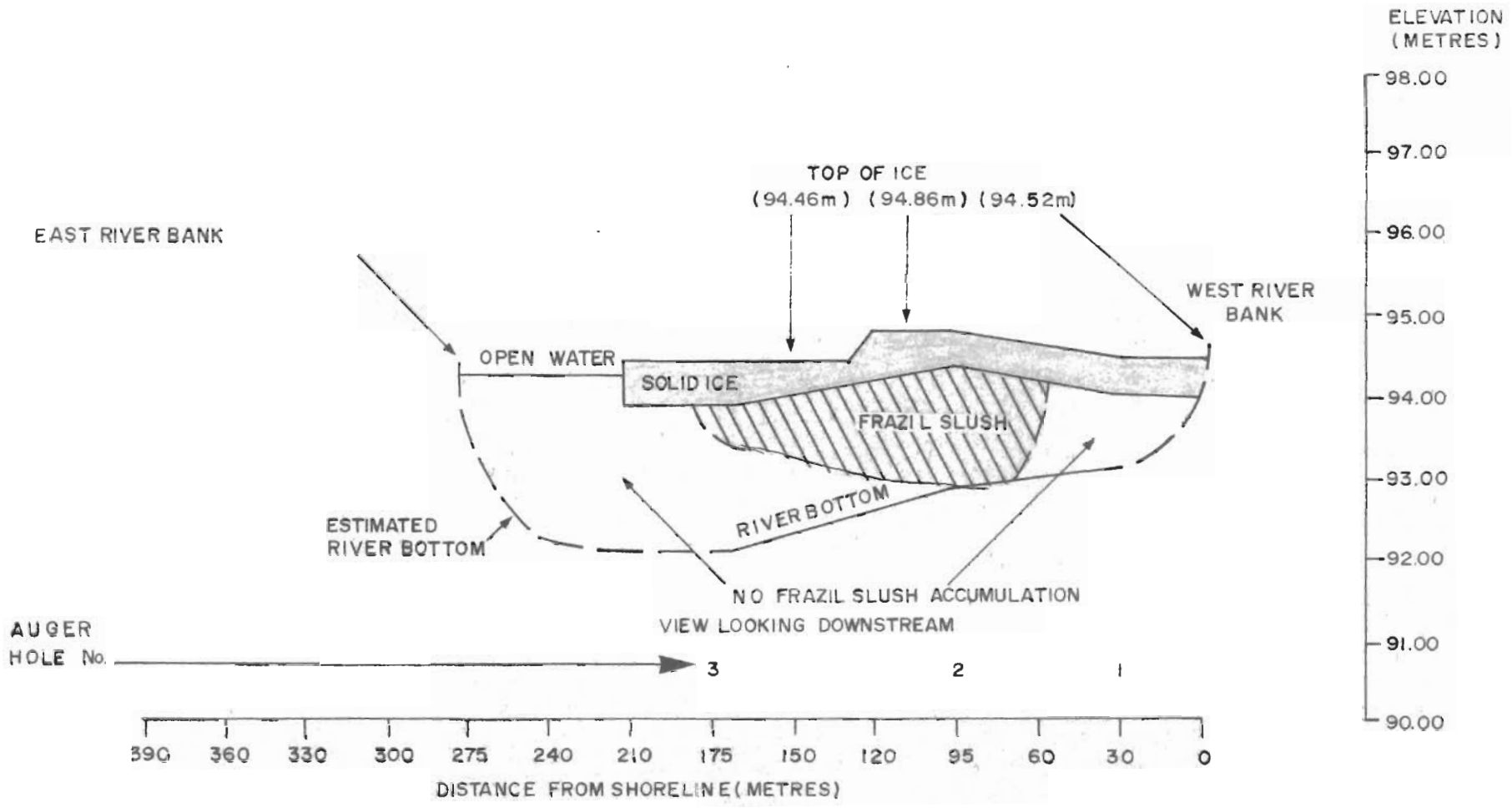
CANADA – NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 7, FEB. 22, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "31" 97.221 m GEODETIC.

DEPTH OF SNOW PATCHES OVER ICE IS 1 TO 2 mm.



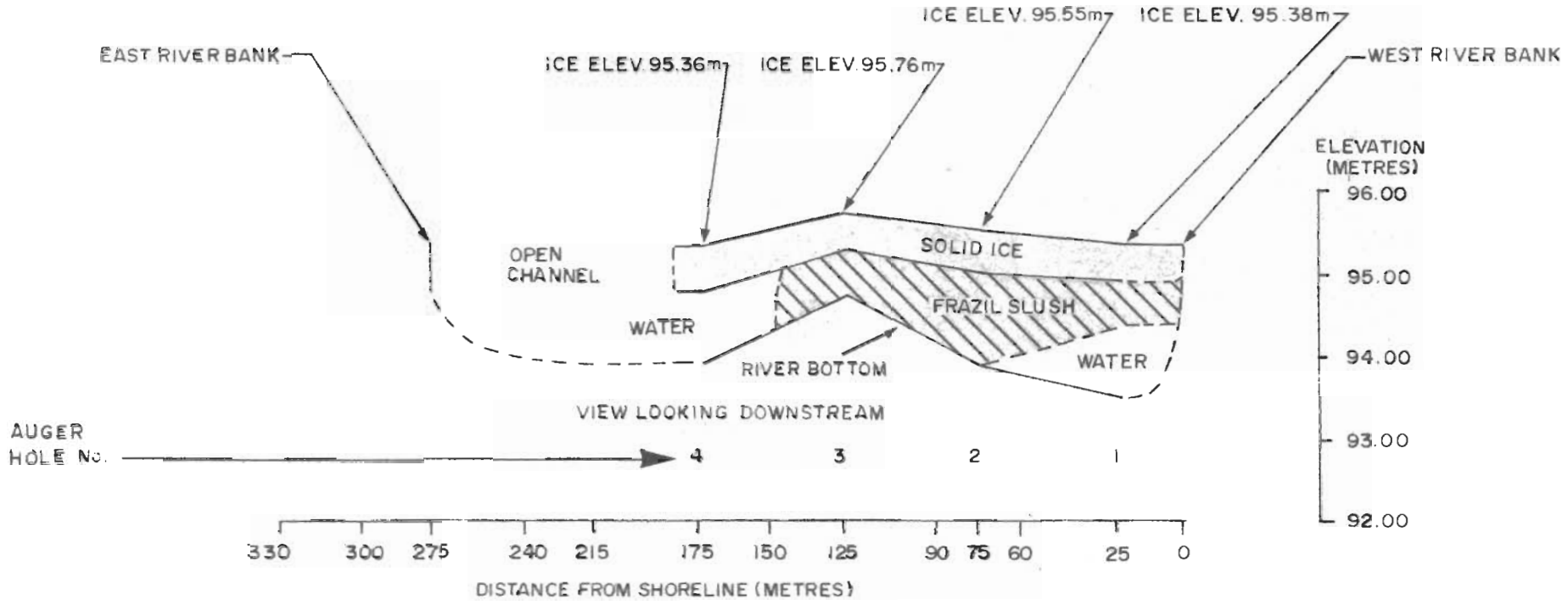
CANADA–NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION 31, FEB. 23, 1984

NOTES:

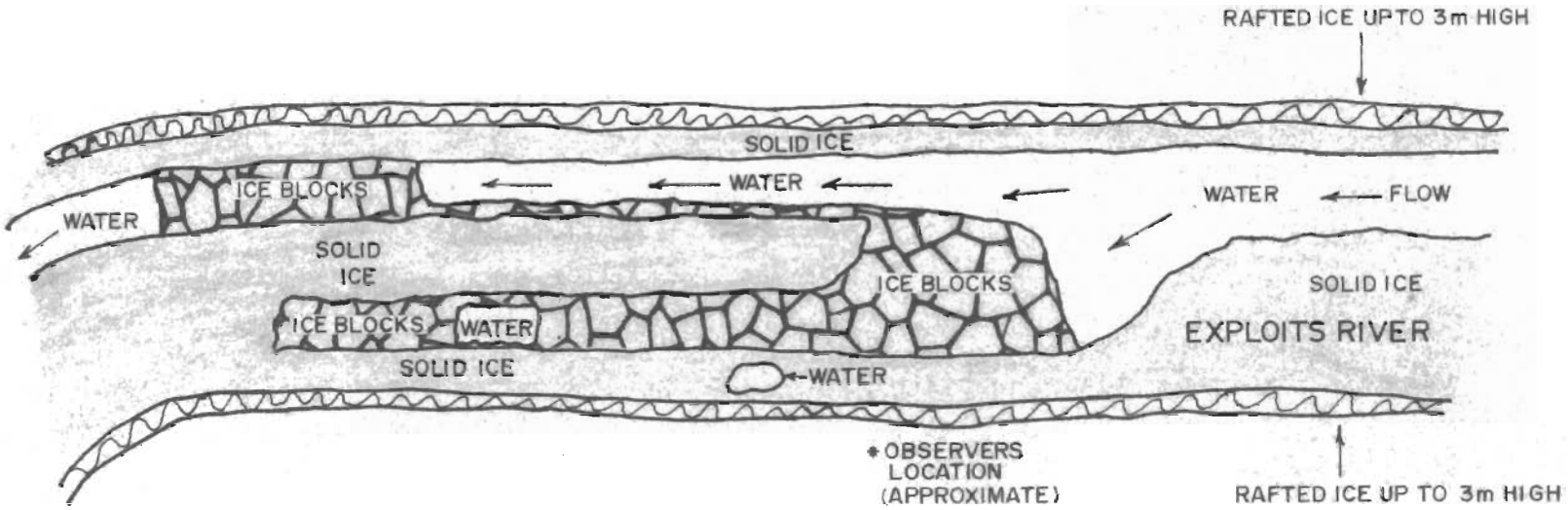
ELEVATIONS ARE REFERRED TO TBM 32 99.500m GEODETIC.

AT HOLES 3 & 4, BED MEASUREMENTS WERE POSSIBLY ON ROCKS AT BOTTOM



CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

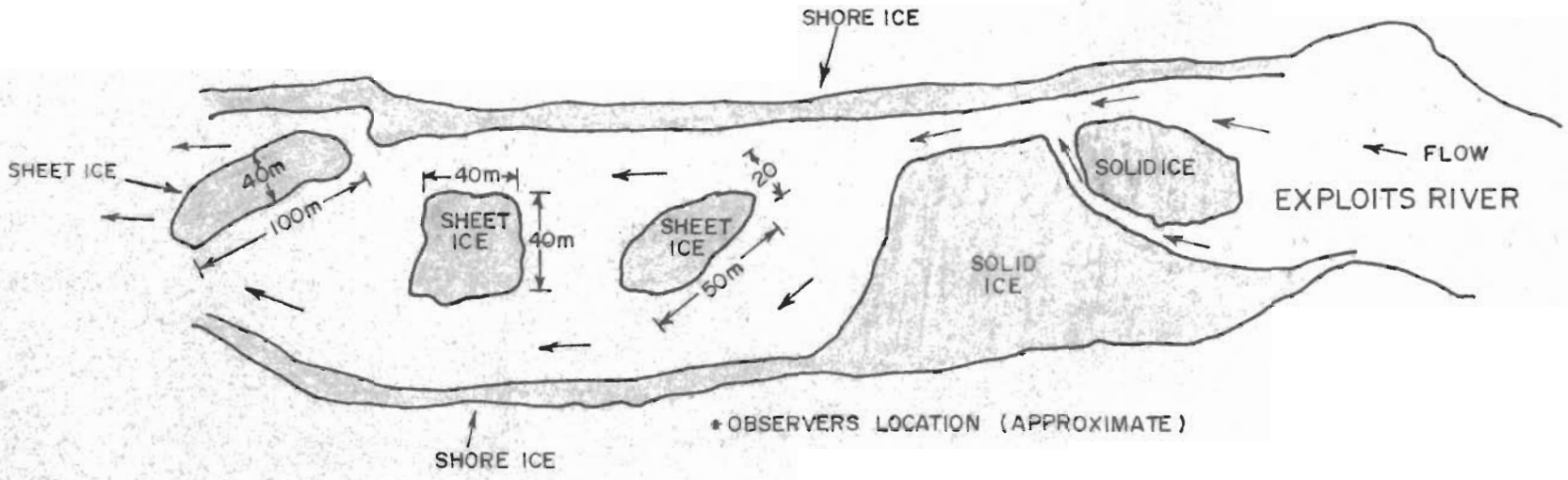
FIGURE
CROSS-SECTION 32, FEB. 24, 1984



CANADA – NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

UPSTREAM ICE EDGE (10.1 ROAD km FROM LITTLE RED INDIAN BROOK BRIDGE) MARCH 5, 1984

FIGURE

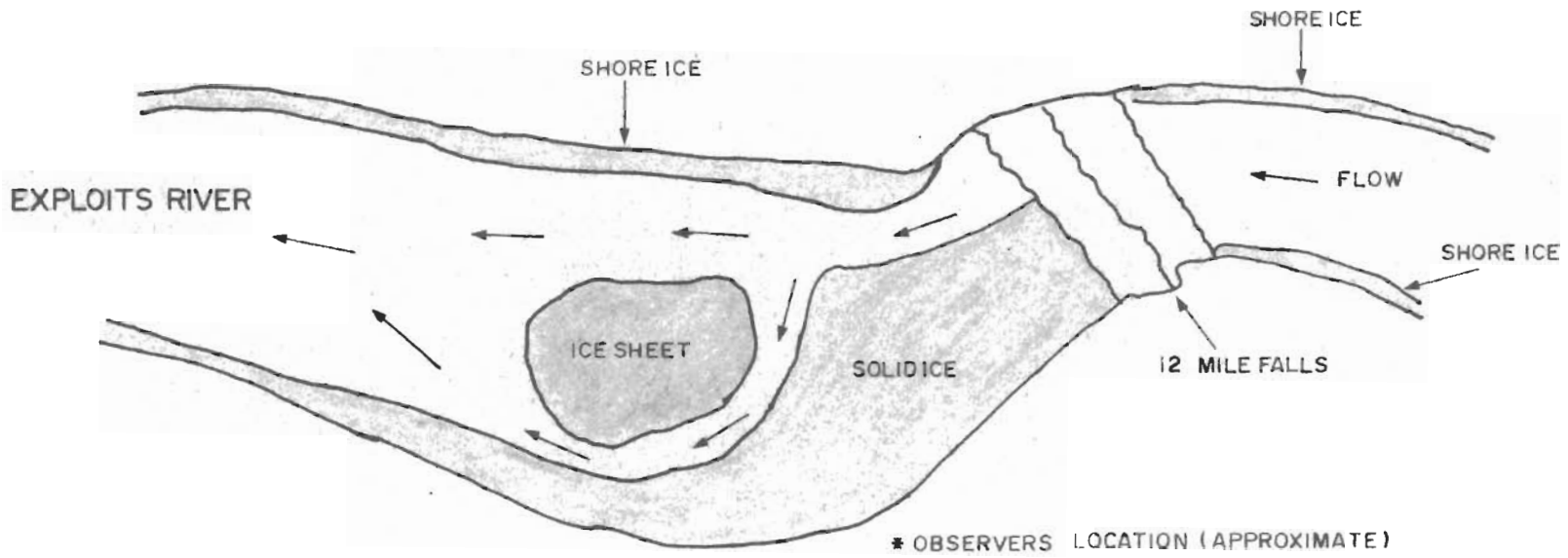


CANADA – NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

UPSTREAM ICE EDGE (12.5 ROAD km FROM LITTLE RED INDIAN BROOK BRIDGE) MARCH 5, 1984

FIGURE

NOTE: THE LARGE STATIONAY ICE SHEET APPERED TO BE GROUNDED ON 1 OR 2 SMALL ISLANDS.
THIS SHEET HAS AN ICE THICKNESS, VISIBLE ABOVE WATER, OF APPROX. 0.6 m.



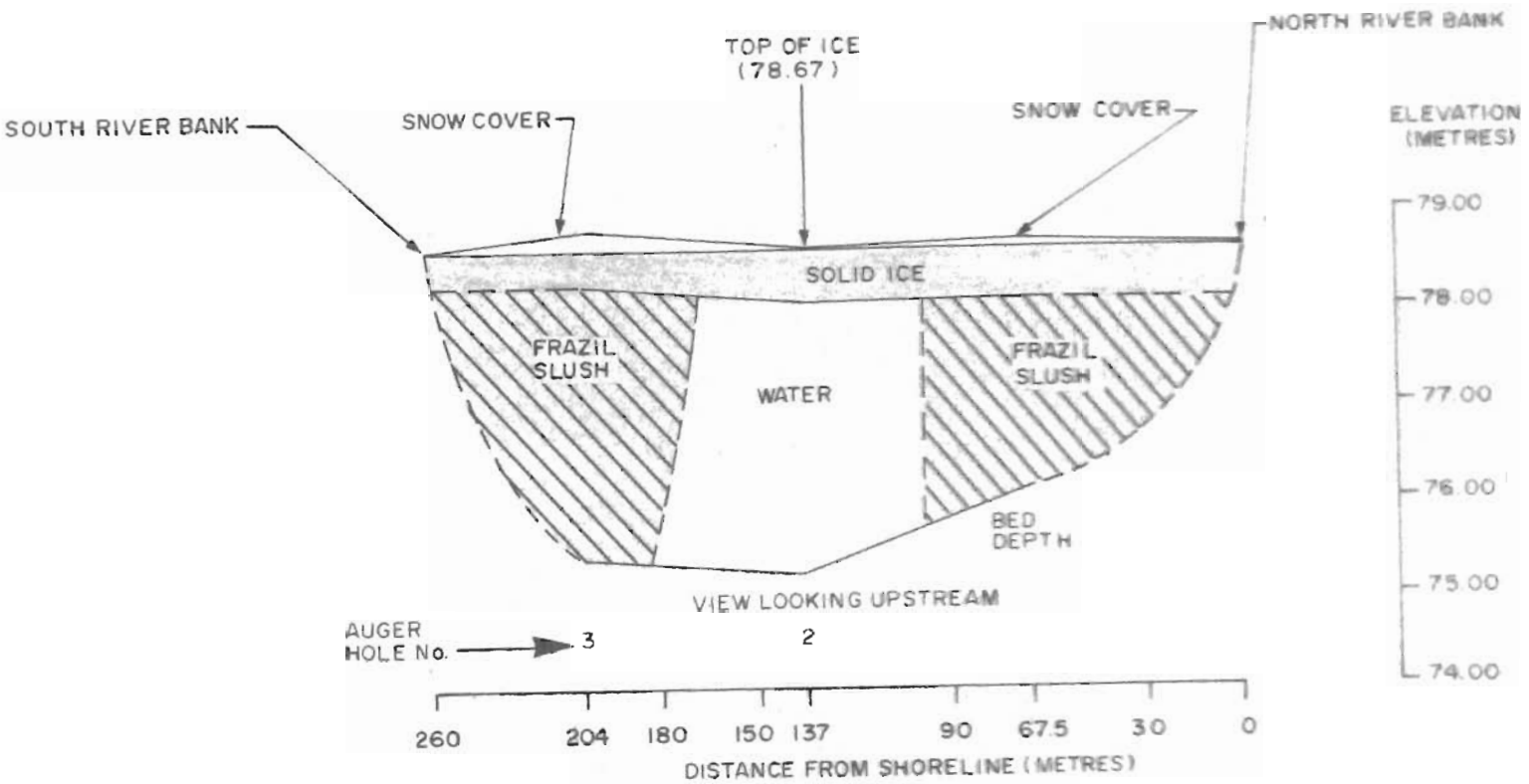
CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

UPSTREAM ICE EDGE AT 12 MILE FALLS MARCH 5, 1984

FIGURE

NOTES:

ELEVATIONS ARE REFERRED TO TBM "G1" 82.936 m GEODETIC.

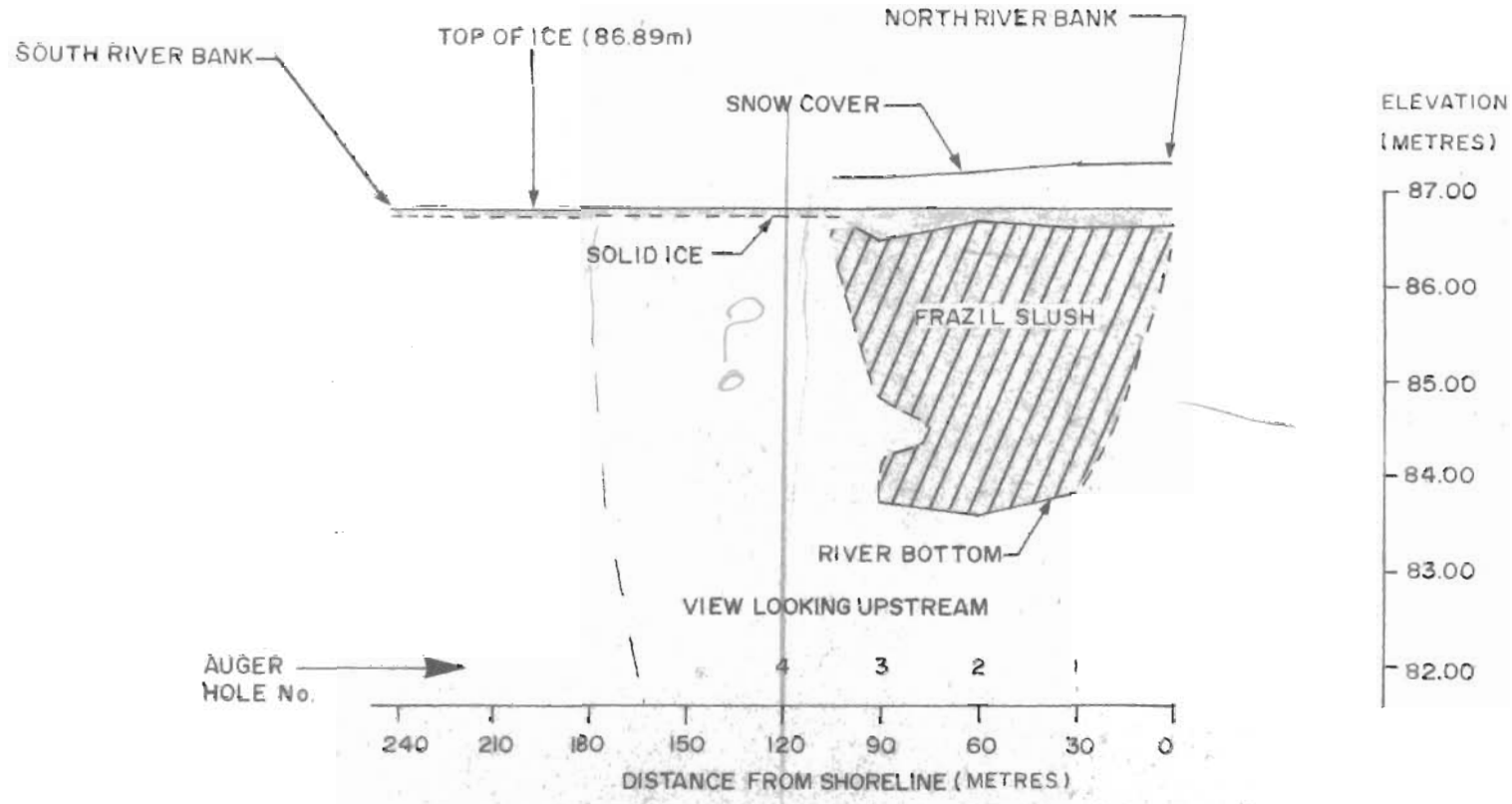


CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS-SECTION G1, MARCH 5, 1984

NOTES:

ELEVATIONS ARE REFERRED TO TBM "F" - 91.244 m GEDETIC.

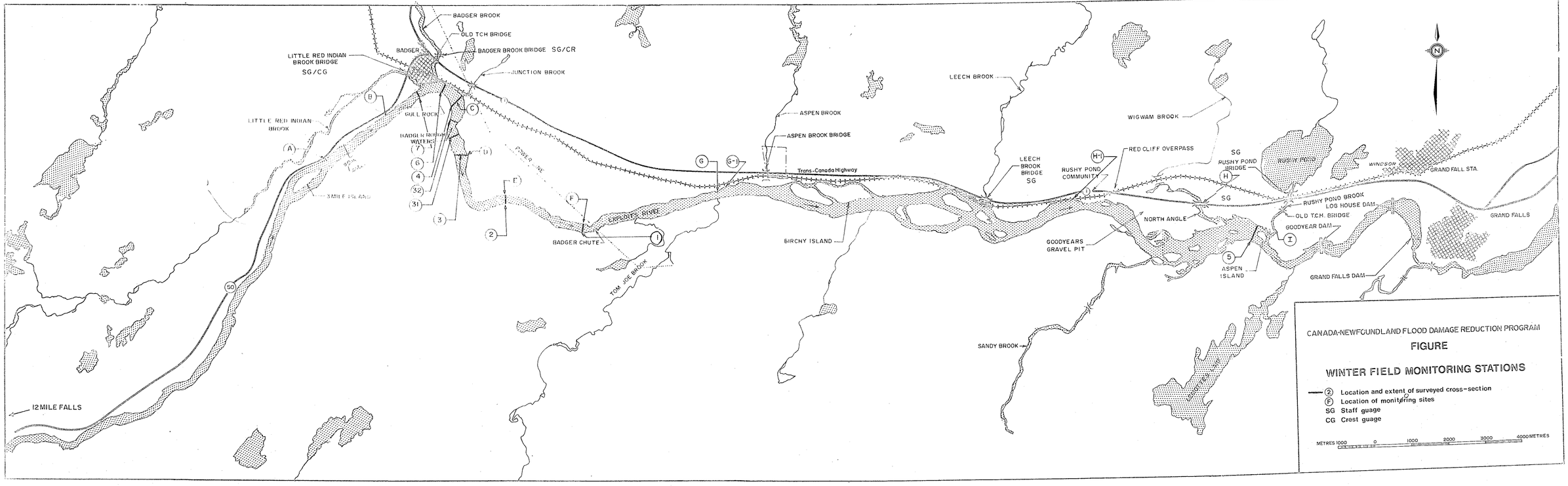


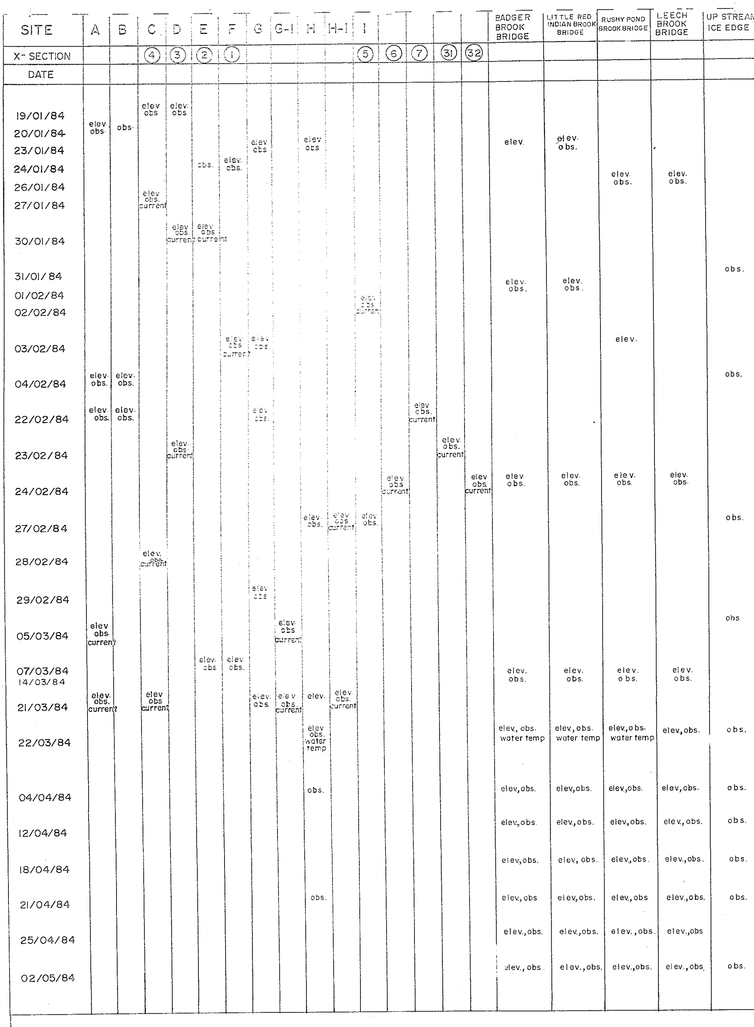
CANADA - NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE
CROSS - SECTION 1, FEB. 3, 1984


CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM
WINTER FIELD MONITORING STATIONS
② Location and extent of surveyed cross-section
Ⓕ Location of monitoring sites
SG Staff guage
CG Crest guage
METRES 1000 0 1000 2000 3000 4000 METRES
BADGER
BADGER BROOK
OLD TCH BRIDGE
BADGER BROOK BRIDGE SG/CR
LITTLE RED INDIAN BROOK BRIDGE SG/CG
JUNCTION BROOK
LITTLE RED INDIAN BROOK
GULL ROCKS
BADGER ROUGH WATERS
BEATONS ISLAND
THREE MILE ISLAND
TWELVE MILE FALLS AND EXPLOITS DAM
Buchans Road
POWER LINE
C.N.R.
THE BIG BEND
BADGER CHUTE
EXPLOITS RIVER
TOM JOE BROOK
ASPEN BROOK
ASPEN BROOK BRIDGE
Trans-Canada Highway
ELEVEN MILE ISLAND
BIRCHY ISLAND
BATTLE ISLAND
BEOTHUK ISLAND
GOAT ISLAND
LEECH BROOK
LEECH BROOK BRIDGE SG
HAPPY VALE FARM
RUSHY POND COMMUNITY
RED CLIFF OVERPASS
RED CLIFF
WIGWAM BROOK
RUSHY POND BRIDGE SG
RUSHY POND
WINCSOR
GRAND FALL STA
RUSHY POND BROOK LOG HOUSE DAM
OLD T.C.H. BRIDGE
GOODYEAR DAM
GRAND FALLS DAM
GRAND FALLS
GOODYEAR'S PULPWOOD HOLDING AREA
CAMP ISLAND
NORTH ANGLE CULVERT
GOODYEARS GRAVEL PIT
BILLY BAILLS ISLAND
ASPEN ISLAND
RUSHY PULPWOOD HOLDING AREA
SANDY BROOK

FIG. 41


BADGER BROOK
OLD TCH BRIDGE
BADGER
BADGER BROOK BRIDGE SG/CR
LITTLE RED INDIAN BROOK BRIDGE SG/CG
JUNCTION BROOK
LEECH BROOK
WIGWAM BROOK
ASPEN BROOK
ASPEN BROOK BRIDGE
LITTLE RED INDIAN BROOK
GULL ROCK
BADGER BROOK WATER
POWER LINE
Trans-Canada Highway
LEECH BROOK BRIDGE SG
RED CLIFF OVERPASS
RUSHY POND COMMUNITY
SG
RUSHY POND BRIDGE
RUSHY POND
WINDSOR
GRAND FALL STA.
SG
RUSHY POND BROOK
LOG HOUSE DAM
OLD TCH BRIDGE
GOODYEAR DAM
GRAND FALLS
NORTH ANGLE
GOODYEARS GRAVEL PIT
ASPEN ISLAND
GRAND FALLS DAM
BIRCHY ISLAND
EXPLOITS RIVER
BADGER CHUTE
TOM JOE BROOK
SANDY BROOK
SANDY LAKE
3 MILE ISLAND
12 MILE FALLS
CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM
FIGURE
WINTER FIELD MONITORING STATIONS
(2) Location and extent of surveyed cross-section
(F) Location of monitoring sites
SG Staff guage
CG Crest guage
METRES 1000 0 1000 2000 3000 4000 METRES



SITE	A	B	C	D	E	F	G	G-I	H	H-I	I					BADGER BROOK BRIDGE	LITTLE RED INDIAN BROOK BRIDGE	RUSHY POND BROOK BRIDGE	LEECH BROOK BRIDGE	UP STREAM ICE EDGE
X-SECTION			4	3	2	1					5	6	7	31	32					
DATE																				
19/01/84			elev obs	elev obs																
20/01/84	elev obs	obs					elev obs		elev obs							elev.	elev obs.			
23/01/84																				
24/01/84					obs.	elev obs.														
26/01/84																		elev obs.	elev obs.	
27/01/84			elev obs current																	
30/01/84				elev obs current	elev obs current															
31/01/84																				obs.
01/02/84																elev. obs.	elev. obs.			
02/02/84											elev obs current									
03/02/84						elev obs current	elev obs											elev.		
04/02/84	elev obs.	elev obs.																		obs.
22/02/84	elev obs.	elev obs.					elev obs.						elev obs current							
23/02/84				elev obs current										elev obs current						
24/02/84												elev obs current			elev obs current	elev. obs.	elev. obs.	elev. obs.	elev. obs.	
27/02/84									elev obs.	elev obs current	elev obs.									obs.
28/02/84			elev current																	
29/02/84							elev obs													
05/03/84	elev obs current							elev obs current												obs
07/03/84 14/03/84					elev obs	elev obs.										elev. obs.	elev. obs.	elev. obs.	elev. obs.	
21/03/84	elev obs current		elev obs current				elev obs.	elev obs current	elev.	elev obs current										
22/03/84									elev obs water temp							elev, obs. water temp	elev, obs. water temp	elev, obs water temp	elev, obs.	obs.
04/04/84									obs.							elev, obs.	elev, obs.	elev, obs.	elev, obs.	obs.
12/04/84																elev, obs.	elev, obs.	elev, obs.	elev, obs.	obs.
18/04/84																elev, obs.	elev, obs.	elev, obs.	elev, obs.	obs.
21/04/84									obs.							elev, obs	elev, obs.	elev, obs	elev, obs.	obs.
25/04/84																elev, obs.	elev, obs.	elev, obs.	elev, obs	
02/05/84																elev, obs.	elev, obs.	elev, obs.	elev, obs.	obs.

LEGEND: obs = ICE/WATER CONDITIONS RECORDED
elev = ICE/WATER ELEVATION RECORDED
current = CURRENT READINGS TO DETERMINE FRAZIL ICE LOCATION RECORDED
water temp = WATER TEMPERATURE RECORDED

CANADA-NEWFOUNDLAND FLOOD DAMAGE REDUCTION PROGRAM

FIGURE

SUMMARY OF WINTER FIELD MONITORING PROGRAM