

JWEL PROJECT NO. 8558-0015

**FISH AND FISH HABITAT
COMPONENT STUDY
TRANS LABRADOR HIGHWAY - PHASE III
(HAPPY VALLEY-GOOSE BAY
TO CARTWRIGHT JUNCTION)**

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SUBMITTED TO

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EXECUTIVE SUMMARY

The Department of Works, Services and Transportation (WST) is proposing to construct a two-lane, gravel surface highway from Cartwright Junction to Happy Valley-Goose Bay. This highway section, approximately 250 km in length, would comprise Trans Labrador Highway - Phase III and will link the existing TLH highway sections to the east and west.

The proposal was registered for provincial environmental assessment in April 2002 and following normal review, the Newfoundland and Labrador Department of Environment (DOE) called for an environmental impact assessment (EIS) that was to include a Fish and Fish Habitat Component Study. The Terms of Reference (TOR) for the Component Study are provided in Appendix 1.

The proposed route will result in 95 stream crossings in five major watersheds; Churchill River, Traverspine River, Kenamu River, Eagle River and Paradise River. The objective of the component study conducted by Jacques Whitford Environment and Innu Environmental Limited Partnership was to review existing information on the distribution of fish species in the study area and conduct field surveys at all of the proposed stream crossing locations. No fish sampling was conducted.

Aerial surveys by helicopter were conducted at all crossing locations and ground surveys were conducted at all ground accessible crossing sites where the upstream area was greater than 2 km², and the habitat was classed as spawning and rearing habitat (Type I and Type II). In total, 35 ground surveys were completed.

The fish habitat was characterized at each crossing location, using standard terminology and classifications. Stream width, water depth, substrate, habitat type, riparian vegetation, and apparent obstructions to fish migration or navigation were recorded for all crossings. The same was recorded in more detail during ground surveys, along with water velocity, stream gradient and selected water quality parameters (temperature, pH, conductivity, dissolved oxygen, turbidity - and a sample to determine total dissolved solids, alkalinity and dissolved metals). Field reports, photographs and water quality data are included in Appendices 2, 3 and 4 respectively.

The results of the field surveys indicated that 50 of the proposed crossing locations are small streams with a width of less than 2 m. The details of several of the crossings could not be determined due to the small size of the stream and the dense overhead canopy of the forest. At least 44 of the crossings comprised productive fish habitat (Type I and II).

Twenty fish species are reported in the five watersheds that the highway will transect. WST is committed to completing detailed fish surveys along the proposed route in 2003.

Water quality data have been compiled for 35 of the proposed stream crossing locations, and these data will enhance the understanding of regional water quality and represent baseline existing conditions for the purpose of assessment and follow-up.

Most of the water quality values are typical for the region. Parameters such as aluminum and iron were found at level above the Canadian Council of Ministers of the Environment (CCME) Guideline for the Protection of Aquatic Life at some locations, a situation that is quite common in Newfoundland and Labrador waterbodies. Other parameters such as cadmium, selenium and silver had values that were either above the CCME guidelines or at levels that could not be compared to the guidelines, due to the level of quantification attained by the analytical laboratory.

KA MAMUSHTAKANT EIMUN

Nete ut Tshishe Utshimat ka ut pempant (Department of work, Services and Transportation WST) meshkanau ka ut nakatuapatakant kie ka atushkatet ntuentamupant tshetshi tutakant meshkananu nete ut Nutapieunant (Cartwright Junction) nuash nete Apipani-Kuspe tshetshi itamuniit. Ume meshkanau miam 250Km tshipa tatupashkuniau, nete ut Napatau Labrador Mishte Meshkanu - Phase III tshipa itamu kie nete Labrador City mak Uapush (Wabush) meshkanau kietamua.

Neme nentuentakant tshetshi tutakant meshkanau mashinateikanipan nete Tshishe Utshimat tshetshi minu nantussentakant kassinu tshekuan eshi innuimikak nete tshe tutakant ne meshkanau. Shiship Pishum 2002 pupun tutakanipan mashineikan, nete Newfoundland mak Napatau Labrador tshishe utshimat kanantussentakant kassinu tshekuan eshi innuimikak assit ntuentakanipan tshetshi tutakant mashineikan (EIS) ishinikateu ne eshi nantussenimant kassinu eshikusht namesh kie eshinakunit nete etat. Ne mashineikan Katutakant (TOR) eshiantussenimant namesh uauitakanu nete Appendix 1 mashineikant katutakant ueshkat.

Ne meshkanau tshe itamutakant 95 shipissa tshika takuna petetat etatinikau shipua, Mishte shipu, Traverspine shipu, Kenamu shipu, Eagle River mak Paradise shipu. Ntshe ka nantussentakau Jacques Whitford Environment kassinu eshi inniumikanit tshekuanu nete assit kie ntshe Innu Environmental Limited tapishkut atushkatamupant nenu enantussentakant kassinu eshi- inniumikanit tshekuanu nete assit tshe tutakanit meshkananu, nenu muk namesha nete etantshi nantussentamupant kie nete shipissa eitkunetshi. Apu tut utinanikue namesh tshetshi nantusseimakant.

Nete ut ishpimit nantussentakanipan nete tshe itamut meshkanau kauashteitshesht apitshiakanipan kie nete eitakuaki shipissa nuash 2 km tatipashkuniau nete nantussentakant kie ekute etakue namesh (Type I mak Type II) ishinikateu nenu eshi nantussenimakant. Mamu 35 nete tshiashtakantshi enantussentakant tshe itamutakant meshkanau.

Tipan nete tutakanipan ne mashineikan eshi uauinakant namesh eshi nantussenimakant nete eitat Eshkupiat ne shipiss, eshpishat nipi, eshi-takuak neta shipissit, eshinakunit nete ueuaukuut namesh, eshinakunit umitshiim namesh kie nete eshinakuak assi tekuaki nenua shipissa kassinu ne ishi nantussentakanipan nete eitat namesh. Kie nantussentakanipan ne nipi etakaamut, eshinakuak nete tekuak ne nipi (Etakamut kie tshekuan nete eshi tekuak nipi) Eku ume eshi nantussentakant akunakanipan akunanakant kie nete mashineikant Appendices 2,3 mak 4 etashtet mashineikant takun ume eshi uauitakant.

Ekue nete epamutaenanut enantussentakantshi shipissa 50 km nantussentakapani, Apu tut tshi nutem minu nantussentakantshi ushamikat apishashua. Muk 44 sentakua etakue namesh (Type 1 mak Type 2, Eshinakusht.

Ekue nemeua petetat shipua ka uietetshi uta mashineikant nishunnu eishinakusht namesh eitaue nete shipit kie ekute nete ne meshkanau tshe tutakant. Ntshe kanantussentakau WST minuat tshika nantussentamut nete eitantshi namesha patush 2003 pupun tshe atushkatet ne tshe nantussentakant.

Nipi eshinakuak nantussentakapani 35 tatuiet ishi utnakanipan nete shipissa tekunikau nete meshkanau ua tutakant kie ne eshi nantussentakant tshika setakun eshinakuak nipi kie eukun tshe utshi uitamakuiak eshi meshkakent tshekuan neta nipit.

Pesse ne nipi eshishat peikutau itentakun nete kutaka nipi tekunikau. Ntshe ka utshimakaniit nenu tshetshi Nantussentakant Kassinu Tshekuanu Eshi-inniumikant Nete Assit (CCME) tutamupant mashineikanu tshe ishi nashekanit nenu tshipa ishi nantussentakant nipi kie kassinu ne aushish kiemak namesh etat nete nipit, kie eukun eshi tutakant nete Newfoundland mak Napatau Labrador ua nantussentakantshi nipi. Kie nete uet tshetshue nakatuapakant ne eshi nantussentakant nipi apu shuka atapan ishi tutakant ne tshipa ishi nantussentakant nipi.

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1.0 INTRODUCTION

1.1 Background

The Department of Works, Services and Transportation (WST) is proposing to construct a two-lane, gravel surface highway from Cartwright Junction to Happy Valley-Goose Bay, a distance of approximately 250 km. This highway represents the final link of an all-season ground transportation route between the Labrador Straits, southern Labrador, Upper Lake Melville, western Labrador and Quebec. The proposed alignment for the Trans Labrador Highway - Phase III (TLH - Phase III) will result in 95 stream crossings. The stream crossings are associated with five watersheds; the Churchill River watershed, the Traverspine River watershed, the Kenamu River watershed, the Eagle River watershed and the Paradise River watershed.

In anticipation of requirements for environmental assessment, WST contracted Jacques Whitford Environment Limited (JW) and Innu Environmental Partnership Limited (IELP) to prepare the following fish habitat component study.

1.2 Watersheds

The TLH - Phase III will cross five large watersheds; Paradise River, Eagle River, Kenamu River, Traverspine River (which is a tributary of the Churchill River), and the Churchill River itself. The proposed watercourse crossings vary from small streams to the Churchill River. The nearest communities to the proposed route are Paradise River and Cartwright, approximately 50 and 75 km from Cartwright Junction, respectively, and Happy Valley-Goose Bay at the western end of the route. No permanent residents are located along the route and existing outfitting operations are quite distant from the route.

The physical characteristics of the four basins are provided in Table 1.1. Churchill River, with a basin area of 93,415 km², is not included in the table, as there is only a single crossing proposed near its mouth.

Table 1.1 Physical Characteristics of Four Rivers

	Paradise River	Eagle River	Kenamu River	Traverspine River
Drainage Area (sq. km)	5,276	10,824	4,403	728
Mean width (km)	38	58	32	18
Axial length (km)	122	139	119	48
Basin perimeter (km)	359	605	502	148
Maximum basin relief (m)	485	610	305	518
Length by meander of main stem (km)	129	135	150	95
Total length including tributaries (km)	3,373	3,548	613	464
Number of tributaries	94	81	77	26
Geological formation	Granitic gneiss	Granitic gneiss	Granite and Granitic gneiss	Gneiss, anorthosite and associated rocks
Source: Compiled from Anderson (1985)				

1.3 Fish and Fish Habitat

Both Paradise River and Eagle River drain in a northeast direction into Sandwich Bay on the coast of Labrador. The TLH - Phase II runs, in part, parallel to Paradise River. The TLH - Phase III will cross the main stem near Paradise Junction and then traverse over 50 km of the watershed in an east-northeast direction. Anadromous Atlantic salmon have access to spawning and rearing habitat up to and 75 km beyond the highway crossing. The lower sections of the river, below the crossing location, are steeper gradient and less suitable as rearing habitat. Anderson (1985) relates reports that Paradise River is not suitable for salmon angling due to the lack of pools. However, subsequent to the construction of TLH - Phase II, the Department of Fisheries and Oceans (DFO) designated Paradise River as a scheduled salmon river. No angling catches had been reported to 1985 but the stock from Paradise River contributed to the, then commercial, salmon fishery of Sandwich Bay.

The Eagle River is one of the largest salmon rivers in North America and up to five years ago was the only scheduled salmon river along the proposed route. There are several outfitting operations that cater to recreational angling on the Eagle River. The proposed highway will cross approximately 125 km of the river basin.

West of the Eagle River, Kenamu River drains north to Hamilton Inlet, which includes Lake Melville and Groswater Bay. The proposed highway will cross approximately 40 km of this watershed at a location approximately 80 km from the river mouth. Most of the length of Kenamu River is suitable rearing habitat

for Atlantic salmon, with only partial barriers presented by rapids on the main stem. However, slow waters in the lower reaches of the river produce poor angling conditions and there is little fishing activity (Anderson 1985).

The Traverspine River also flows in a northerly direction to enter the lower Churchill River, 10 km from the mouth. The proposed highway will traverse the basin at the approximate middle, which is 20 to 25 km wide. The route then runs up the western side of the Traverspine basin to a bridge across the Churchill River. Various potential barriers to salmon migration have been described on the Traverspine River, but again, angling activity is very low due to its remoteness and the presence of poorly suited conditions for angling (Anderson 1985).

The proposed bridge crossing the Churchill River is located approximately 20 km from the mouth of the river. Although there are 20 species of fish reported in Churchill River, only some of these have been reported below Muskrat Falls. The area of the crossing is wide with sandy substrate.

1.4 Objectives

The objective of this component study is to identify the habitat type and quality at each proposed stream crossing location for TLH - Phase III between Happy Valley-Goose Bay and Cartwright Junction. The Terms of Reference (TOR) for this study, included as Appendix 1, provide the details of the required information and indicates the study methodology.

1.5 Study Team

The study team that participated in activities leading to this report is shown in Table 1.2.

Table 1.2 Study Team for TLH - Phase III Fish Habitat Component Study

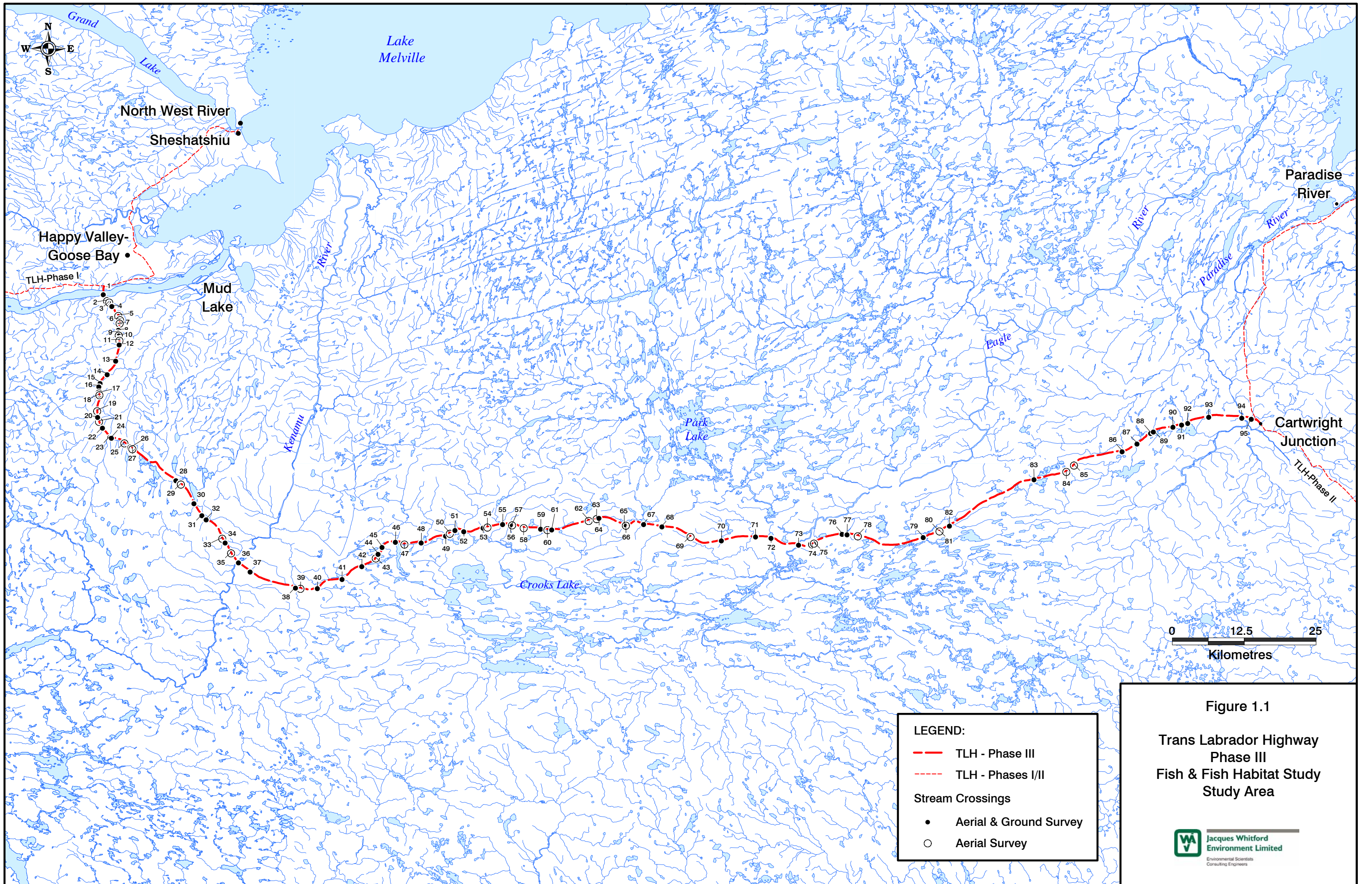
Role	Personnel	Affiliation
Program Management	Bruce Bennett, Fisheries Scientist	JW
Field Surveys/Activities	Barry Wicks, Fisheries Biologist	JW
	Matt Hynes, Technologist	JW
	Herman Montague, Field Assistant	Innu Environmental Limited Partnership
	Peter Jefford, Pilot	Universal Helicopters
Mapping/GPS	David Kearsey	JW

1.6 Study Area

The study area consists of those areas where stream crossing structures will be constructed along the preferred route between Happy Valley-Goose Bay and Cartwright Junction (Refer to Figure 1.1).

1.7 Coordination with Innu Nation

An application for a Research Authorization was submitted to Innu Nation prior to the initiation of the study. The application was developed based on guidelines “Conducting Research in Innu Territory” provided to JW by Innu Nation.



2.0 METHODOLOGY

2.1 Identification of Stream Crossing Sites

WST provided 1:50,000 scale maps with the proposed route marked on them. Ninety-five stream crossing locations were numbered sequentially along the route, beginning with the Churchill River and ending at Cartwright Junction. The maps were accompanied by a preliminary list of crossings that identified the crossing number and location, as well as the size of the upstream drainage basin and the estimated size of the required water transfer structure (culvert or bridge). The study TOR (Appendix 1) required that an aerial survey be conducted of all identified stream crossing locations. A further requirement was that on-ground detailed surveys were to be conducted at all crossings except those that are:

- bog drainage areas;
- areas of obvious Type III (rapids) and Type IV (steadies) habitat; and/or
- crossing sites with an upstream drainage area of less than 2 km².

Upon review of the mapping and topography, it was determined that some crossing locations would not be reasonably accessible (i.e., no safe landing area nearby).

In cases where ground surveys were not conducted, the rationale for omitting the ground survey was documented on field data forms.

2.2 Field Surveys

2.2.1 Aerial Survey

The aerial survey was conducted from 23 to 26 September 2002, flying a Jet Ranger with Universal Helicopters out of Happy Valley-Goose Bay. The survey team was comprised of a fisheries biologist, a field technologist, a field assistant and the pilot. Surveys were conducted according to JW/IELP standard operating procedures. Information was collected following methodology and criteria as outlined in DFO's *Standard Methods Guide for Freshwater Fish and Fish Habitat Surveys in Newfoundland and Labrador* (Sooley et al. 1998).

The 500-m section of stream, extending 250 m upstream and downstream of the crossing location, was classified using Beak salmonid habitat classification (Sooley et al. 1998) as defined in Table 2.1. The Beak habitat classification is based largely on substrate and flow characteristics, as defined in Tables 2.2 and 2.3, respectively, as well as depth. Other information collected during the aerial survey includes an estimate of channel width, bank material composition, back slope, bank vegetation, cover, gradient and the

identification of potential obstructions. Information collected was recorded on field data sheets that are included as Appendix 2.

Table 2.1 Characteristics of the Four Beak Habitat Types

Habitat Type	Description
Type I	<p>Good salmonid spawning and rearing habitat; often with some feeding pools for larger age classes</p> <p>Flow: moderate riffles;</p> <p>Current: 0.1 to 0.3 m/s;</p> <p>Depth: relatively shallow, 0.3 to 1 m;</p> <p>Substrate: gravel to small cobble size rocks or boulders; and</p> <p>General habitat types: primarily riffle, pool.</p>
Type II	<p>Good salmonid rearing habitat with limited spawning, usually only in isolated gravel pockets; Good feeding and holding areas for larger fish in deeper pools, pockets, or backwater eddies:</p> <p>Flows: heavier riffles to light rapids</p> <p>Current: 0.3 to 1 m/s</p> <p>Depth: variable from 0.3 to 1.5 m;</p> <p>Substrate: larger cobble, rubble sized rock to boulders and bedrock, some gravel pockets between larger rocks; and</p> <p>General habitat types: run, riffle, pocketwater, pool.</p>
Type III	<p>Poor rearing habitat with no spawning capabilities, used for migratory purposes:</p> <p>Flows: very fast, turbulent, heavy rapids, chutes, small waterfalls;</p> <p>Depth: variable, 0.3 to 1.5 m;</p> <p>Substrate: large rock and boulders, bedrock; and</p> <p>General habitat types: run, pocketwater, cascades.</p>
Type IV	<p>Poor juvenile rearing habitat with no spawning capability, provides shelter and feeding habitat for larger, older salmonids (especially brook trout):</p> <p>Flows: sluggish;</p> <p>Current: 0.15 m/s</p> <p>Depth: variable but often 1 m;</p> <p>Substrate: soft sediment or sand, occasionally large boulders or bedrock, macrophytes present in many locations; and</p> <p>General habitat types: steady, pool, glide.</p>
Source: Sooley et al. (1998).	

Table 2.2 Classification of Substrate

Substrate	Description
Bedrock (BR)	Continuous solid rock exposed by the scouring forces of the river/stream
Boulder (Bo)	Boulder sized rocks from 25 cm to greater than 1 m in diameter
Rubble (R)	Large rocks from 14 to 25 cm in diameter
Cobble (C)	Moderate to small sized rocks from 6 to 13 cm in diameter
Pebble (P)	Small rocks to stones from 3 to 5 cm in diameter
Gravel (G)	Small stones from 2 mm to 3 cm in diameter
Fines (F)	Sand and smaller sized material on margins of streams or between rocks and stones, up to 2 mm in diameter

Adapted from Sooley et al. (1998).
Pebble substrate has been included with cobble as indicated in Bradbury et al. (2001).

Table 2.3 Classification of Flow

Flow Type	Description
Run	Swiftly flowing water with some surface agitation but no minor flow obstructions, coarser substrate (gravel, cobble boulder)
Riffle	Shallower section with swiftly flowing, turbulent water with some partially exposed substrate (usually cobble or gravel dominated)
Pocketwater	Turbulence increased greatly by numerous emergent boulders which create eddies or scour holes (pockets) behind the obstructions
Steady (or Flat)	Water surface is smooth and substrate is made up of organic matter, sand, mud, and fine gravel. This habitat differs from a pool due to length, associated with low gradient. This habitat type generally has a flat bottom.
Pool	Deeper area comprising full or partial width of stream, due to depth or width flow velocity is reduced. Pool has rounded surface on bottom.
Cascade (Rapids)	Area of steeper gradient with irregular and rapids flows, often with turbulent white water. Rapids are primarily associated with larger stream sections and rivers. In larger rivers it is recommended that the survey crew not attempt to conduct cross sections in these types of habitat.
Glide	Wide, shallow pool flowing smoothly and gently, with low to moderate velocities and little or no surface turbulence. Substrate usually consists of cobble, gravel and sand.

Source: Sooley et al. (1998).

During the aerial survey, those streams that required ground surveys were verified. Streams were selected for conducting ground surveys based on the criteria outlined above. Where possible (i.e., if a stream was adequately visible), a generalized sketch of the surveyed section was included on the data sheet. All data were recorded on standardized field data sheets (Appendix 2) and field notebooks. Digital photographs were taken of all stream crossings and the area 250 m upstream and downstream of the crossing was videotaped. Photographs of the stream crossings are included in Appendix 3.

2.2.2 Ground Surveys

Ground surveys were conducted at the required locations in accordance with the TOR criteria (Appendix 1), except for those locations that could not be safely accessed due to dense forest, excessive brush and standing dead wood (resulting from past forest fire), or from other factors.

Ground surveys were conducted on 35 streams over the period September 26 to October 1, 2002. In addition to the 500-m section surveyed from the air, a focussed survey was conducted on an approximately 50-m section where the proposed stream crossing is to be located. The determination of this location was based on the information provided by WST and the observed stream conditions. Global Positioning System (GPS) way points for the stream crossing locations are included in Appendix 2.

All stream characteristics collected during the aerial survey for the 500-m section (habitat type, flow type, substrate type, etc.) were again recorded for the stream crossing location. Representative photographs were taken upstream and downstream of the crossing location and a GPS position was recorded. A sketch of the 50-m section outlining key features was recorded on the field data sheets (Appendix 2).

Where visibility was not obstructed, stream gradient was measured over the 50-m section with a clinometer. If visibility was obstructed (e.g., by vegetation cover), the stream gradient over the 50-m section was estimated.

2.2.3 Water Quality and Flow

A Hydrolab Datasonde 4 Water Quality Multiprobe was used to obtain water temperature, pH, conductivity, dissolved oxygen and turbidity measurements. All readings were recorded on data sheets (Appendix 2) and as part of the water quality data results (Appendix 4).

Two water samples were collected at each stream crossing location for the determination of alkalinity, total dissolved solids, and total metals (ICP-MS scan). These samples were kept on ice and shipped to Phillip Analytical Services in Halifax, Nova Scotia, for analysis. The analytical results are included as Appendix 4. Surface velocity measurements were measured with a Gurley flow meter. Where it was safe to do so, the velocity measurements were obtained at mid-stream, as a surface velocity. If this was not possible, surface

velocity was taken closer to the stream bank. In these cases, water depth and distance from the stream bank were recorded along with velocity measurements. The flow data were recorded on the field data sheets (Appendix 2) and as part of the water quality results (Appendix 4).

3.0 RESULTS

3.1 Background Summary of Surveyed Stream Crossings

The proposed route for TLH - Phase III will result in 95 stream crossings in five watersheds. An overview of the five watersheds is provided in Section 1.3. Stream crossings are numbered sequentially (1 to 95) from the Churchill River near Happy Valley-Goose Bay, to tributaries of the Paradise River near Cartwright Junction, as shown in Tables 3.1 to 3.5 (refer to Figure 1.1 for locations).

The crossings in each watershed are listed by number and distance from the Churchill River (along the proposed highway route) and stream order in Tables 3.1 to 3.5. A headwater stream with no tributary is a first order stream, a second order stream has a first order tributary draining to it, a third order stream has a second order stream draining to it, etc. (Scruton et al. 1992). Any ponds or lakes upstream of each crossing and approximate distance to the crossing are also shown in Tables 3.1 to 3.5, as are lakes or main stem rivers downstream of each crossing and distance to these. This information is relevant in that watercourse features upstream of the crossing may contain spawning and rearing habitat. Downstream features such as steadies and lakes (depositional areas) may represent the downstream extent of the adverse effects of a siltation event. The areas and types of habitat downstream will also determine the potential habitat damage from an accidental release (pollution event).

Table 3.1 Background Summary of Stream Crossings on Churchill River and Minor Tributaries

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
1	0	3+	90,000+					Churchill River
2	0.8	1	0.5	N	-	M	1	< 2 km ² drainage upstream
3	1.3	1	1	N	-	M	1.5	< 2 km ² drainage upstream
4	2	2	2.6	N	-	M	4.5	
5	4	1	0.6	N	-	M	5	< 2 km ² drainage upstream
6	4.6	1	0.5	N	-	M	7	< 2 km ² drainage upstream
7	5.2	1	0.6	N	-	M	8	< 2 km ² drainage upstream
8	6.5	2	4	H	2.3	M	15	
9	6.9	3	3.7	H	4	M	15	
10	7.4	2	1.8	N	-	M	15	< 2 km ² drainage upstream
11	8.3	1	0.7	N	-	M	15	< 2 km ² drainage upstream
12	8.7	2	4.7	N	-	M	15	

Notes:
 Upstream of crossings have headwater pond (H), a lake(s) with tributaries (L), or none (N).
 Downstream of crossings have Lake (L), steady (S), large tributary (T), or the main stem of the river (M).

Table 3.2 Background Summary of Stream Crossings on Traverspine River and Tributaries

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
13	11.6	1	2.4	N	-	M	3.0	
14	14.3	1	3.1	N	-	M	4.5	
15	16.3	3	26.5	L	3.0	M	6	
16	16.9	3	56.8	L	6.5	M	6.5	
17	18.2	1	1.15	N	-	M	7.5	< 2 km ² drainage upstream
18	18.5	1	0.5	N	-	M	7.8	< 2 km ² drainage upstream
19	21.4	2	1.7	N	-	M	3.0	< 2 km ² drainage upstream
20	22.5	2	2.1	N	-	M	2.5	
21	23.3	1	0.7	N	-	M	2.5	< 2 km ² drainage upstream
22	24.6	3+	77	L	10	M	2.5	
23	26.7	3+	191	-	-	-	-	Traverspine River
24	27	3	29	L	4	M	0.4	
25	29.5	1	0.4	N	-	M	3.0	< 2 km ² drainage upstream
26	30.9	1	0.15	N	-	L	3.5	< 2 km ² drainage upstream
27	31.1	1	0.25	N	-	L	3.5	< 2 km ² drainage upstream
<p>Notes:</p> <p>Upstream of crossings have headwater pond (H), a lake(s) with tributaries (L), or none (N).</p> <p>Downstream of crossings have Lake (L), steady (S), large tributary (T), or the main stem of the river (M).</p>								

Table 3.3 Background Summary of Stream Crossings on Kenamu River and Tributaries

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
28	40.2	3+	72.3	L	1.5	L	3	
29	41.3	1	0.78	N	-	L	3	< 2 km ² drainage upstream
30	45.6	2	11.9	L	2	L	0.5	
31	48.2	1	2.7	N	-	T	1	
32	49.2	2	6.3	N	-	T	0.5	
33	53.7	1	1.5	N	-	M	5	< 2 km ² drainage upstream
34	54.6	1	6.95	N	-	M	4	
35	56.7	1	1	N	-	M	3	< 2 km ² drainage upstream
36	58.8	3+	2, 026	-	-	-	-	Kenamu River
37	60.9	1	4.75	N	-	M	3.5	
38	69.4	3+	41.6	S	0.5	M	11	
39	70.3	1	1.3	N	-	M	12	< 2 km ² drainage upstream
40	73.3	3	14.3	H	3	M	15	
41	78	2	7.8	N	-	L	0.3	
42	82.2	1	2.9	L	1	L	4	

Notes:
 Upstream of crossings have headwater pond (H), a lake(s) with tributaries (L), STEADY (s) or none (N).
 Downstream of crossings have Lake (L), steady (S), large tributary (T), or the main stem of the river (M).

Table 3.4 Background Summary of Stream Crossings on Eagle River and Tributaries

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
43	85.1	1	0.5	H	.05	L	0.2	< 2 km ² drainage upstream
44	85.8	-	na	N	-	L	1	Crossing is on a pond
45	87.4	2	5	L	.05	L	2.5	
46	90.1	3+	71.8	L	3	L	6	Crossing is on a pond
47	91.8	1	1.75	N	-	L	0.4	< 2 km ² drainage upstream
48	94.7	3	36.7	L	0.3	L	3.2	
49	99.3	1	2.6	N	-	L	1	
50	100.2	1	1.6	N	-	L	0.5	< 2 km ² drainage upstream

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
51	101.3	3	11.8	N	0.1	L	0.4	
52	102.9	3+	140	S	0.03	S	2	Crossing is on a steady
53	106.5	2	2.7	N	-	T	2.5	
54	107.2	1	0.3	N	-	T	3	< 2 km ² drainage upstream
55	109.9	3+	70.8	L	3.5	T	3.5	
56	111.3	1	2	N	-	T	4	
57	111.6	1	1.5	N	-	T	4	< 2 km ² drainage upstream
58	113.7	1	1	N	-	L	1.5	< 2 km ² drainage upstream
59	116.7	2	9.4	L	1.5	L	3.5	
60	117.9	1	1.5	N	-	L	3	< 2 km ² drainage upstream
61	118.6	2	13.1	H	2.5	L	4	
62	125.3	1	1.5	N	-	L	5.5	< 2 km ² drainage upstream
63	126.8	1	1	N	-	L	4	< 2 km ² drainage upstream
64	127.2	2	3.8	N	-	L	3.5	
65	130.8	2	4.1	H	3	L	0.5	
66	131.1	1	0.7	H	0.5	L	0.7	< 2 km ² drainage upstream
67	134.5	2	5.6	N	-	L	0.05	
68	137.7	1	2.05	N	-	L	1	
69	142.9	1	1.725	N	-	S	0.6	< 2 km ² drainage upstream
70	148.7	1	4.6	N	-	L	2	
71	154.9	3	55.3	S	2.5	T	3	
72	157.5	1	3.1	N	-	L	.15	
73	162.6	3+	3, 644	-	-	-	-	Eagle River - South Branch
74	165.1	1	0.9	N	-	M	2.5	< 2 km ² drainage upstream
75	165.4	1	1.9	N	-	M	2.5	< 2 km ² drainage upstream
76	170.6	1	4.2	N	-	L	.5	
77	171.2	2	17.3	L	3.5	L	0.1	
78	172.7	1	1.2	H	0.15	L	3	< 2 km ² drainage upstream
79	184.8	3+	376	L	2	S	2	Otter Brook
80	187.6	1	1.2	N	-	T	1	< 2 km ² drainage upstream
81	187.9	1	1.1	N	-	T	1.1	< 2 km ² drainage upstream
82	189.9	3	25	L	3	T	1.5	

Notes:
Upstream of crossings have headwater pond (H), a lake(s) with tributaries (L), or none (N).
Downstream of crossings have Lake (L), steady (S), large tributary (T), or the main stem of the river (M).

Table 3.5 Background Summary of Stream Crossings on Paradise River and Tributaries

Stream Crossing #	Distance from Churchill River (km)	Stream Order	Watershed Area (km ²)	Upstream		Downstream		Comment
				Pond or Lake	Distance to crossing (km)	Lake or Main Stem	Distance to crossing (km)	
83	206.7	2	11.4	L	0.6	L	0.5	
84	211.9	1	1.9	N	-	L	0.5	< 2 km ² drainage upstream
85	213.8	1	0.8	N	-	T	7	< 2 km ² drainage upstream
86	218.9	3	78	L	1.2	T	9	
87	221.8	3	24	L	5	L	1	
88	224.8	3+	35	S	0.1	L	0.15	
89	225.3	1	6.55	S	0.3	L	0.1	
90	228.9	1	2.55	H	1.5	L	2	
91	230.6	2	16.6	L	2	L	1.2	
92	231.7	1	2.5	H	1.4	L	0.4	
93	235.5	1	2.74	H	0.7	L	3	
94	241.2	3+	3, 339	-	-	-	-	Paradise River
95	242.6	1	6.8	N	-	M	1.5	

Notes:
 Upstream of crossings have headwater pond (H), a lake(s) with tributaries (L), or none (N).
 Downstream of crossings have Lake (L), steady (S), large tributary (T), or the main stem of the river (M).

3.2 Fish Habitat

It is assumed that all stream crossings are potential productive stream habitat and, therefore, the surveys were conducted to collect detailed habitat information at each crossing location either from the air, on the ground or both. The selection of ground survey locations were based on crossings that could be accessed safely, crossings with an upstream basin area greater than 2 km² and crossings with Beak Type I or Type II habitat. If all criteria were met, a detailed habitat assessment of the proposed crossing was conducted on the ground. The number of streams surveyed on the ground, as well as those eliminated from the ground survey and the elimination criteria, are summarized in Table 3.6.

Table 3.6 Number of Streams Surveyed from Air and on the Ground

Total Number of Crossings	Ground Surveys Completed	Streams That Were Not Surveyed on the Ground			
		Upstream Drainage < 2 km ²	Type III or IV Habitat	Inaccessible for Landing	Other *
95	35	36	13	8	3

NOTE:
 * Churchill River was not ground surveyed for practical reasons, an osprey prevented approach to one crossing site, and one crossing had sub-surface flow (not stream habitat).

Thirty-six streams were eliminated from the ground survey requirement, based on drainage area being less than 2 km², as determined by WST from 1:50,000 scale topographic mapping. Of the remaining 59 streams, 13 were eliminated since they were observed to be Type III or Type IV habitat, eight were inaccessible and three were eliminated for other reasons (i.e., Churchill River could not be adequately surveyed on the ground, an aggressive osprey prevented the chopper from landing at stream 31 and stream 92 was intermittent and disappeared under ground). In total, 35 of 95 stream crossings were surveyed on the ground.

A detailed aerial assessment was not possible on 20 watercourse crossings due to the small size of some streams and visual impairment created by an extremely thick tree canopy. The majority (16) of these streams have a drainage area of less than 2 km². The summary information for the 95 stream crossings is shown in Tables 3.7 to 3.11.

Table 3.7 Summary Information of Stream Crossings - Churchill River and Minor Tributaries

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
1				x	riffle	II	Churchill River
2	x				(riffle)	(II)	Upstream Basin area < 2 km ²
3	x				N/A	N/A	Upstream Basin area < 2 km ²
4	x				(riffle)	(II)	
5	N/A				N/A	N/A	Upstream Basin area < 2 km ²
6	x				(riffle)	(II)	Upstream Basin area < 2 km ²
7	x				(riffle)	(II)	Upstream Basin area < 2 km ²
- 8 -		x			riffle	II	Fish observed (1)
- 9 -	x				riffle	II	
10	x				N/A	N/A	Upstream Basin area < 2 km ²
11	x				N/A	N/A	Upstream Basin area < 2 km ²
12	x				N/A	N/A	

Crossing numbers are sequential and shown in Figure 1.1, see Table 2.3 for flow and Table 2.1 for habitat.
 Crossing numbers indicated with hyphens (- # -) are those where ground surveys were conducted.
 N/A denotes crossings where the stream was obscured by forest canopy and habitat character could not be determined.
 Flow and habitat types in brackets are estimated from partial views or immediately adjacent sections.

Table 3.8 Summary Information of Stream Crossings - Traverspine River and Tributaries

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
- 13 -		x			riffle	II	Brook trout observed (1)
14		x			riffle	I	
15			x		riffle	II	
- 16 -			x		riffle/pool	II	
17	x				N/A	N/A	Upstream Basin area < 2 km ²
18	x				N/A	N/A	Upstream Basin area < 2 km ²
19	x				N/A	N/A	Upstream Basin area < 2 km ²
20		x			(riffle)	(II)	
21	x				N/A	N/A	Upstream Basin area < 2 km ²
- 22 -				x	rapids	III	
- 23 -			x		riffle	II	Traverspine River
- 24 -			x		rapids	III	
25	x				N/A	N/A	Upstream Basin area < 2 km ²
26	x				N/A	N/A	Upstream Basin area < 2 km ²
27	x				N/A	N/A	Upstream Basin area < 2 km ²

Crossing numbers are sequential and shown in Figure 1.1, see Table 2.3 for flow and Table 2.1 for habitat.
 Crossing numbers indicated with hyphens (- # -) are those where ground surveys were conducted.
 N/A denotes crossings where the stream was obscured by forest canopy and habitat character could not be determined.
 Flow and habitat types in brackets are estimated from partial views or immediately adjacent sections.

Table 3.9 Summary Information of Stream Crossings on Kenamu River and Tributaries

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
- 28 -			x		riffle	II	
29	x				N/A	N/A	Upstream Basin area < 2 km ²
30			x		steady	IV	
31	x				N/A	N/A	Osprey (prevented ground survey)
32	x				(riffle)	(II)	
33	x				(riffle)	(II)	Upstream Basin area < 2 km ²
34	x				(riffle)	(II)	
35							No stream was visible at the coordinates
- 36 -				x	riffle	II	Kenamu River
- 37 -	x				steady	IV	
- 38 -			x		riffle	II	
39	x				N/A	N/A	Upstream Basin area < 2 km ²
- 40 -		x			riffle	II	
- 41 -		x			riffle	I	
- 42 -		x			riffle	II	

Crossing numbers are sequential and shown in Figure 1.1, see Table 2.3 for flow and Table 2.1 for habitat.
 Crossing numbers indicated with hyphens (- # -) are those where ground surveys were conducted.
 N/A denotes crossings where the stream was obscured by forest canopy and habitat character could not be determined.
 Flow and habitat types in brackets are estimated from partial views or immediately adjacent sections.

Table 3.10 Summary Information of Stream Crossings on Eagle River and Tributaries

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
43	x				N/A	N/A	Pond ? Upstream Basin area < 2 km ²
44					N/A	N/A	This crossing is a pond
45				x	riffle	II	
46		x			steady	IV	
47	x				steady	IV	Upstream Basin area < 2 km ²
- 48 -		x			riffle	II	
49	x				steady	IV	
50	x				(steady)	(IV)	Upstream Basin area < 2 km ²
- 51 -		x			riffle	II	
- 52 -			x		riffle	II	
- 53 -	x				riffle	II	

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
54							No stream was visible at the coordinates
- 55 -			x		riffle	II	
- 56 -	x				riffle	II	
57							No stream was visible at the coordinates
58	x				steady	IV	Upstream Basin area < 2 km ²
59	x				riffle	II	
60	x				steady	IV	Upstream Basin area < 2 km ²
- 61 -		x			riffle	II	
62	x				steady	IV	Upstream Basin area < 2 km ²
63	x				steady	IV	Upstream Basin area < 2 km ²
- 64 -	x				riffle	II	
- 65 -		x			riffle	II	
66	x				steady	IV	Upstream Basin area < 2 km ²
- 67 -		x			riffle	II	
- 68 -	x				riffle	II	
69	x				(riffle/steady)	(II/IV)	Upstream Basin area < 2 km ²
70	x				steady	IV	
71			x		steady	IV	
72	x				steady	IV	
- 73 -				x	riffle	II	Eagle River
74	x				N/A	N/A	Upstream Basin area < 2 km ²
75	x				riffle	II	Upstream Basin area < 2 km ²
76	x				steady	IV	
77				x	steady	IV	
78	x				steady	IV	Upstream Basin area < 2 km ²
- 79 -				x	riffle	II	
80	x				steady	IV	Upstream Basin area < 2 km ²
81	x				steady	IV	Upstream Basin area < 2 km ²
- 82 -		x			riffle	II	

Crossing numbers are sequential and shown in Figure 1.1, see Table 2.3 for flow and Table 2.1 for habitat.
Crossing numbers indicated with hyphens (- # -) are those where ground surveys were conducted.
N/A denotes crossings where the stream was obscured by forest canopy and habitat character could not be determined.
Flow and habitat types in brackets are estimated from partial views or immediately adjacent sections.

Table 3.11 Summary Information of Stream Crossings - Paradise River and Tributaries

Stream Crossing Number	Channel Width				Flow Type	Beak Habitat Type	Comment
	0-2 m	2-5 m	5-20 m	> 20 m			
83		x			steady	IV	
84		x			steady	IV	Upstream Basin area < 2 km ²
85							No stream was visible at the coordinates
86			x		steady	IV	
- 87 -	x				riffle	II	
- 88 -			x		steady	IV	
- 89 -		x			riffle	II	
- 90 -	x				steady	IV	
- 91 -			x		steady	IV	
92	x				intermittent	nil	Stream appears to go underground
93		x			steady	IV	
- 94 -				x	riffle	II	Paradise River
- 95 -	x				riffle	II	

Crossing numbers are sequential and shown in Figure 1.1, see Table 2.3 for flow and Table 2.1 for habitat.
 Crossing numbers indicated with hyphens (- # -) are those where ground surveys were conducted.
 N/A denotes crossings where the stream was obscured by forest canopy and habitat character could not be determined.
 Flow and habitat types in brackets are estimated from partial views or immediately adjacent sections.

Within the Churchill River watershed, there are 12 stream crossings (crossing numbers 1 to 12) associated with the construction of the TLH - Phase III. Seven of these crossings are associated with Type II habitat. The five remaining streams could not be classified for habitat type due to the small size of the streams and visual impairment created by an extremely thick tree canopy. Nine of the twelve stream crossings had a channel width of 0 to 2 m, one crossing was 2 to 5 m wide, one could not be determined and one (Churchill River) was in excess of 20 m. Two ground surveys were completed in this watershed area.

The Traverspine River watershed is associated with 15 stream crossings (13 to 27). Five of the crossings have Type II habitat, two have Type III habitat, one has Type I habitat and seven could not be determined. Seven of the stream crossings are 0 to 2 m wide, three are 2 to 5 m wide, four are 5 to 20 m wide and one is in excess of 20 m wide. Five ground surveys were completed in the Traverspine River watershed.

There are fifteen stream crossings (28 to 42) in the Kenamu River watershed. Eight of the crossings are associated with Type II habitat, two are Type IV habitat, three could not be classified, one is Type I habitat and one stream could not be found at the designated coordinates. Seven of the fifteen crossings are 0 to 2 m, three are 2 to 5 m, three are 5 to 20 m and one (Kenamu River) is in excess of 20 m. Seven ground surveys were conducted in the Kenamu River watershed.

There are 40 stream crossings (43 to 82) associated with the Eagle River watershed. Eighteen of the crossings have Type II habitat, 17 have Type IV habitat, two were not classified due to visual impairment, one was a pond crossing and two had no identifiable streams for the given coordinates. Twenty- three of the forty streams within the Eagle River watershed are 0 to 2 m in width, seven are 2 to 5 m in width, three are 5 to 20 m in width and four are greater than 20 m in width. One crossing is located on a pond and at two crossing locations no stream was visible. Fourteen streams within the Eagle River watershed were surveyed on the ground.

There are 13 stream crossings (83 to 95) in the Paradise River watershed. Seven of the thirteen stream crossings are associated with Type IV habitat, four have Type II habitat, one had no stream for the given coordinates and one stream disappeared underground at the proposed crossing. Four of the thirteen streams in the Paradise River watershed are 0 to 2 m, four are 2 to 5 m, three are 5 to 20 m and one (Paradise River) is in excess of 20 m. Two streams could not be determined.

3.3 Fish Species

The identification and characterization of potential fish habitat has been done without reference to verifying fish presence and use of the habitat. The TOR (Appendix 1) for the component study do not require any fish sampling to be conducted, primarily for two reasons. First, DFO made a preliminary determination that the planned road construction methods are not likely to result in a harmful alteration, disturbance or destruction (HADD) of productive fish habitat, as described under Section 35(2) of the *Fisheries Act*. As such, directed fish sampling would not be required to complete the component study.

Secondly, WST have committed to fish population studies to be completed during the construction phase, when time and access will be more favourable to conducting comprehensive surveys. The protocols to be used have been developed by the Inland Fish and Wildlife Division, who will take the lead in the survey. This will provide extensive new baseline information on fish in the area.

Although fish surveys were not requested by DFO, WST, in consultation with other stakeholders, planned to include qualitative electrofishing surveys in the field studies that were to be conducted. However, due to the late timing of the field surveys, the justification for quantitative or qualitative sampling would be open to challenge. There is risk of harm to spawning fish and their deposited eggs, and the spawning season would bias normal fish distribution in lake and stream habitat. DFO reflected these constraints in the

conditions that they attached to the experimental licence issued for sampling in the fall season and, as a consequence, the surveys were postponed indefinitely.

A brief overview of the species found in the five watersheds is provided in Table 3.12. Fish that were observed during the ground surveys at crossing locations were noted (as indicated in Tables 3.7 to 3.11); however, the lack of observations should not be taken as an indication of fish absence.

Table 3.12 Summary of Fish Species in the Watersheds Crossed by TLH - Phase III

Species	Paradise River	Eagle River	Kenamu River	Traverspine River	Churchill River
Atlantic salmon - <i>Salmo salar</i> (S) Ouananiche (R)	✓	✓	✓	✓	✓
Brook trout - <i>Salvelinus fontinalis</i> (S & R)	✓	✓	✓	✓	✓
Threespine stickleback - <i>Gasterosteus aculeatus</i>		Sus	✓		✓
Burbot - <i>Lota lota</i>			Rare	✓	✓
Lake trout - <i>Salvelinus namaycush</i>					✓
Arctic charr - <i>Salvelinus alpinus</i>					✓
Lake whitefish - <i>Coregonus clupeaformis</i>			✓		✓
Round whitefish - <i>Prosopium cylindraceum</i>			✓		✓
White sucker - <i>Catostomus commersoni</i>	✓	✓	✓		✓
Longnose sucker - <i>Catostomus catostomus</i>		✓	✓		✓
Rainbow smelt - <i>Osmerus mordax</i> (S)		Sus	✓	✓	✓
Atlantic sturgeon - <i>Acipenser oxyrhynchus</i> (S)			Rare		✓
American eel - <i>Anguilla rostrata</i> (S)	✓	Sus			✓
Ninespine stickleback - <i>Pungitius pungitius</i>	✓	Sus			✓
Northern pike - <i>Esox lucius</i>	U	✓			✓
Lake chub - <i>Couesius plumbeus</i>				U	✓
Mottled sculpin - <i>Cottus bairdi</i>					✓
Slimy sculpin - <i>Cottus cognatus</i>					✓
Pearl dace - <i>Semotilus margarita</i>					✓
Longnose dace - <i>Rhinichthys cataractae</i>					✓
Legend: (S) sea run, (R) resident, (✓) reported, (Sus) suspected, (U) unconfirmed. Source: Compiled from Anderson (1985).					

3.4 Water Quality

3.4.1 Field Measurements

A summary of the field measurements relating to water quality at the 35 stream crossing locations that were surveyed on the ground is provided in Table 3.13. Each parameter is listed, as is the method of determination, the units of quantification, the number of locations that measurements were obtained from, summary statistics and Canadian Council of Ministers of the Environment (CCME) Guidelines for the Protection of Aquatic Life (CCME 2000), where guidelines exist. The summary statistics provide the maximum, minimum and median values that were measured, without regard to site location or watershed. If there were measured values for all locations, the mean value is also provided.

Table 3.13 Summary of Water Quality Field Measurements

Parameters	Method	EQL	Units	Number of Stations	Summary Statistics				CCME Guidelines*
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	35	11.4	2.82	5.42	5	narrative
pH	Hydrolab		units	35	8.76	5.72	7.59	8	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	35	9.9	2.4	5.7	6	
Dissolved O ₂	Hydrolab		mg/L	35	12.9	8.91	11.11	11	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	35	9.7	0.1	2.5	3	narrative
Stream Velocity	Pygmy Gurley		m/s	35	0.59	0.07	0.3	0.3	
Gradient	Inclinometer		degrees	34	6	0.5	< 1		

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

3.4.2 Laboratory Results

Summaries of the laboratory results for water chemistry for 35 stream crossing locations, grouped by watershed, are provided in Tables 3.14 to 3.18. Each parameter is listed, as is the method of determination, the limits of quantification, the units of quantification, the number of locations that quantifiable measurements were obtained from, summary statistics and CCME Guidelines for the Protection of Aquatic Life (CCME 2000), where guidelines exist. The summary statistics provide the maximum, minimum and median values that were measured. If there were measured values for all locations, the mean value is also provided, otherwise there can be no mean that includes unquantified results. Relevant field measurements are also included for the watersheds.

Most of the water quality values are typical for the region. Not surprisingly, many of the metals are at concentrations that are below the Estimated Quantitation Limit (EQL). The EQL is the lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The EQL is generally 5 to 10 times the Method Detection Limit.

In comparing the results with the CCME Guidelines for the Protection of Aquatic Life, some parameters must be noted. Aluminum concentrations in water often exceed the guideline in Newfoundland and Labrador waters without apparent consequence. The speciation of aluminum is the key to the actual toxicity and the toxicity may be reduced when aluminum ions are bound to organic or other compounds. Based on the results reported, aluminum exceeds the guideline on almost all of the samples examined in this study.

Although the quantified levels of cadmium are below measurement ($<0.3 \mu\text{g/L}$), the guideline is lower still ($0.017 \mu\text{g/L}$). One sample from the Eagle River watershed had a concentration of measurable cadmium, which was above the guideline.

The guideline for iron ($300 \mu\text{g/L}$) is based on effects to fish and invertebrate development. A total of 28 of the 35 stations had iron levels that exceeded the freshwater guideline, to levels as high as 1,800 and, 2,300 $\mu\text{g/L}$ (in Eagle watershed) and 3,200 $\mu\text{g/L}$ (at a station in the Kenamu watershed).

Selenium and silver each have CCME guideline levels (1.0 mg/L and $0.1 \mu\text{g/L}$, respectively) that are below the normal ELQ provided by the laboratory ($2 \mu\text{g/L}$ and $0.5 \mu\text{g/L}$, respectively); therefore, as with cadmium, the analytical results cannot be determined to guideline limits. However, all results were below the ELQ.

All other parameters that have CCME Guidelines for the Protection of Aquatic Life were determined to be below the guideline levels for all samples (i.e., arsenic, chromium, copper, lead, nickel, thallium and zinc). The guideline levels for these parameters are shown in Tables 3.14 to 3.18.

Table 3.14 Water Chemistry Results for Two Samples from Churchill River Tributaries

Parameters	Method	EQL	Units	Samples with Quantifiable Levels	Summary Statistics				CCME Guidelines *
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	2	7.83	7.79	7.81	8	narrative
pH	Hydrolab		units	2	8.76	7.99	8.375	8	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	2	9.9	7.1	8.5	9	
Dissolved O ₂	Hydrolab		mg/L	2	10.14	9.28	9.71	10	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	2	3.3	0.8	2.05	2	narrative
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	2	11	8	9.5	10	
Total Dissolved Solids	Grav.	10	mg/L	2	50	40	45	45	
Aluminum	ICP-MS	10	µg/L	2	310	240	275	275	5 - 100
Antimony	ICP-MS	2	µg/L	0	< 2		< 2		
Arsenic	ICP-MS	2	µg/L	0	< 2		< 2		5
Barium	ICP-MS	5	µg/L	2	22	12	17	17	
Beryllium	ICP-MS	5	µg/L	0	< 5		< 5		
Bismuth	ICP-MS	2	µg/L	0	< 2		< 2		
Boron	ICP-MS	5	µg/L	2	11	9	< 5	10	
Cadmium	ICP-MS	0.3	µg/L	0	< 0.3		< 0.3		0.017
Chromium	ICP-MS	2	µg/L	0	< 2		< 2		8.9
Cobalt	ICP-MS	1	µg/L	0	< 1		< 1		
Copper	ICP-MS	2	µg/L	2	5	2	3.5	4	2 - 4
Iron	ICP-MS	20	µg/L	2	890	470	680	680	300
Lead	ICP-MS	0.5	µg/L	1	0.8	0.8	< 0.5		1 - 7
Manganese	ICP-MS	2	µg/L	2	20	12	16	16	
Molybdenum	ICP-MS	2	µg/L	0	< 2		< 2		
Nickel	ICP-MS	2	µg/L	0	< 2		< 2		25 - 150
Selenium	ICP-MS	2	µg/L	0	< 2		< 2		1.0
Silver	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		0.1
Strontium	ICP-MS	5	µg/L	2	22	14	18	18	
Thallium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		0.8
Tin	ICP-MS	2	µg/L	0	< 2		< 2		
Titanium	ICP-MS	2	µg/L	2	8	2	5	5	
Uranium	ICP-MS	0.1	µg/L	1	0.1	0.1	< 0.1		
Vanadium	ICP-MS	2	µg/L	0	< 2		< 2		
Zinc	ICP-MS	2	µg/L	2	6	4	5	5.0	30

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

Table 3.15 Water Chemistry Results for Five Samples from Traverspine River and Tributaries

Parameters	Method	EQL	Units	Samples with Quantifiable Levels	Summary Statistics				CCME Guidelines *
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	5	5.88	5.39	5.49	6	narrative
pH	Hydrolab		units	5	8.6	7.97	8.5	8	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	5	7	5.4	5.5	6	
Dissolved O ₂	Hydrolab		mg/L	5	12.67	11.04	11.23	12	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	5	4.4	1.4	2.4	3	narrative
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	5	9	6	7	7	
Total Dissolved Solids	Grav.	10	mg/L	5	50	30	40	38	
Aluminum	ICP-MS	10	µg/L	5	220	150	200	194	5 - 100
Antimony	ICP-MS	2	µg/L	0	< 2		< 2		
Arsenic	ICP-MS	2	µg/L	0	< 2		< 2		5
Barium	ICP-MS	5	µg/L	5	14	10	10	11	
Beryllium	ICP-MS	5	µg/L	0	< 5		< 5		
Bismuth	ICP-MS	2	µg/L	0	< 2		< 2		
Boron	ICP-MS	5	µg/L	1	5	5	< 5		
Cadmium	ICP-MS	0.3	µg/L	0	< 0.3		< 0.3		0.017
Chromium	ICP-MS	2	µg/L	0	< 2		< 2		8.9
Cobalt	ICP-MS	1	µg/L	0	< 1		< 1		
Copper	ICP-MS	2	µg/L	5	3	2	2	2	2 - 4
Iron	ICP-MS	20	µg/L	5	940	150	640	622	300
Lead	ICP-MS	0.5	µg/L	1	0.5	0.5	< 0.5		1 - 7
Manganese	ICP-MS	2	µg/L	5	20	2	8	10	
Molybdenum	ICP-MS	2	µg/L	0	< 2		< 2		
Nickel	ICP-MS	2	µg/L	1	2	2	< 2		25 - 150
Selenium	ICP-MS	2	µg/L	0	< 2		< 2		1.0
Silver	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		0.1
Strontium	ICP-MS	5	µg/L	5	24	16	17	18	
Thallium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		0.8
Tin	ICP-MS	2	µg/L	0	< 2		< 2		
Titanium	ICP-MS	2	µg/L	5	4	2	3	3	
Uranium	ICP-MS	0.1	µg/L	1	0.2	0.2	< 0.1		
Vanadium	ICP-MS	2	µg/L	0	< 2		< 2		
Zinc	ICP-MS	2	µg/L	5	5	2	3	3.2	30

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

Table 3.16 Water Chemistry Results for Seven Samples from Kenamu River and Tributaries

Parameters	Method	EQL	Units	Samples with Quantifiable Levels	Summary Statistics				CCME Guidelines *
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	7	6.95	4.58	6.33	6	narrative
pH	Hydrolab		units	7	8.6	7.39	7.73	8	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	7	8.6	4.6	6.1	6	
Dissolved O ₂	Hydrolab		mg/L	7	12.72	8.93	10.86	11	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	7	9.7	0.5	1.1	3	narrative
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	7	11	6	8	8	
Total Dissolved Solids	Grav.	10	mg/L	7	30	20	20	24	
Aluminum	ICP-MS	10	µg/L	7	210	80	110	126	5 - 100
Antimony	ICP-MS	2	µg/L	0	< 2		< 2		
Arsenic	ICP-MS	2	µg/L	0	< 2		< 2		5
Barium	ICP-MS	5	µg/L	7	19	7	9	10	
Beryllium	ICP-MS	5	µg/L	0	< 5		< 5		
Bismuth	ICP-MS	2	µg/L	0	< 2		< 2		
Boron	ICP-MS	5	µg/L	0	< 5		< 5		
Cadmium	ICP-MS	0.3	µg/L	0	< 0.3		< 0.3		0.017
Chromium	ICP-MS	2	µg/L	0	< 2		< 2		8.9
Cobalt	ICP-MS	1	µg/L	1	1	< 1	< 1		
Copper	ICP-MS	2	µg/L	3	2	< 2	< 2		2 - 4
Iron	ICP-MS	20	µg/L	7	3,200	110	450	787	300
Lead	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		1 - 7
Manganese	ICP-MS	2	µg/L	7	100	3	6	22	
Molybdenum	ICP-MS	2	µg/L	0	< 2		< 2		
Nickel	ICP-MS	2	µg/L	0	< 2		< 2		25 - 150
Selenium	ICP-MS	2	µg/L	0	< 2		< 2		1.0
Silver	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		0.1
Strontium	ICP-MS	5	µg/L	7	19	11	15	15	
Thallium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		0.8
Tin	ICP-MS	2	µg/L	0	< 2		< 2		
Titanium	ICP-MS	2	µg/L	4	6	2	2		
Uranium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		
Vanadium	ICP-MS	2	µg/L	0	< 2		< 2		
Zinc	ICP-MS	2	µg/L	7	4	2	2	2.6	30

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

Table 3.17 Water Chemistry Results for 14 Samples from Eagle River and Tributaries

Parameters	Method	EQL	Units	Samples with Quantifiable Levels	Summary Statistics				CCME Guidelines *
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	14	6.09	3.07	4.27	4	narrative
pH	Hydrolab		units	14	7.8	6.49	7.365	7	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	14	9.2	2.4	6.2	6	
Dissolved O ₂	Hydrolab		mg/L	14	12.57	9.61	11.065	11	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	14	9.2	1.4	3.15	4	narrative
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	11	34	< 5	6		
Total Dissolved Solids	Grav.	10	mg/L	14	40	10	30	29	
Aluminum	ICP-MS	10	µg/L	14	170	80	100	111	5 - 100
Antimony	ICP-MS	2	µg/L	0	< 2		< 2		
Arsenic	ICP-MS	2	µg/L	0	< 2		< 2		5
Barium	ICP-MS	5	µg/L	7	8	< 5	5		
Beryllium	ICP-MS	5	µg/L	0	< 5		< 5		
Bismuth	ICP-MS	2	µg/L	0	< 2		< 2		
Boron	ICP-MS	5	µg/L	1	6	< 5	< 5		
Cadmium	ICP-MS	0.3	µg/L	1	0.3	< 0.3	< 0.3		0.017
Chromium	ICP-MS	2	µg/L	0	< 2		< 2		8.9
Cobalt	ICP-MS	1	µg/L	0	< 1		< 1		
Copper	ICP-MS	2	µg/L	5	37,348	< 2	< 2		2-4
Iron	ICP-MS	20	µg/L	14	2300	150	520	736	300
Lead	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		1 - 7
Manganese	ICP-MS	2	µg/L	14	71	6	10.5	16	
Molybdenum	ICP-MS	2	µg/L	0	< 2		< 2		
Nickel	ICP-MS	2	µg/L	0	< 2		< 2		25 - 150
Selenium	ICP-MS	2	µg/L	0	< 2		< 2		1.0
Silver	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		0.1
Strontium	ICP-MS	5	µg/L	14	18	7	12	12	
Thallium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		0.8
Tin	ICP-MS	2	µg/L	0	< 2		< 2		
Titanium	ICP-MS	2	µg/L	3	3	< 2	< 2		
Uranium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		
Vanadium	ICP-MS	2	µg/L	0	< 2		< 2		
Zinc	ICP-MS	2	µg/L	14	8	2	2.5	3.4	30

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

Table 3.18 Water Chemistry Results for Seven Samples from Paradise River and Tributaries

Parameters	Method	EQL	Units	Samples with Quantifiable Levels	Summary Statistics				CCME Guidelines *
					Maximum	Minimum	Median	Mean	
Temperature	Hydrolab		°C	7	11.4	2.82	5.78	6	narrative
pH	Hydrolab		units	7	8.09	5.72	6.41	7	6.5 - 9.0
Conductivity	Hydrolab		µS/cm	7	8.1	4.1	4.8	5	
Dissolved O ₂	Hydrolab		mg/L	7	12.9	8.91	11.51	11	5.5 - 9.5
Turbidity	Hydrolab	0.1	NTU	7	6.7	0.1	3.4	3	narrative
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	1	7	< 5	< 5		
Total Dissolved Solids	Grav.	10	mg/L	7	50	30	40	39	
Aluminum	ICP-MS	10	µg/L	7	370	130	280	261	5 - 100
Antimony	ICP-MS	2	µg/L	0	< 2		< 2		
Arsenic	ICP-MS	2	µg/L	0	< 2		< 2		5
Barium	ICP-MS	5	µg/L	7	11	6	9	9	
Beryllium	ICP-MS	5	µg/L	0	< 5		< 5		
Bismuth	ICP-MS	2	µg/L	0	< 2		< 2		
Boron	ICP-MS	5	µg/L	0	< 5		< 5		
Cadmium	ICP-MS	0.3	µg/L	0	< 0.3		< 0.3		0.017
Chromium	ICP-MS	2	µg/L	0	< 2		< 2		8.9
Cobalt	ICP-MS	1	µg/L	0	< 1		< 1		
Copper	ICP-MS	2	µg/L	3	2	< 2	< 2		2-4
Iron	ICP-MS	20	µg/L	7	940	420	650	640	300
Lead	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		1 - 7
Manganese	ICP-MS	2	µg/L	7	15	5	9	10	
Molybdenum	ICP-MS	2	µg/L	0	< 2		< 2		
Nickel	ICP-MS	2	µg/L	0	< 2		< 2		25 - 150
Selenium	ICP-MS	2	µg/L	0	< 2		< 2		1.0
Silver	ICP-MS	0.5	µg/L	0	< 0.5		< 0.5		0.1
Strontium	ICP-MS	5	µg/L	7	16	9	12	12	
Thallium	ICP-MS	0.1	µg/L	0	< 0.1		< 0.1		0.8
Tin	ICP-MS	2	µg/L	0	< 2		< 2		
Titanium	ICP-MS	2	µg/L	7	5	2	3	3	
Uranium	ICP-MS	0.1	µg/L	1	0.1		< 0.1		
Vanadium	ICP-MS	2	µg/L	0	< 2		< 2		
Zinc	ICP-MS	2	µg/L	7	8	3	4	4.3	30

* CCME Guidelines for Protection of Aquatic Life (CCME 2000).

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APPENDIX 1

**FISH HABITAT FIELD STUDY
TERMS OF REFERENCE**

APPENDIX 1
TERMS OF REFERENCE
Fish and Fish Habitat Component Study
PHASE III
TRANS LABRADOR HIGHWAY
GOOSE BAY TO CARTWRIGHT JUNCTION

INTRODUCTION

The Department of Works, Services and Transportation has been required through the Provincial Environmental Assessment Process to prepare an Environmental Impact Statement for the Phase III of the Trans Labrador Highway between Happy Valley-Goose Bay and Cartwright Junction.

Potential effects of the construction of stream crossings on fish and fish habitat have been identified by DFO and the Innu Nation. In order to effectively determine these potential impacts and identify appropriate mitigative measures, it is necessary to gather the important site specific habitat information at each crossing.

RATIONALE / OBJECTIVES

To identify the habitat type and quality and to assess mitigation requirements (i.e., based on erodible soils, slopes) at each proposed stream crossing location for Phase III Trans Labrador Highway between Happy Valley-Goose Bay and Cartwright Junction.

STUDY AREA

The study area will consist of those locations where streams crossing structures will be constructed along the preferred route between Happy Valley-Goose Bay and Cartwright Junction.

STUDY METHODOLOGY OUTPUTS

A. FISH HABITAT SURVEYS

The consultant must produce a report providing the information required at each of the stream crossings as outlined in the Fish Habitat Survey section of DFO's Standard Methods Guide For Freshwater Fish and Fish Habitat Surveys In Newfoundland and Labrador: Rivers and Streams.

An aerial survey of all crossings is to be conducted following the Standard Methods Guide methodology and criteria. Digital Photographs are to be taken of all watercourse crossings and the area 250 m upstream and downstream of each crossing should be videotaped. This report must also include a sketch of each crossing including GPS coordinates. All data is to be recorded on standardized field data sheets.

Ground surveys are to be performed on all stream crossings except:

- 1) Bog drainage areas.
- 2) Areas of obvious type III and IV habitat.
- 3) Watercourses with a drainage area of less than 2 km².

There are approximately **58** stream crossings requiring survey information. These streams have been identified using a 1:50,000 map as potential fish habitat (i.e. they are not simple drainage from a bog or hill). From preliminary examinations it appears that approximately 43 of the 58 stream crossings will require ground surveys based on the 2 km² drainage area factor. However, this number may vary once they are examined in the field due to other factors.

In these cases where there is no ground survey conducted, the rationale for not doing so should be well-documented.

Specific information requirements of each crossing include but is not limited to;

- 1) Section Characteristics
 - section length and width (m)
 - water level (Low, Moderate, High)
 - water Temp (°C)
 - surface Velocity (m/s)
 - gradient (%)

Additional Information requirements would include:

Key watershed characteristics: should be provided including drainage area upstream, number of waterbodies upstream, distance to next watercourse downstream etc. These may have special importance in decision making.

Water quality measurements: will be gathered, including turbidity, conductivity, total dissolved solids, alkalinity, pH, dissolved oxygen.

2) Habitat Characteristics

This includes a quantification of each meso-habitat by estimating the proportion of various habitat types including pools, riffles, steadies, rapids and other types identified in the Standards Methods Guide.

3) Substrate

This includes an estimate of the portion (%) of the substrate types including bedrock, large boulders, small boulders, cobble/rubble, gravel/pebble, fines, and siltation as defined by the standard methods guide.

4) Cover

This includes the relative portion (%) of cover contained in the survey section and identified as one of three types, Overhanging, Instream (logs, substrate, debris, etc), or Instream vegetation, as defined by the standards methods guide.

5) Riparian Vegetation

This includes the identification, quantification and qualification of the vegetation growing on or near the banks of the stream crossing as defined by the standard methods guide.

6) Obstructions

This includes the identification and qualification of any obstructions located in the stream directly upstream or downstream of the crossing as described in the standard methods guide. A photograph is to be included with the description of the obstruction.

7) Sketch

A sketch outlining and identifying key features must also be completed at each crossing as described in the standard methods guide.

8) Habitat Classification

Each stream crossing must be classified under the Beak method as described in the standard methods guide.

The consultant must also provide a listing of all fish species present in each watershed area. This is to be completed through literature and background research, no original field research will be necessary.

The stream survey data generated from these surveys will be provided in a digital form on a CD-ROM in a format suitable for incorporation in a Geographic Information System (GIS). As a minimum, the information will consist of sufficient number of geographic coordinates of point locations, line locations and/or spatial extent, as appropriate of the features at the selected map scale. The information must be organized and labelled such that each unique feature is distinguishable from all other. Appropriate descriptive parameters of each data set such as projection, UTM Zone, datum and data collection method (e.g., GPS, aerial survey, etc.) must also be included. The format should, as a minimum, be in ASCII tabular format or in a spreadsheet or database format such as Lotus 1-2-3, or Excel.

B. FISH SURVEYS

Electrofishing surveys will be conducted at select stream crossings within the Paradise River, Eagle River, Kenamu River, and Traverspine River Watersheds. These surveys are to be conducted in accordance with the Fish Surveys section of DFO Standard Methods Guide For Freshwater Fish and Fish Habitat Surveys In Newfoundland and Labrador: Rivers and Streams.

These electrofishing surveys are to be completed on selected representative secondary and tertiary streams, Exact areas must be located within the 250 m upstream and 250 m downstream area surrounding the proposed stream crossing as outlined in the Fish Habitat Survey Section.

Location, methods (electrofishing, minnow traps, gillnets, etc.) and timing for surveys should be determined by the consultant in consultation with DFO, Innu Nation and other agencies/individuals as appropriate to maximize the value of the information collected. Two methods should be deployed in each sampling location.

APPENDIX 2

**FISH HABITAT STUDY
GPS WAY POINTS FOR STREAM CROSSINGS
AND
FIELD DATA SHEETS**

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Peter Joffe, Herman Montague

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

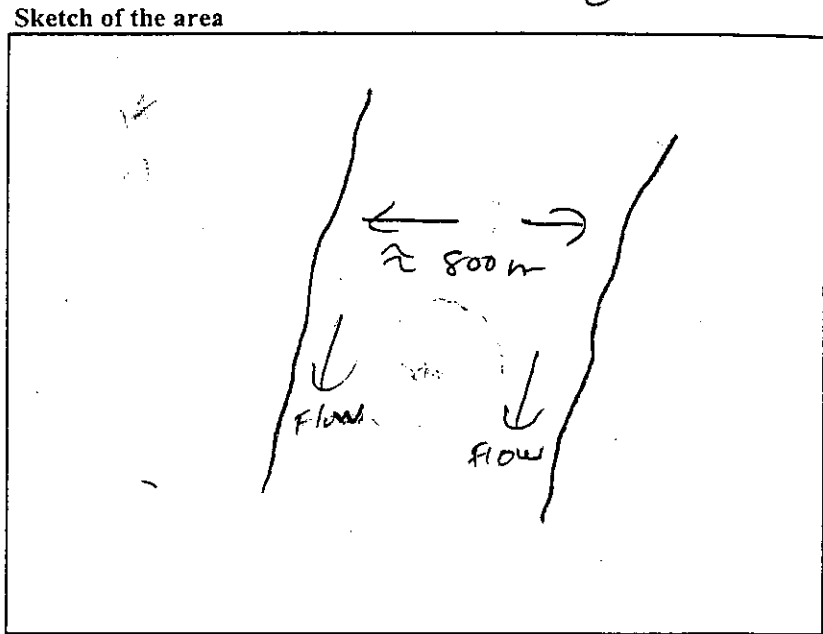
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input checked="" type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input checked="" type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input checked="" type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox" value="5"/>	Shrubs <input type="checkbox" value="25"/>	Trees <input type="checkbox" value="70"/>		
Cover < 1%	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="100"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

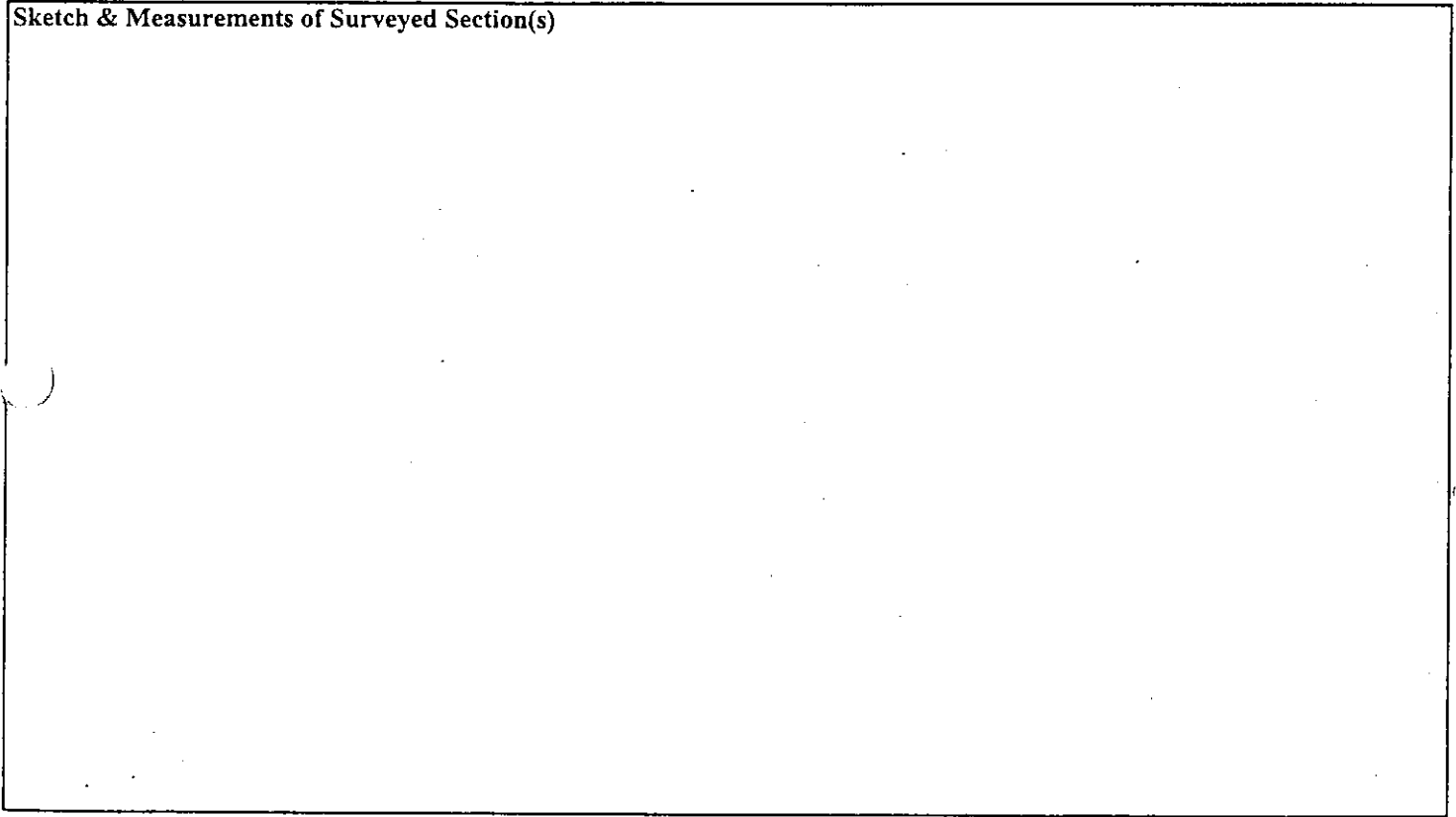
Surface velocity

Other: NO ground Survey required
for Church's River

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

classification below based on being able to see stream at 3 locations

										Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>						
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>						
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>						
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input checked="" type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>				
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>						
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>				
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>				
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="text" value="5"/>	Shrubs <input type="text" value="35"/>	Trees <input type="text" value="60"/>						
Cover ^{97%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="50"/>	Canopy <input type="text" value="50"/>	None <input type="checkbox"/>						
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>				
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>						

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey # **2**

Ground survey completed

Ground Survey not Completed **NO**

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

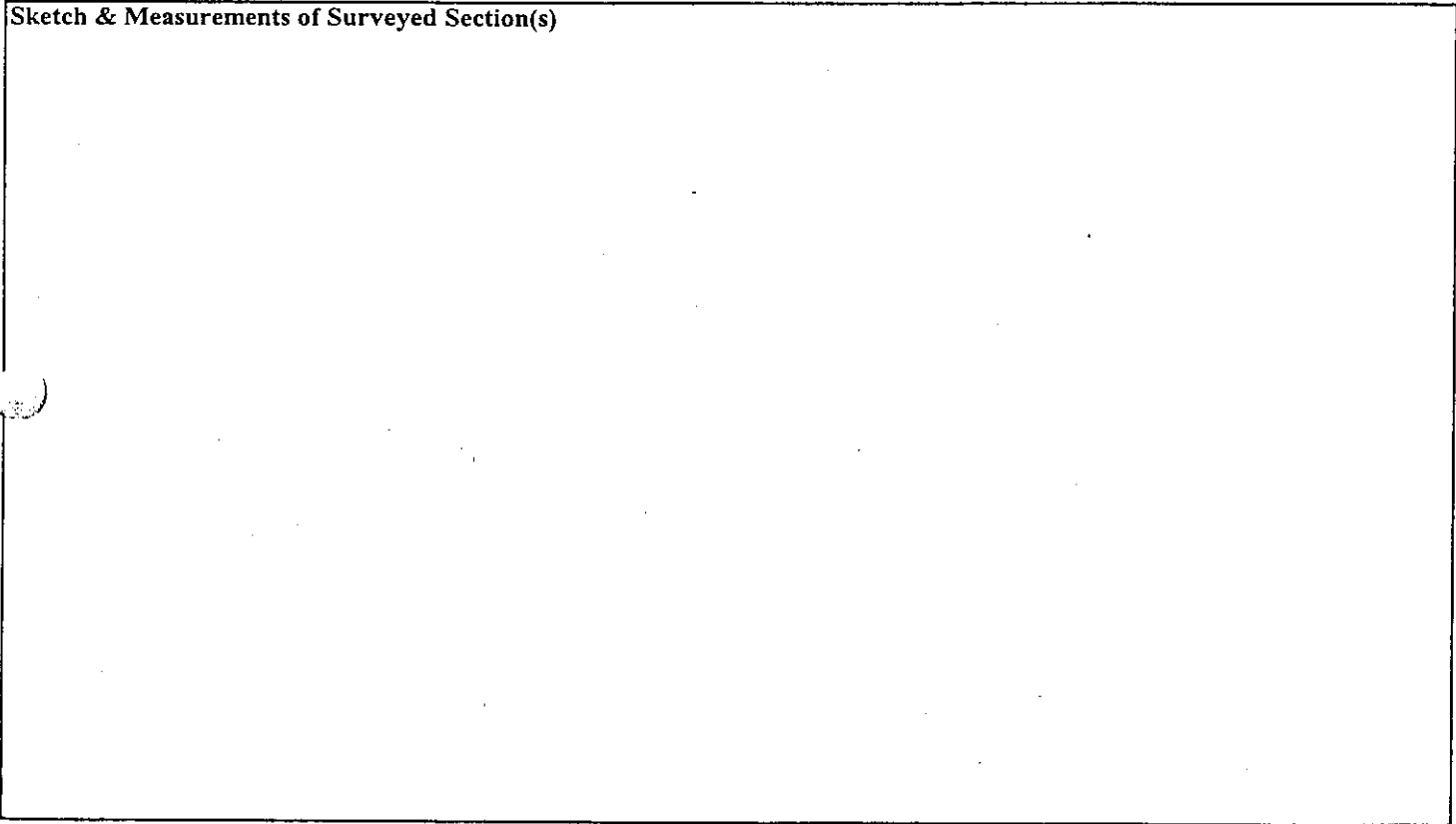
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="20"/>	Trees <input checked="" type="checkbox" value="80"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="20"/>	Canopy <input type="checkbox" value="80"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#3

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

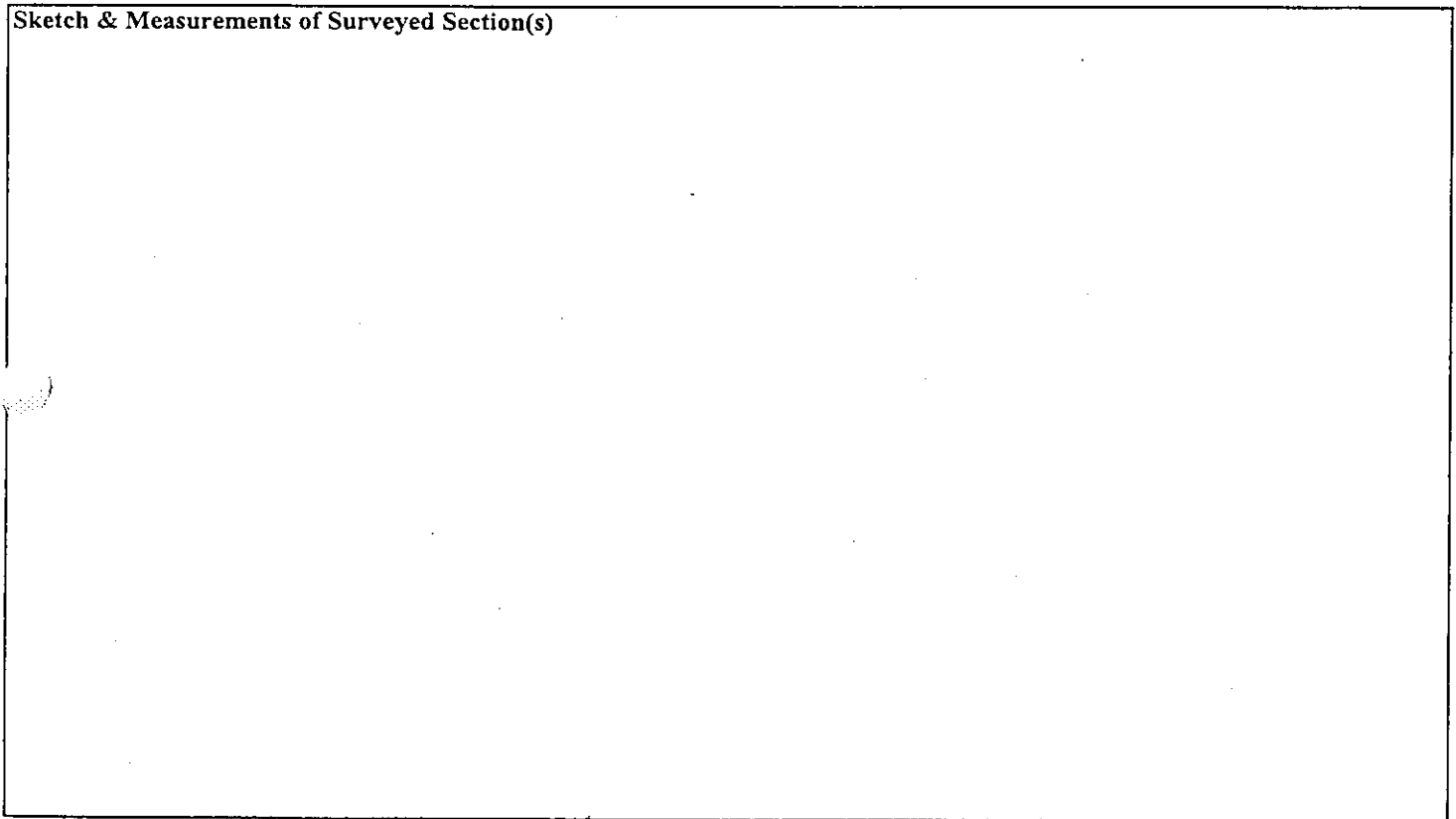
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Classification below based on being able to view stream briefly in 4 discrete locations.

							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="20"/>	Trees <input type="text" value="80"/>			
Cover ^{abw}	Instream <input type="checkbox"/>	Overhang <input type="text" value="50"/>	Canopy <input type="text" value="50"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#A can't land!

Ground Survey completed	<input type="checkbox"/>	Ground Survey not Completed	<input type="checkbox" value="NO"/>
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	Crossing less than 2 km ² (on DWST list)
pH	<input type="checkbox"/>	<input type="checkbox"/>	Bog drainage
Conductivity	<input type="checkbox"/>	<input type="checkbox"/>	Type IV (steady) flow
Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	Type III (cascade/rapids) flow
Turbidity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No accessible by helicopter
Surface velocity	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____
Water Samples collected	<input type="checkbox"/>		
Gradient (inclinometer)	<input type="checkbox"/>		

Sketch & Measurements of Surveyed Section(s)

up + 887 xing

LEGENDS / NOTES

- Backslope**
- Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Can't see stream at all.
 took photos and video of
 where stream is supposed
 to be located.
 spruce and shrubs at
 the edge of 2 bogs.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>	
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#5

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

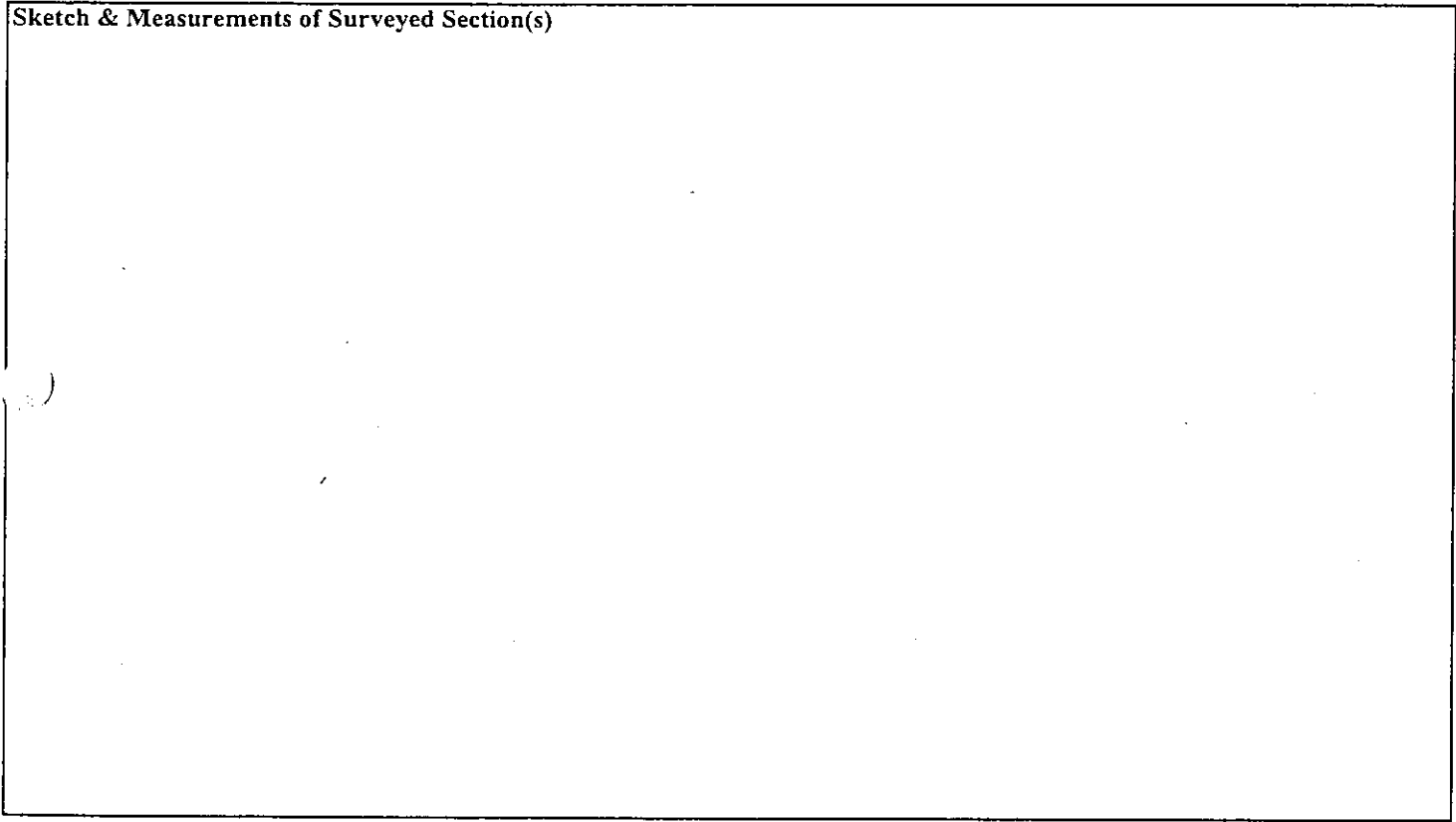
Surface velocity

Other: Not on List

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

could see very little stream

classification based on being able to view stream briefly in 3 discrete areas

							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="50"/>	Trees <input type="text" value="50"/>			
Cover <i>aaola</i>	Instream <input type="checkbox"/>	Overhang <input type="text" value="50"/>	Canopy <input type="text" value="50"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope
fines less than 2 mm	Shallow gully 1 m
gravel 2mm - 3 cm	Medium gully 2-3 m
pebble 3 - 5 cm	Deep gully ≥4 m
cobble 6-13 cm	Forest stream see over
rubble 14-25 cm	Flood plain see over
boulder 26 cm and up	Bog/Fen see over

Cover	
Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#6

Ground survey completed

Ground Survey not Completed No

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

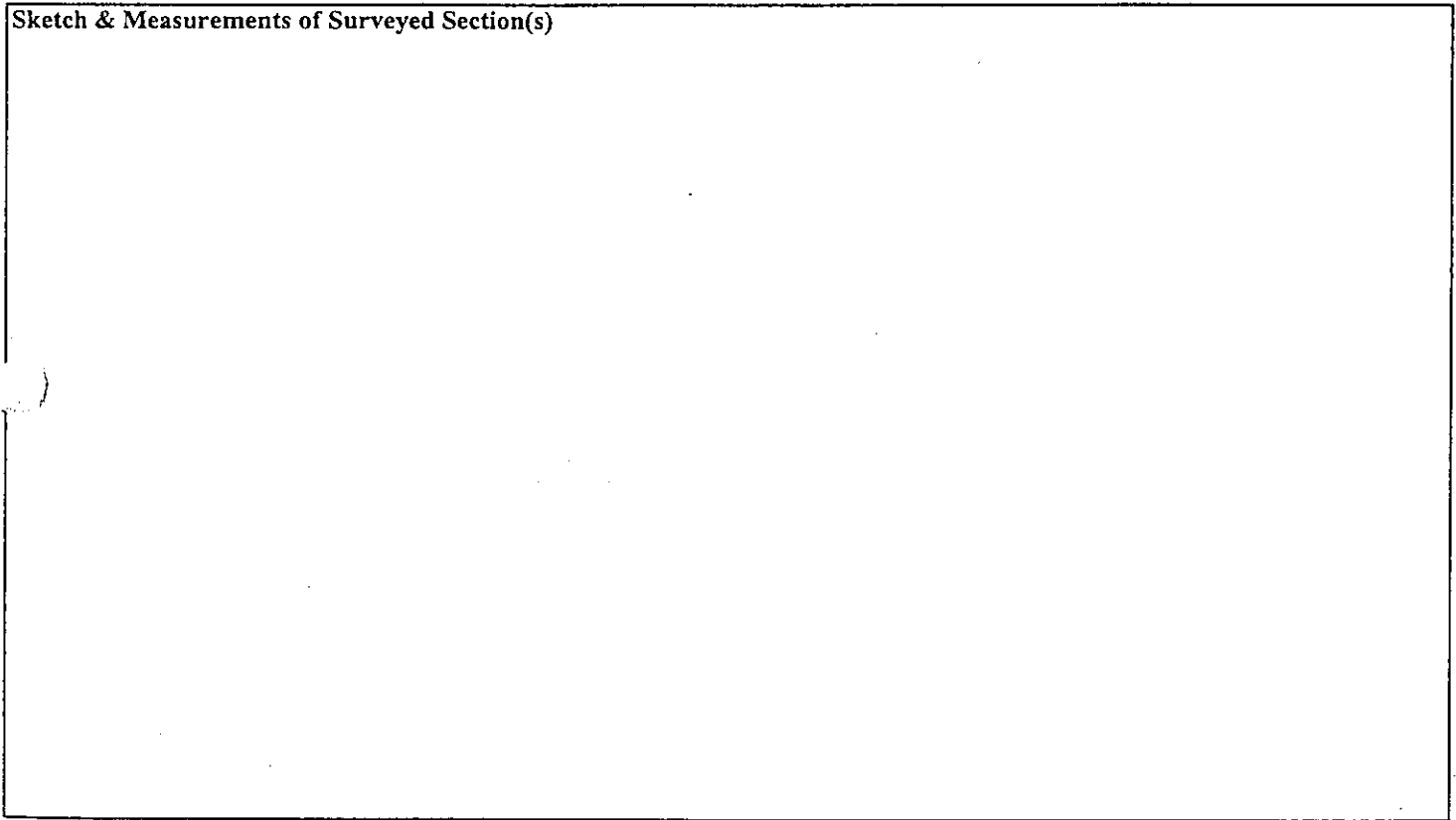
Surface velocity

Other: not on list

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. #7

Date Sept 23/02

Surveyed by Bw/mH/Hm/PJ

Watershed Churchill

GPS Co-ord. See list

Aerial Photo #

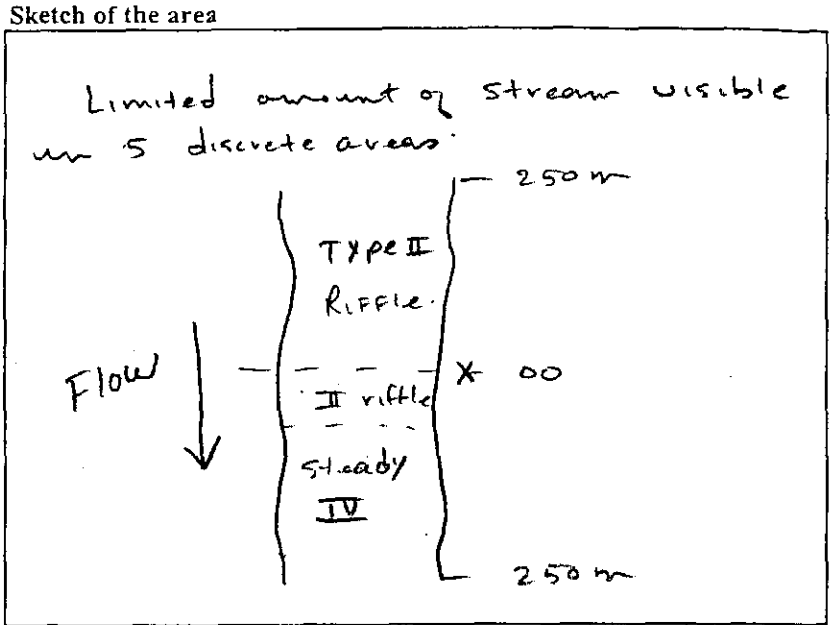
Map Number BF/1

Photo Numbers 41

Video yes

Area Surveyed 500m aerial.

Water Samples No



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover <u>95%</u>	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#7

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature



Crossing less than 2 km² (on DWST list)

pH



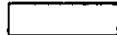
Bog drainage

Conductivity



Type IV (steady) flow

Dissolved Oxygen



Type III (cascade/rapids) flow

Turbidity



No accessible by helicopter

Surface velocity

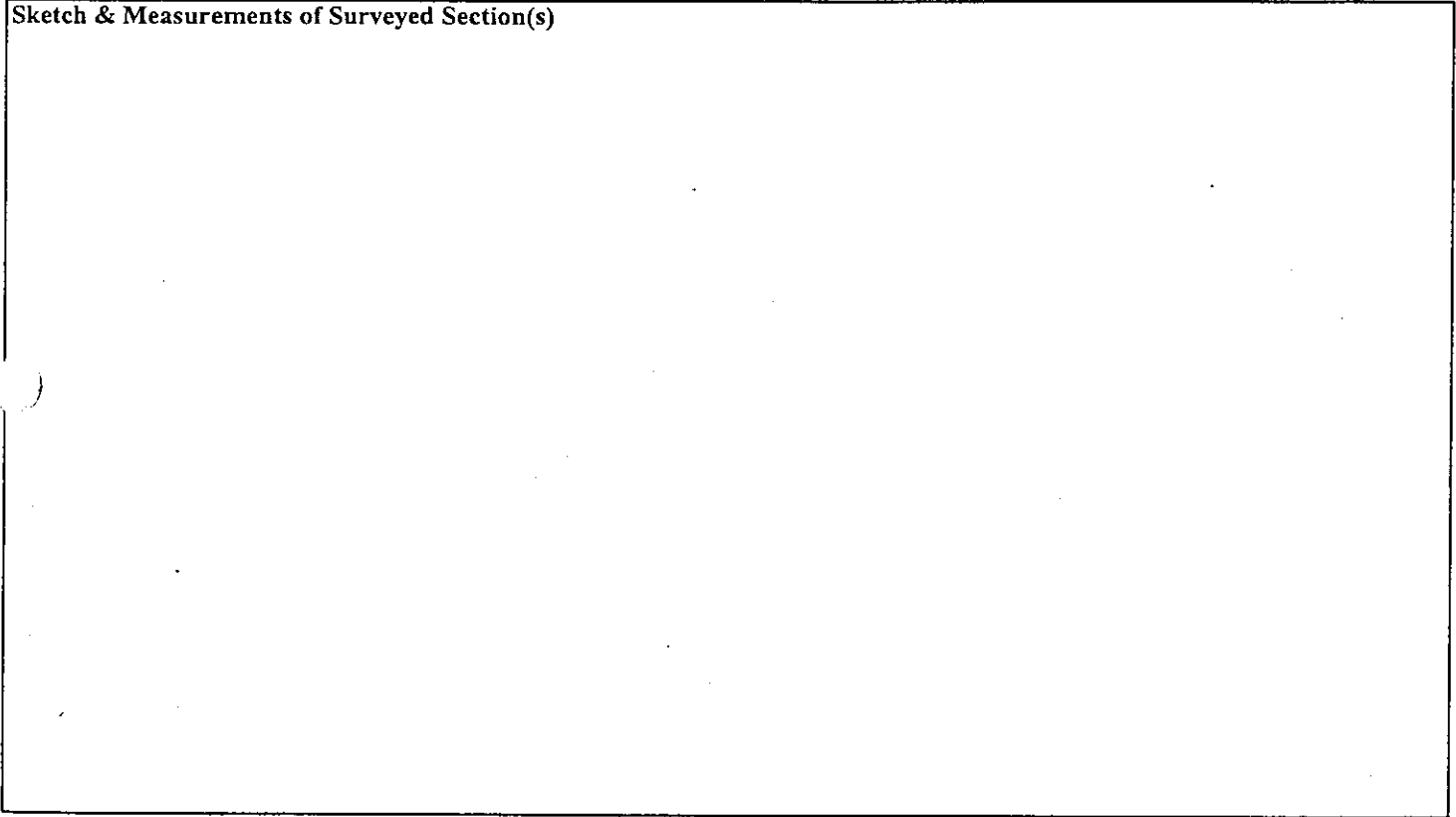


Other: (10+)

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

888 Chopper Landing.
 Could not view stream enough
 to classify.
 Refer to Ground Survey for
 Xing Info.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="60"/>	Trees <input type="text" value="40"/>		
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="60"/>	Canopy <input type="text" value="40"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#8

Ground Survey

Ground survey completed Yes Ground Survey not Completed *Questionable*

Temperature 7.79 Crossing less than 2 km² (on DWST list) *Landing*

pH 7.99 Bog drainage *Alders*

Conductivity 7.1 Type IV (steady) flow

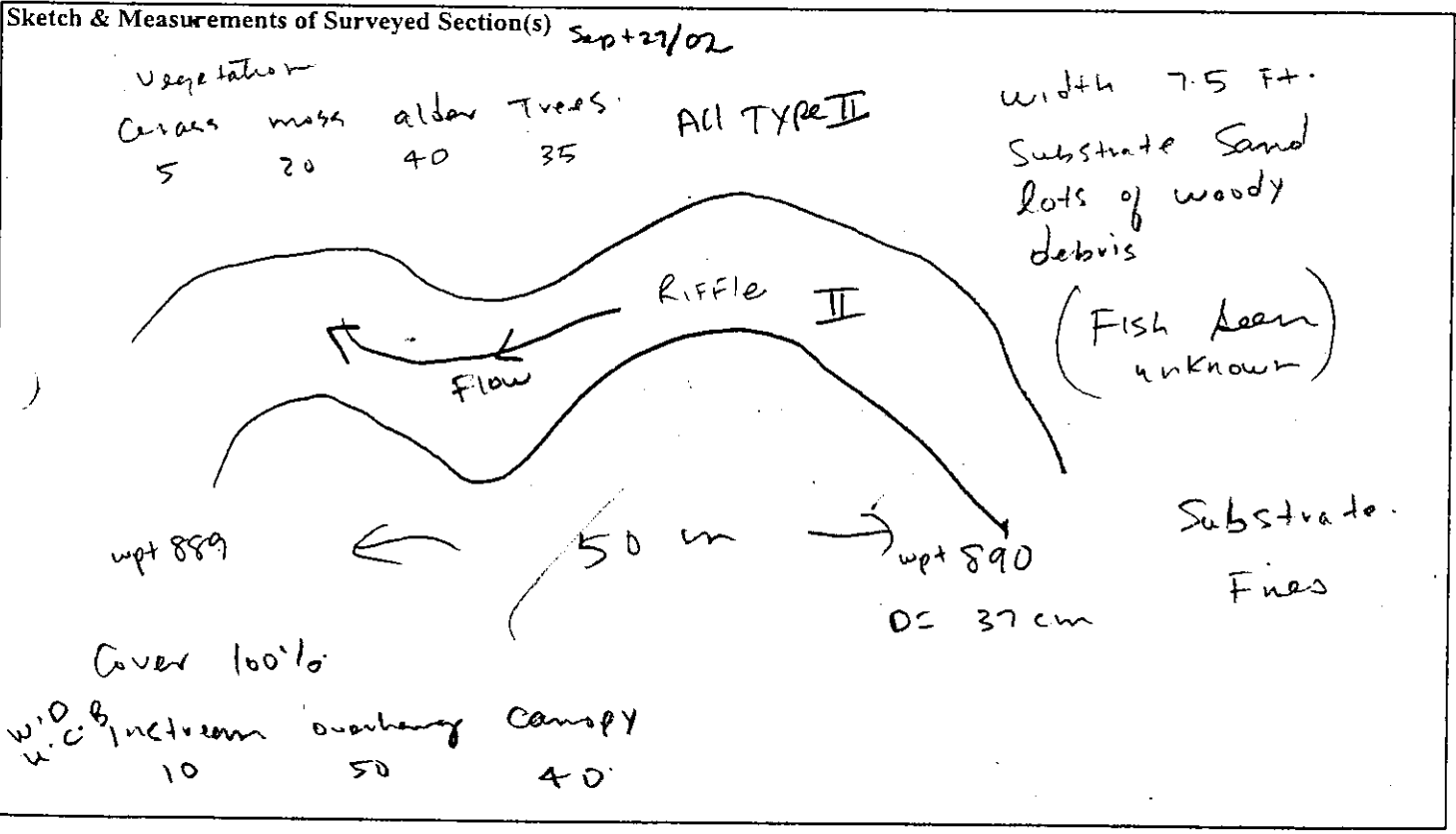
Dissolved Oxygen 10.14 Type III (cascade/rapids) flow

Turbidity 0.8 No accessible by helicopter

Surface velocity 22/min 30cm Other: _____
middle of stream

Water Samples collected Yes

Gradient (inclinometer) 1% EST



LEGENDS / NOTES

Backslope

- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Stream could not be seen clear enough to classify from the air.

Refer to Ground Survey for crossing description

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="60"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="40"/>	Canopy <input type="checkbox" value="60"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#9.

Ground Survey Landing spot
420m
brow
crossing.

Ground survey completed **yes** Ground Survey not Completed

Temperature **7.83** Crossing less than 2 km² (on DWST list)

pH **8.76** Bog drainage

Conductivity **9.9** Type IV (steady) flow

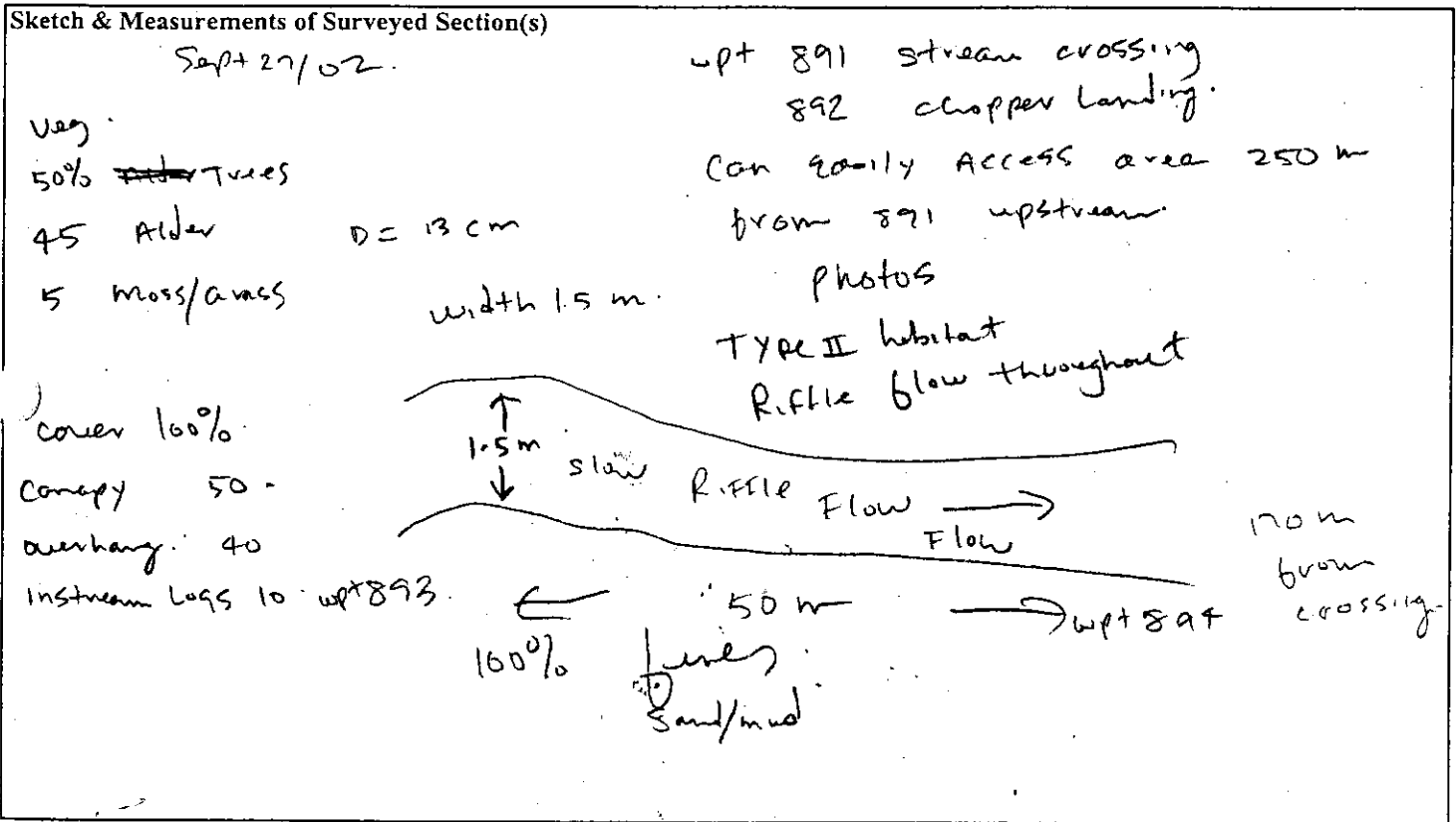
Dissolved Oxygen **9.28** Type III (cascade/rapids) flow

Turbidity **3.3** No accessible by helicopter

Surface velocity **15 cms / min** 10 cm Other: _____

Water Samples collected **yes** middle of stream

Gradient (inclinometer) **0.5 to 1%** **est**



LEGENDS / NOTES

Backslope

- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Stream could not be viewed
clear enough to classify.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#10

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

see very little of stream
 Stream could not be viewed
 well enough to classify.

							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="50"/>	Trees <input type="text" value="50"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="10"/>	Canopy <input type="text" value="90"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

11

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

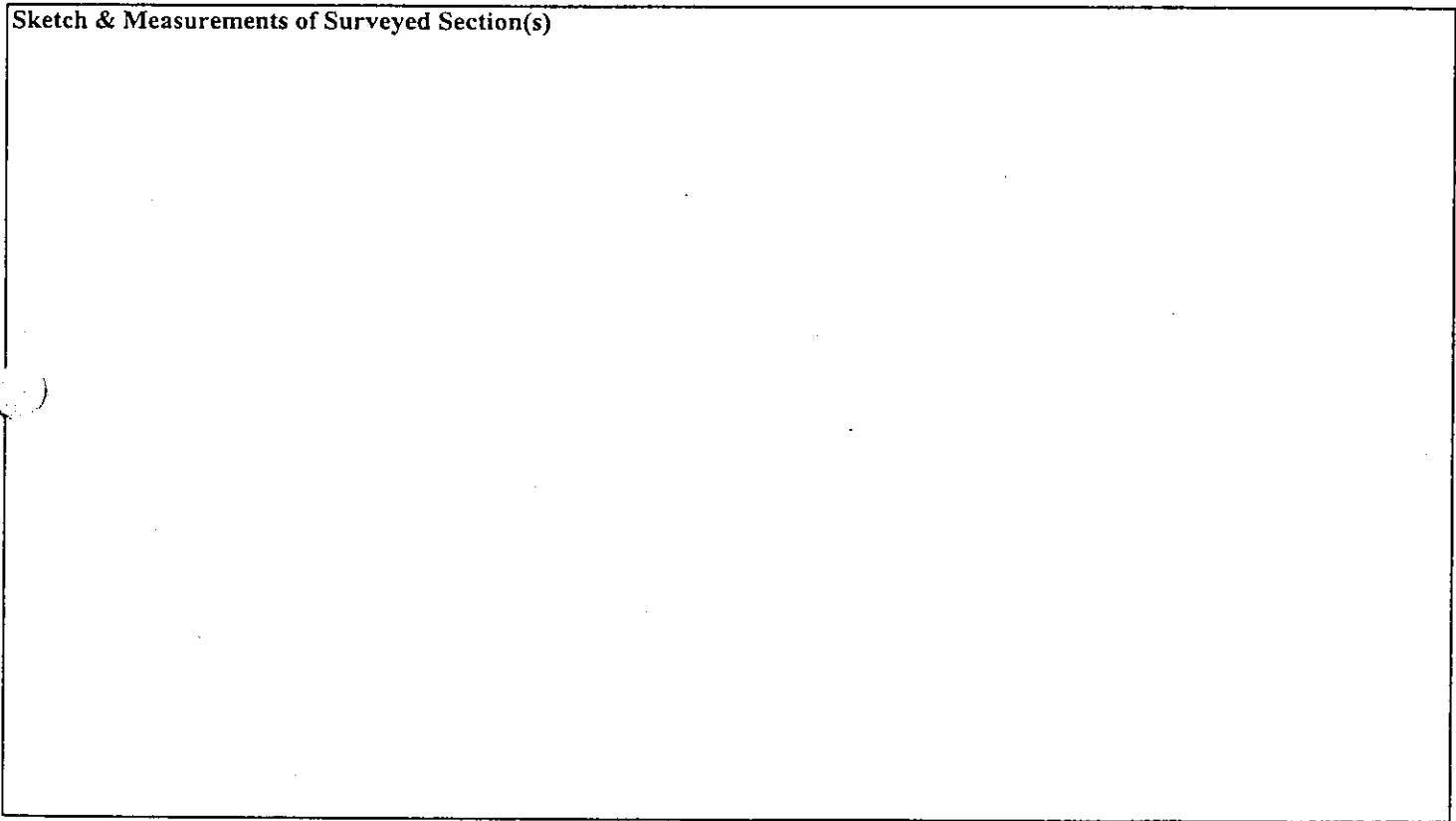
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Stream could not be seen clear enough to classify.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="60"/>			
Cover 100%	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="30"/>	Canopy <input type="checkbox" value="70"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Temperature

pH

Conductivity

Dissolved Oxygen

Turbidity

Surface velocity

Water Samples collected

Gradient (inclinometer)

Ground Survey not Completed

Crossing less than 2 km² (on DWST list)

Bog drainage

Type IV (steady) flow

Type III (cascade/rapids) flow

No accessible by helicopter

Other: _____

12. Potential Landing spot 650 m away
Thick spruce all around

Sketch & Measurements of Surveyed Section(s)

wpt 895 stream crossing

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

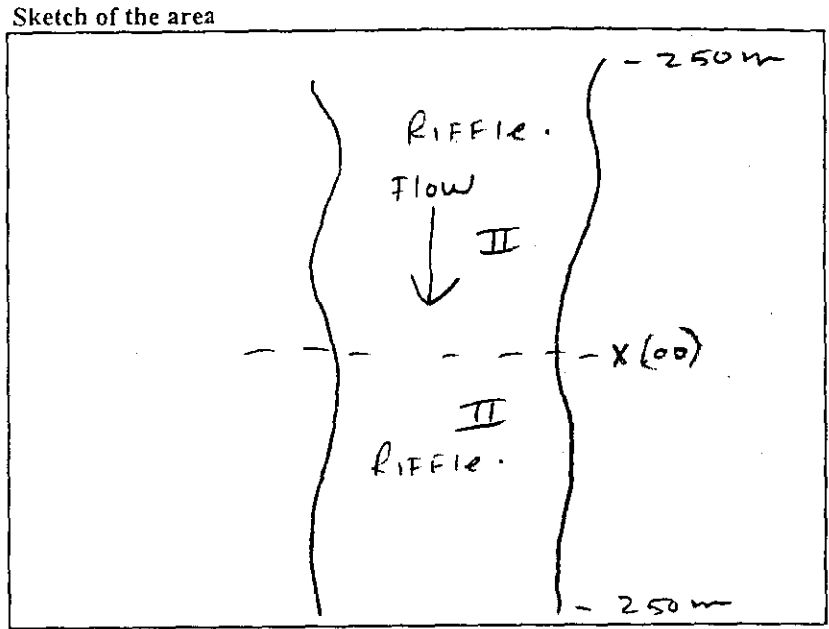
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input checked="" type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{95%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#13.

Landing Site 370 m away.

Ground Survey

Ground survey completed YES

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

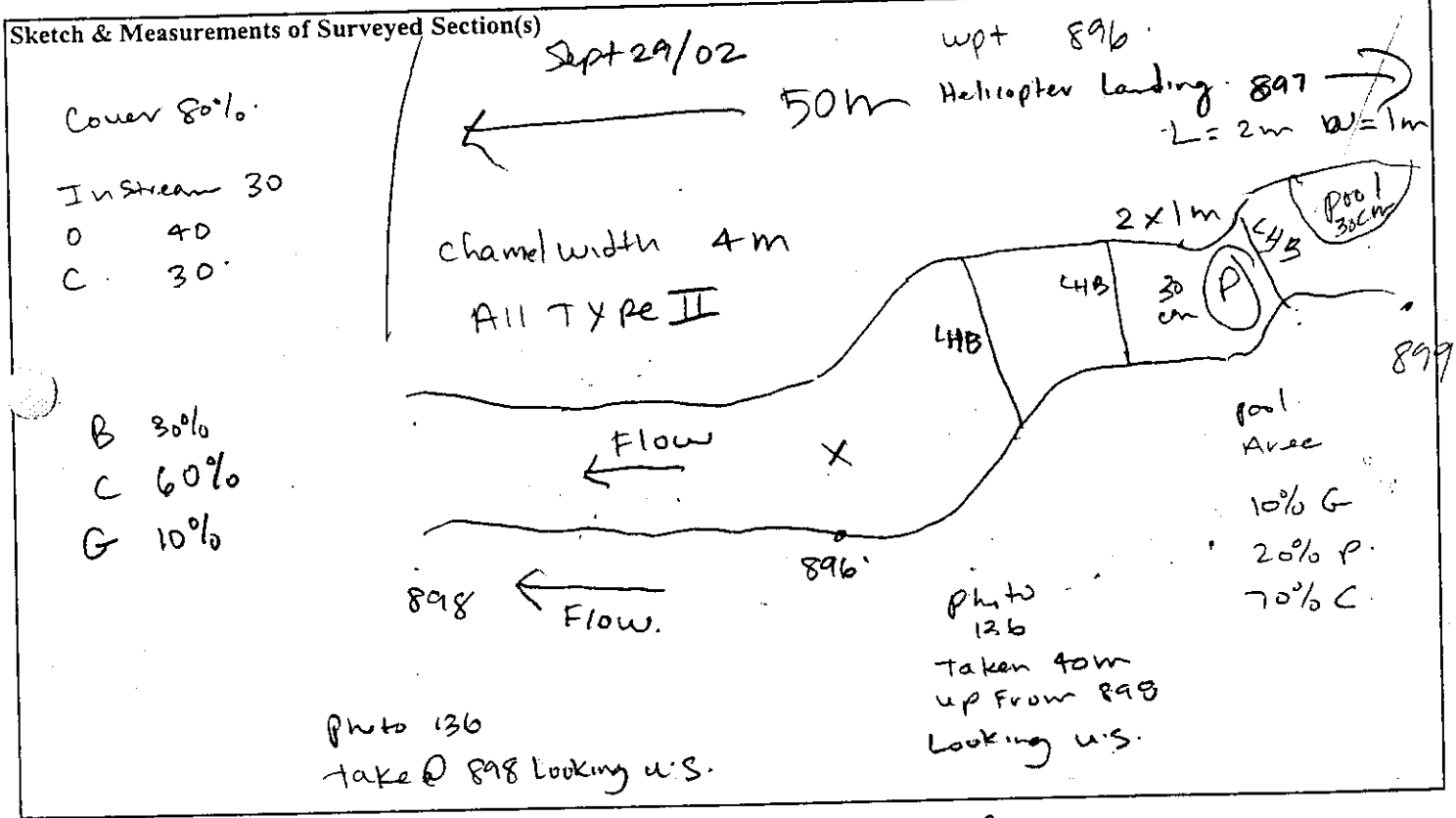
Surface velocity

Other: _____

Water Samples collected YES

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Brook Trout seen in u.s. pool

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

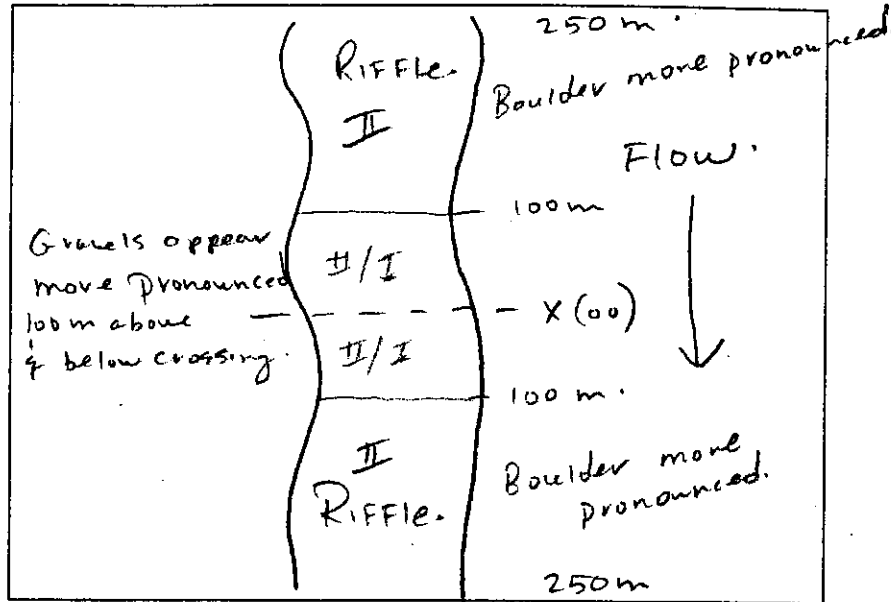
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



						Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover ^{40%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Temperature

pH

Conductivity

Dissolved Oxygen

Turbidity

Surface velocity

Water Samples collected

Gradient (inclinometer)

Ground Survey not Completed

Crossing less than 2 km² (on DWST list)

Bog drainage

Type IV (steady) flow

Type III (cascade/rapids) flow

No accessible by helicopter

Other: _____

1A

Potential land 500m through woods / Alder (thick)

Sketch & Measurements of Surveyed Section(s)

landing Site 500 m ~~check later~~
 from crossing check later

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

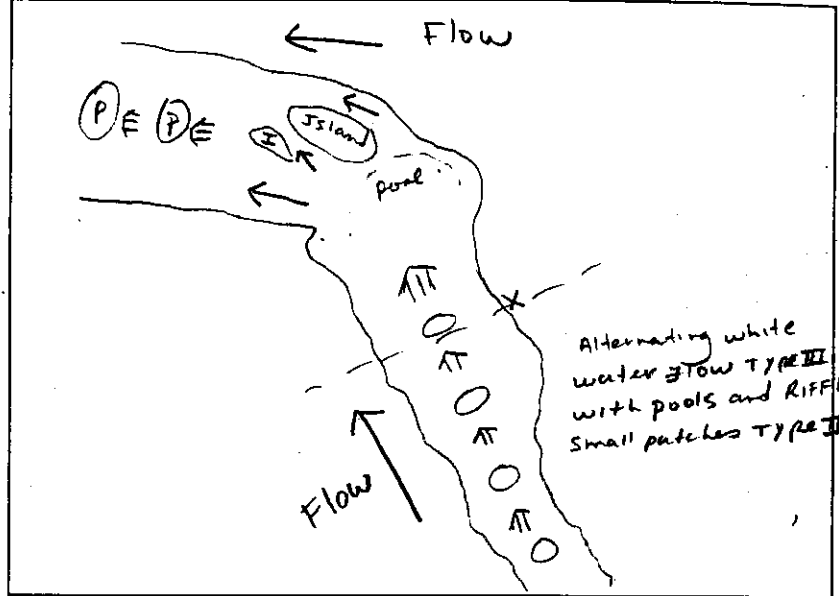
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments					
Depth	0 - 1 m	<input type="text" value="85"/>	1 - 2 m	<input type="text" value="15"/>	>2 m	<input type="text"/>	Unknown	<input type="text"/>				
Channel Width	0 - 2 m	<input type="text"/>	2 - 5 m	<input type="text"/>	5 - 20 m	<input checked="" type="checkbox"/>	>20 m	<input type="text"/>				
Flow Type	Steady	<input type="text"/>	Riffle	<input type="text" value="75"/>	Rapids	<input type="text" value="15"/>	Pools	<input type="text" value="15"/>				
Substrate Type	Fines	<input type="text"/>	Gravel	<input type="text" value="5"/>	Cobble/Rubble	<input type="text" value="15"/>	Boulder	<input type="text" value="80"/>	Bedrock	<input type="text"/>	Unknown	<input type="text"/>
Bank Habitat	Type I	<input type="text"/>	Type II	<input type="text" value="90"/>	Type III	<input type="text" value="10"/>	Type IV	<input type="text"/>				
Bank Material	Fines	<input type="text"/>	Gravel/Pebble	<input type="text"/>	Cobble/Rubble	<input type="text" value="20"/>	Boulder	<input type="text" value="80"/>	Bedrock	<input type="text"/>	Unknown	<input type="text"/>
Backslope	Shallow Gully	<input type="text"/>	Medium Gully	<input checked="" type="checkbox"/>	Deep Gully	<input type="text"/>	Forest Stream	<input type="text"/>	Flood Plain	<input type="text"/>	Bog/Fen	<input type="text"/>
Bank Vegetation	Bog	<input type="text"/>	Grasses	<input type="text"/>	Shrubs	<input type="text" value="40"/>	Trees	<input type="text" value="60"/>				
Cover	<input type="text" value="20%"/> Instream	<input type="text" value="20"/>	Overhang	<input type="text" value="50"/>	Canopy	<input type="text" value="30"/>	None	<input type="text"/>				
Potential Obstruction	Falls	<input type="text"/>	Rapids	<input type="text"/>	Chute	<input type="text"/>	Cascade	<input checked="" type="checkbox"/>	Intermittent	<input type="text"/>	None	<input type="text"/>
Est. Gradient	0 - 1 %	<input type="text"/>	1 - 3 %	<input type="text"/>	3 - 5 %	<input type="text"/>	>5 %	<input type="text"/>				

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed *No*

Cannot Land.

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

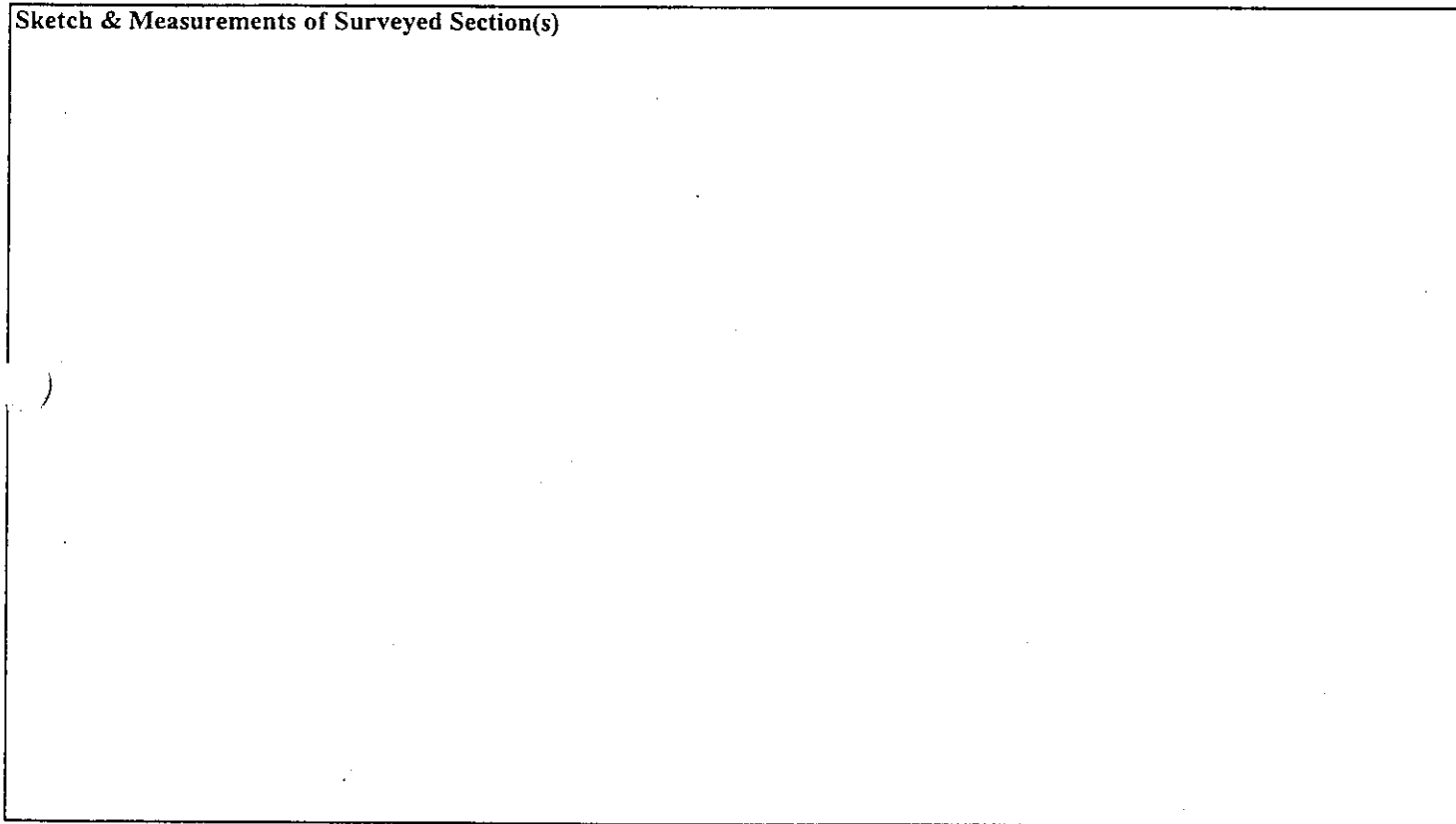
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

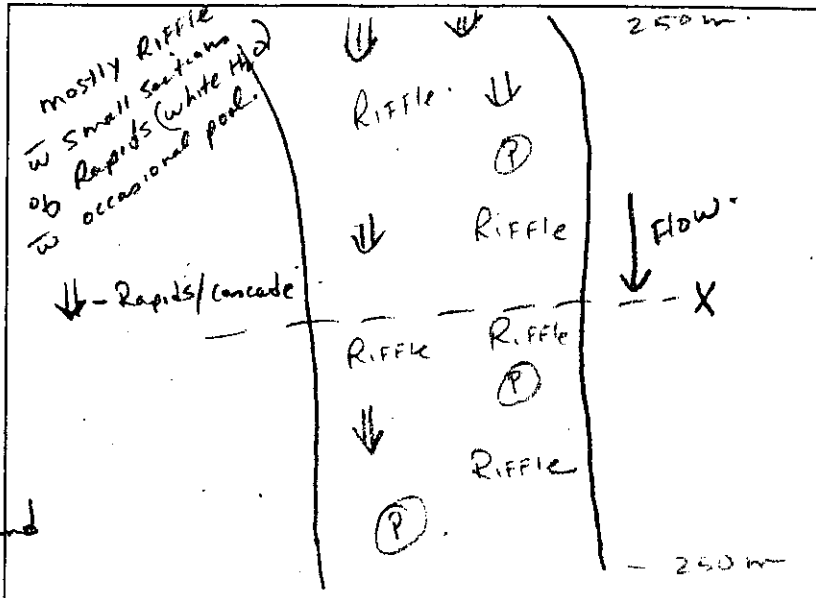
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox" value="80"/>	Rapids <input type="checkbox" value="10"/>	Pools <input type="checkbox" value="10"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="20"/>	Boulder <input type="checkbox" value="80"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox" value="95"/>	Type III <input type="checkbox" value="5"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="50"/>	Trees <input type="checkbox" value="50"/>	
Cover	10% Instream <input type="checkbox" value="30"/>	Overhang <input type="checkbox" value="40"/>	Canopy <input type="checkbox" value="30"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow-gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#16 350 m to crossing 16

Ground Survey

Ground survey completed YES Ground Survey not Completed

Temperature 5.42 Crossing less than 2 km² (on DWST list)

pH 8.50 Bog drainage

Conductivity 5.4 Type IV (steady) flow

Dissolved Oxygen 11.56 Type III (cascade/rapids) flow

Turbidity 4.1 No accessible by helicopter

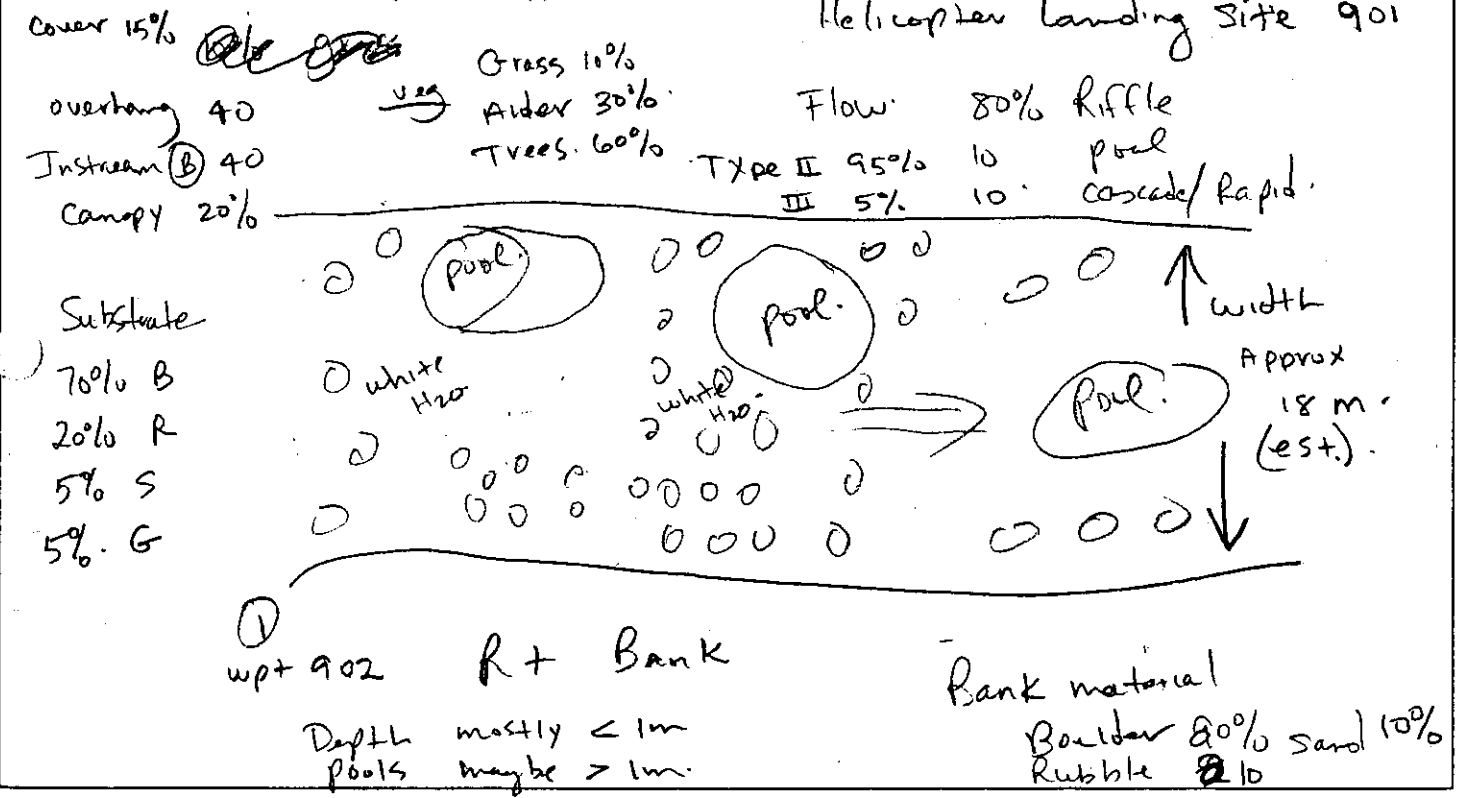
Surface velocity 105 Revs/min (38cm) Other: _____
MIDDLE of STREAM

Water Samples collected YES

Gradient (inclinometer) 2%

Sept 29/02

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Lot of rain yesterday. Difficult to see (turbidity)

Backslope

- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

could not view stream well enough to classify.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	f
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="50"/>	Trees <input type="text" value="50"/>			
Cover ^{99%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="30"/>	Canopy <input type="text" value="70"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

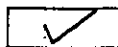
Ground Survey

17

Ground survey completed

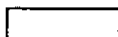
Ground Survey not Completed ND

Temperature



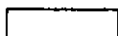
Crossing less than 2 km² (on DWST list)

pH



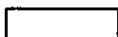
Bog drainage

Conductivity



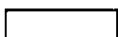
Type IV (steady) flow

Dissolved Oxygen



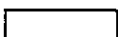
Type III (cascade/rapids) flow

Turbidity



No accessible by helicopter

Surface velocity

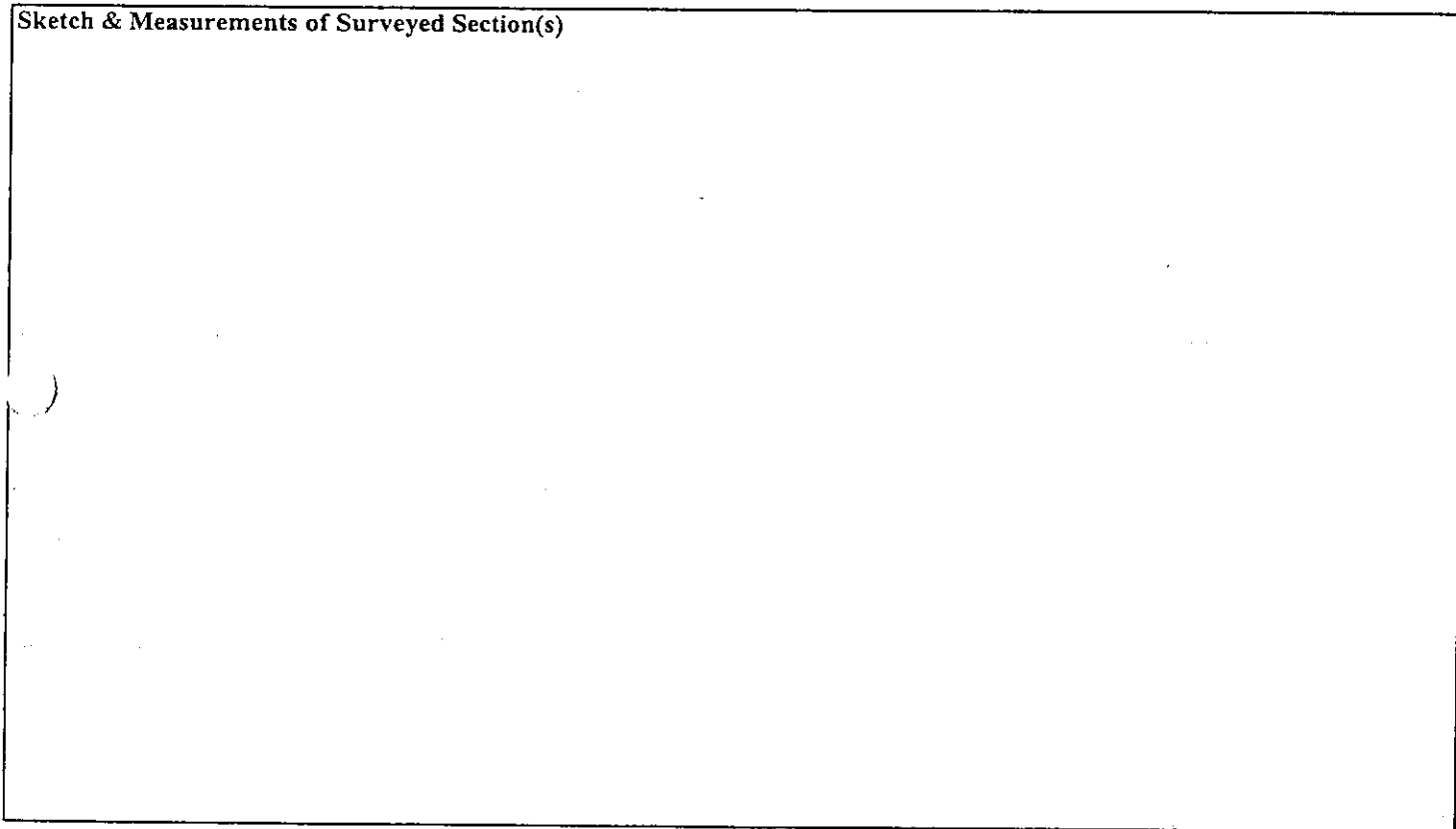


Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream
clear enough to classify.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="60"/>	
Cover	100% Instream <input type="checkbox"/>	Overhang <input type="text" value="40"/>	Canopy <input type="text" value="60"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

18

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

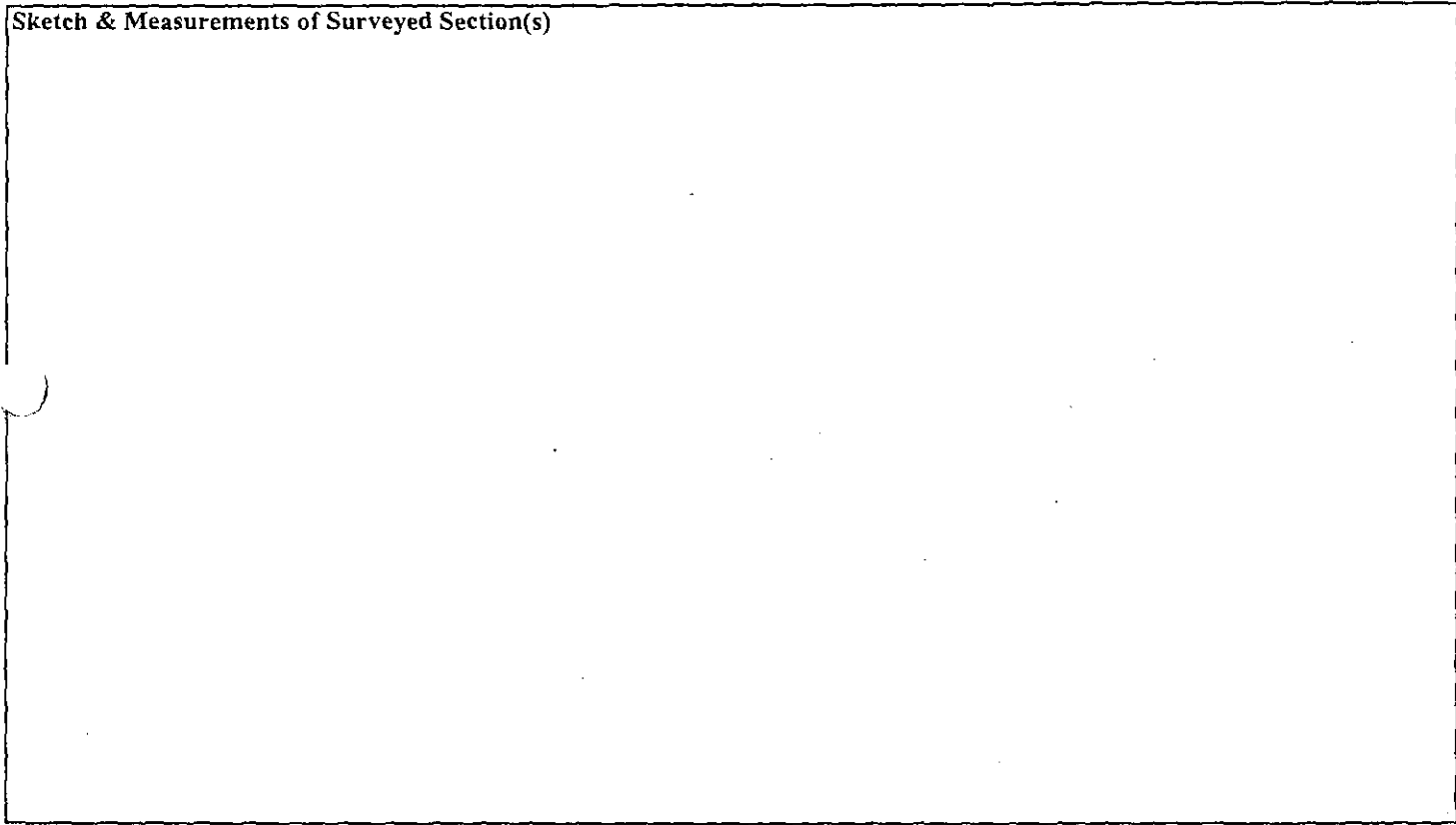
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary *intermittent* channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream well enough to classify.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox" value="5"/>	Shrubs <input type="checkbox" value="20"/>	Trees <input type="checkbox" value="75"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox" value="99"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate

finer less than 2 mm

gravel 2mm - 3 cm

pebble 3 - 5 cm

cobble 6-13 cm

rubble 14-25 cm

boulder 26 cm and up

Backslope

Shallow gully 1 m

Medium gully 2-3 m

Deep gully ≥ 4 m

Forest stream see over

Flood plain see over

Bog/Fen see over

Cover

Instream submergent/emergent vegetation

Overhang grasses/shrubs within 1 m of water

Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#19

Ground Survey

Ground survey completed

Temperature

pH

Conductivity

Dissolved Oxygen

Turbidity

Surface velocity

Water Samples collected

Gradient (inclinometer)

Ground Survey not Completed NO

Crossing less than 2 km² (on DWST list)

Bog drainage

Type IV (steady) flow

Type III (cascade/rapids) flow

No accessible by helicopter

Other: _____

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

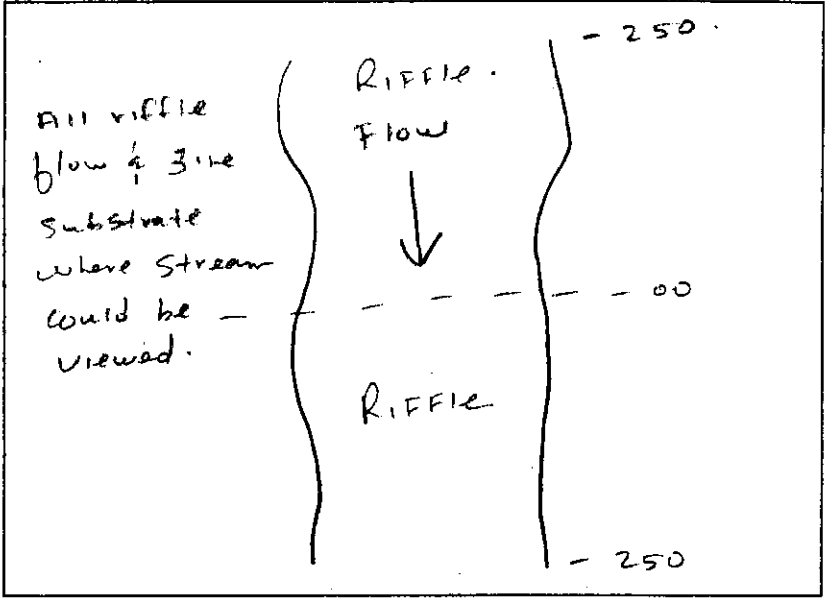
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. #20
 Date Sept 23/02
 Surveyed by Bw/mH/Hm/PJ
 Watershed Traverspine
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 F/2
 Photo Numbers 55
 Video Yes
 Area Surveyed 500m Aerial
 Water Samples NO

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/> 5	Shrubs <input type="checkbox"/> 45	Trees <input type="checkbox"/> 50	
Cover	90% Instream <input type="checkbox"/>	Overhang <input type="checkbox"/> 10	Canopy <input type="checkbox"/> 90	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed #20

Ground Survey not Completed NO

~ 450 m to walk to crossing - (can't not find) at 450

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

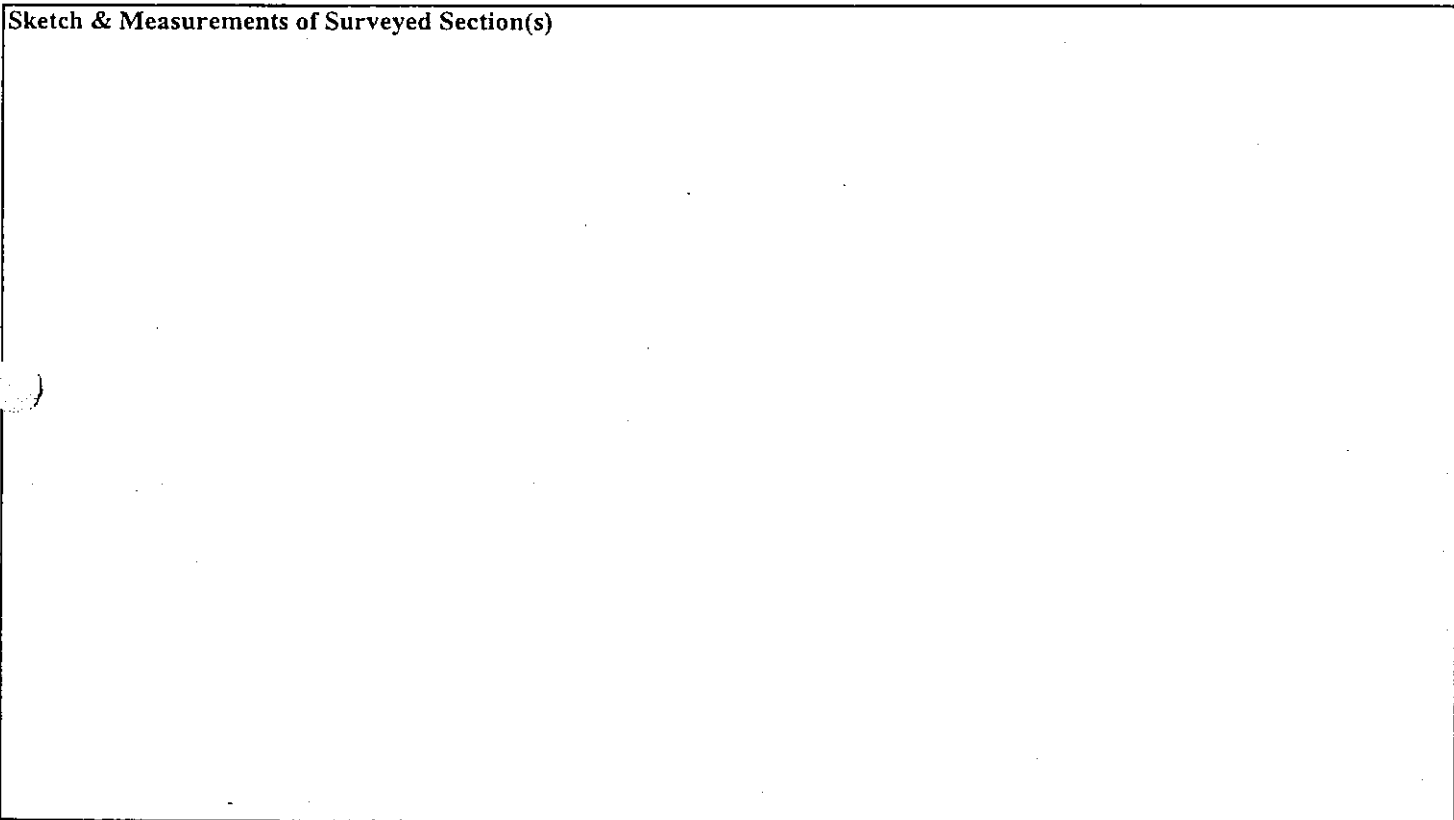
Surface velocity

Other: 750 m away - maybe

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could see very little H₂O.
 could not view well enough
 to classify.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="text" value="5"/>	Shrubs <input type="text" value="25"/>	Trees <input type="text" value="70"/>	
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="text" value="99%"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#21

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

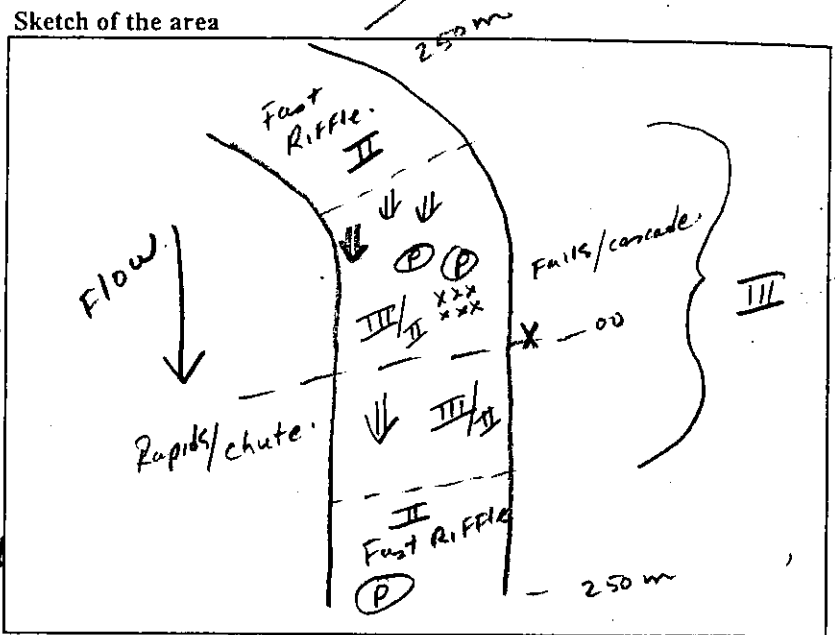
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input type="text" value="70"/>	1 - 2 m <input type="text" value="30"/>	> 2 m <input type="text"/>	Unknown <input type="text"/>			
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input type="text"/>	> 20 m <input checked="" type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="text" value="50"/>	Rapids <input type="text" value="40"/>	Pools <input type="text" value="10"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="20"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="text" value="50"/>	Type III <input type="text" value="50"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="20"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="text" value="50"/>	Deep Gully <input type="text" value="50"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="text" value="5"/>	Shrubs <input type="text" value="35"/>	Trees <input type="text" value="60"/>			
Cover %	Instream <input type="text" value="20"/>	Overhang <input type="text" value="60"/>	Canopy <input type="text" value="20"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input checked="" type="checkbox"/>	Rapids <input checked="" type="checkbox"/>	Chute <input checked="" type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	> 5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

22

≈ 350m distance

Ground survey completed Yes

Ground Survey not Completed

low stream

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity 1 meter from shore 50 cm depth

Other: _____

Water Samples collected Yes

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

Sept 29/02.

Cover - 50%

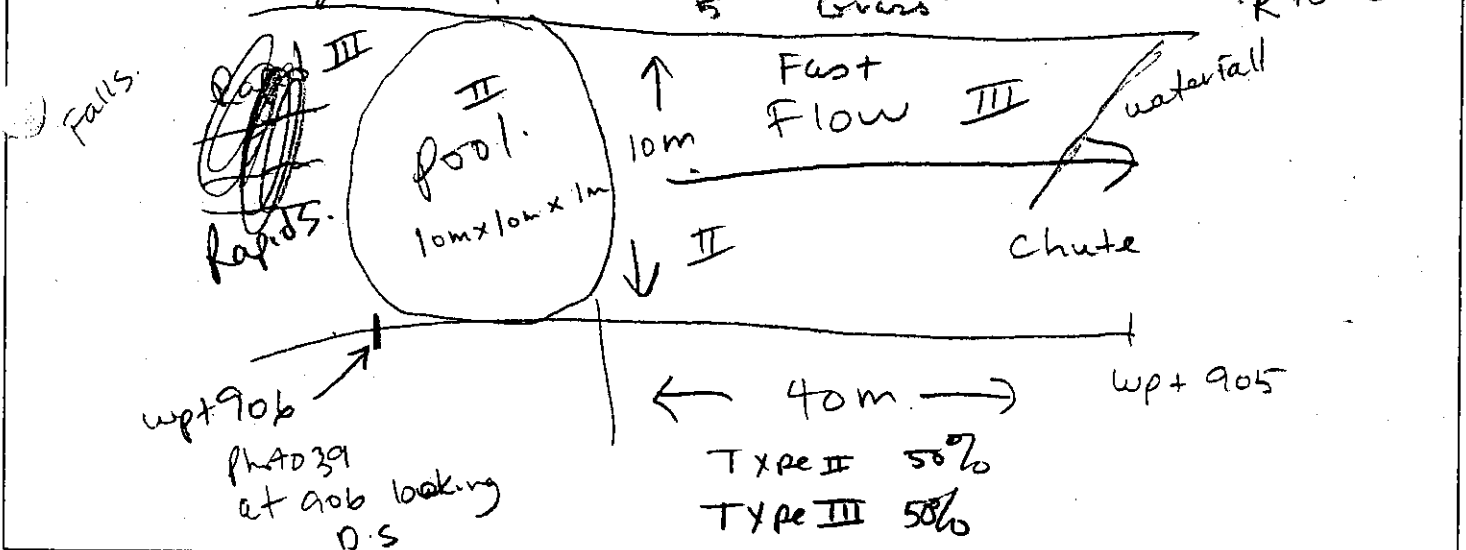
chipper up + 90°

(P) (B) Instream 60
Canopy 30
overhanging 10

Vegetation

70% Trees
25% Shrubs
5 Grass

Substrate
B 60%
B.R 30%
R 10%



LEGENDS / NOTES

- Backslope**
- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

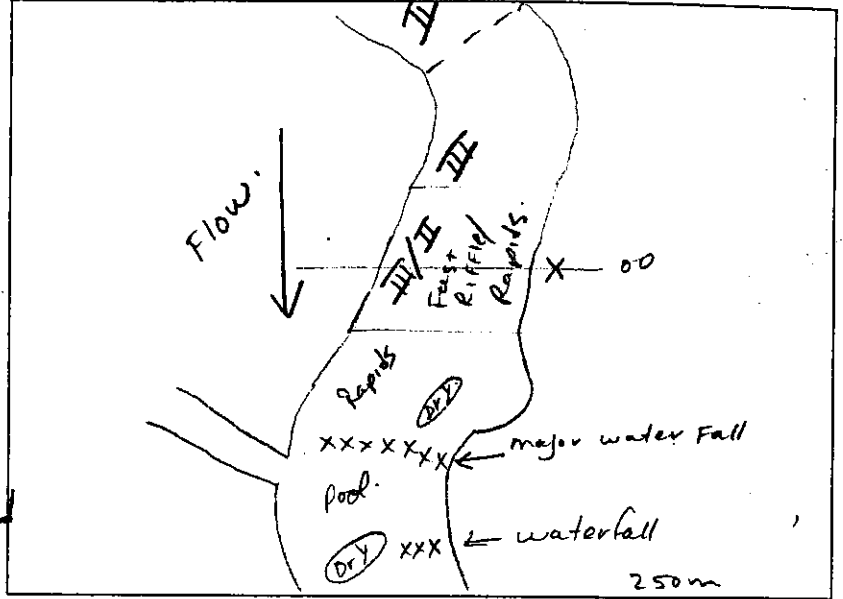
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input type="text" value="90"/>	1 - 2 m <input type="text" value="10"/>	>2 m <input type="text"/>	Unknown <input type="text"/>			
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input type="text" value="40"/>	>20 m <input type="text" value="60"/>			
Flow Type	Steady <input type="text"/>	Riffle <input type="text" value="30"/>	Rapids <input type="text" value="60"/>	Pools <input type="text" value="10"/>			
Substrate Type	Fines <input type="text"/>	Gravel <input type="text" value="5"/>	Cobble/Rubble <input type="text" value="15"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="20"/>	Unknown <input type="text"/>	
Bank Habitat	Type I <input type="text"/>	Type II <input type="text" value="40"/>	Type III <input type="text" value="60"/>	Type IV <input type="text"/>			
Bank Material	Fines <input type="text"/>	Gravel/Pebble <input type="text" value="10"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="10"/>	Unknown <input type="text"/>	
Backslope	Shallow Gully <input type="text"/>	Medium Gully <input type="text" value="60"/>	Deep Gully <input type="text" value="40"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/>	Bog/Fen <input type="text"/>	
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text" value="10"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="50"/>			
Cover %	Instream <input type="text" value="80"/>	Overhang <input type="text" value="20"/>	Canopy <input type="text"/>	None <input type="text"/>			
Potential Obstruction	Falls <input checked="" type="checkbox"/>	Rapids <input checked="" type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="text"/>	1 - 3 % <input type="text"/>	3 - 5 % <input type="text"/>	>5 % <input type="text"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

23

Can land on Stream Bank

Ground survey completed yes

Ground Survey not Completed

Temperature 5.81

Crossing less than 2 km² (on DWST list)

pH 8.53

Bog drainage

Conductivity 5.5

Type IV (steady) flow

Dissolved Oxygen 11.04

Type III (cascade/rapids) flow

Turbidity 1.4

No accessible by helicopter

Surface velocity 90 Revs/min

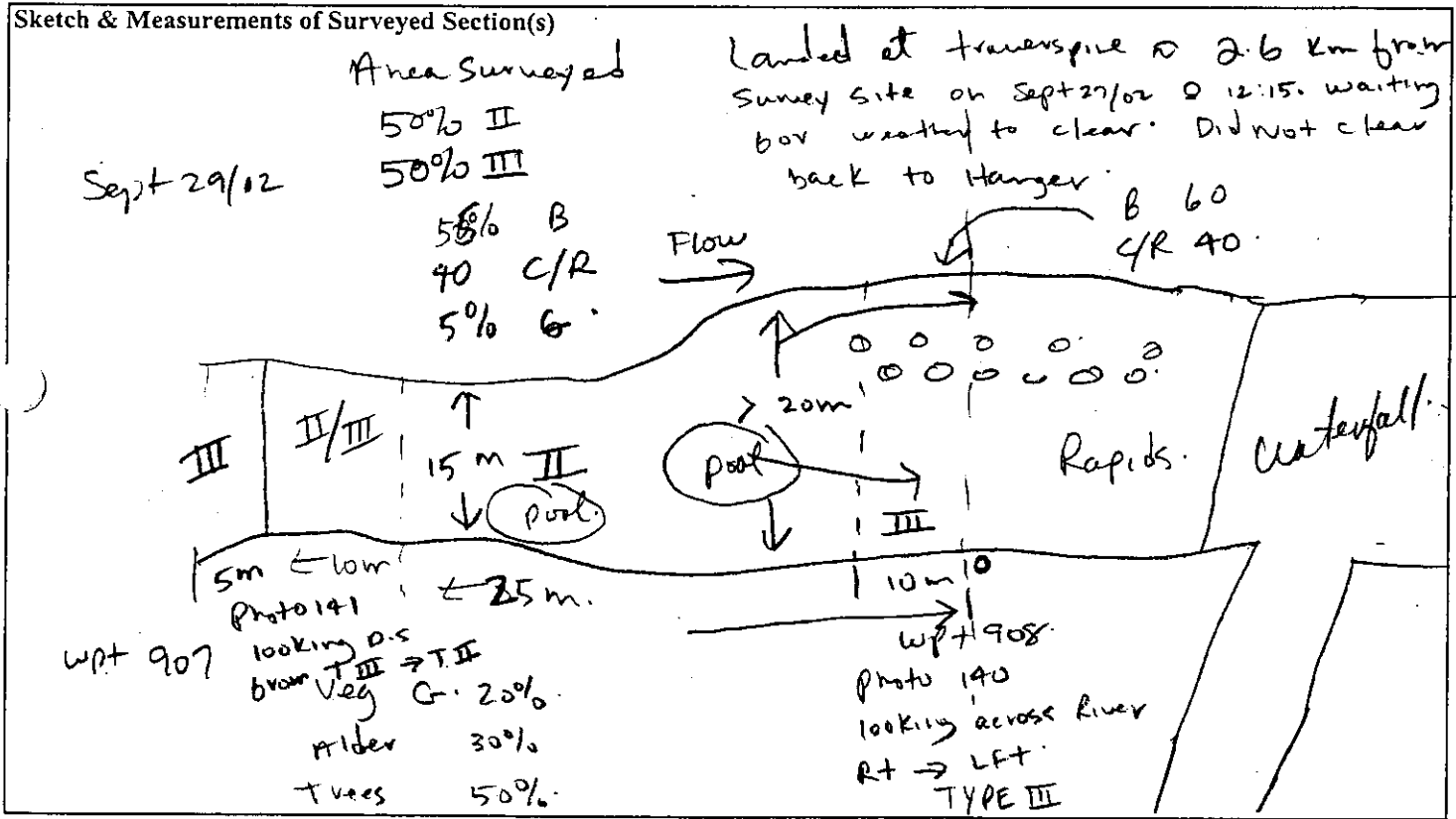
Other: _____

Middle of Stream 58cm

Water Samples collected yes

Gradient (inclinometer) 1.5%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

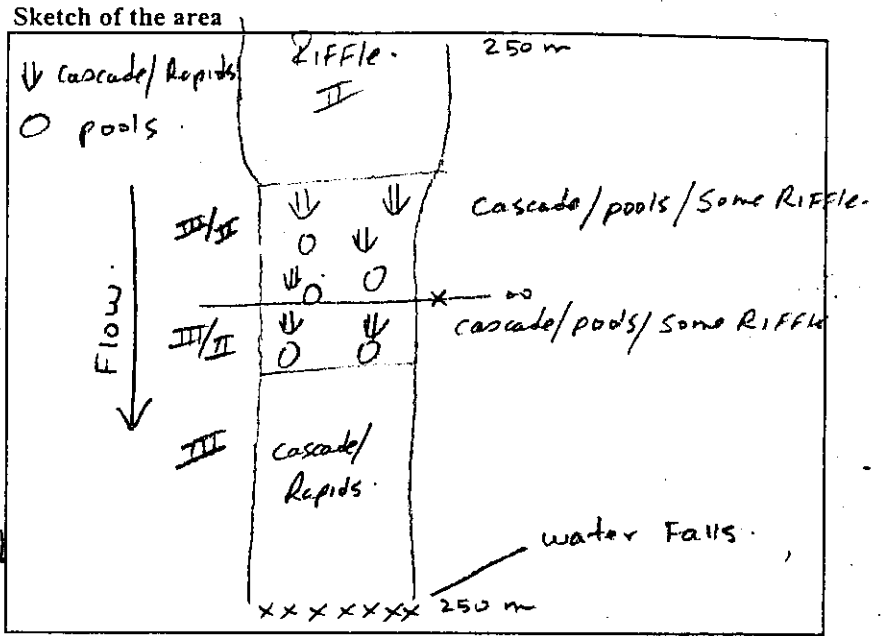
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="text" value="30"/>	5 - 20 m <input type="text" value="70"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="text" value="30"/>	Rapids <input type="text" value="50"/>	Pools <input type="text" value="20"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="text" value="10"/>	Boulder <input type="text" value="90"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="text" value="50"/>	Type III <input type="text" value="50"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="80"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="20"/>	Trees <input type="text" value="80"/>			
Cover %	Instream <input type="text" value="40"/>	Overhang <input type="text" value="30"/>	Canopy <input type="text" value="30"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 5.88

Crossing less than 2 km² (on DWST list)

pH 7.97

Bog drainage

Conductivity 5.9

Type IV (steady) flow

Dissolved Oxygen 11.23

Type III (cascade/rapids) flow

Turbidity 2.4

No accessible by helicopter

Surface velocity 58 Rev/min

Other: _____

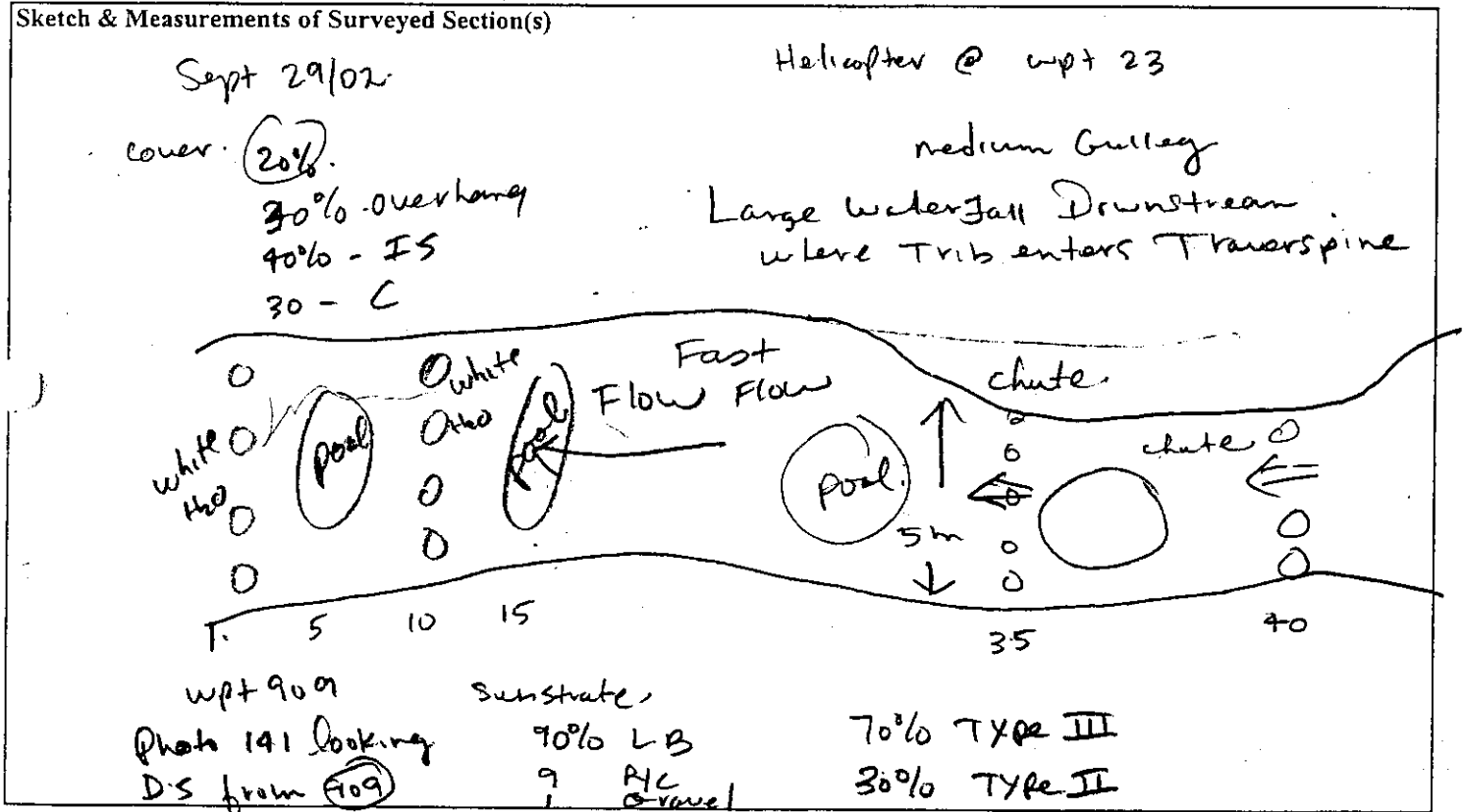
Behind Boulder 1/2 meters from shore (46 cm)

Water Samples collected Yes

Gradient (inclinometer) 4%

#24 Difficult would have to lean at 23 ~ 300m

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Bank material same as Substrate.

Backslope

Found Another stream B^{tn} 23 & 24 enters Traverspine at waterfalls Brief characterization on

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

could not see stream well enough to classify.

						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

25

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature



Crossing less than 2 km² (on DWST list)

pH



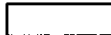
Bog drainage

Conductivity



Type IV (steady) flow

Dissolved Oxygen



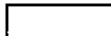
Type III (cascade/rapids) flow

Turbidity



No accessible by helicopter

Surface velocity

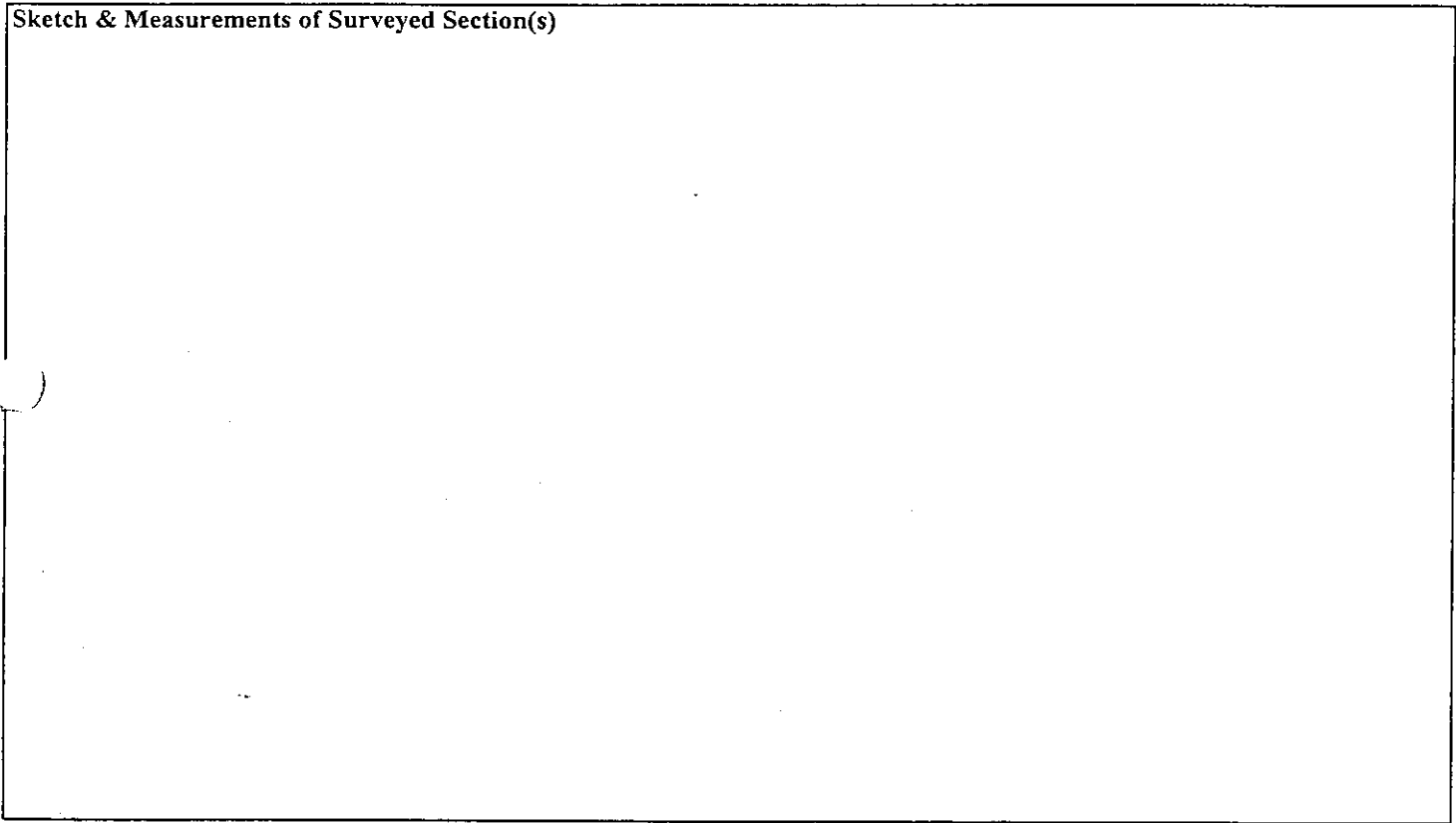


Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

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Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

could not see stream well enough to classify.

						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="30"/>	Trees <input type="text" value="70"/>		
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="30"/>	Canopy <input type="text" value="70"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#26

Ground survey completed

Ground Survey not Completed N D

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream well enough to classify.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox" value="5"/>	Shrubs <input type="checkbox" value="50"/>	Trees <input type="checkbox" value="45"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="60"/>	Canopy <input type="checkbox" value="40"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#27.

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature



Crossing less than 2 km² (on DWST list)

pH



Bog drainage

Conductivity



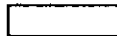
Type IV (steady) flow

Dissolved Oxygen



Type III (cascade/rapids) flow

Turbidity



No accessible by helicopter

Surface velocity

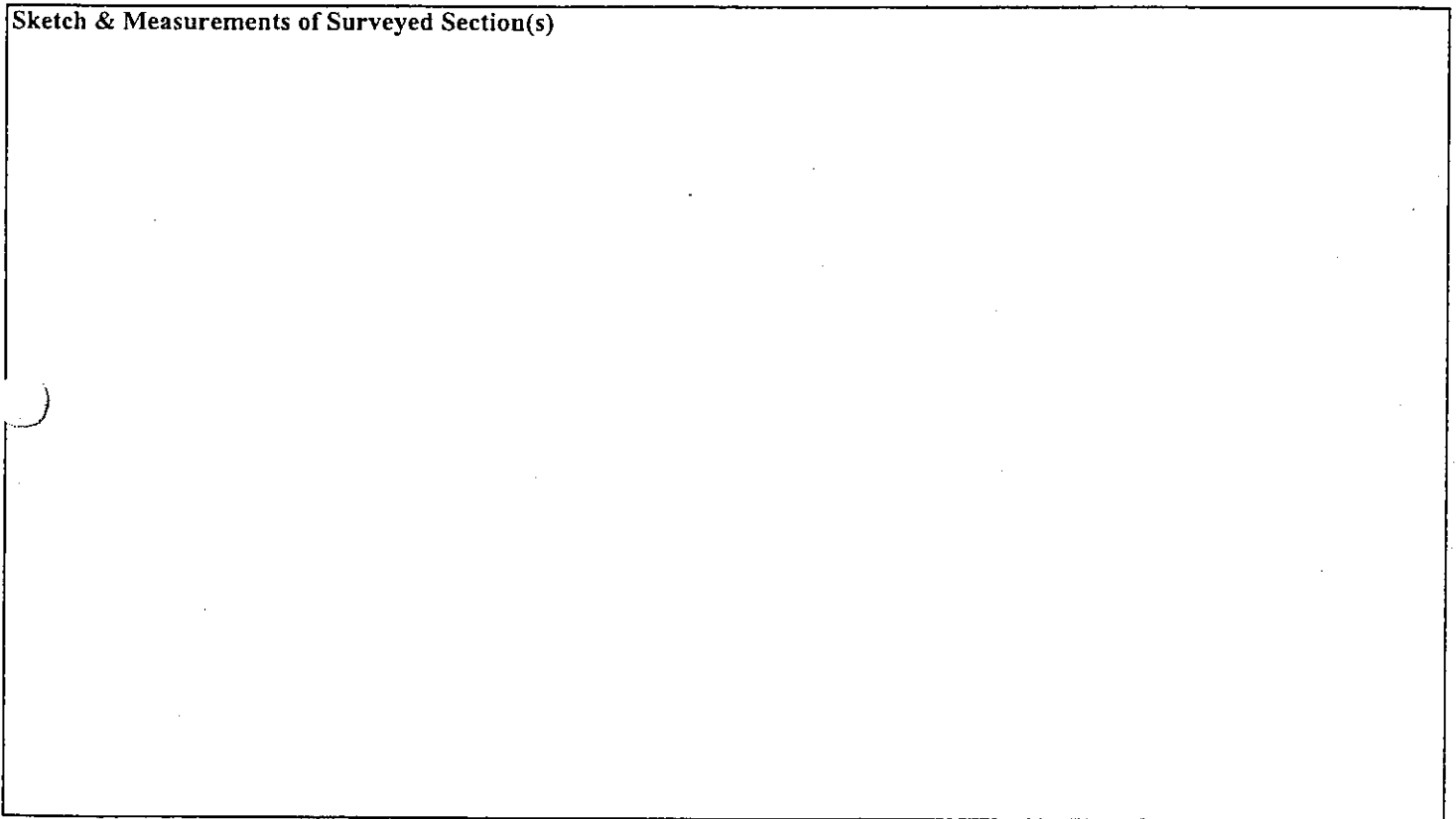


Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

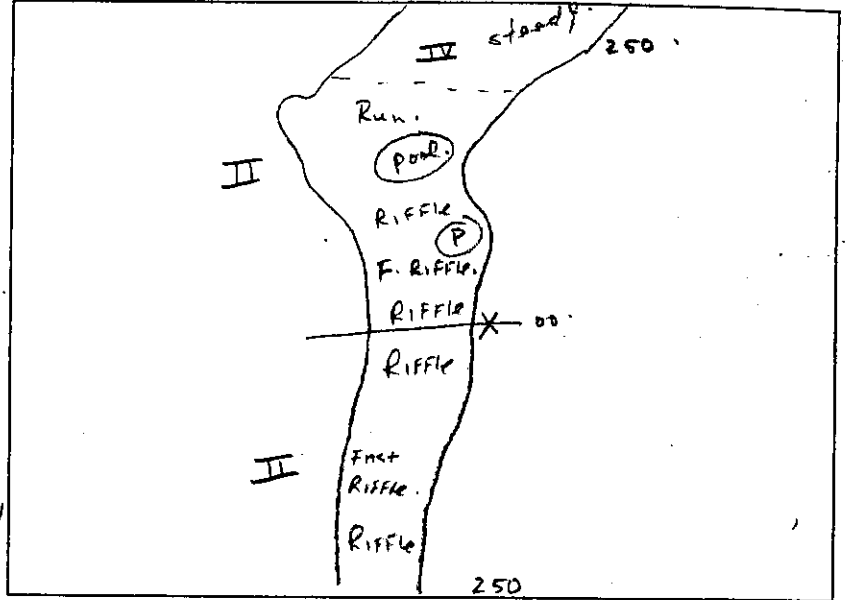
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



						Comments	
Depth	0 - 1 m <input type="text" value="90"/>	1 - 2 m <input type="text" value="10"/>	>2 m <input type="text"/>	Unknown <input type="text"/>			
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input type="text" value="70"/>	>20 m <input type="text" value="30"/>			
Flow Type	Steady <input type="text" value="5"/>	Riffle <input type="text" value="85"/>	Rapids <input type="text"/>	Pools <input type="text" value="10"/>			
Substrate Type	Fines <input type="text"/>	Gravel <input type="text" value="10"/>	Cobble/Rubble <input type="text" value="40"/>	Boulder <input type="text" value="50"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Habitat	Type I <input type="text"/>	Type II <input type="text" value="95"/>	Type III <input type="text"/>	Type IV <input type="text" value="5"/>			
Bank Material	Fines <input type="text" value="10"/>	Gravel/Pebble <input type="text"/>	Cobble/Rubble <input type="text" value="50"/>	Boulder <input type="text" value="40"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Backslope	Shallow Gully <input type="text" value="40"/>	Medium Gully <input type="text" value="60"/>	Deep Gully <input type="text"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/>	Bog/Fen <input type="text"/>	
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text" value="5"/>	Shrubs <input type="text" value="35"/>	Trees <input type="text" value="60"/>			
Cover 15%	Instream <input type="text" value="30"/>	Overhang <input type="text" value="40"/>	Canopy <input type="text" value="30"/>	None <input type="text"/>			
Potential Obstruction	Falls <input type="text"/>	Rapids <input type="text"/>	Chute <input type="text"/>	Cascade <input type="text"/>	Intermittent <input type="text"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1% <input type="text"/>	1 - 3% <input type="text"/>	3 - 5% <input type="text"/>	>5% <input type="text"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

28

≈ 250 m from Straa
looks Good

Ground survey completed YES

Ground Survey not Completed

Temperature 6.33

Crossing less than 2 km² (on DWST list) FOR SURVEY

pH 7.73

Bog drainage

Conductivity 5.6

Type IV (steady) flow

Dissolved Oxygen 12.72

Type III (cascade/rapids) flow

Turbidity 9.7

No accessible by helicopter

Surface velocity 100 Revs/min

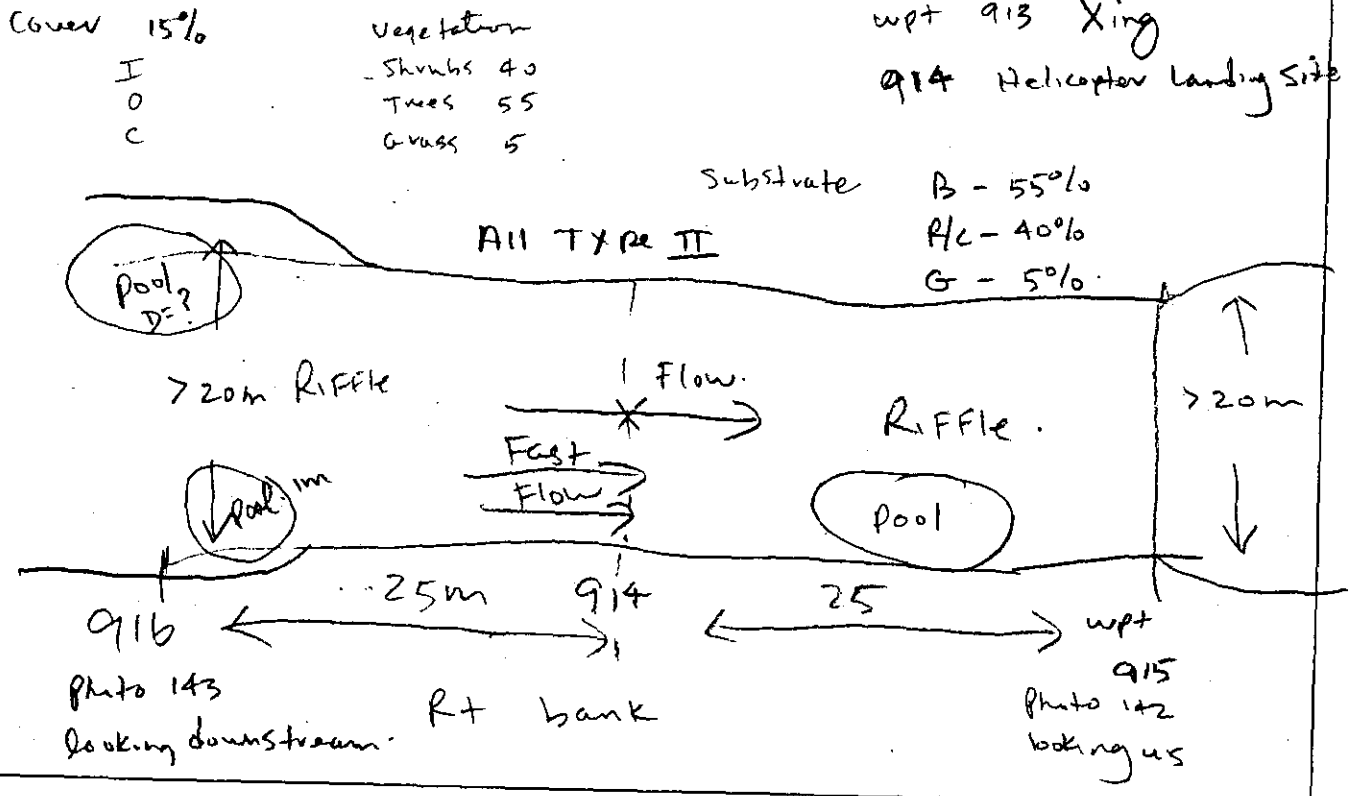
Other: _____

70cm depth / 1 meter from shore

Water Samples collected YES

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

water extremely (black/brown) poor visibility on Substrate.

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream well enough to classify.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="60"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="60"/>	Canopy <input type="text" value="40"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

29

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

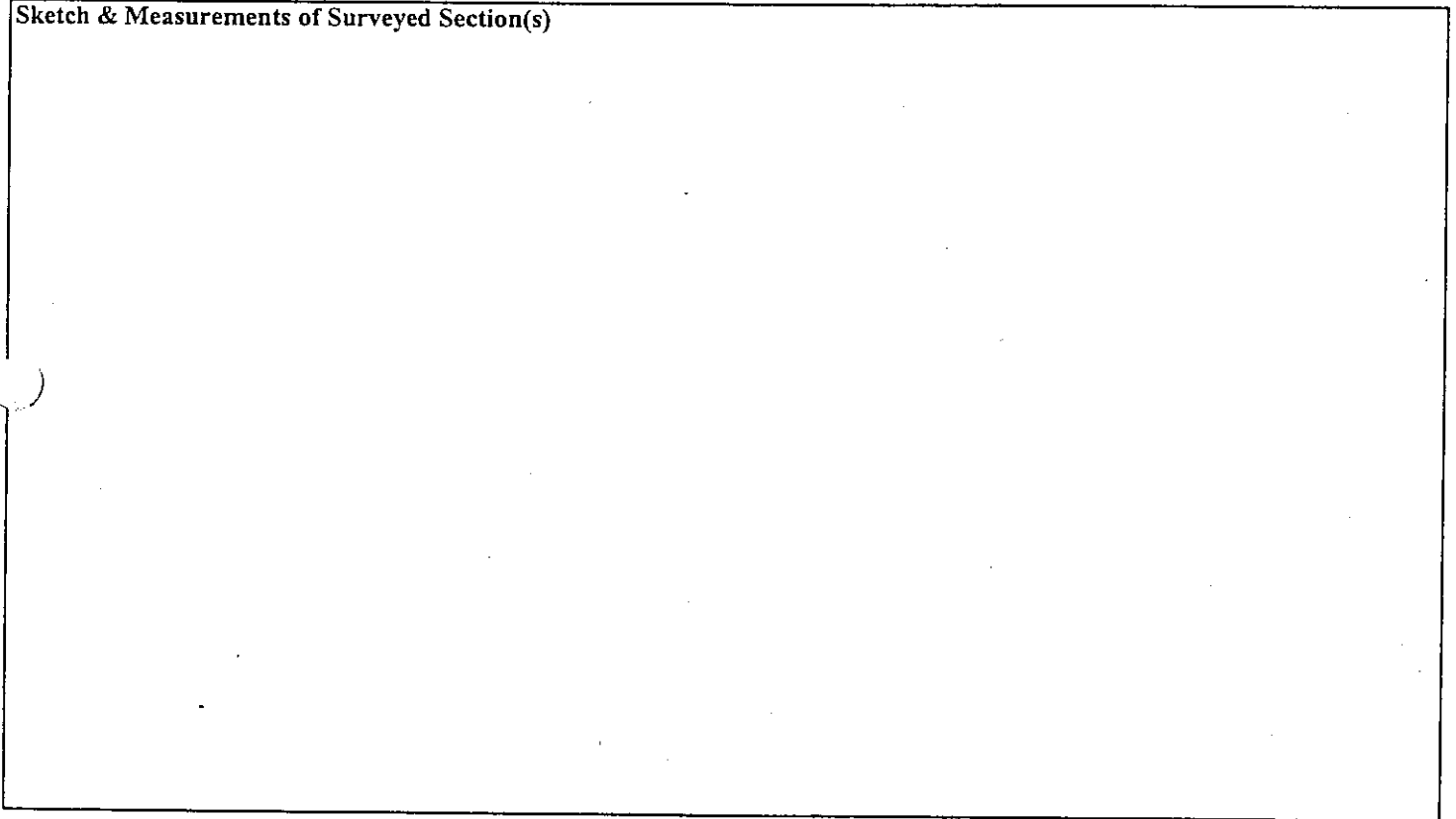
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

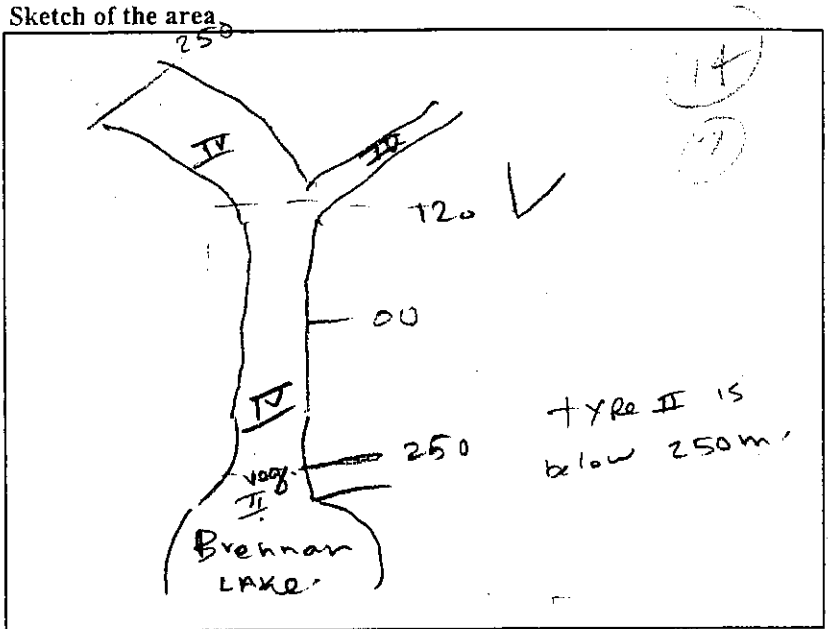
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input checked="" type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate

fines less than 2 mm

gravel 2mm - 3 cm

pebble 3 - 5 cm

cobble 6-13 cm

rubble 14-25 cm

boulder 26 cm and up

Backslope

Shallow gully 1 m

Medium gully 2-3 m

Deep gully ≥4 m

Forest stream see over

Flood plain see over

Bog/Fen see over

Cover

Instream submergent/emergent vegetation

Overhang grasses/shrubs within 1 m of water

Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey #30

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

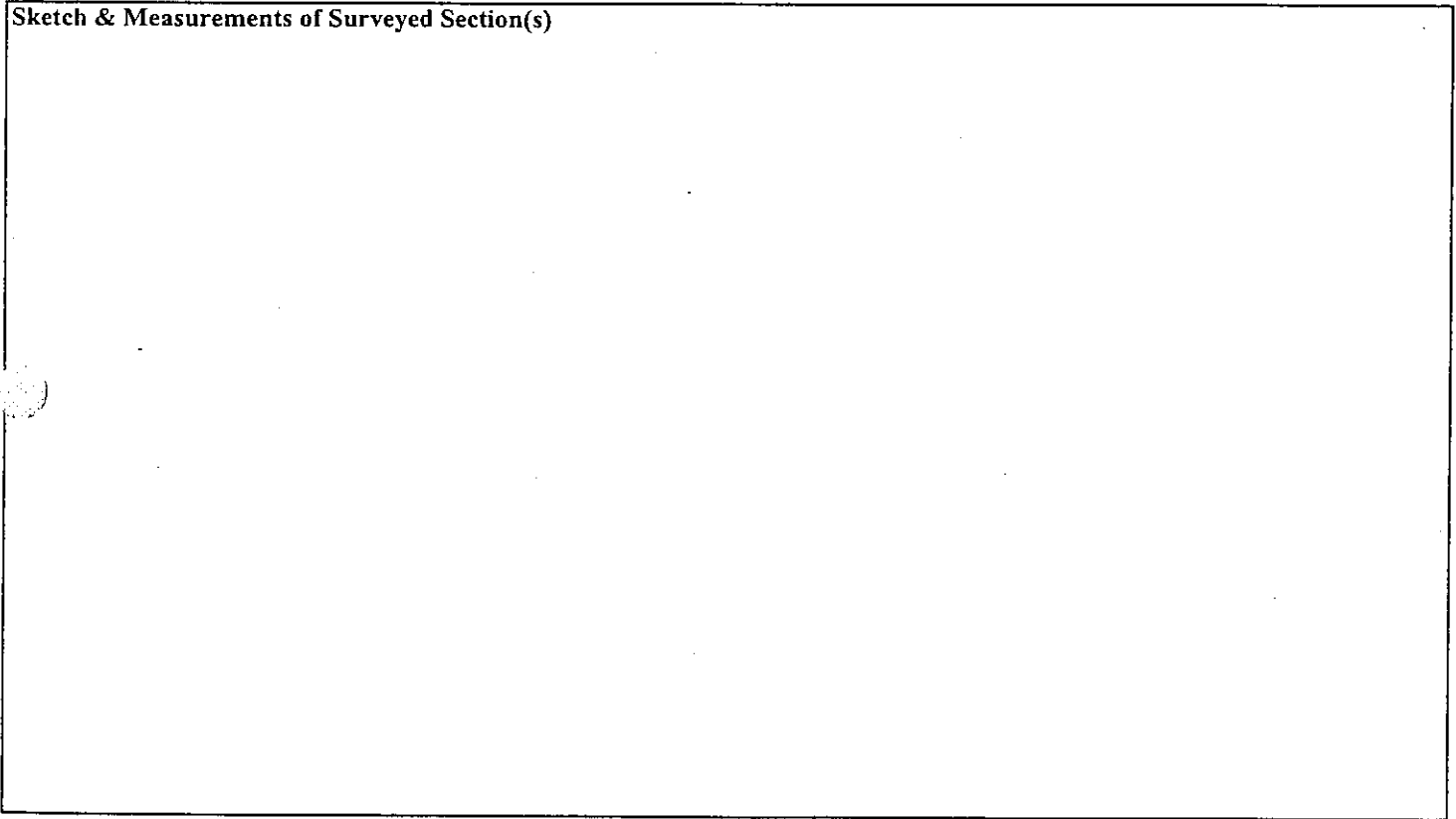
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

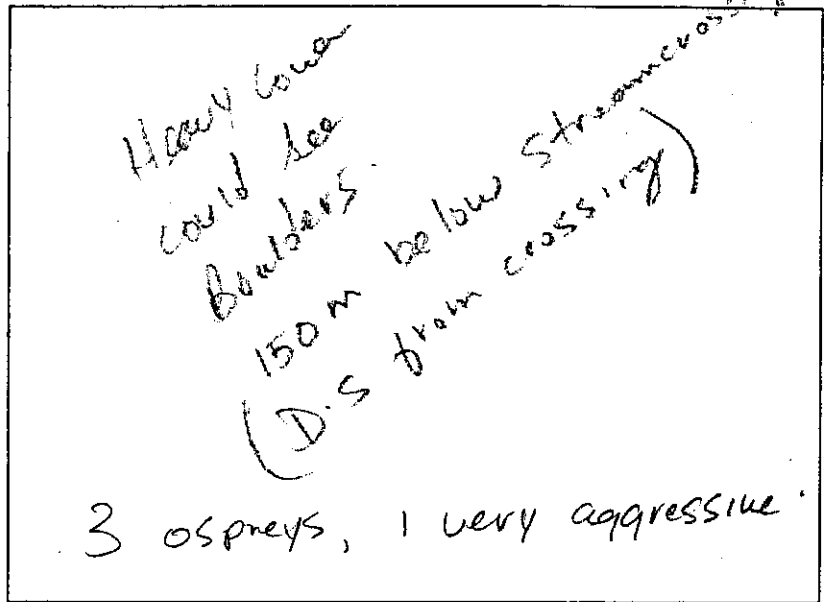
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



								Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input checked="" type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>				
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>				
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>				
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>				
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>		
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="50"/>	Trees <input type="checkbox" value="50"/>				
Cover ^{90%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="60"/>	Canopy <input type="checkbox" value="40"/>	None <input type="checkbox"/>				
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>		
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>				

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#31

can land

Ground Survey

Ground survey completed

Ground Survey not Completed

easily.

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

osprey very aggressive

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

3rd attempt at stream

osprey aggressive.

(Cannot survey this site although accessibility is good.)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

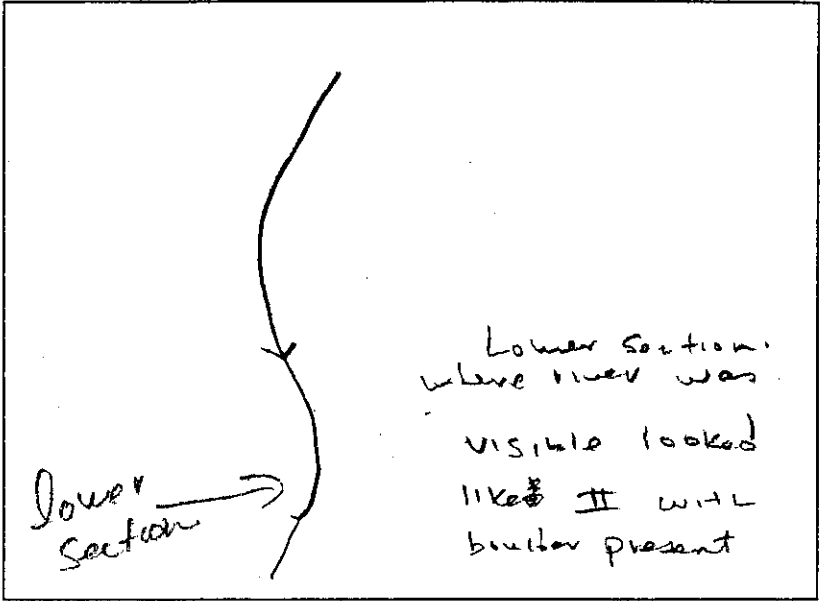
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="50"/>	Trees <input type="text" value="50"/>			
Cover ^{100%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="60"/>	Canopy <input type="text" value="40"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#32

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

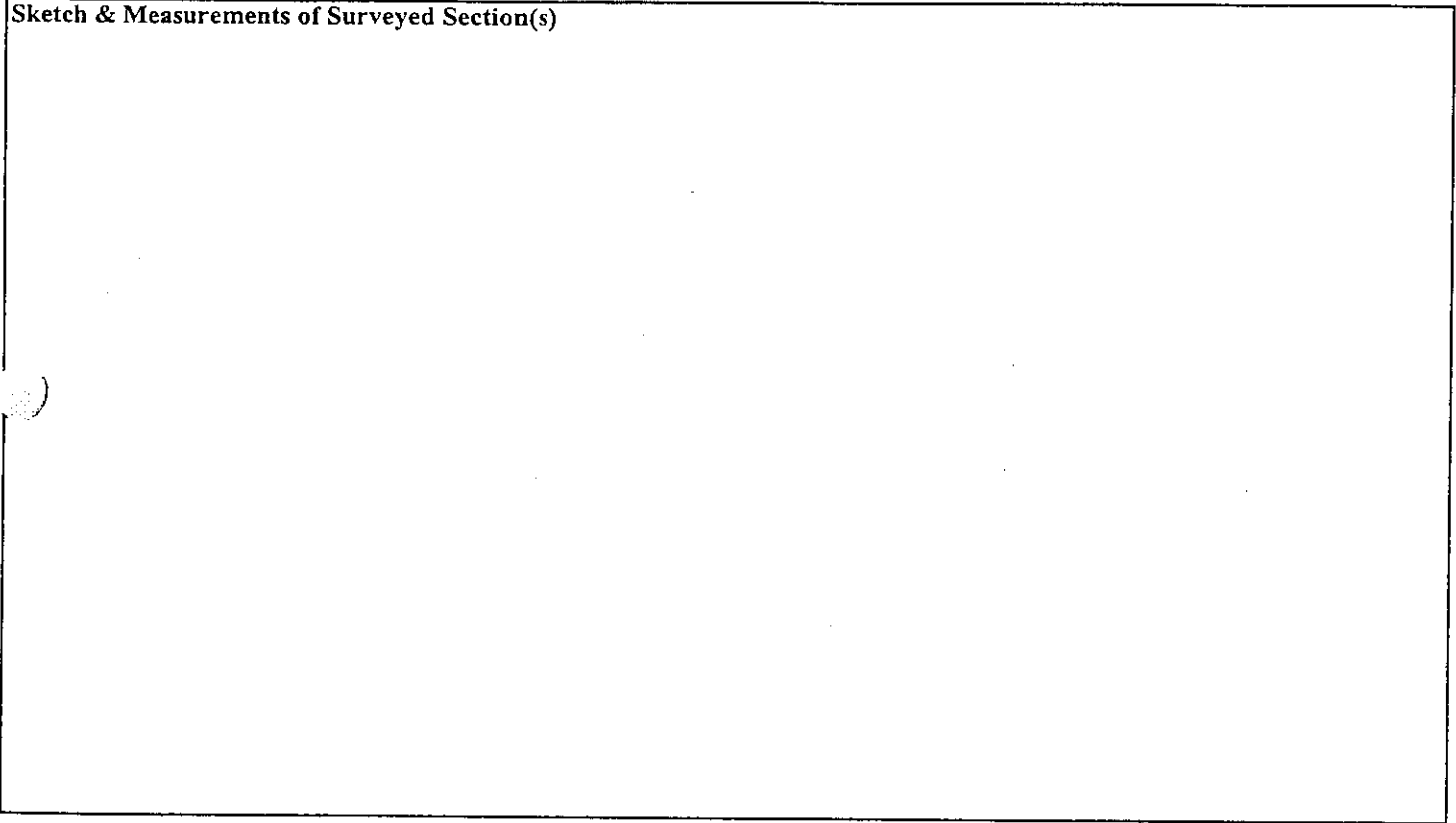
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

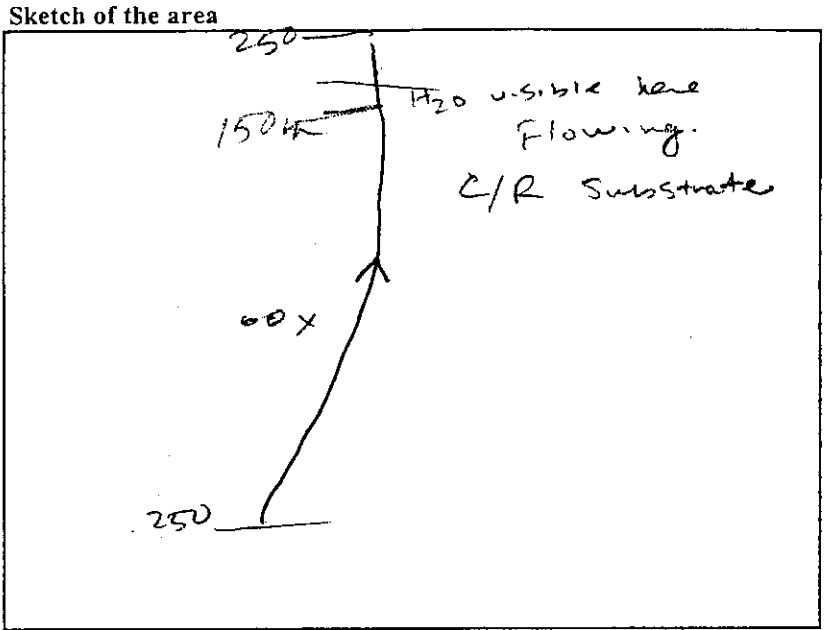
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



					Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="80"/>	Trees <input type="text" value="20"/>		
Cover	100% Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope
fines less than 2 mm	Shallow gully 1 m
gravel 2mm - 3 cm	Medium gully 2-3 m
pebble 3 - 5 cm	Deep gully ≥4 m
cobble 6-13 cm	Forest stream see over
rubble 14-25 cm	Flood plain see over
boulder 26 cm and up	Bog/Fen see over

Cover	
Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water
	can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey #33

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

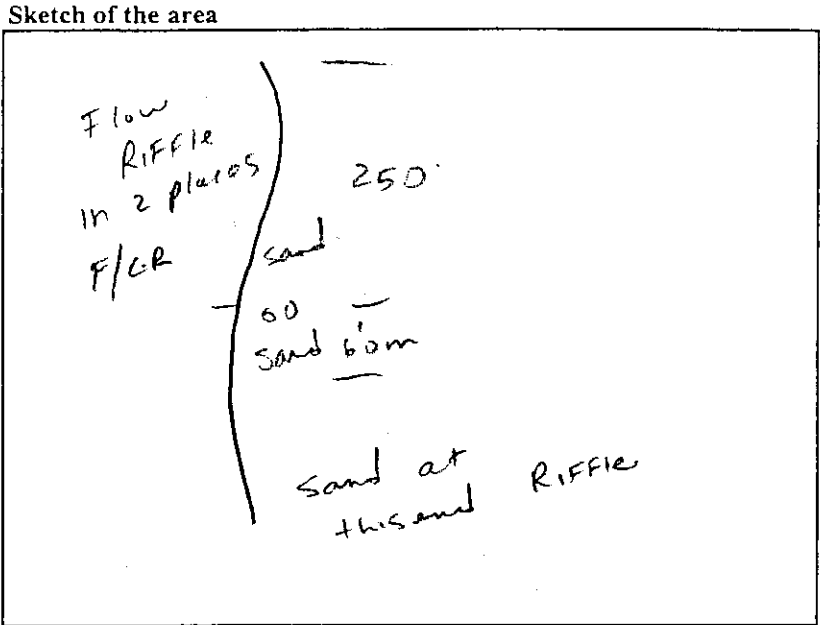
Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 34
 Date Sept 24/02
 Surveyed by BW/mH/PJ
 Watershed Kenamer
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 C/16
 Photo Numbers 69
 Video Yes
 Area Surveyed 500 m Aerial
 Water Samples NO



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input checked="" type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover <u>98%</u>	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

34

Good Site for landing

APPROX 200

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

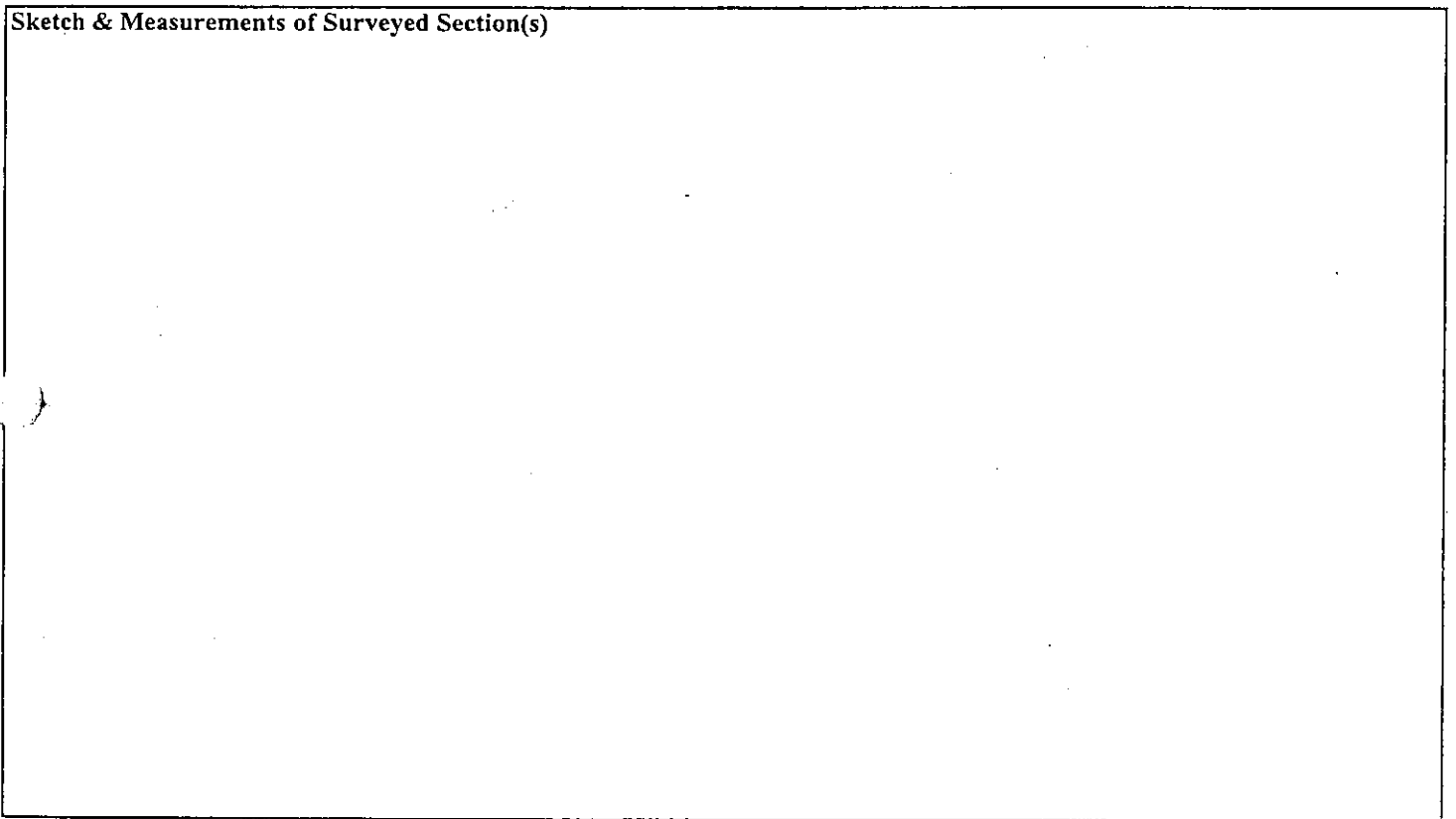
Other: No Landing Site

Water Samples collected

Dead trees in Bog prevents landing at 200 m

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

channel
 No stream could be identified at this co-ordinate

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#35

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage NO Stream

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

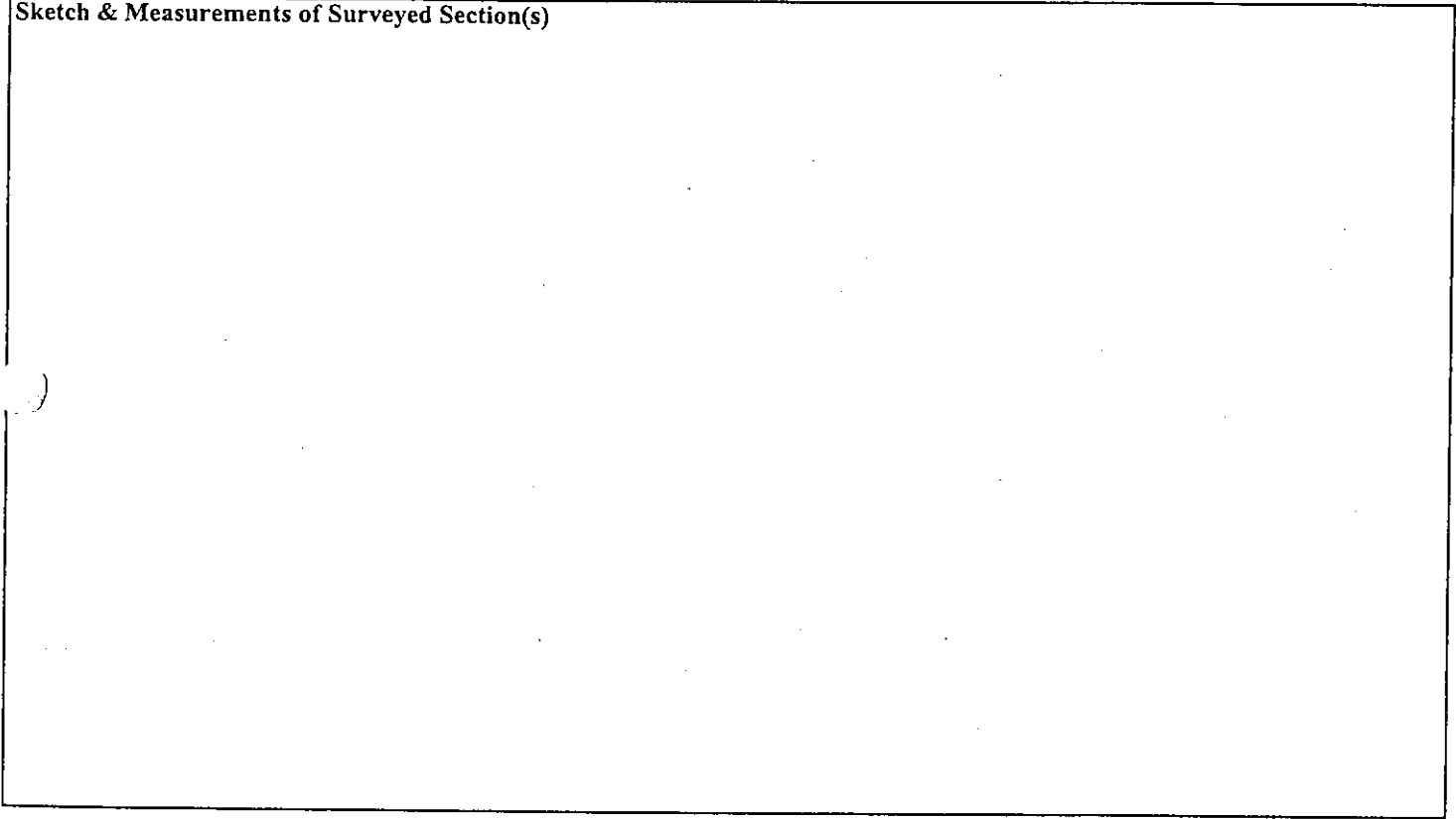
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

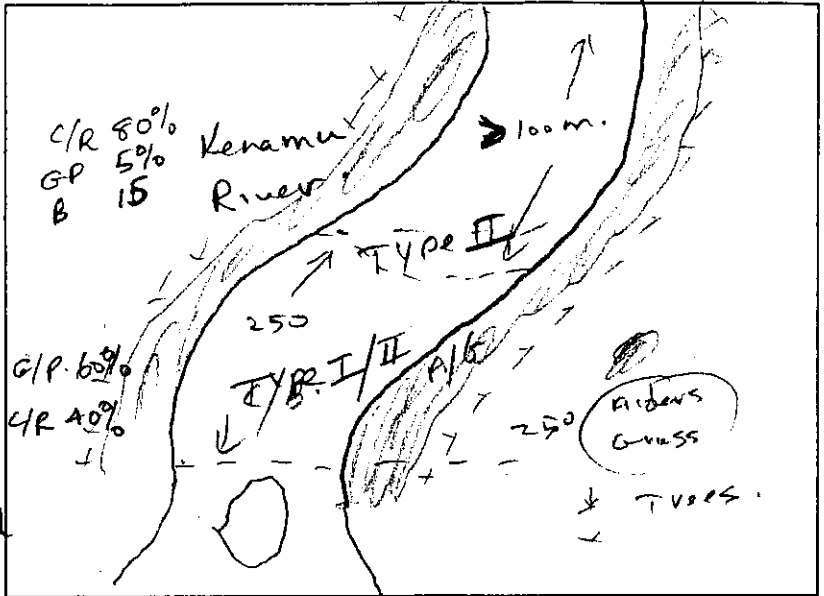
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. #36
 Date Sept 24/02
 Surveyed by BW/mH/pJ
 Watershed Kenamu
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 C/16
 Photo Numbers 70
 Video yes
 Area Surveyed 500m Aerial 50m ground
 Water Samples yes

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/> 40	1 - 2 m <input checked="" type="checkbox"/> 30	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input checked="" type="checkbox"/> ≈ 100m		
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/> 90	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/> 10		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input checked="" type="checkbox"/> 30	Cobble/Rubble <input checked="" type="checkbox"/> 80	Boulder <input type="checkbox"/> 10	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/> 10	Cobble/Rubble <input checked="" type="checkbox"/> 80	Boulder <input type="checkbox"/> 10	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input checked="" type="checkbox"/> 100	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/> 35	Shrubs <input checked="" type="checkbox"/> 35	Trees <input type="checkbox"/> 30		
Cover	5% Instream <input checked="" type="checkbox"/> 100%	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#36

Can land on stream

Ground survey completed Yes

Ground Survey not Completed

Barb.

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

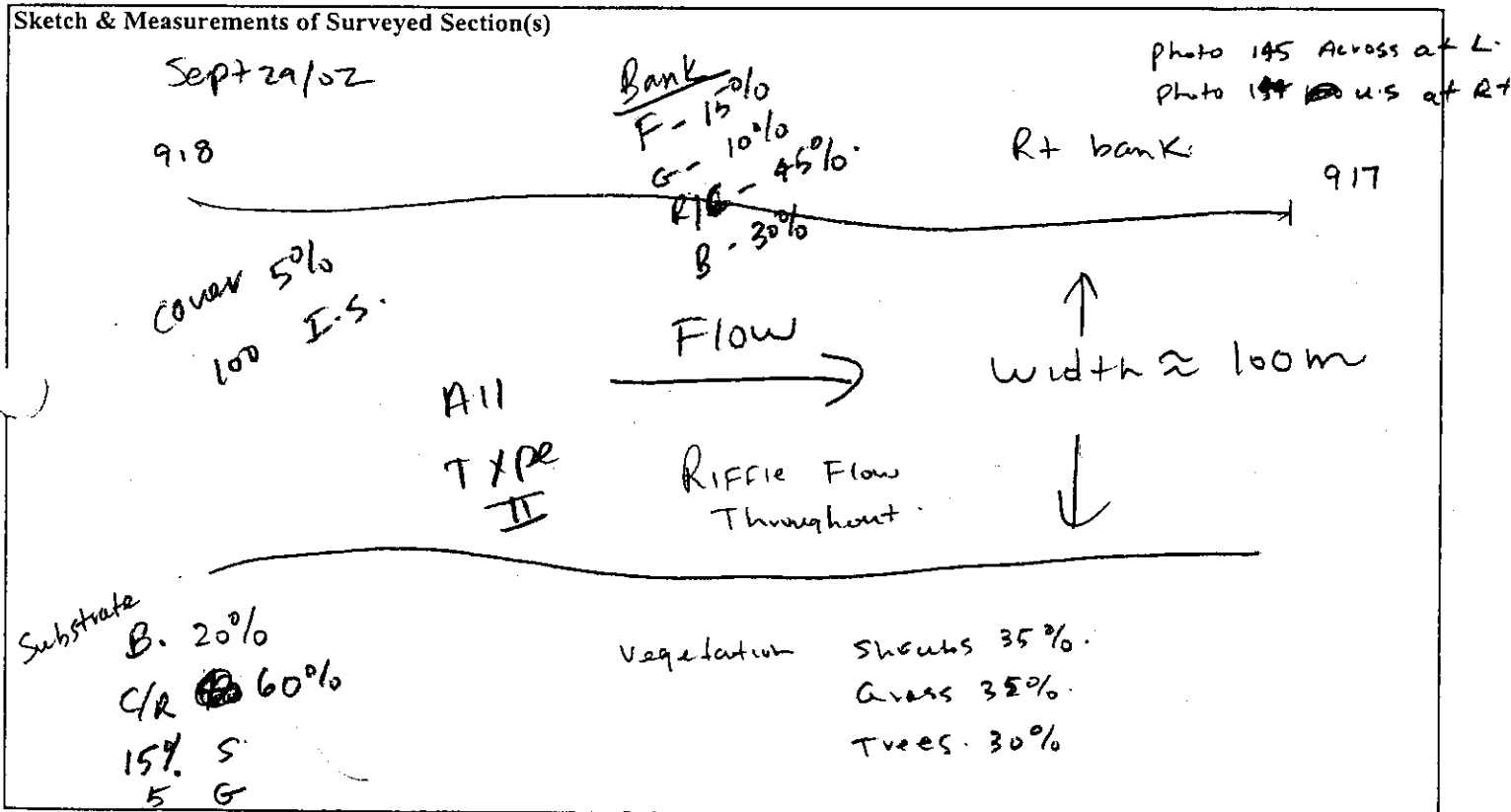
Other: _____

40 cm depth / 1 meter from Bank

Water Samples collected Yes

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

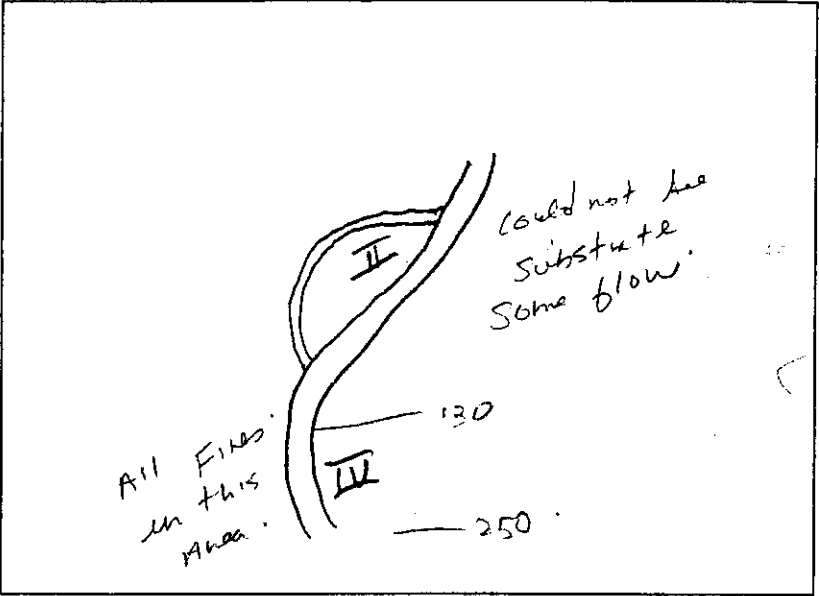
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{98%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

- Substrate
- finer less than 2 mm
 - gravel 2mm - 3 cm
 - pebble 3 - 5 cm
 - cobble 6-13 cm
 - rubble 14-25 cm
 - boulder 26 cm and up
- Backslope
- Shallow gully 1 m
 - Medium gully 2-3 m
 - Deep gully ≥4 m
 - Forest stream see over
 - Flood plain see over
 - Bog/Fen see over

- Cover
- Instream submergent/emergent vegetation
 - Overhang grasses/shrubs within 1 m of water
 - Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#31

landing spot ≈ 100m

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 6.95

Crossing less than 2 km² (on DWST list)

pH 8.39

Bog drainage

Conductivity 4.6

Type IV (steady) flow

Dissolved Oxygen 8.93

Type III (cascade/rapids) flow

Turbidity 6.1

No accessible by helicopter

Surface velocity 28 Revs/min

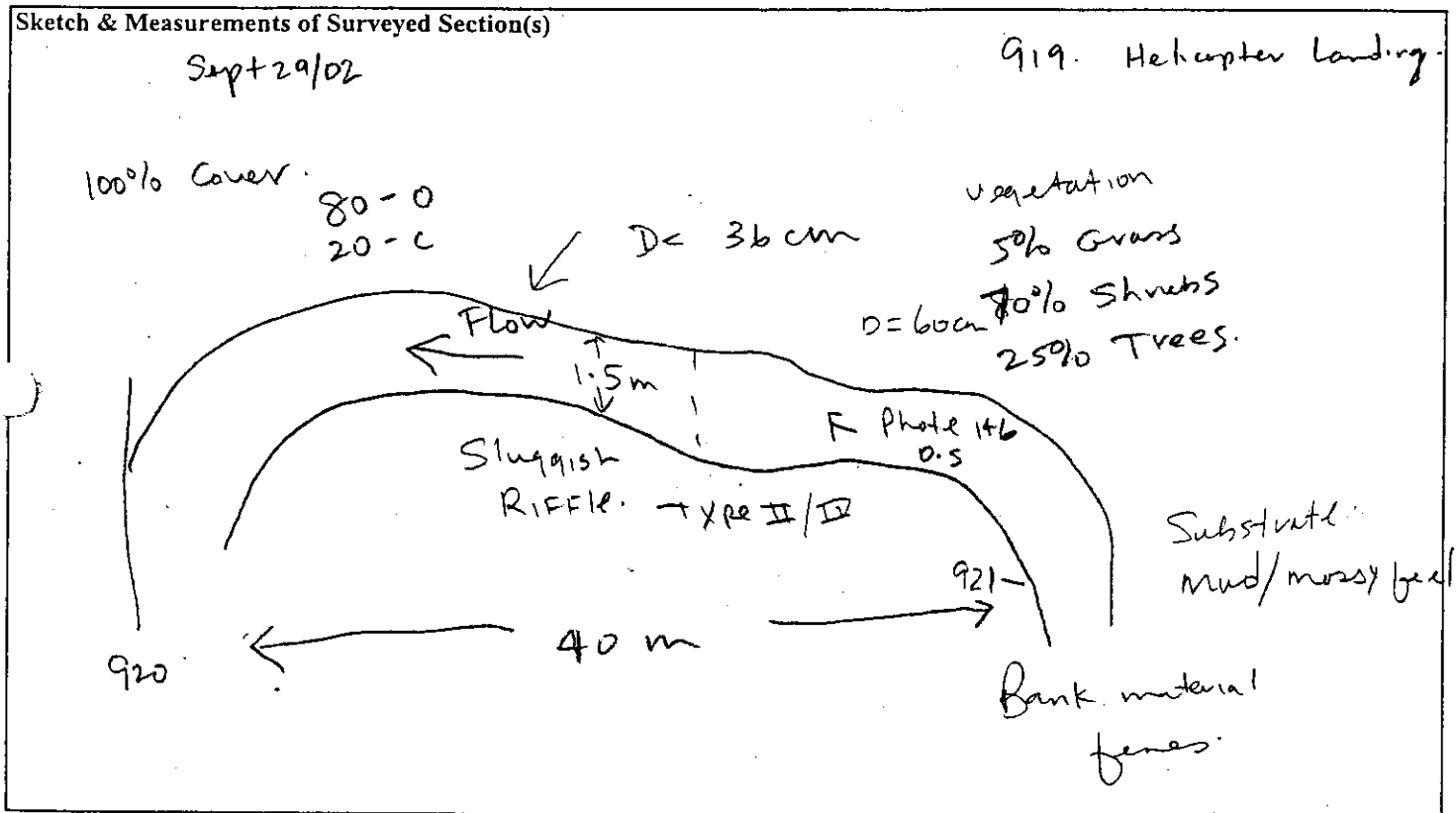
Other: _____

Middle of stream / 30cm depth

Water Samples collected Yes

Gradient (inclinometer) 0.5 to 1% est

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

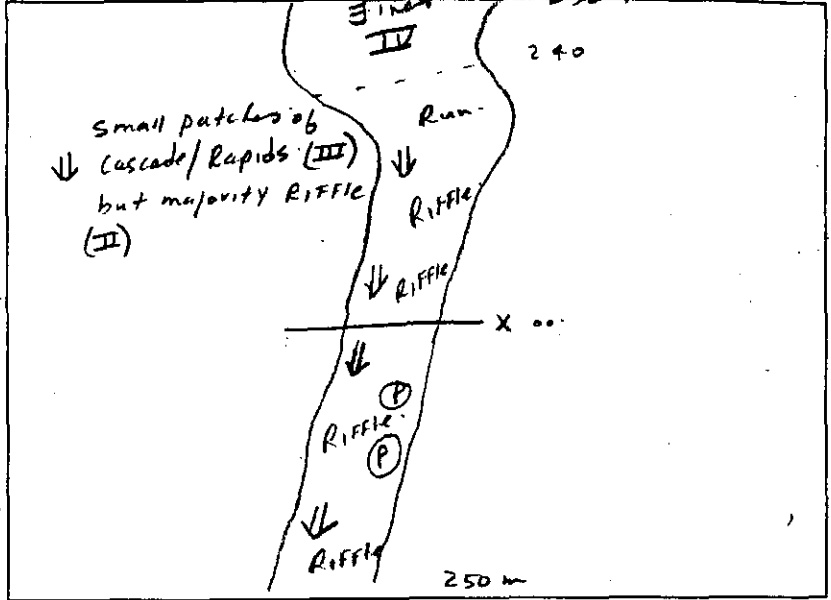
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input type="text" value="70"/>	1 - 2 m <input type="text" value="30"/>	>2 m <input type="text"/>	Unknown <input type="text"/>		
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="text"/>		
Flow Type	Steady <input type="text" value="10"/>	Riffle <input type="text" value="70"/>	Rapids <input type="text" value="10"/>	Pools <input type="text" value="10"/>		
Substrate Type	Fines <input type="text" value="10"/>	Gravel <input type="text"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="10"/>	Unknown <input type="text"/>
Bank Habitat	Type I <input type="text"/>	Type II <input type="text" value="80"/>	Type III <input type="text" value="10"/>	Type IV <input type="text" value="10"/>		
Bank Material	Fines <input type="text" value="10"/>	Gravel/Pebble <input type="text"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="60"/>	Bedrock <input type="text" value="10"/>	Unknown <input type="text"/>
Backslope	Shallow Gully <input type="text"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input type="text"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/>	Bog/Fen <input type="text"/>
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text"/>	Shrubs <input type="text" value="30"/>	Trees <input type="text" value="70"/>		
Cover	2% Instream <input type="text" value="50"/>	Overhang <input type="text" value="10"/>	Canopy <input type="text" value="40"/>	None <input type="text"/>		
Potential Obstruction	Falls <input type="text"/>	Rapids <input type="text"/>	Chute <input type="text"/>	Cascade <input type="text"/>	Intermittent <input type="text"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="text"/>	1 - 3 % <input type="text"/>	3 - 5 % <input type="text"/>	>5 % <input type="text"/>		

Substrate

- finer less than 2 mm
- gravel 2mm - 3 cm
- pebble 3 - 5 cm
- cobble 6-13 cm
- rubble 14-25 cm
- boulder 26 cm and up

Backslope

- Shallow gully 1 m
- Medium gully 2-3 m
- Deep gully ≥4 m
- Forest stream see over
- Flood plain see over
- Bog/Fen see over

Cover

- Instream submergent/emergent vegetation
- Overhang grasses/shrubs within 1 m of water
- Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

38

Car land approx 300 m

Ground survey completed Yes

Ground Survey not Completed

Temperature 5.84

Crossing less than 2 km² (on DWST list)

pH 7.74

Bog drainage

Conductivity 6.6

Type IV (steady) flow

Dissolved Oxygen 11.52

Type III (cascade/rapids) flow

Turbidity 0.5

No accessible by helicopter

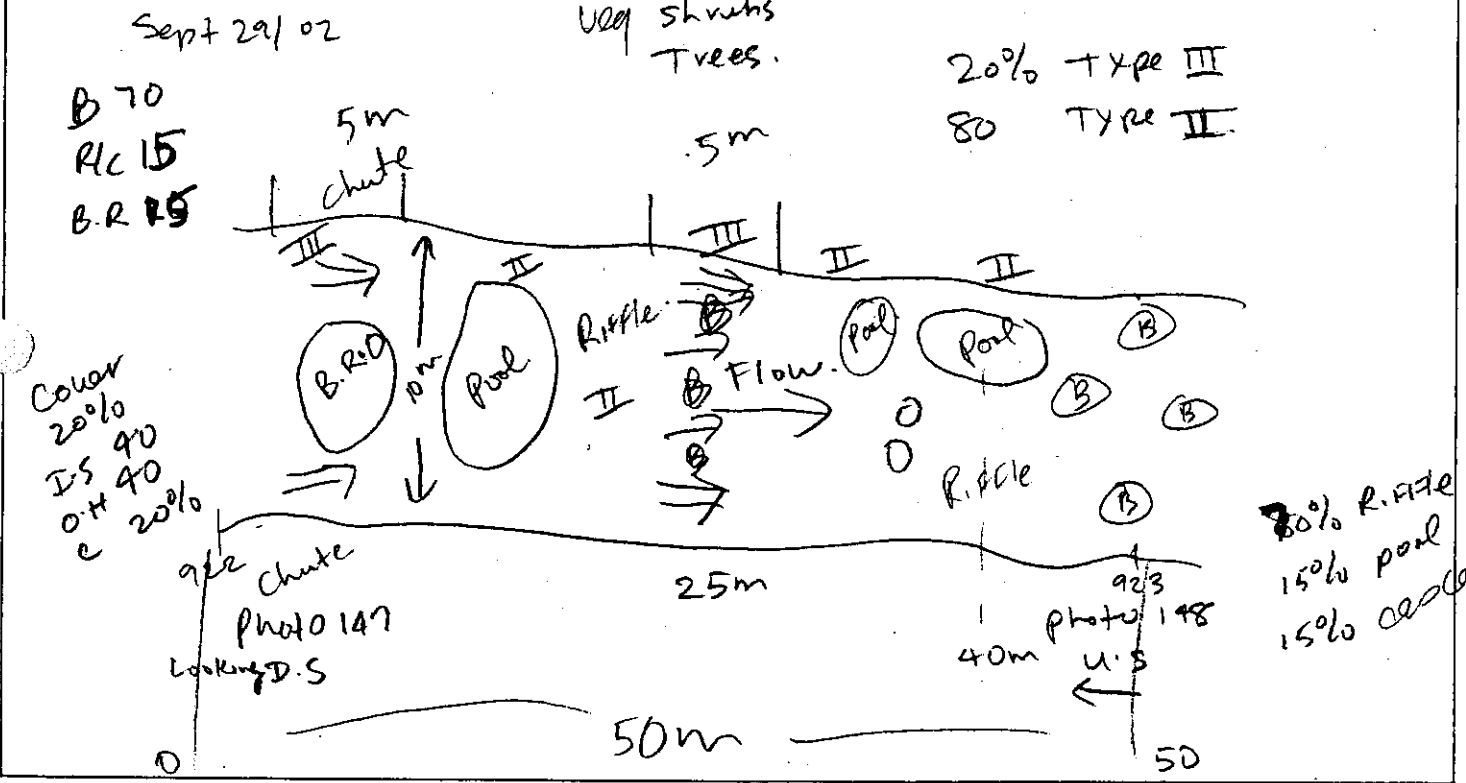
Surface velocity 74 Rev/min
1 meter from shore / 15 cm

Other: _____

Water Samples collected Yes

Gradient (inclinometer) 1.5%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Last survey for 09/29. Pilot called off survey due to wet snow and dropping temps

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

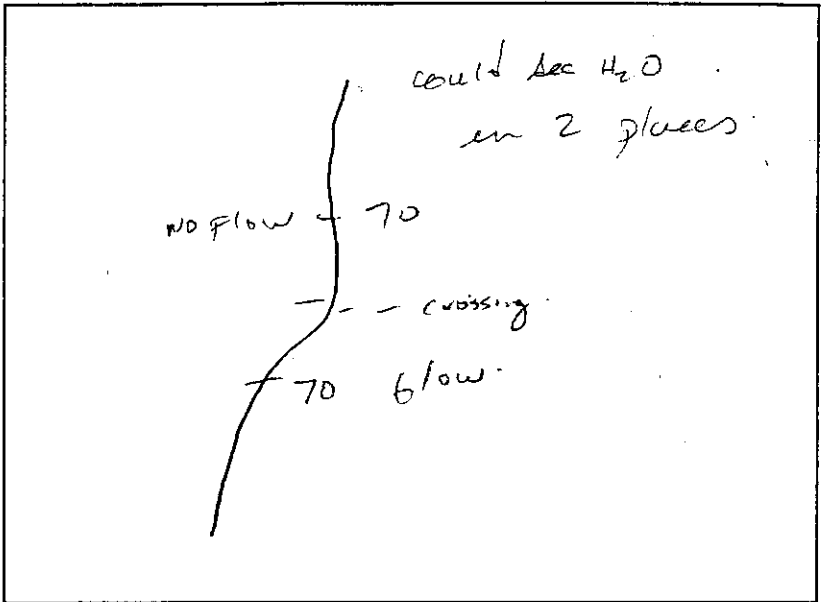
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	unknown	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="70"/>	Trees <input type="text" value="30"/>		
Cover ^{99%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="70"/>	Canopy <input type="text" value="30"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#39

Ground Survey

Ground survey completed

Ground Survey not Completed No

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

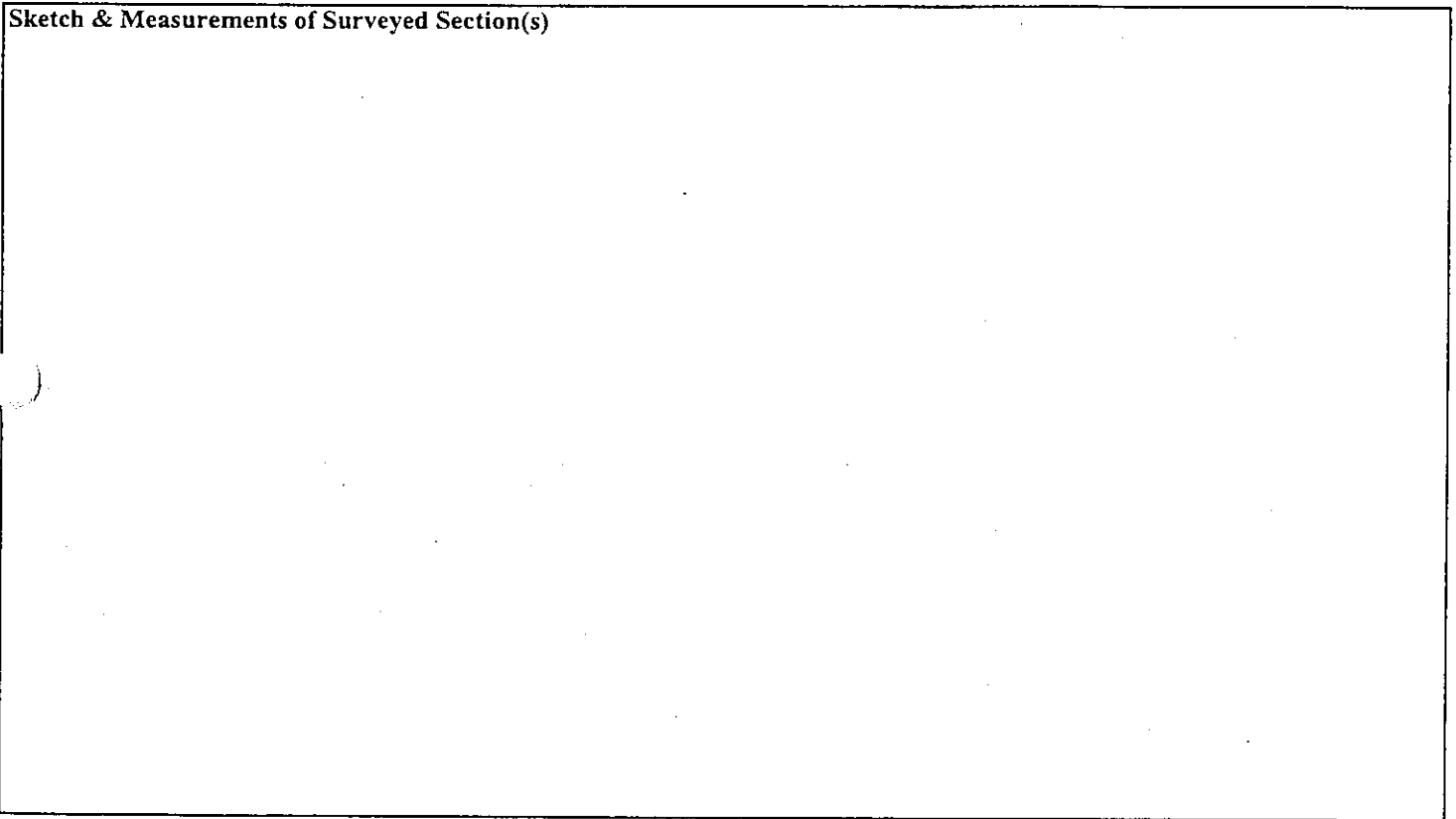
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 40

Date Sept 24/02

Surveyed by BW/mH/PJ

Watershed Kenamer

GPS Co-ord. See list

Aerial Photo #

Map Number 13 B/13

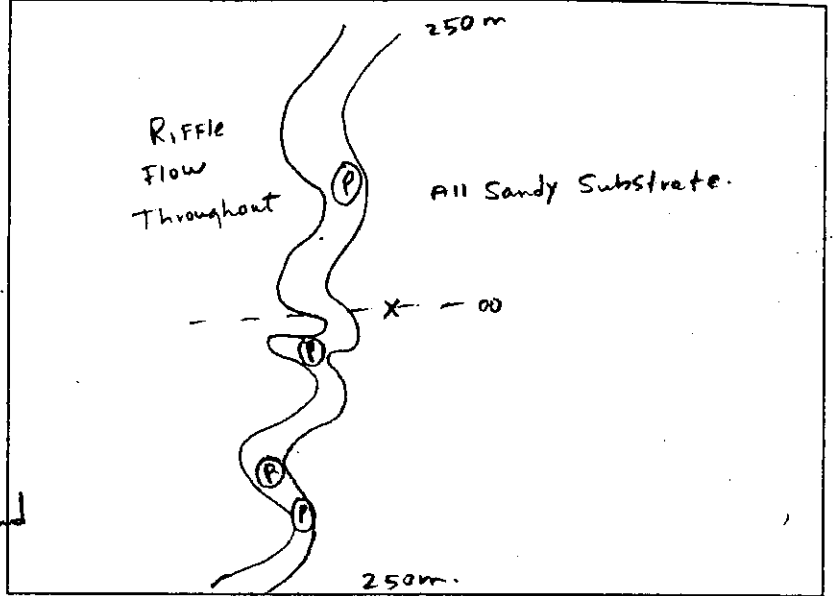
Photo Numbers 74

Video Yes

Area Surveyed 500 m aerial some ground

Water Samples Yes

Sketch of the area



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input checked="" type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>		
Cover	40% Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1% <input type="checkbox"/>	1 - 3% <input type="checkbox"/>	3 - 5% <input type="checkbox"/>	>5% <input type="checkbox"/>		

Substrate

Backslope

Cover

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#40

~ 250 m from 00
can land near
Stream

Ground survey completed yes

Ground Survey not Completed

Temperature 5.21

Crossing less than 2 km² (on DWST list)

pH 7.48

Bog drainage

Conductivity 6.9

Type IV (steady) flow

Dissolved Oxygen 10.30

Type III (cascade/rapids) flow

Turbidity 1.0

No accessible by helicopter

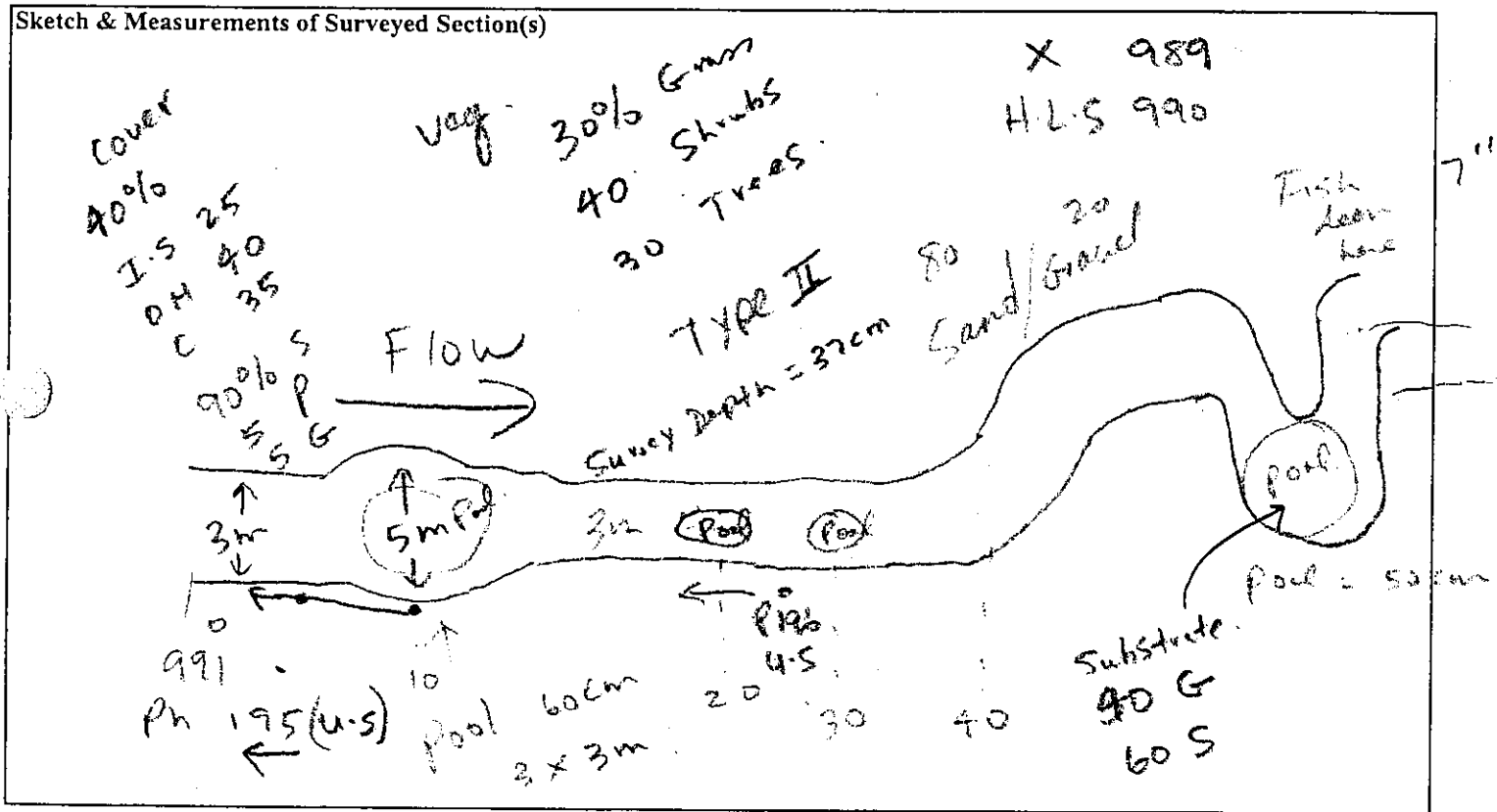
Surface velocity 62 revs/min
37 cm / center

Other: _____

Water Samples collected yes

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

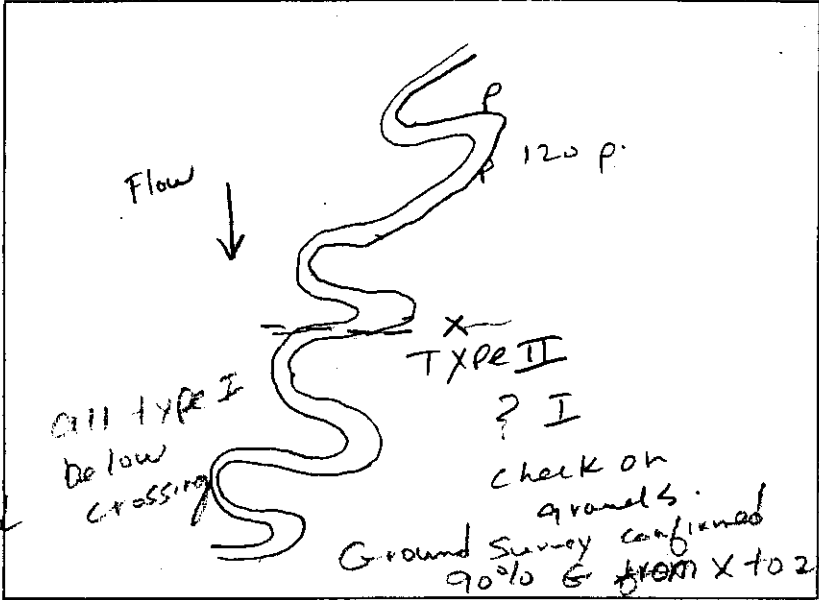
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox" value="90"/>	Rapids <input type="checkbox"/>	Pools <input checked="" type="checkbox" value="10"/>		
Substrate Type	Fines <input checked="" type="checkbox" value="100"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input checked="" type="checkbox" value="50"/>	Type II <input checked="" type="checkbox" value="50"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input checked="" type="checkbox" value="100"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox" value="50"/>	Trees <input checked="" type="checkbox" value="50"/>		
Cover ^{10%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox" value="60"/>	Canopy <input checked="" type="checkbox" value="40"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#41

Downstream 250 m

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Good sandstone walk stream

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

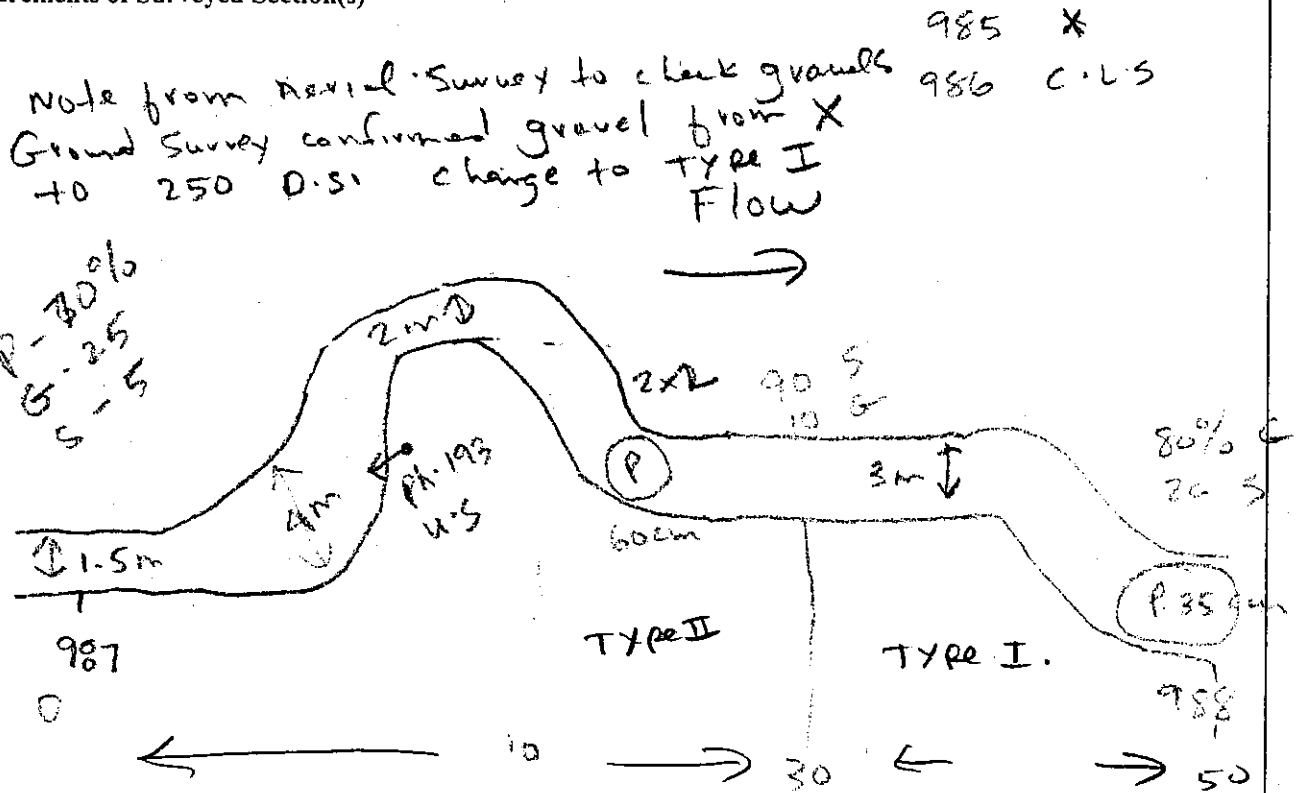
Other: _____

18 cm / center

Water Samples collected Yes

Gradient (inclinometer) PST

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

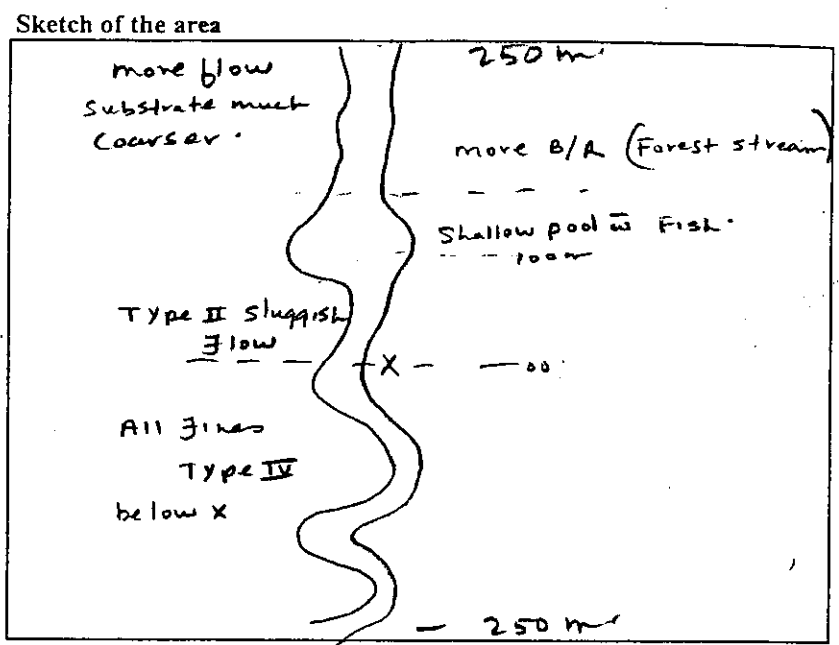
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/> 50	Riffle <input type="checkbox"/> 40	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/> 10			
Substrate Type	Fines <input type="checkbox"/> 80	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/> 50	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/> 50			
Bank Material	Fines <input type="checkbox"/> 80	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/> 80	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/> 20	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/> 10	Shrubs <input type="checkbox"/> 50	Trees <input type="checkbox"/> 40			
Cover 40% Instream	<input type="checkbox"/> 50	Overhang <input type="checkbox"/> 30	Canopy <input type="checkbox"/> 20	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate: fines less than 2 mm, gravel 2mm - 3 cm, pebble 3 - 5 cm, cobble 6-13 cm, rubble 14-25 cm, boulder 26 cm and up

Backslope: Shallow gully 1 m, Medium gully 2-3 m, Deep gully ≥ 4 m, Forest stream see over, Flood plain see over, Bog/Fen see over

Cover: Instream submergent/emergent vegetation, Overhang grasses/shrubs within 1 m of water, Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

42

Landing Site 250 m downstream

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

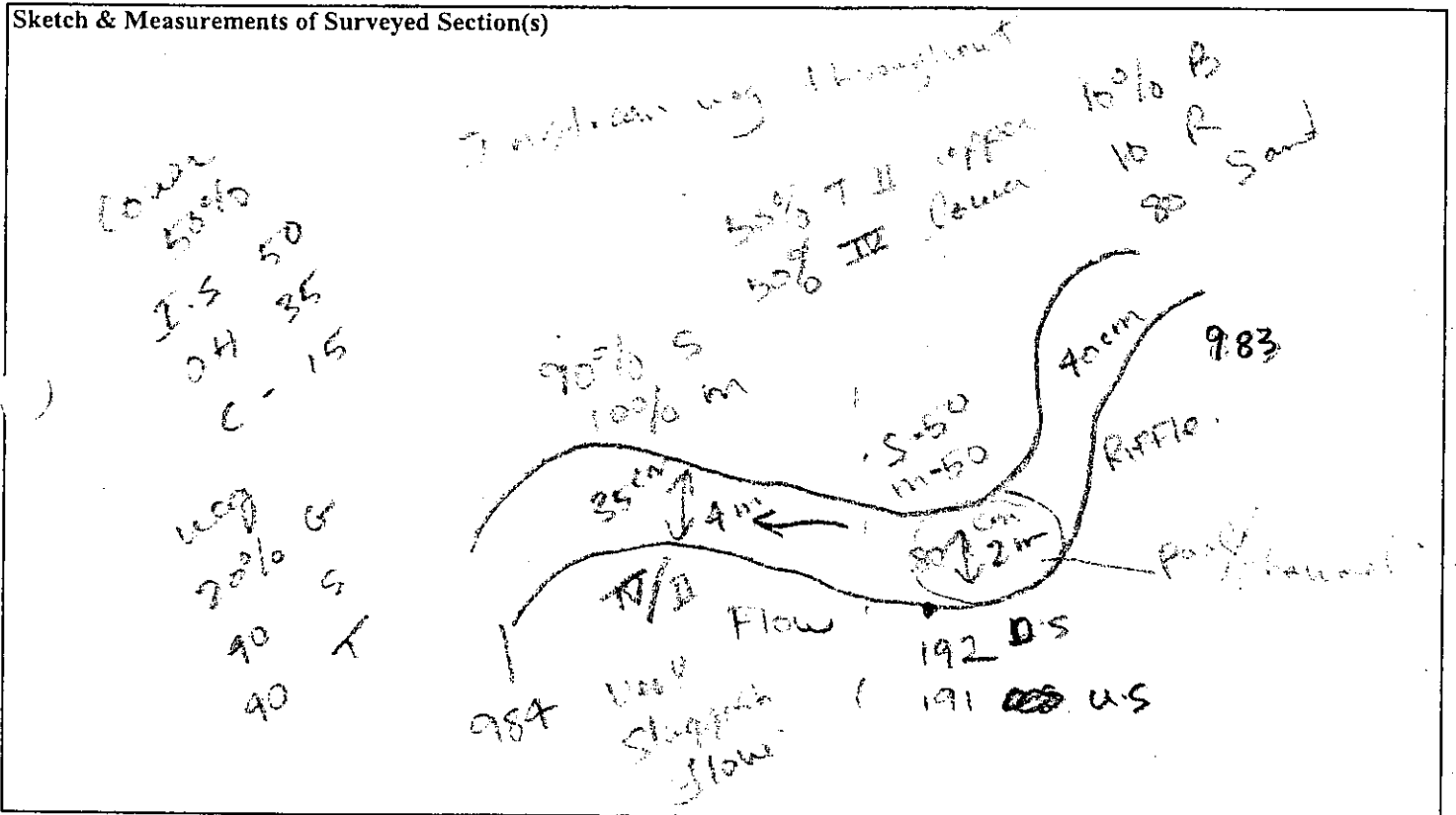
Surface velocity

Other: _____

Water Samples collected Yes
36 cm / center

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES Lots of grass upstream. Sabe B and R at 983

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BA

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

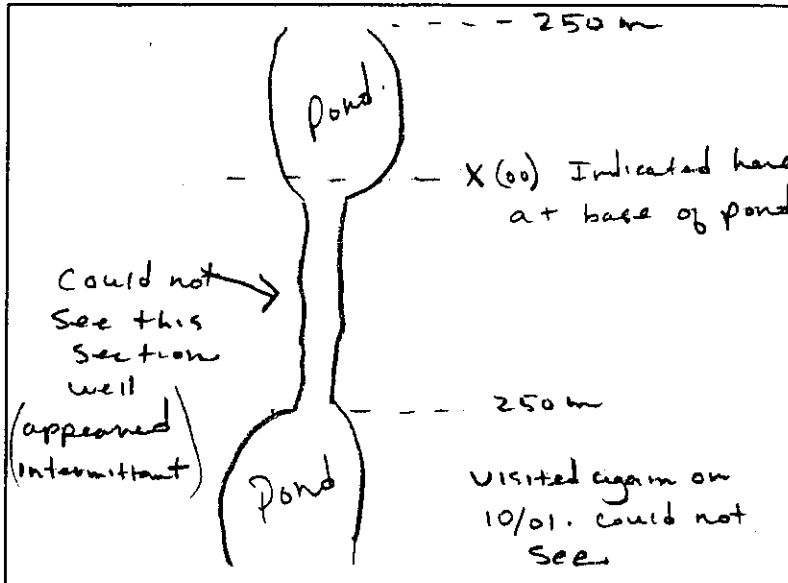
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="60"/>		
Cover %	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="40"/>	Canopy <input type="checkbox" value="60"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey 43

Ground survey completed <input type="checkbox"/>	Ground Survey not Completed <input checked="" type="checkbox"/> ND
Temperature <input type="checkbox"/>	<input checked="" type="checkbox"/> Crossing less than 2 km ² (on DWST list)
pH <input type="checkbox"/>	<input type="checkbox"/> Bog drainage
Conductivity <input type="checkbox"/>	<input type="checkbox"/> Type IV (steady) flow
Dissolved Oxygen <input type="checkbox"/>	<input type="checkbox"/> Type III (cascade/rapids) flow
Turbidity <input type="checkbox"/>	<input type="checkbox"/> No accessible by helicopter
Surface velocity <input type="checkbox"/>	<input type="checkbox"/> Other: _____
Water Samples collected <input type="checkbox"/>	
Gradient (inclinometer) <input type="checkbox"/>	

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BA

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

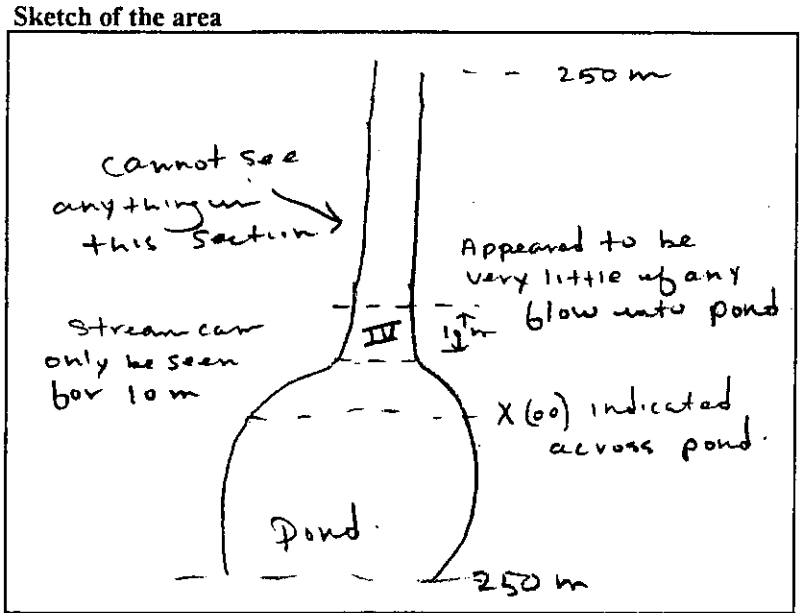
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/> 50	Trees <input checked="" type="checkbox"/> 50		
Cover %	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/> 50	Canopy <input checked="" type="checkbox"/> 50	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate

finer less than 2 mm

gravel 2mm - 3 cm

pebble 3 - 5 cm

cobble 6-13 cm

rubble 14-25 cm

boulder 26 cm and up

Backslope

Shallow gully 1 m

Medium gully 2-3 m

Deep gully ≥ 4 m

Forest stream see over

Flood plain see over

Bog/Fen see over

Cover

Instream submergent/emergent vegetation

Overhang grasses/shrubs within 1 m of water

Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

A4

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

crossing is at pond. Little if any stream flow in

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

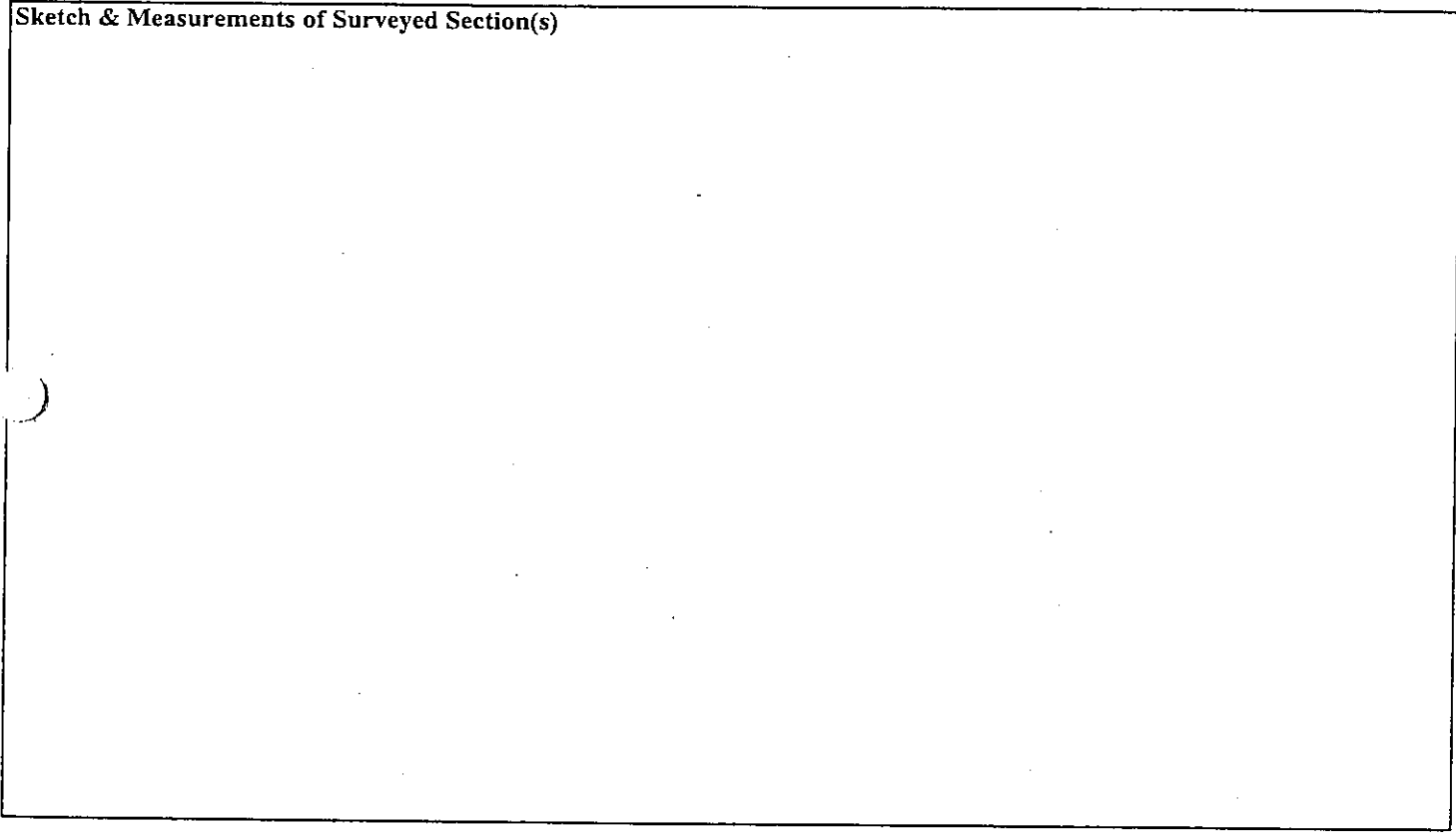
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

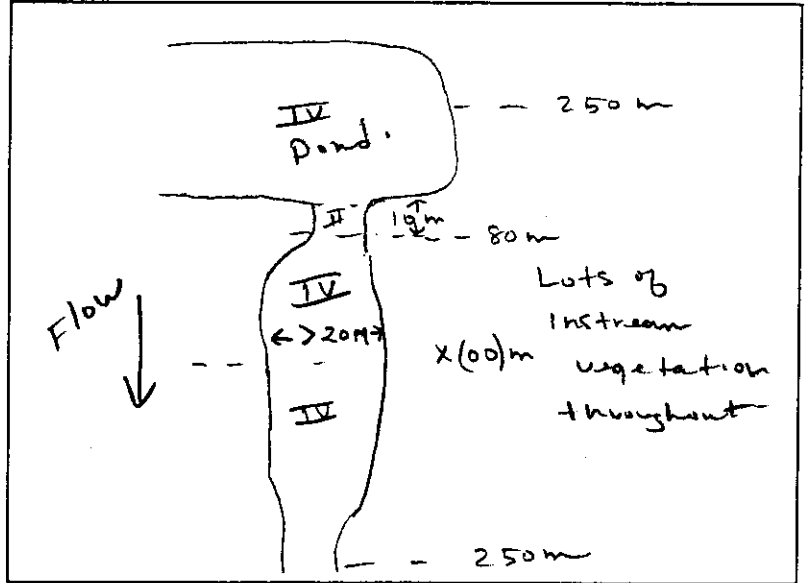
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BA

Stream No. 45
 Date Sep+24/02
 Surveyed by Bw/mH/PJ
 Watershed Eagle
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13B/13
 Photo Numbers 79
 Video yes
 Area Surveyed 500m aerial
 Water Samples NO

Sketch of the area



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input checked="" type="checkbox"/>		
Flow Type	Steady <u>95</u>	Riffle <u>5</u>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <u>90</u>	Gravel <input type="checkbox"/>	Cobble/Rubble <u>2</u>	Boulder <u>8</u>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <u>5</u>	Type III <input type="checkbox"/>	Type IV <u>95</u>		
Bank Material	Fines <u>90</u>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <u>10</u>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <u>5</u>	Shrubs <u>15</u>	Trees <u>80</u>		
Cover <u>15%</u>	Instream <u>100</u>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

45

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

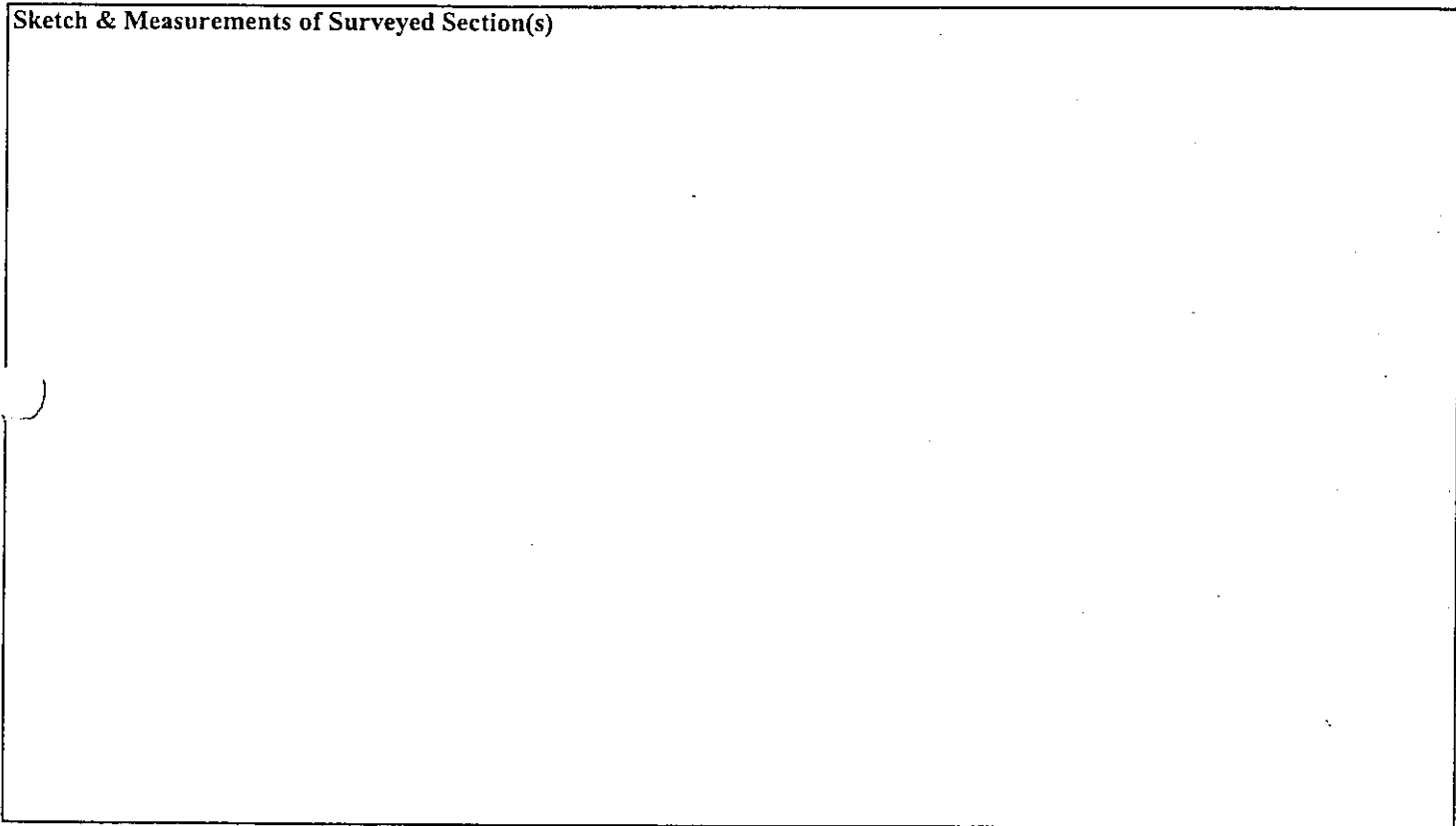
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

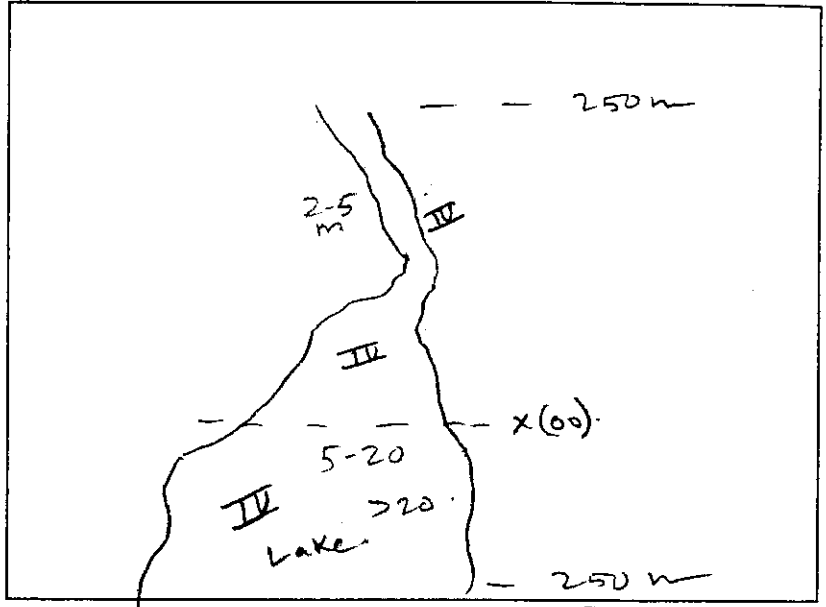
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input checked="" type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>	Pond		
Cover ^{20%}	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate: fines less than 2 mm, gravel 2mm - 3 cm, pebble 3 - 5 cm, cobble 6-13 cm, rubble 14-25 cm, boulder 26 cm and up

Backslope: Shallow gully 1 m, Medium gully 2-3 m, Deep gully ≥4 m, Forest stream see over, Flood plain see over, Bog/Fen see over

Cover: Instream submergent/emergent vegetation, Overhang grasses/shrubs within 1 m of water, Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

46.

Ground Survey

Ground survey completed

Ground Survey not Completed N/O

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

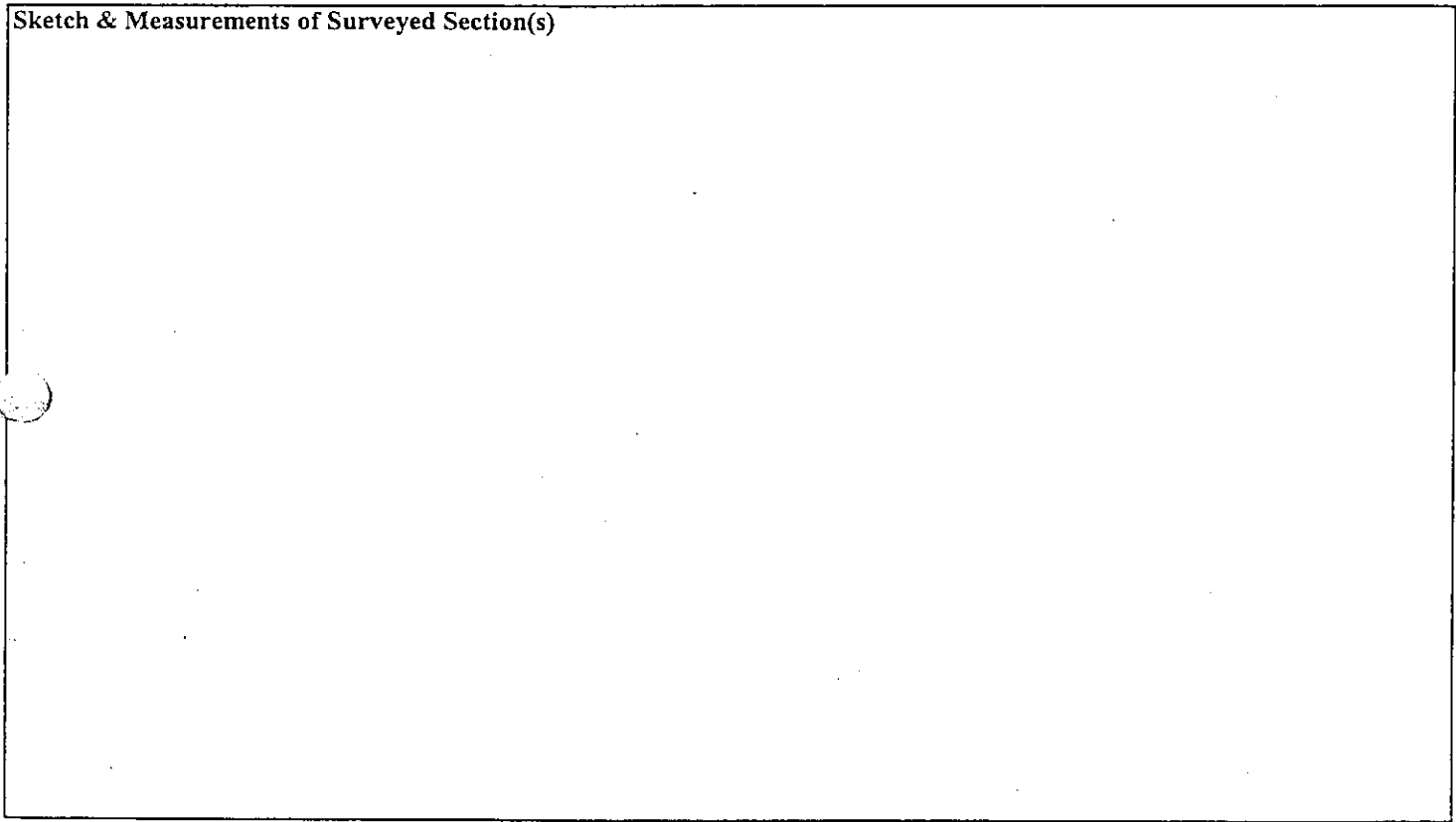
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

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TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

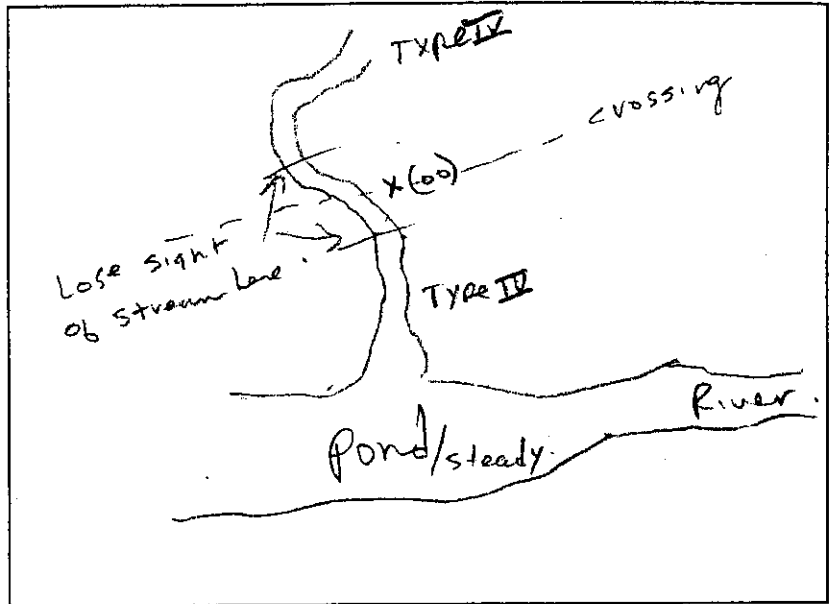
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate

Backslope

Cover

fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

47

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

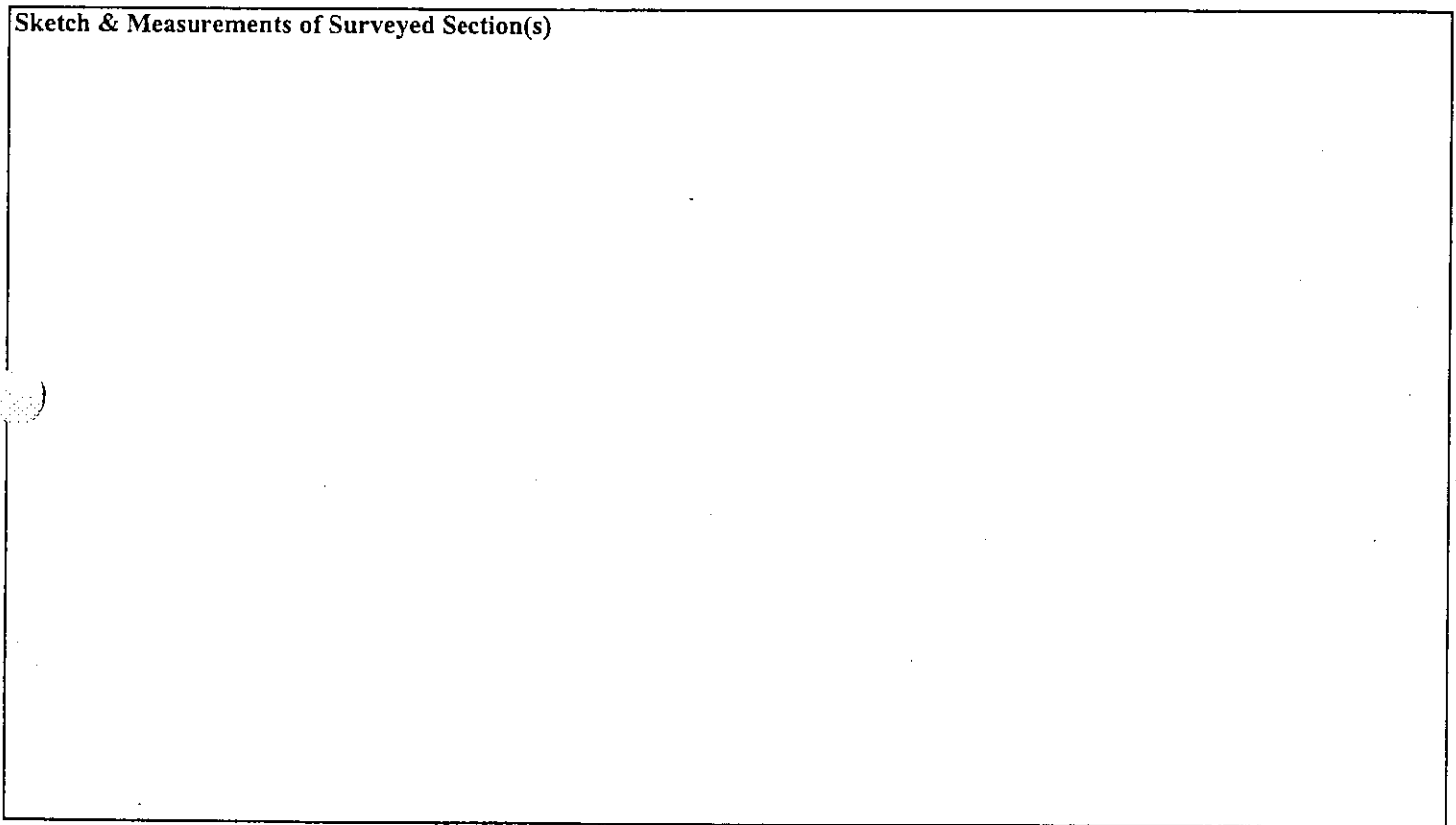
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

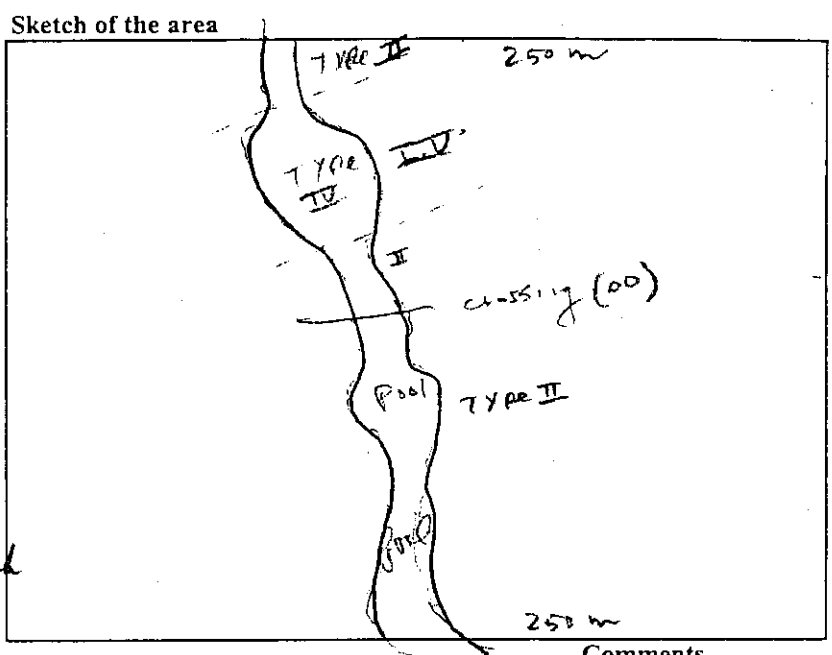
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/> 20	Riffle <input type="checkbox"/> 70	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/> 10			
Substrate Type	Fines <input type="checkbox"/> 20	Gravel <input type="checkbox"/> 10	Cobble/Rubble <input type="checkbox"/> 30	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/> 80	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/> 20			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/> 60	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/> 40	Trees <input type="checkbox"/> 60			
Cover 20	Instream <input type="checkbox"/> 30	Overhang <input type="checkbox"/> 40	Canopy <input type="checkbox"/> 30	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

10

Can land \approx 150 m from river

Ground Survey not Completed

Temperature 5.52

Crossing less than 2 km² (on DWST list)

pH 7.59

Bog drainage

Conductivity 4.9

Type IV (steady) flow

Dissolved Oxygen 12.19

Type III (cascade/rapids) flow

Turbidity 3.2

No accessible by helicopter

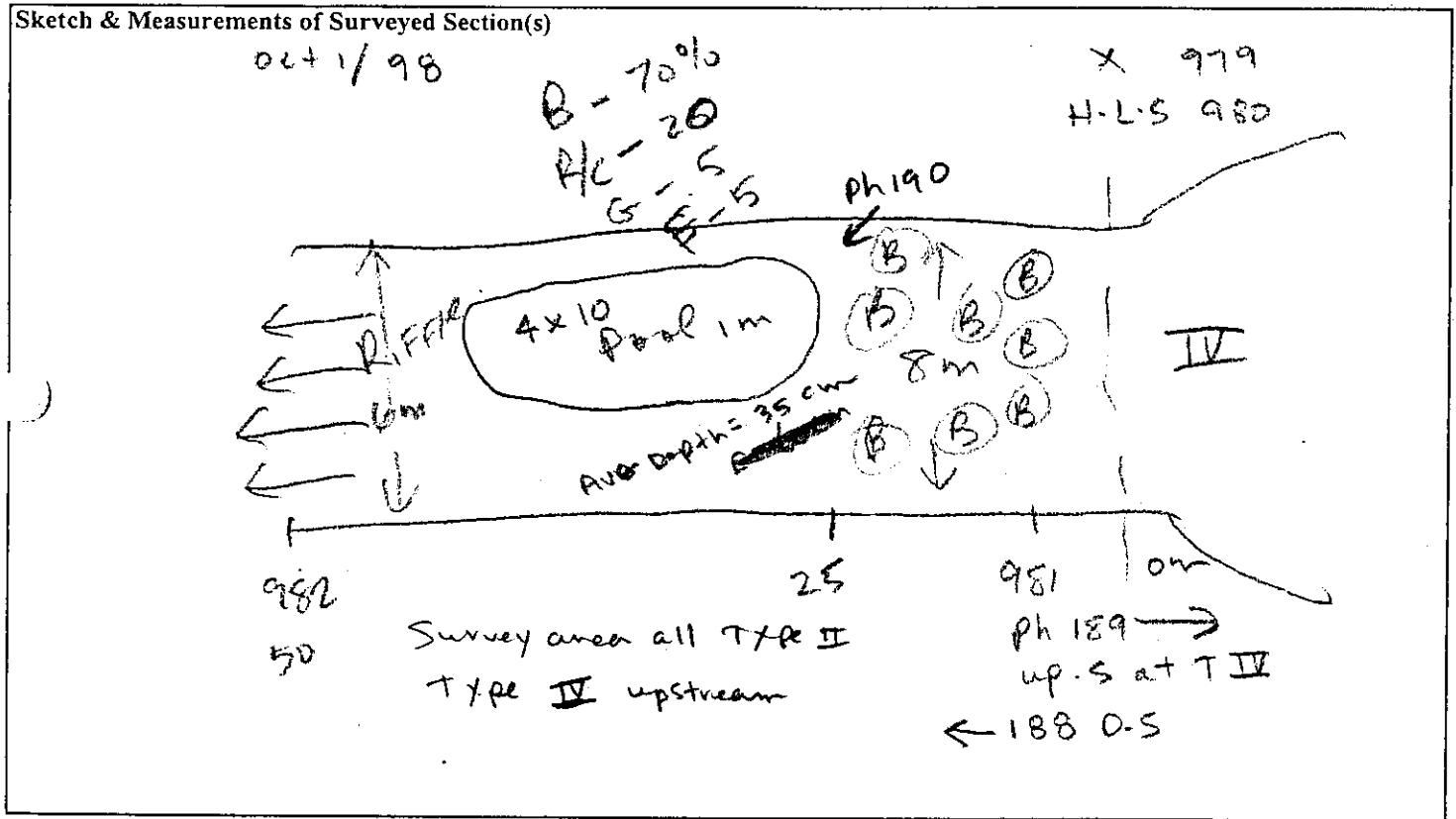
Surface velocity 50 BWS/min
60cm / center of stream

Other: _____

Water Samples collected yes

Gradient (inclinometer) 10/0

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

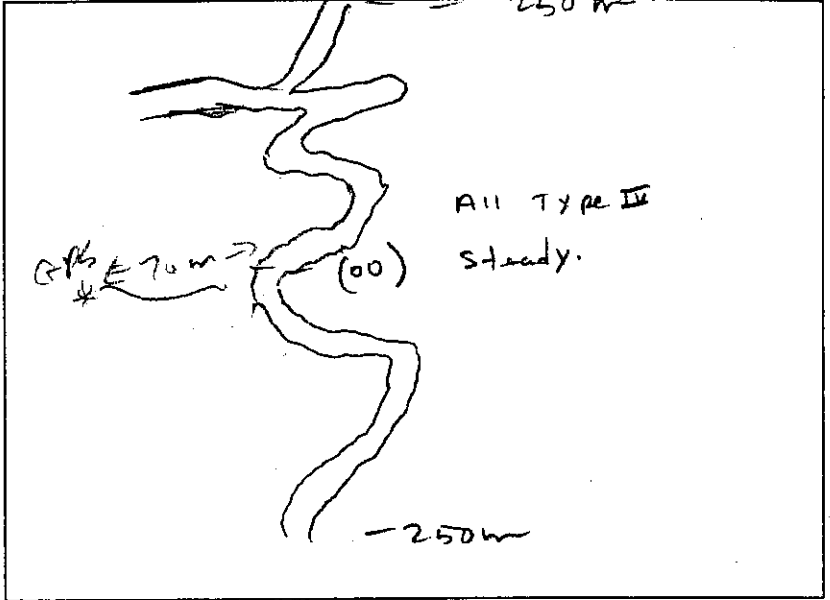
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>	
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input checked="" type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="50"/>	Trees <input type="checkbox" value="50"/>	
Cover	Instream <input type="checkbox" value="20"/>	Overhang <input type="checkbox" value="20"/>	Canopy <input type="checkbox" value="10"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water

can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

99

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

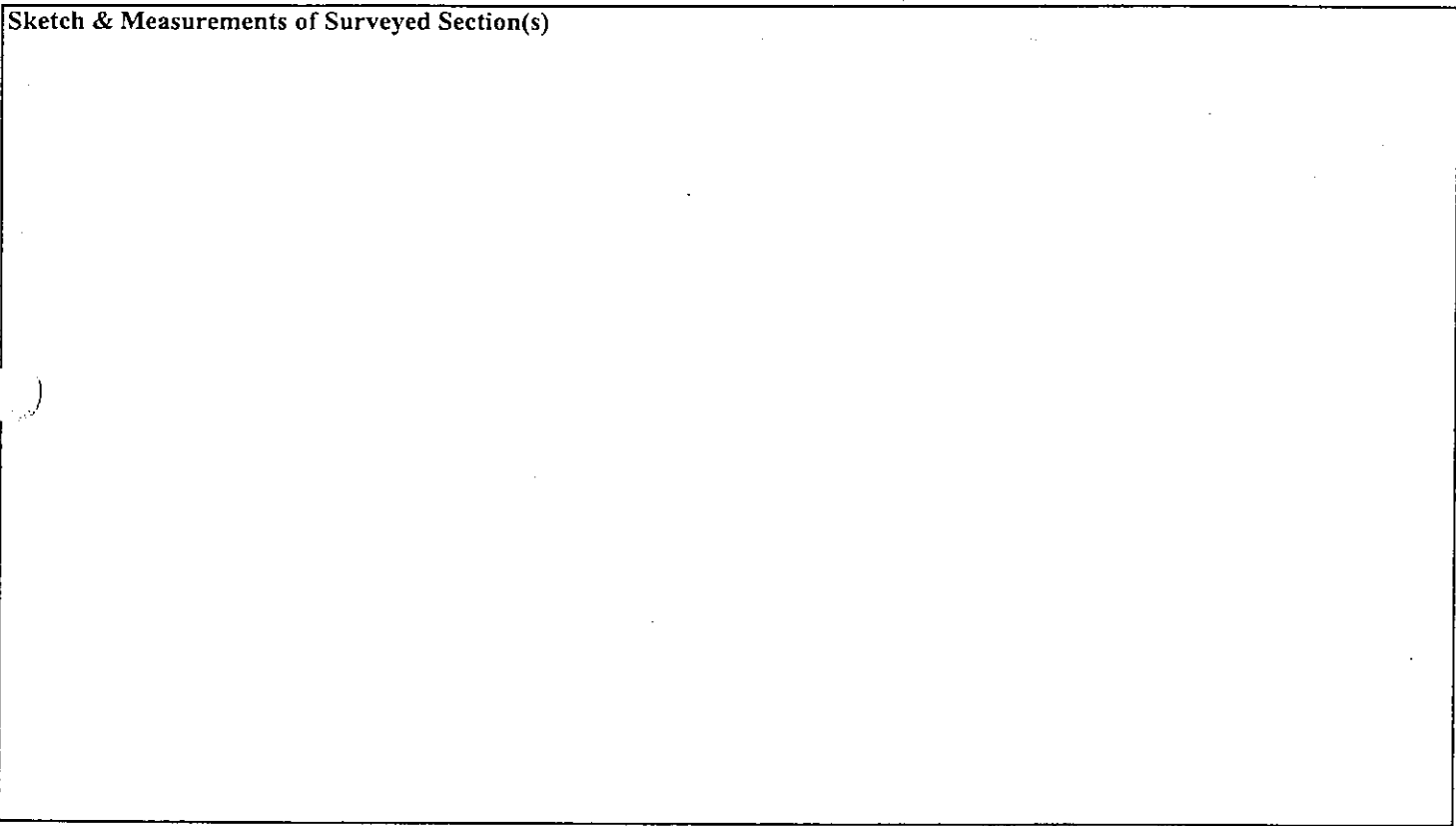
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

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Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Stream visible in 3 places
(Steady) No Flow visible.

Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed **Nb**

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

X 979.

LEGENDS / NOTES

Backslope

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TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

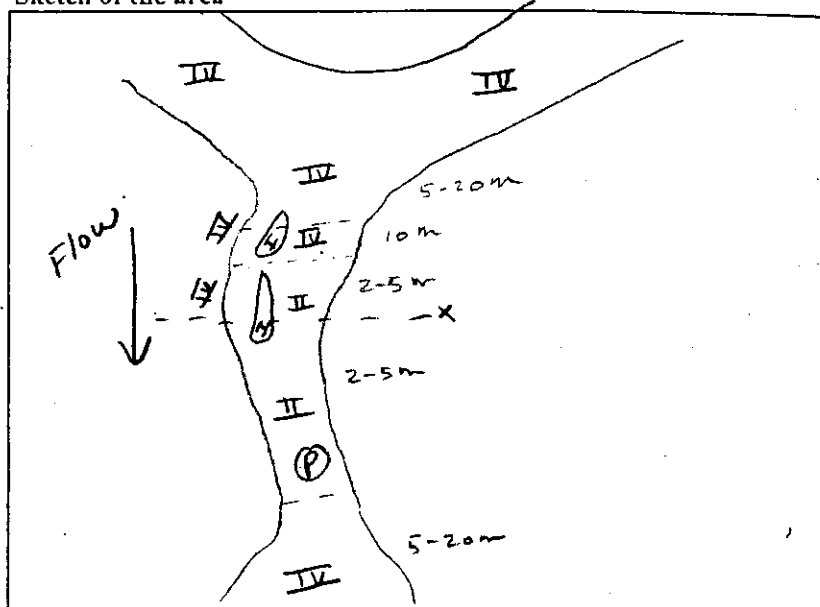
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox" value="50"/>	5 - 20 m <input type="checkbox" value="50"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox" value="50"/>	Riffle <input type="checkbox" value="45"/>	Rapids <input type="checkbox" value="5"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input type="checkbox" value="50"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="30"/>	Boulder <input type="checkbox" value="20"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox" value="50"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox" value="50"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox" value="10"/>	Shrubs <input type="checkbox" value="60"/>	Trees <input type="checkbox" value="30"/>	
Cover 20%	Instream <input type="checkbox" value="70"/>	Overhang <input type="checkbox" value="20"/>	Canopy <input type="checkbox" value="10"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature 5.71

Crossing less than 2 km² (on DWST list)

pH 7.22

Bog drainage

Conductivity 6.0

Type IV (steady) flow

Dissolved Oxygen 11.55

Type III (cascade/rapids) flow

Turbidity 2.0

No accessible by helicopter

Surface velocity 44 Revs/min

Other: _____

53 cm / center of stream

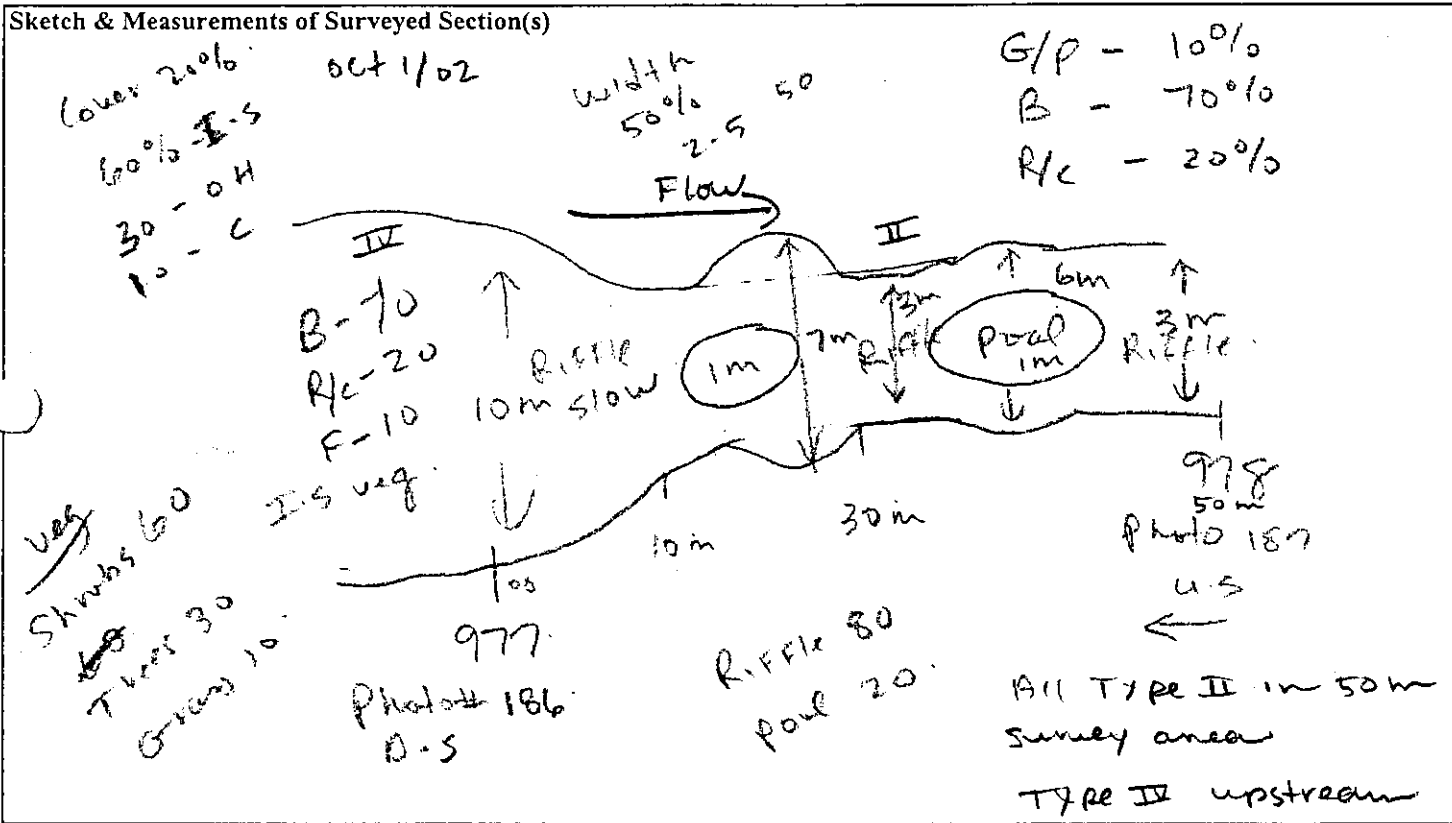
Water Samples collected Yes

Gradient (inclinometer) 1.5%

#51

Can land Rt on River

Sketch & Measurements of Surveyed Section(s)



LEGENDS/NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

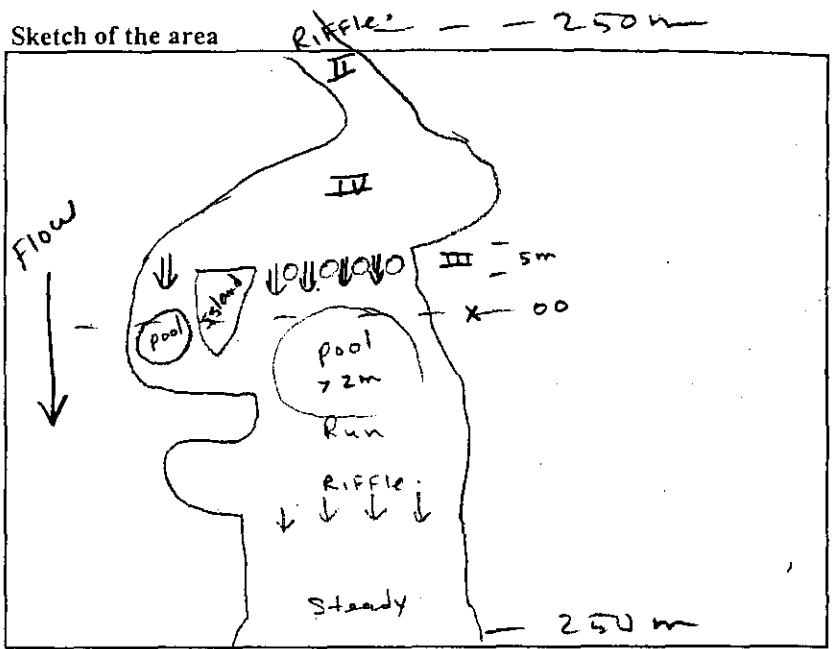
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input type="text" value="10"/>	1 - 2 m <input type="text" value="20"/>	>2 m <input type="text" value="10"/>	Unknown <input type="text"/>			
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="text"/>			
Flow Type	Steady <input type="text" value="35"/>	Riffle <input type="text" value="60"/>	Rapids <input type="text" value="5"/>	Pools <input type="text"/>			
Substrate Type	Fines <input type="text" value="60"/>	Gravel <input type="text"/>	Cobble/Rubble <input type="text" value="10"/>	Boulder <input type="text" value="30"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Bank Habitat	Type I <input type="text"/>	Type II <input type="text" value="65"/>	Type III <input type="text" value="5"/>	Type IV <input type="text" value="30"/>			
Bank Material	Fines <input type="text" value="60"/>	Gravel/Pebble <input type="text"/>	Cobble/Rubble <input type="text" value="10"/>	Boulder <input type="text" value="30"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="text"/>	Deep Gully <input type="text"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/>	Bog/Fen <input type="text"/>	
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text" value="20"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="40"/>			
Cover 20%	Instream <input type="text" value="60"/>	Overhang <input type="text" value="30"/>	Canopy <input type="text" value="10"/>	None <input type="text"/>			
Potential Obstruction	Falls <input type="text"/>	Rapids <input type="text"/>	Chute <input type="text"/>	Cascade <input type="text"/>	Intermittent <input type="text"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="text"/>	1 - 3 % <input type="text"/>	3 - 5 % <input type="text"/>	>5 % <input type="text"/>			

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE

52

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 3.71

Crossing less than 2 km² (on DWST list)

pH 7.54

Bog drainage

Conductivity 4.7

Type IV (steady) flow

Dissolved Oxygen 11.54

Type III (cascade/rapids) flow

Turbidity 2.1

No accessible by helicopter

Surface velocity 33 RPM

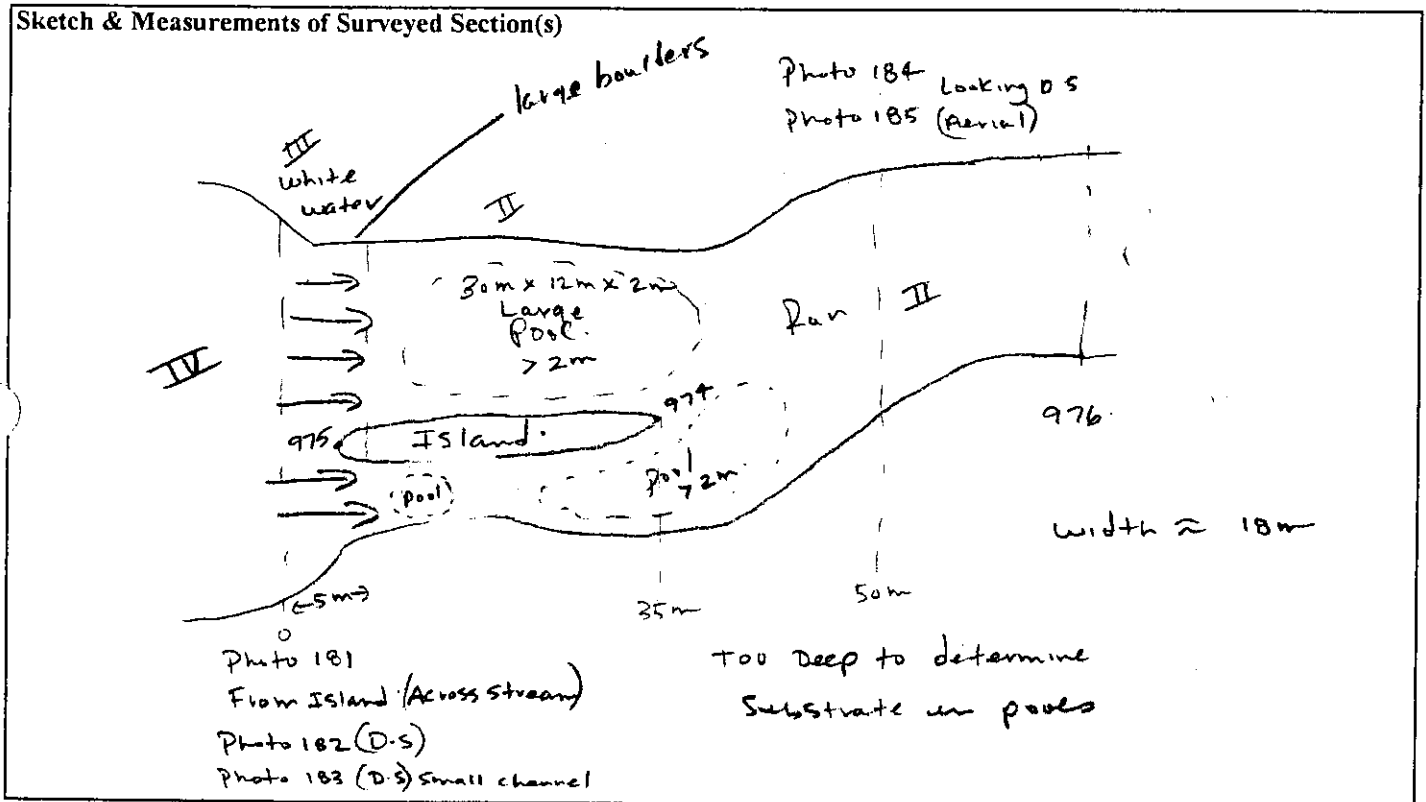
Other: _____

74 cm / 10 m brown Bank

Water Samples collected Yes

Gradient (inclinometer) 1%.

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BA

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

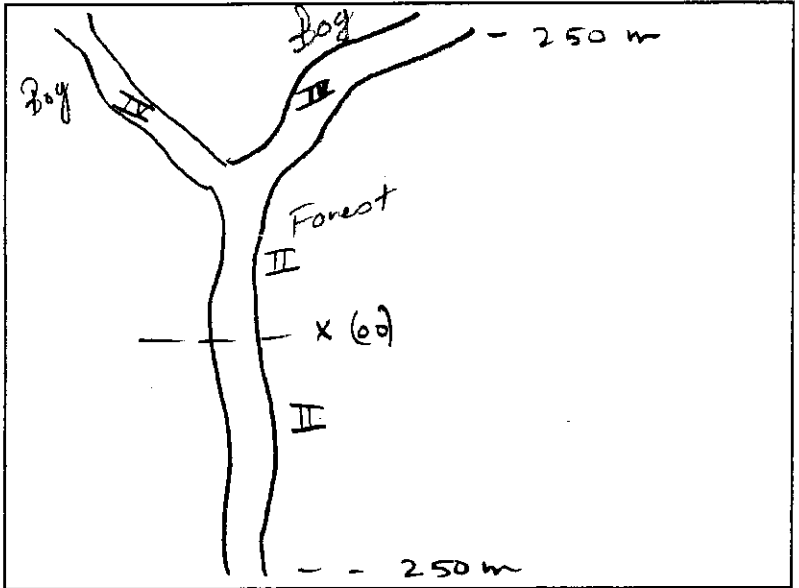
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input checked="" type="checkbox"/> 20	Riffle <input checked="" type="checkbox"/> 80	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 80	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 20	
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow <input type="checkbox"/>	Medium <input type="checkbox"/>	Deep <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/> 80	Flood Plain <input type="checkbox"/> Bog/Fen <input checked="" type="checkbox"/> 20
Bank Vegetation	Bog <input checked="" type="checkbox"/> 10	Grasses <input checked="" type="checkbox"/> 10	Shrubs <input checked="" type="checkbox"/> 30	Trees <input checked="" type="checkbox"/> 50	
Cover	80% Instream <input checked="" type="checkbox"/> 10	Overhang <input checked="" type="checkbox"/> 50	Canopy <input checked="" type="checkbox"/> 40	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate

fines	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed Yes

#53

Car found within 100m

Ground Survey not Completed

Temperature 4.25

Crossing less than 2 km² (on DWST list)

pH 7.14

Bog drainage

Conductivity 7.7

Type IV (steady) flow

Dissolved Oxygen 11.24

Type III (cascade/rapids) flow

Turbidity 2.0

No accessible by helicopter

Surface velocity 32 Rev/min

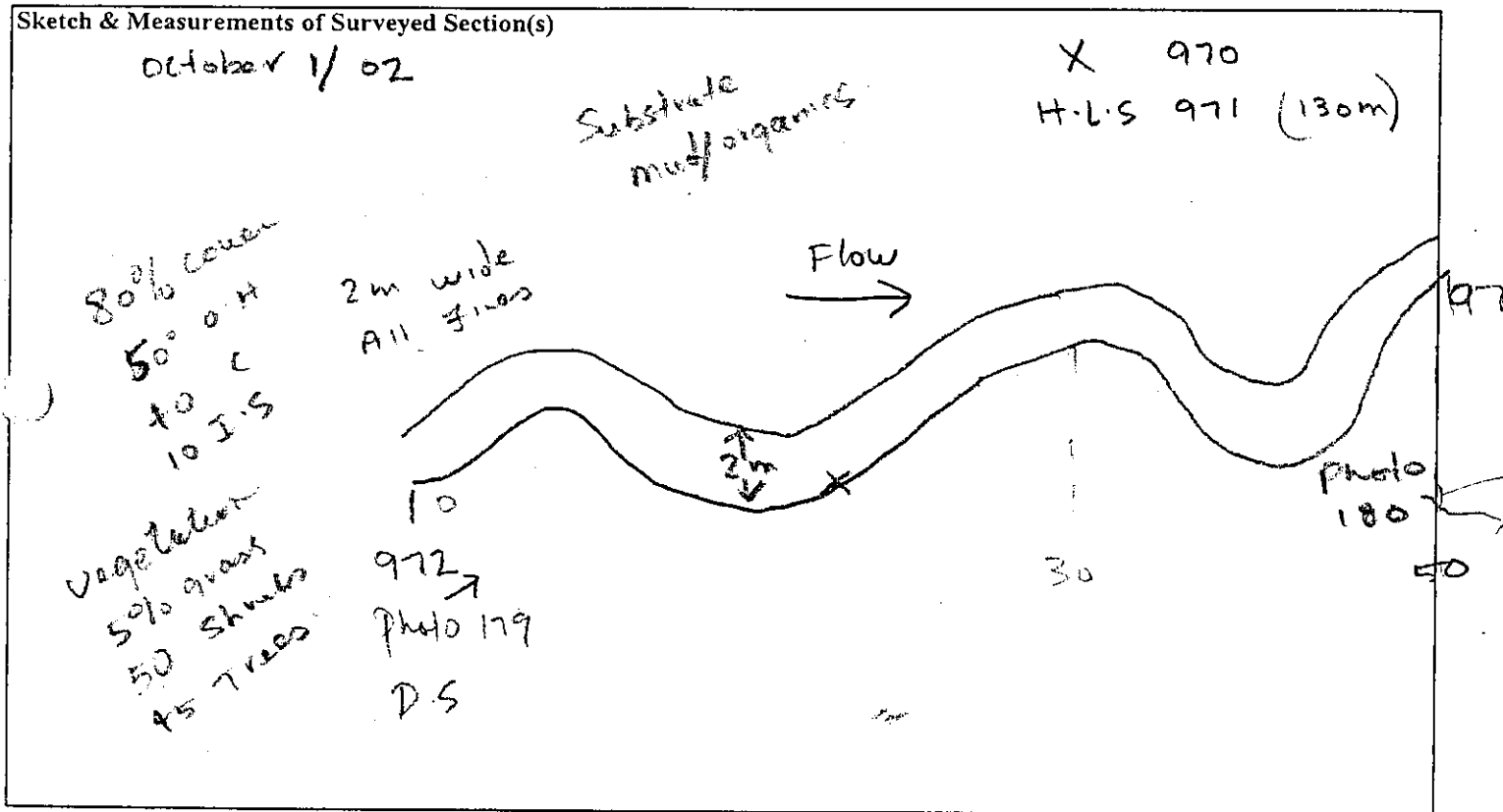
Other: _____

21 cm / center of stream

Water Samples collected Yes

Gradient (inclinometer) 0.5%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

NO stream bed
could be found at
this co-ordinate
little bit of bog
Drainage 100 m below
crossing.

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#54

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage *no stream*

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

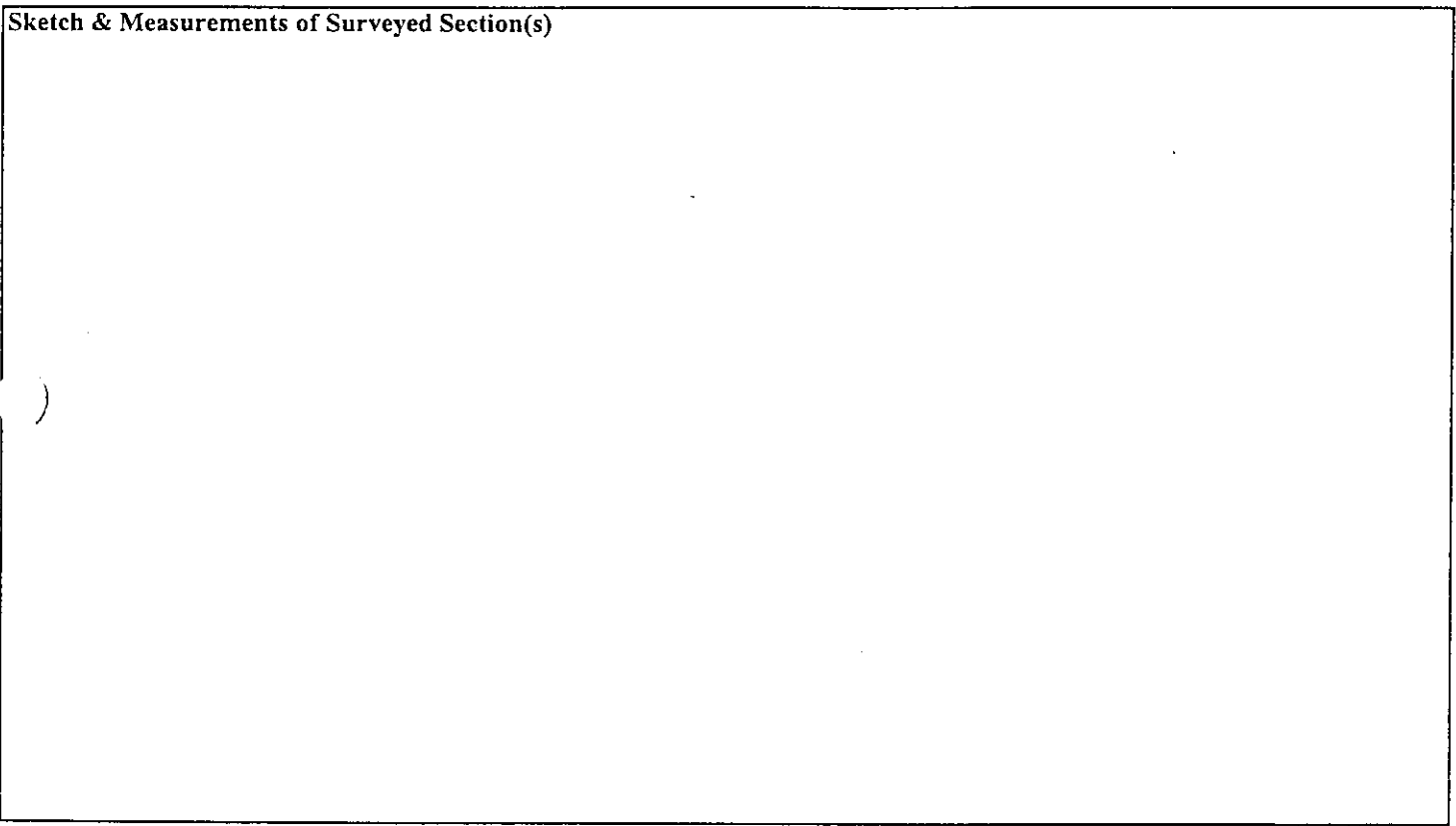
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

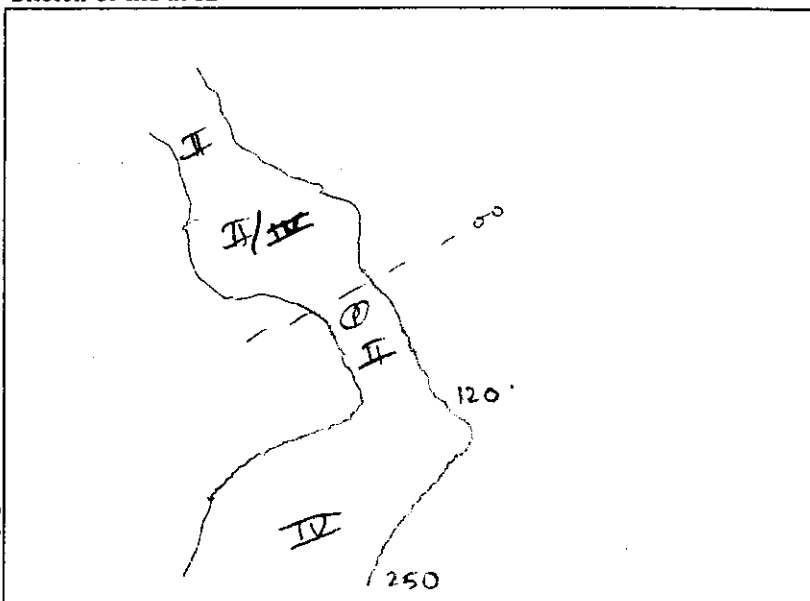
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input checked="" type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/> 40	>20 m <input checked="" type="checkbox"/> 60	
Flow Type	Steady <input checked="" type="checkbox"/> 60	Riffle <input checked="" type="checkbox"/> 40	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/> 10	
Substrate Type	Fines <input checked="" type="checkbox"/> 40	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/> 20	Boulder <input checked="" type="checkbox"/> 40	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 40	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 60	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/> 30	Boulder <input checked="" type="checkbox"/> 50	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> 20
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/> 10	Shrubs <input checked="" type="checkbox"/> 30	Trees <input checked="" type="checkbox"/> 60	
Cover 10%	Instream <input checked="" type="checkbox"/> 20	Overhang <input checked="" type="checkbox"/> 50	Canopy <input checked="" type="checkbox"/> 30	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#55 Can Land in River

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 3.27

Crossing less than 2 km² (on DWST list)

pH 7.40

Bog drainage

Conductivity 6.4

Type IV (steady) flow

Dissolved Oxygen 10.65

Type III (cascade/rapids) flow

Turbidity 2.5

No accessible by helicopter

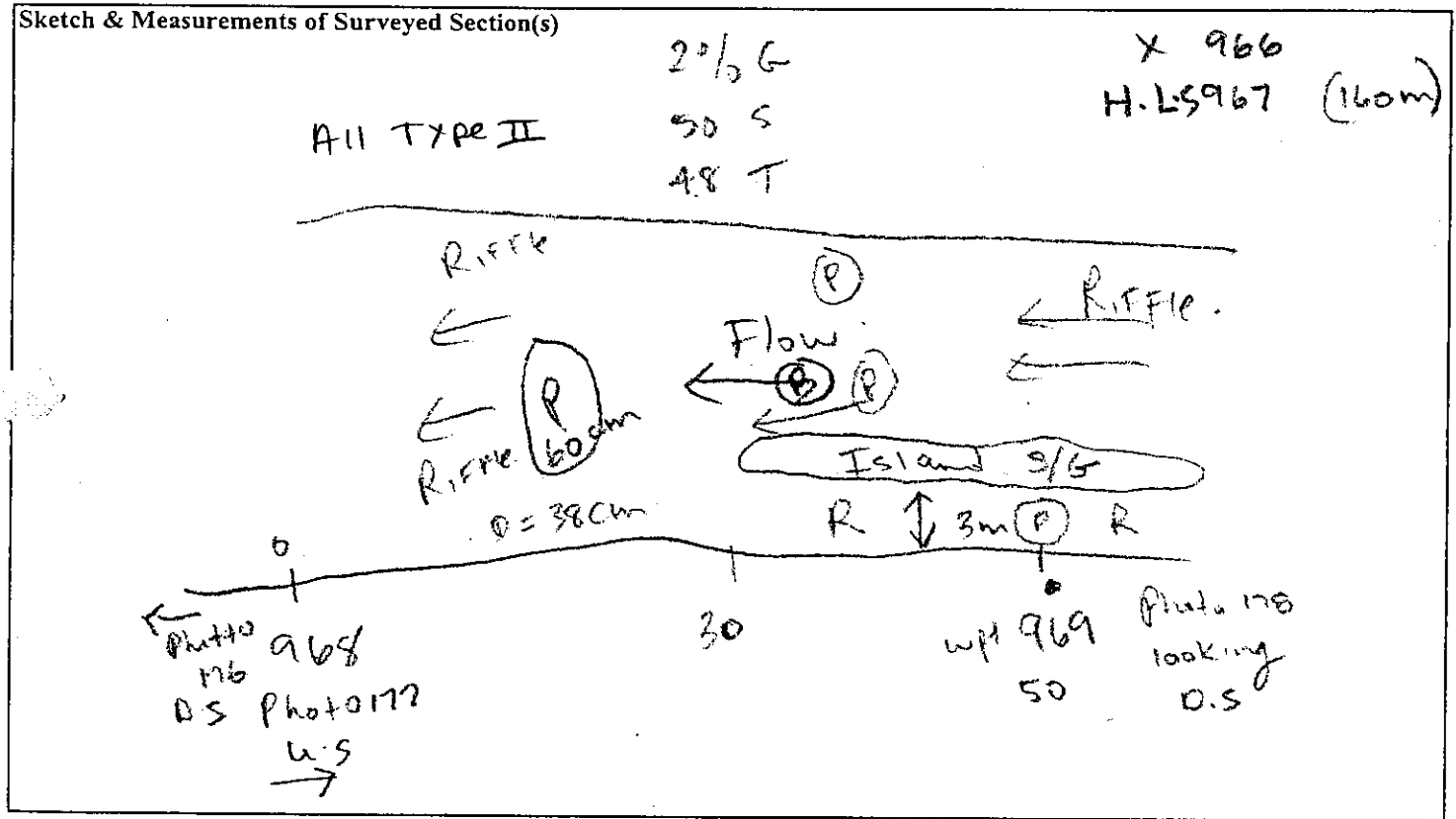
Surface velocity 74 revs/min
38 cm / center

Other: _____

Water Samples collected Yes

Gradient (inclinometer) 2%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

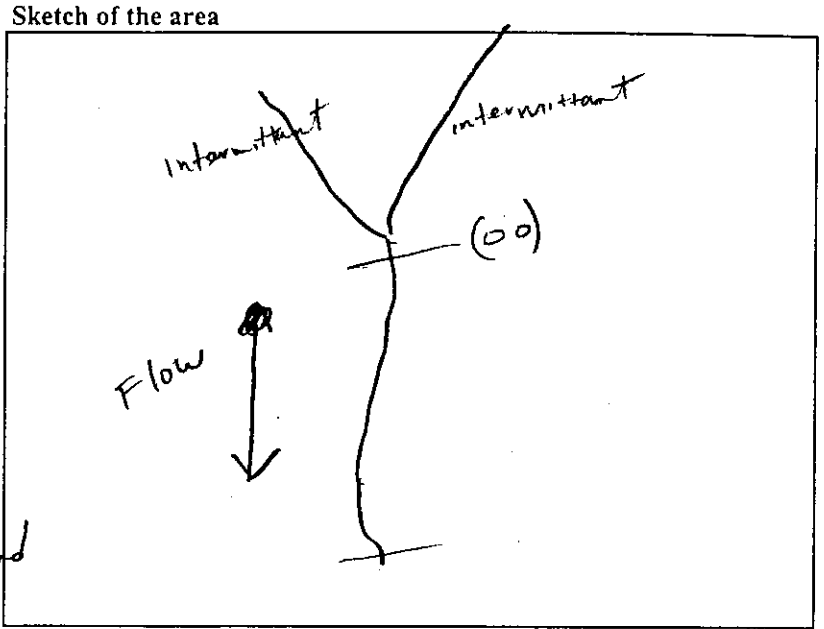
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



										Comments		
Depth	0 - 1 m	<input checked="" type="checkbox"/>	1 - 2 m	<input type="checkbox"/>	>2 m	<input type="checkbox"/>	Unknown	<input type="checkbox"/>				
Channel Width	0 - 2 m	<input checked="" type="checkbox"/>	2 - 5 m	<input type="checkbox"/>	5 - 20 m	<input type="checkbox"/>	>20 m	<input type="checkbox"/>				
Flow Type	Steady	<input type="checkbox"/>	Riffle	<input checked="" type="checkbox"/>	Rapids	<input type="checkbox"/>	Pools	<input type="checkbox"/>				
Substrate Type	Fines	<input type="checkbox" value="30"/>	Gravel	<input type="checkbox"/>	Cobble/Rubble	<input type="checkbox" value="10"/>	Boulder	<input type="checkbox" value="60"/>	Bedrock	<input type="checkbox"/>	Unknown	<input type="checkbox"/>
Bank Habitat	Type I	<input type="checkbox"/>	Type II	<input checked="" type="checkbox"/>	Type III	<input type="checkbox"/>	Type IV	<input type="checkbox"/>				
Bank Material	Fines	<input type="checkbox"/>	Gravel/Pebble	<input type="checkbox"/>	Cobble/Rubble	<input type="checkbox"/>	Boulder	<input type="checkbox" value="60"/>	Bedrock	<input type="checkbox"/>	Unknown	<input type="checkbox" value="40"/>
Backslope	Shallow Gully	<input type="checkbox"/>	Medium Gully	<input type="checkbox"/>	Deep Gully	<input type="checkbox"/>	Forest Stream	<input checked="" type="checkbox"/>	Flood Plain	<input type="checkbox"/>	Bog/Fen	<input type="checkbox"/>
Bank Vegetation	Bog	<input type="checkbox"/>	Grasses	<input type="checkbox"/>	Shrubs	<input type="checkbox" value="50"/>	Trees	<input type="checkbox" value="50"/>				
Cover ^{a/b/o}	Instream	<input type="checkbox"/>	Overhang	<input type="checkbox" value="80"/>	Canopy	<input type="checkbox" value="20"/>	None	<input type="checkbox"/>				
Potential Obstruction	Falls	<input type="checkbox"/>	Rapids	<input type="checkbox"/>	Chute	<input type="checkbox"/>	Cascade	<input type="checkbox"/>	Intermittent	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>
Est. Gradient	0 - 1 %	<input type="checkbox"/>	1 - 3 %	<input type="checkbox"/>	3 - 5 %	<input type="checkbox"/>	>5 %	<input type="checkbox"/>				

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#56

Lean land

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 4.57

Crossing less than 2 km² (on DWST list)

pH 6.49

Bog drainage

Conductivity 3.9

Type IV (steady) flow

Dissolved Oxygen 10.95

Type III (cascade/rapids) flow

Turbidity 3.1

No accessible by helicopter

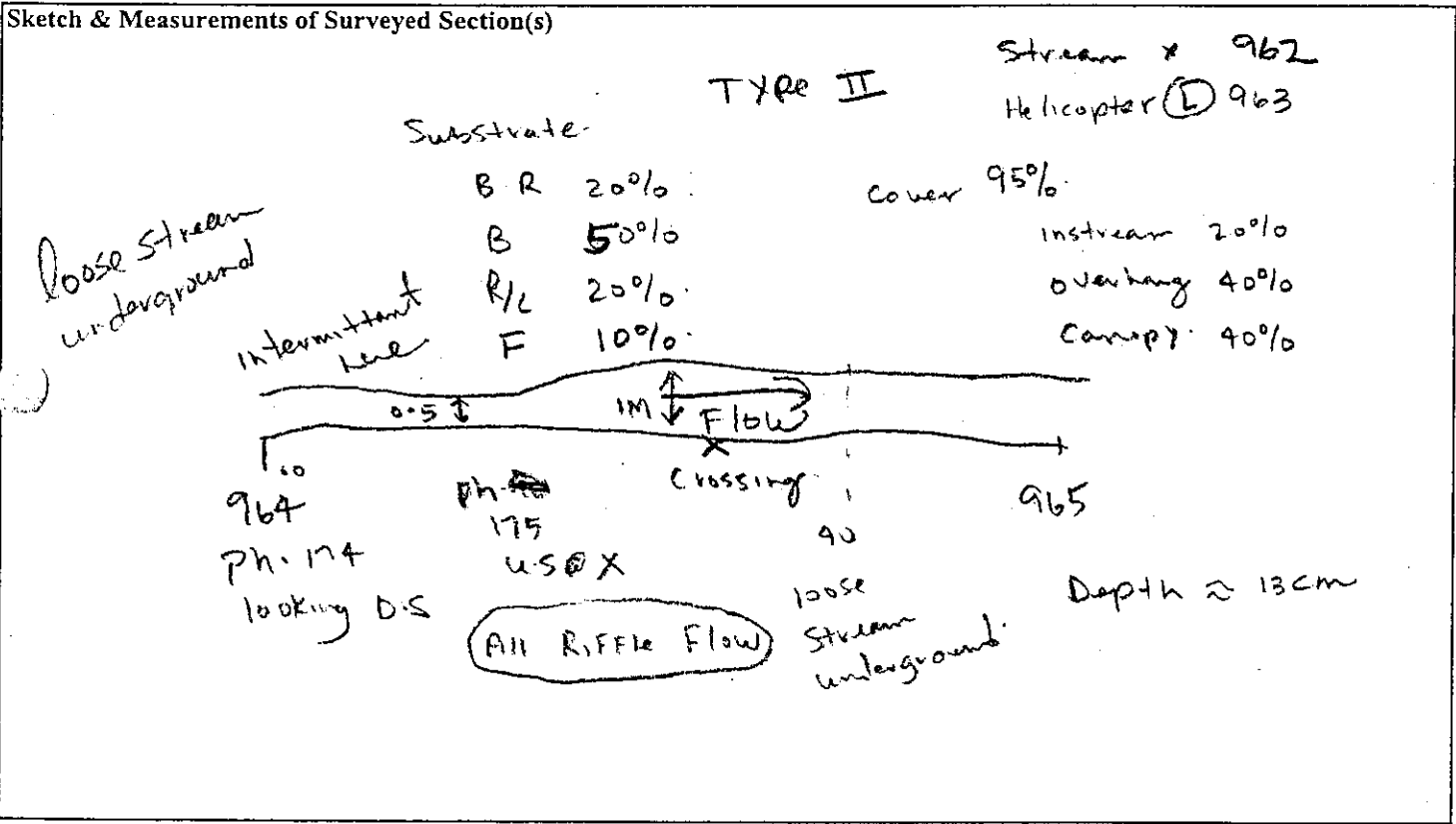
Surface velocity 73 Rev/min
14 cm / center of stream

Other: _____

Water Samples collected Yes.

Gradient (inclinometer) 5%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

NO identifiable stream bed at this location

							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#57

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

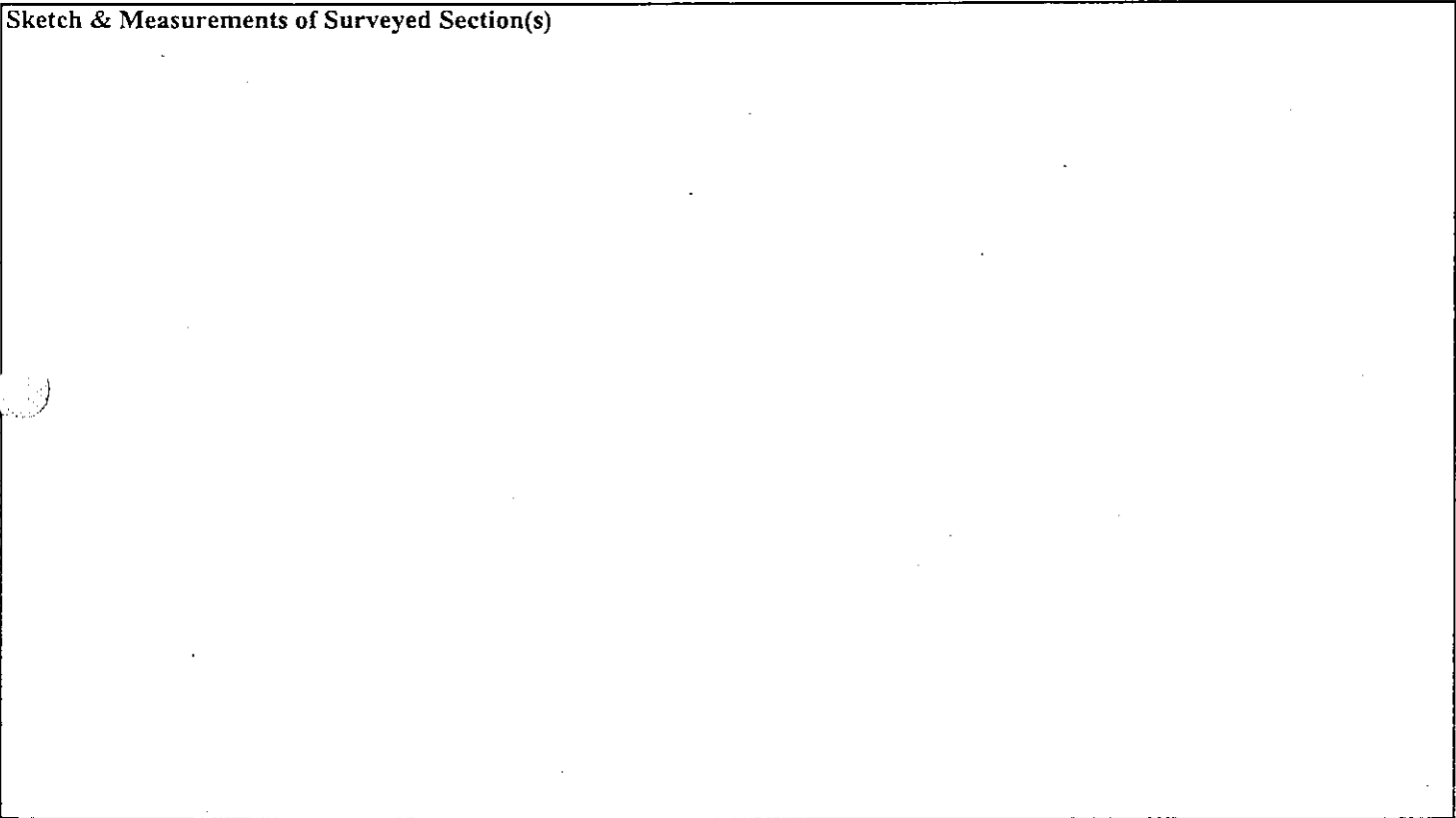
Other: _____

no stream

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

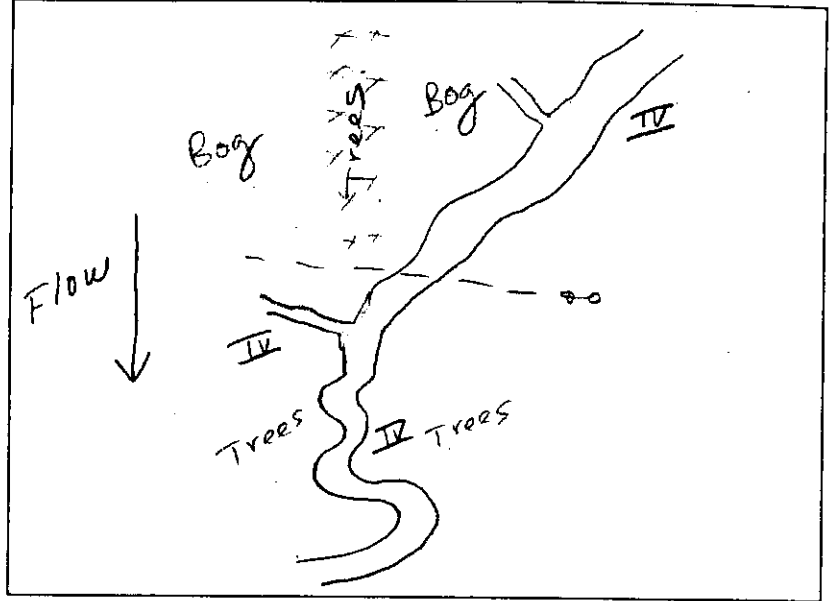
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	60% Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#58

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

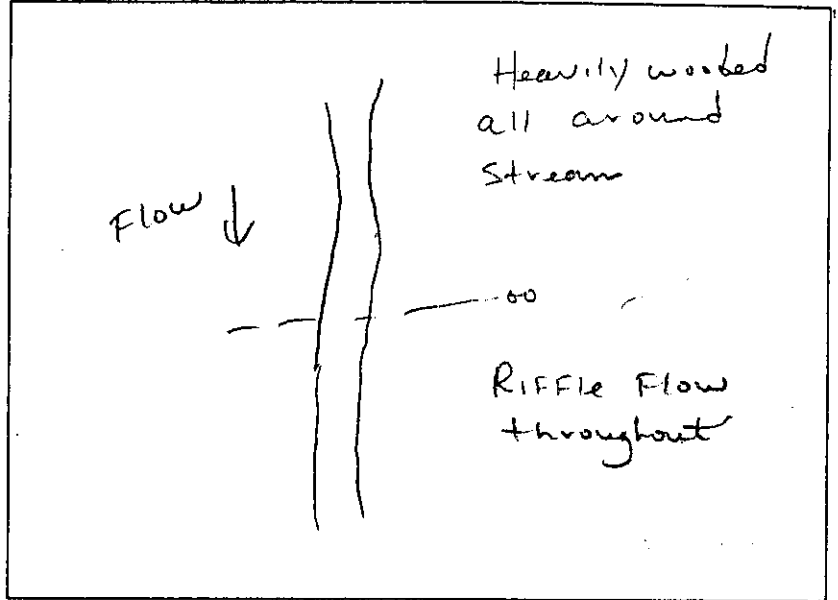
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{50%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#59

Ground Survey

Ground survey completed	<input type="checkbox"/>	Ground Survey not Completed	<input type="checkbox"/> N.D.
Temperature	<input type="checkbox"/>	<input type="checkbox"/>	Crossing less than 2 km ² (on DWST list)
pH	<input type="checkbox"/>	<input type="checkbox"/>	Bog drainage
Conductivity	<input type="checkbox"/>	<input type="checkbox"/>	Type IV (steady) flow
Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	Type III (cascade/rapids) flow
Turbidity	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No accessible by helicopter
Surface velocity	<input type="checkbox"/>	<input type="checkbox"/>	Other: _____
Water Samples collected	<input type="checkbox"/>		
Gradient (inclinometer)	<input type="checkbox"/>		

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

- Backslope**
- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream** has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain** is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen** - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

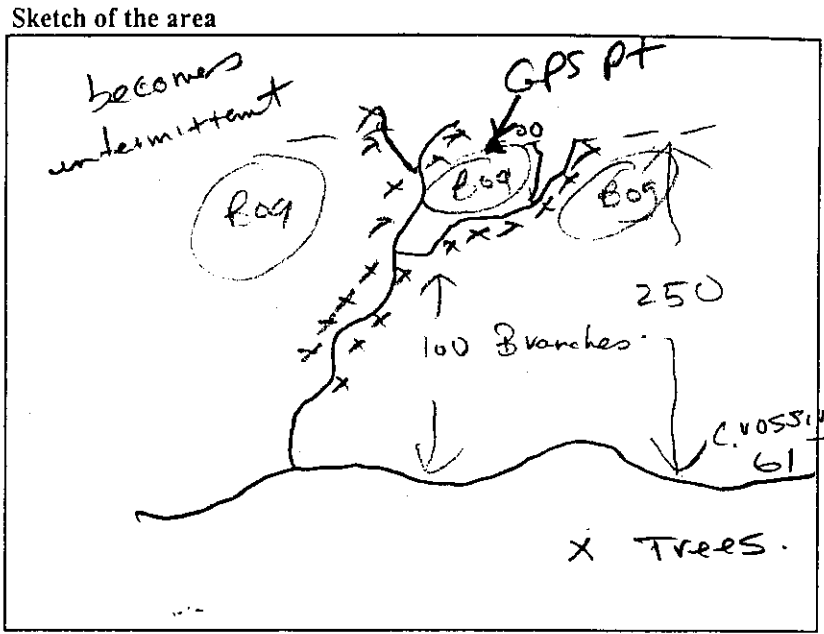
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox" value="10"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox" value="90"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox" value="50"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox" value="50"/>	
Bank Vegetation	Bog <input type="checkbox" value="20"/>	Grasses <input type="checkbox" value="5"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="35"/>			
Cover ^{80%}	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="60"/>	Canopy <input type="checkbox" value="40"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#60

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

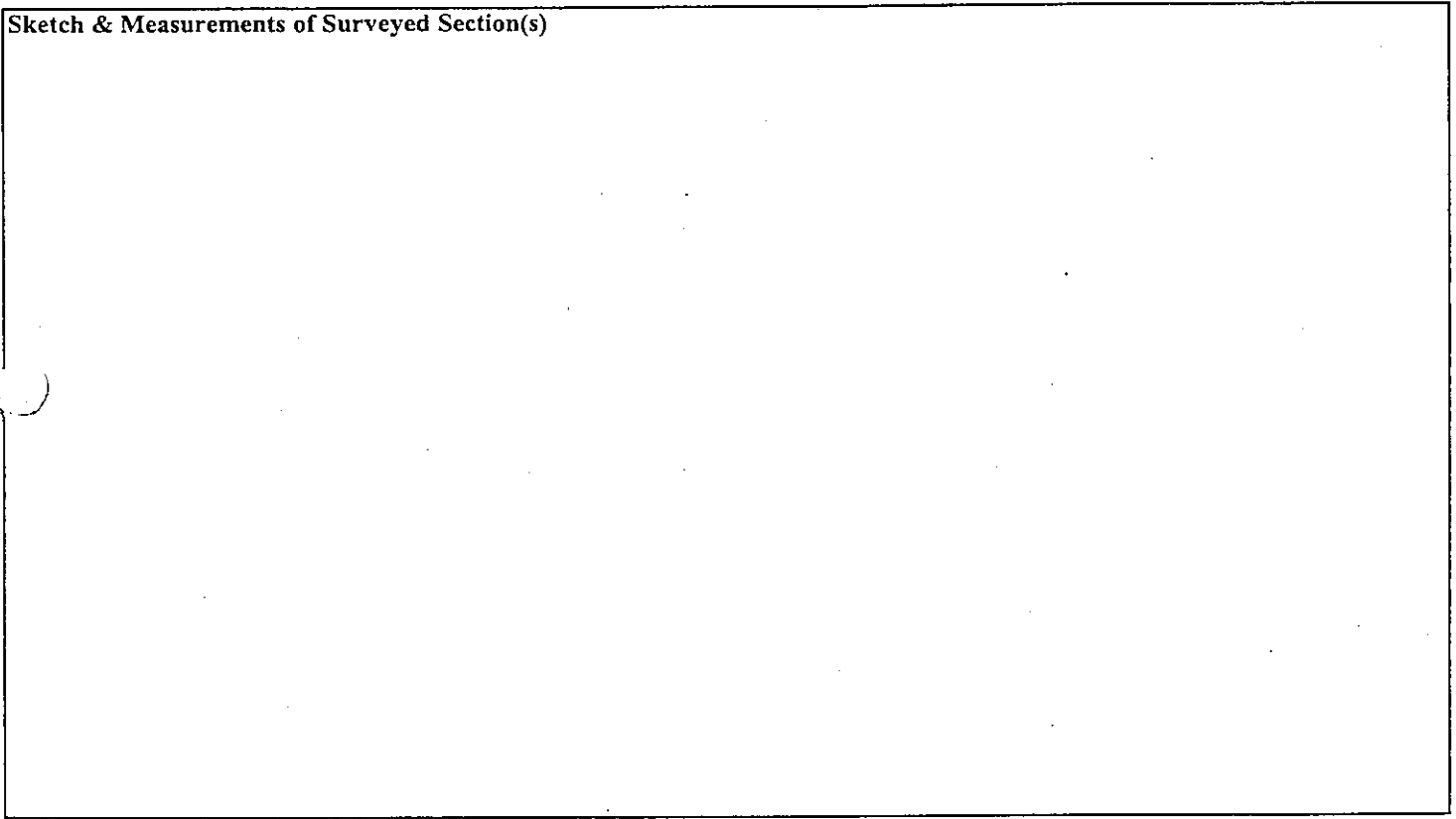
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

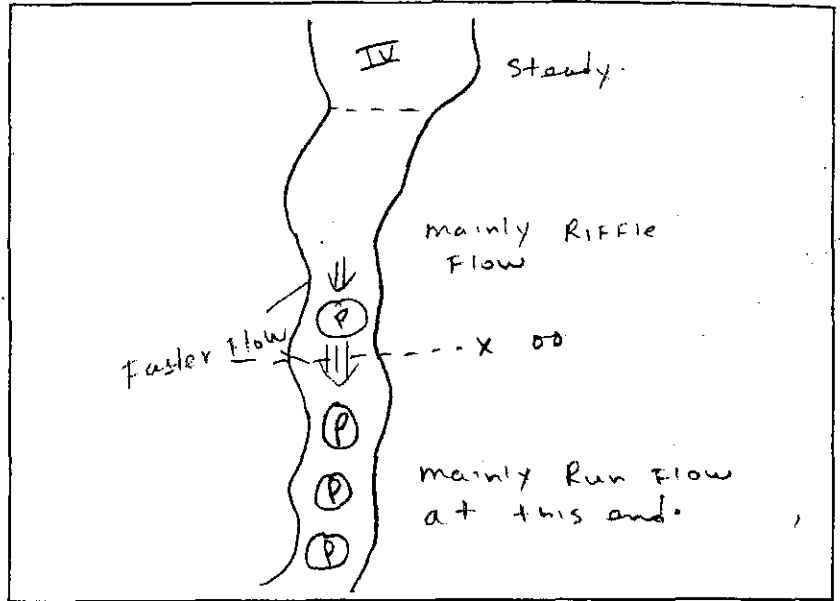
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/> 5	Riffle <input type="checkbox"/> 90	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/> 5	
Substrate Type	Fines <input type="checkbox"/> 30	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 30	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/> 95	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/> 5	
Bank Material	Fines <input type="checkbox"/> 30	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 30	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/> 10	Shrubs <input type="checkbox"/> 30	Trees <input type="checkbox"/> 60	
Cover	40% Instream <input type="checkbox"/> 5	Overhang <input type="checkbox"/> 35	Canopy <input type="checkbox"/> 60	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Backslope

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed **yes**

#61
Ground Survey not Completed

can land within 100 m

Temperature **4.16**

Crossing less than 2 km² (on DWST list)

pH **7.80**

Bog drainage

Conductivity **8.2**

Type IV (steady) flow

Dissolved Oxygen **11.16**

Type III (cascade/rapids) flow

Turbidity **1.4**

No accessible by helicopter

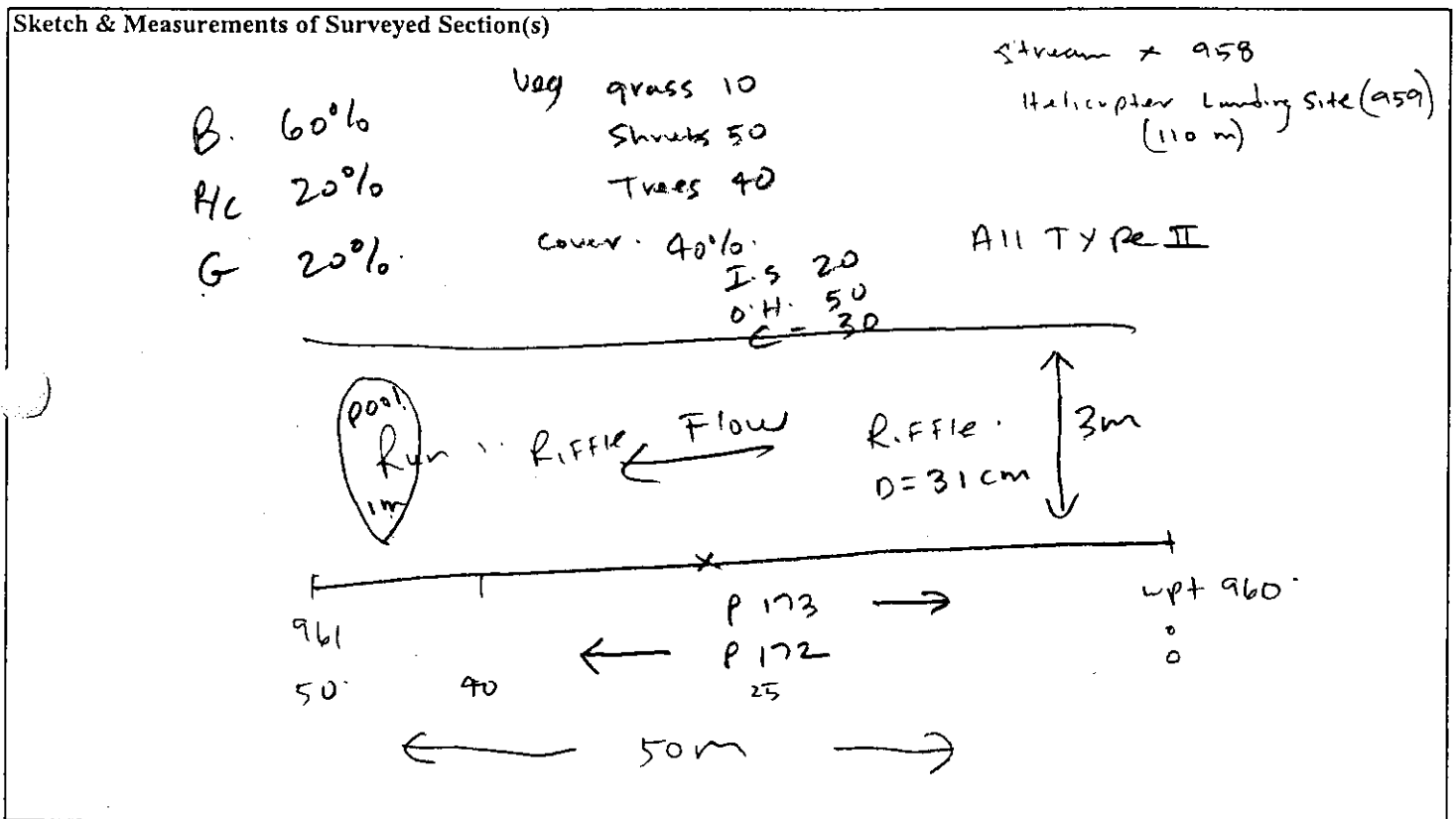
Surface velocity **108 Rev/min**

Other: _____

31 cm / center of stream
Water Samples collected **yes**

Gradient (inclinometer) **10%**

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

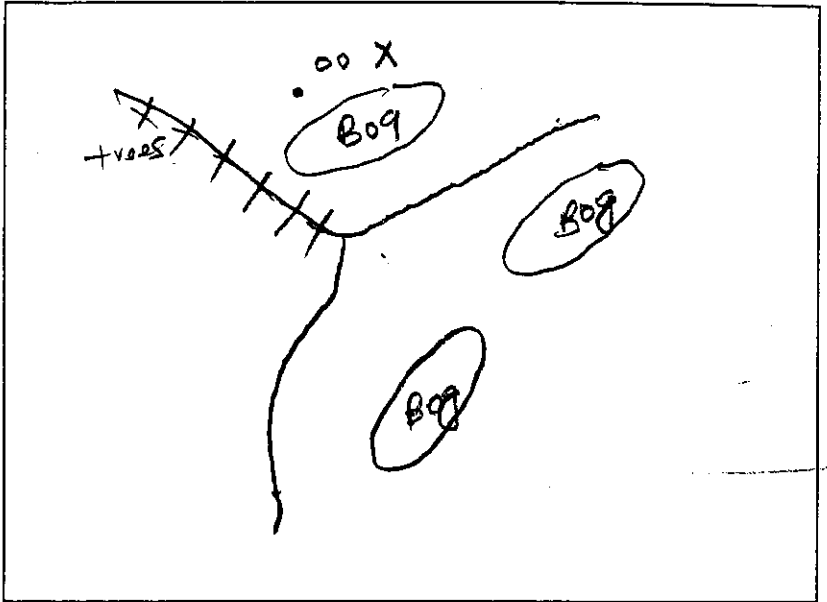
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/> 20	Grasses <input type="checkbox"/> 10	Shrubs <input type="checkbox"/> 10	Trees <input type="checkbox"/> 30			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/> 20	Canopy <input type="checkbox"/> 30	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed **NO**

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

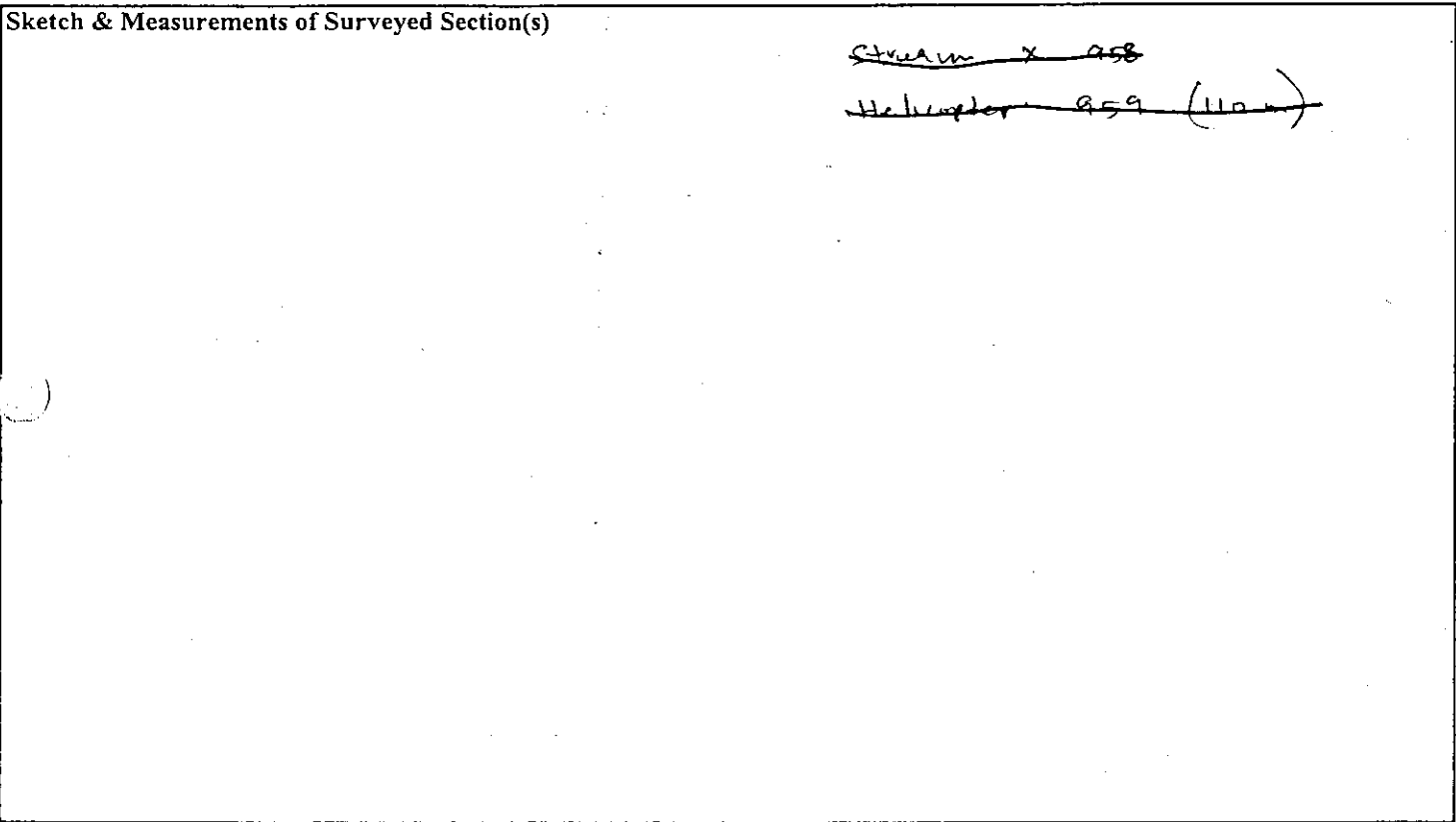
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

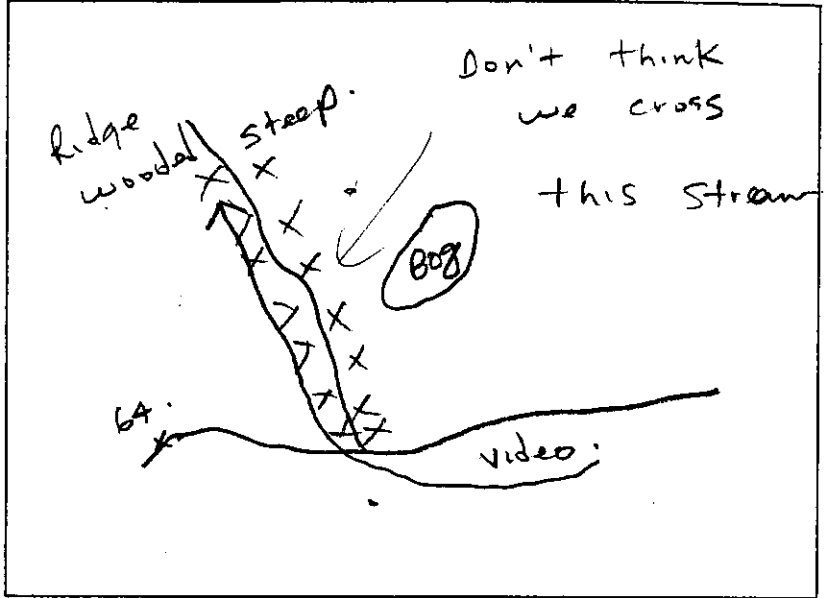
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="text" value="20"/>	Trees <input type="text" value="80"/>			
Cover ^{90%}	Instream <input type="checkbox"/>	Overhang <input type="text" value="80"/>	Canopy <input type="text" value="20"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

63.

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

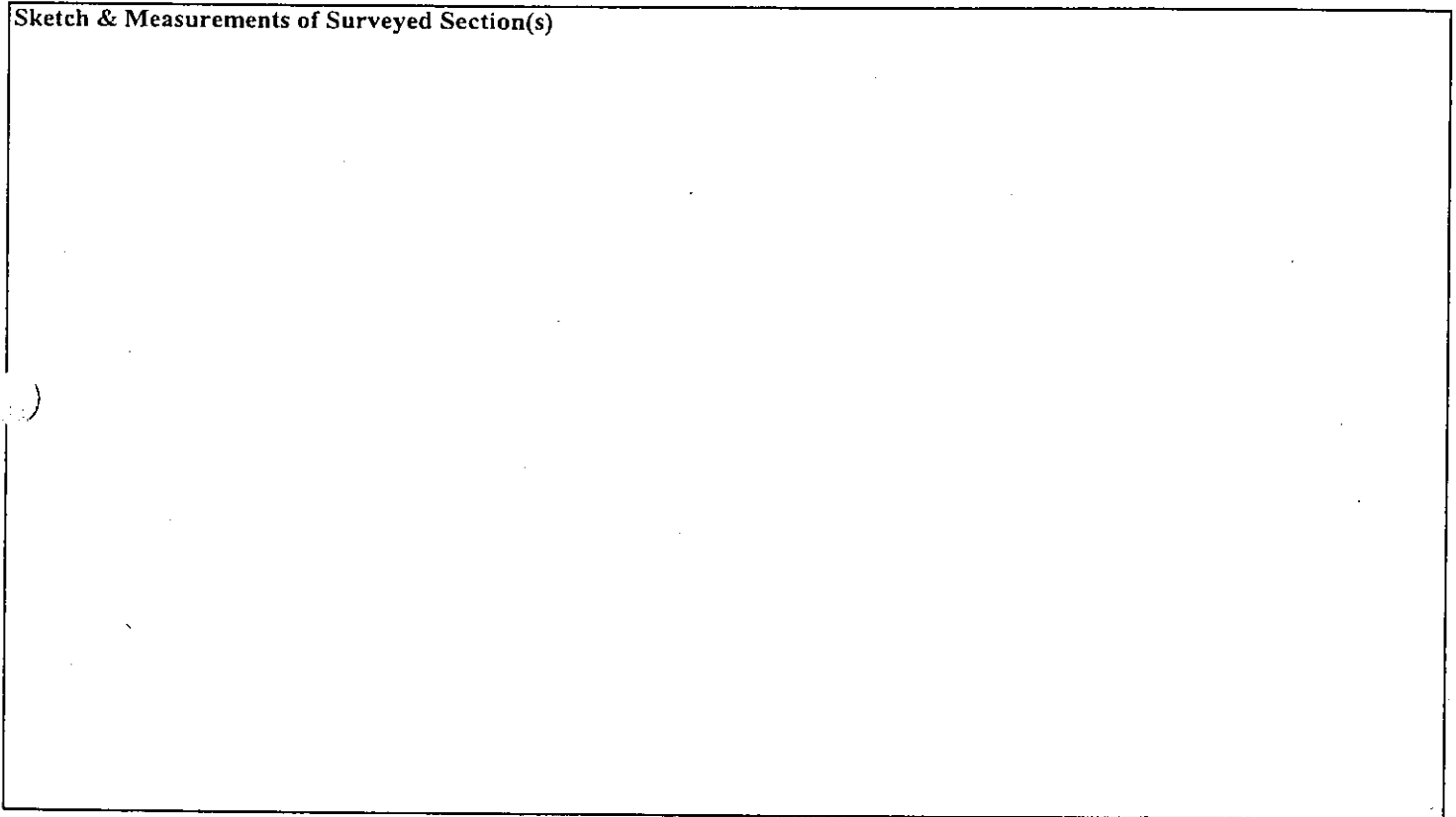
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

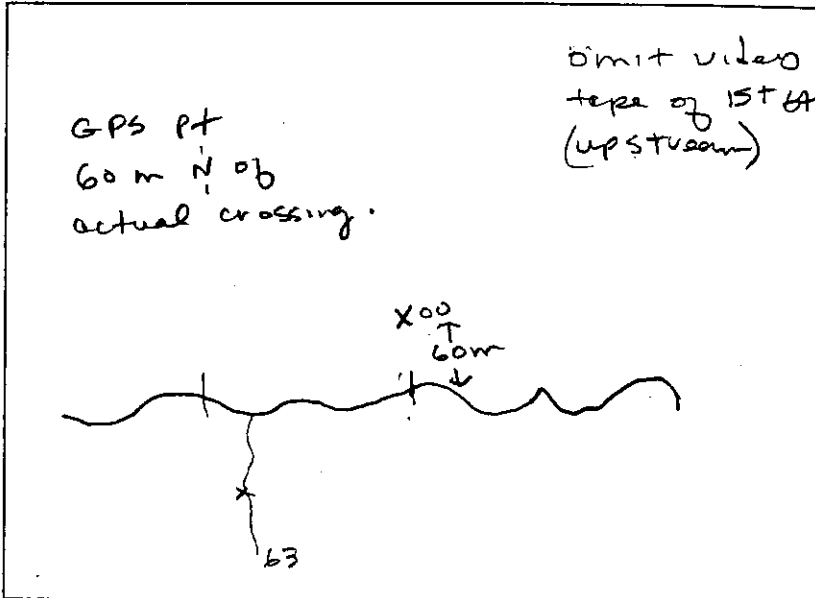
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 64
 Date Sept 25/02
 Surveyed by Bu/mH/Hm/DJ
 Watershed Eagle
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 B/14
 Photo Numbers 96
 Video Yes
 Area Surveyed Aerial 500m
 Water Samples Yes

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{90%}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey #64 Landing Site (Bog near Stream)

Ground survey completed Yes Ground Survey not Completed

Temperature 3.92 Crossing less than 2 km² (on DWST list)

pH 7.61 Bog drainage

Conductivity 7.2 Type IV (steady) flow

Dissolved Oxygen 10.97 Type III (cascade/rapids) flow

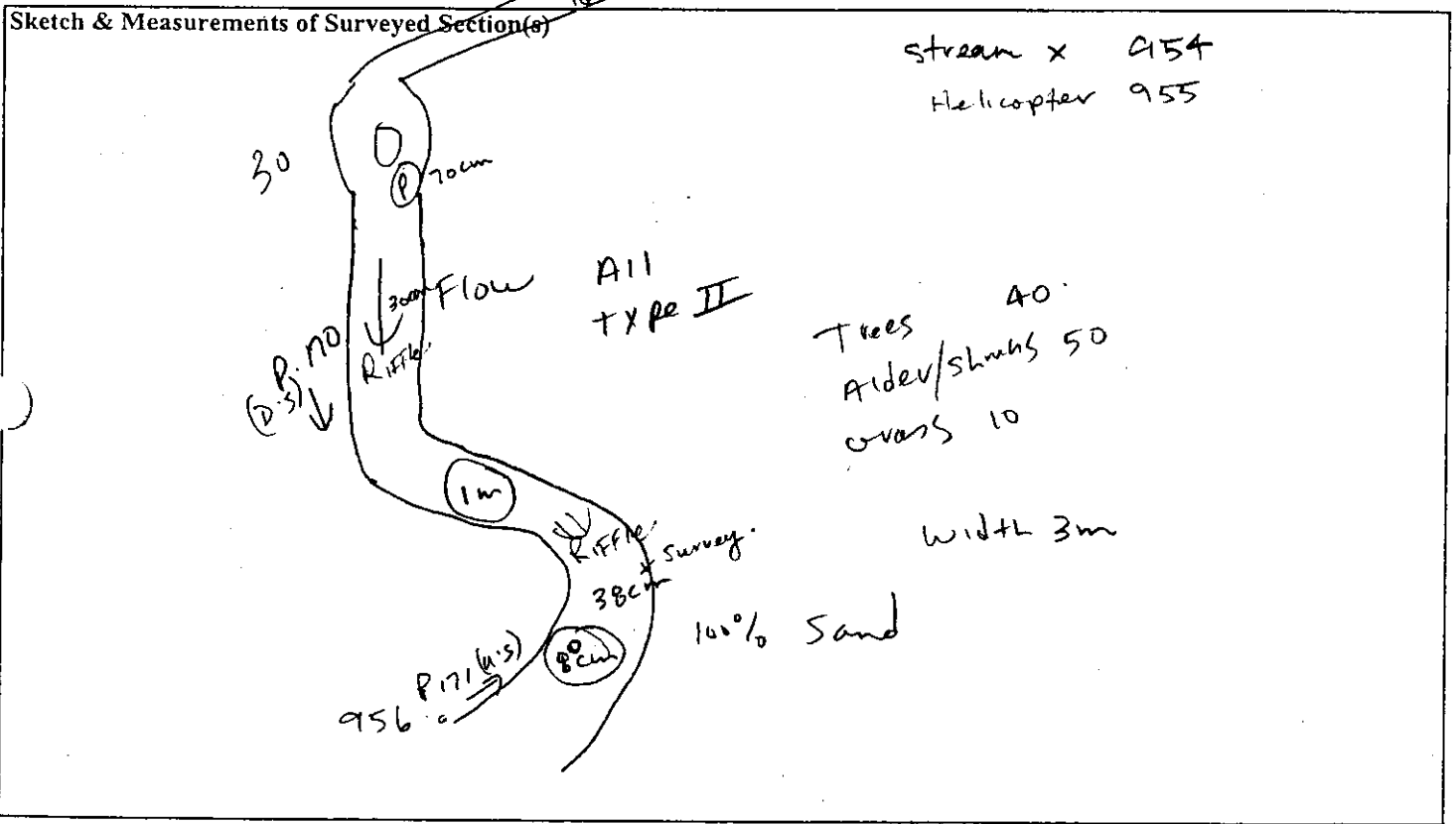
Turbidity 3.5 No accessible by helicopter

Surface velocity 52 Rev/min Other: _____

38 cm / center of stream

Water Samples collected yes 257 wpt

Gradient (inclinometer) 1%



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

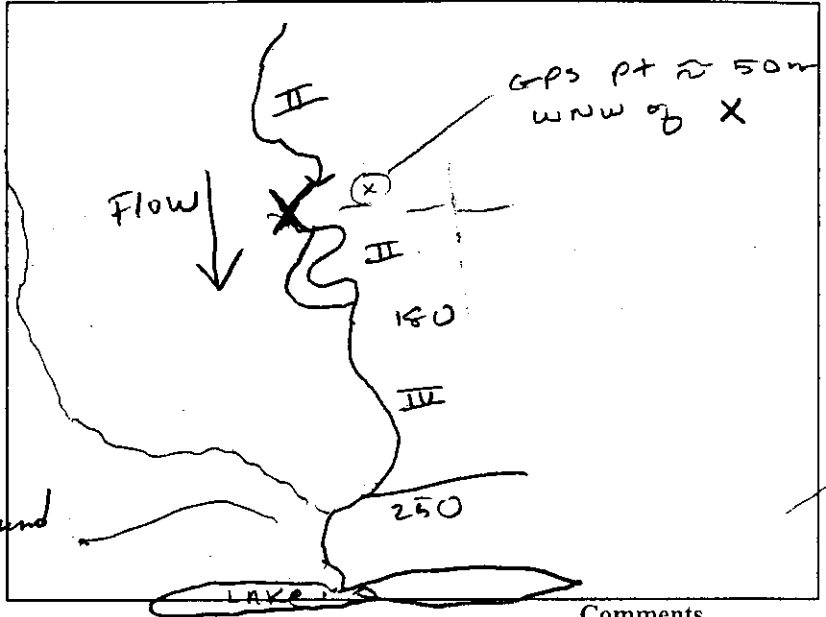
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox" value="50"/>	2 - 5 m <input checked="" type="checkbox" value="50"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox" value="30"/>	Riffle <input checked="" type="checkbox" value="70"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox" value="100"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox" value="70"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox" value="30"/>		
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox" value="70"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox" value="30"/>
Bank Vegetation	Bog <input checked="" type="checkbox" value="30"/>	Grasses <input checked="" type="checkbox" value="10"/>	Shrubs <input checked="" type="checkbox" value="30"/>	Trees <input checked="" type="checkbox" value="30"/>		
Cover ^{60%}	Instream <input checked="" type="checkbox" value="20"/>	Overhang <input checked="" type="checkbox" value="40"/>	Canopy <input checked="" type="checkbox" value="40"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

65 landing site 100 m

Ground Survey Ground survey completed Ground Survey not Completed

Temperature 4.14 Crossing less than 2 km² (on DWST list)

pH 7.33 Bog drainage

Conductivity 8.0 Type IV (steady) flow

Dissolved Oxygen 9.61 Type III (cascade/rapids) flow

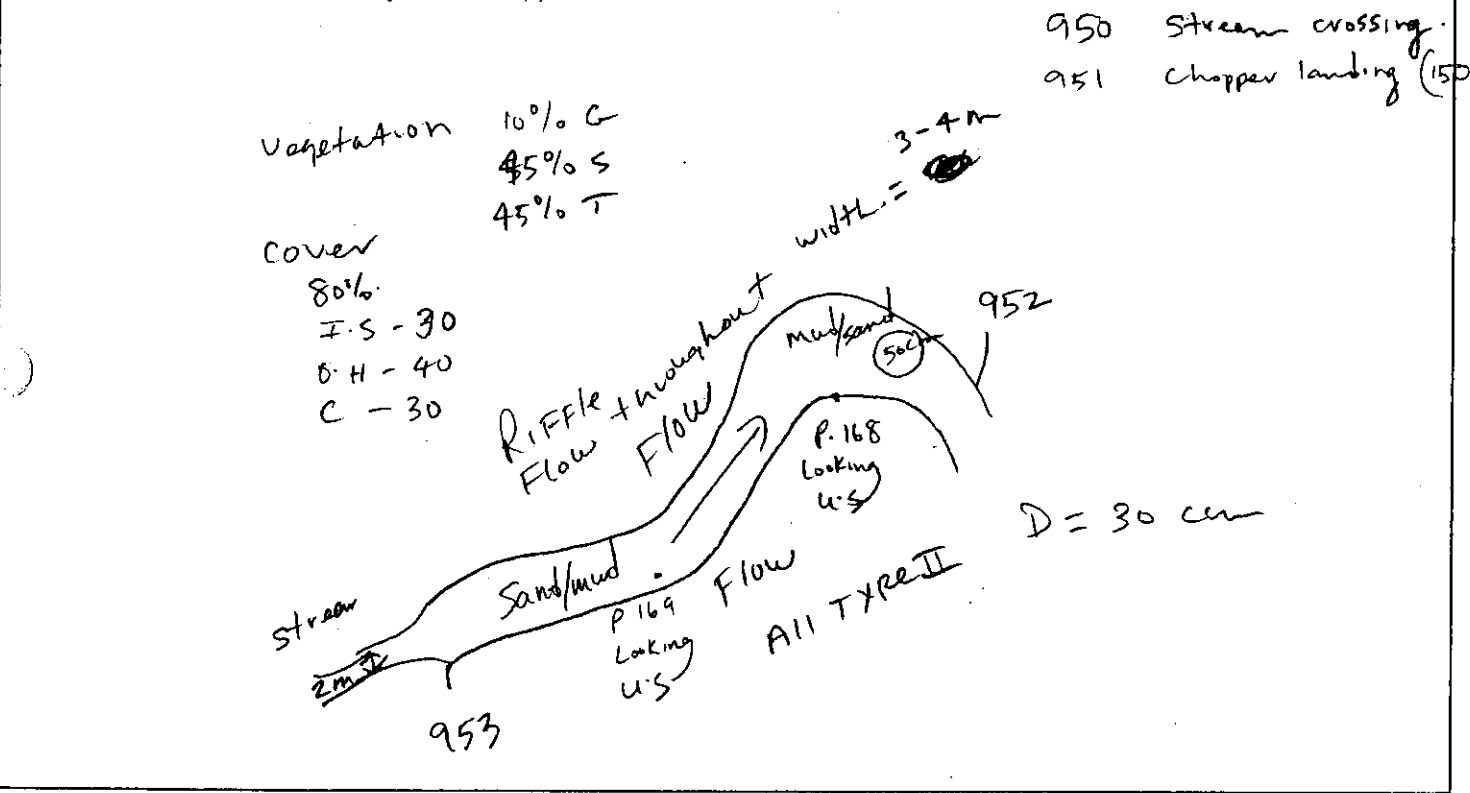
Turbidity 4.1 No accessible by helicopter

Surface velocity 18 Rev/min Other: _____
 50 cm / center of stream

Water Samples collected yes

Gradient (inclinometer) 0.5%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

- Backslope**
- Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material
- Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils
- Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting
- Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

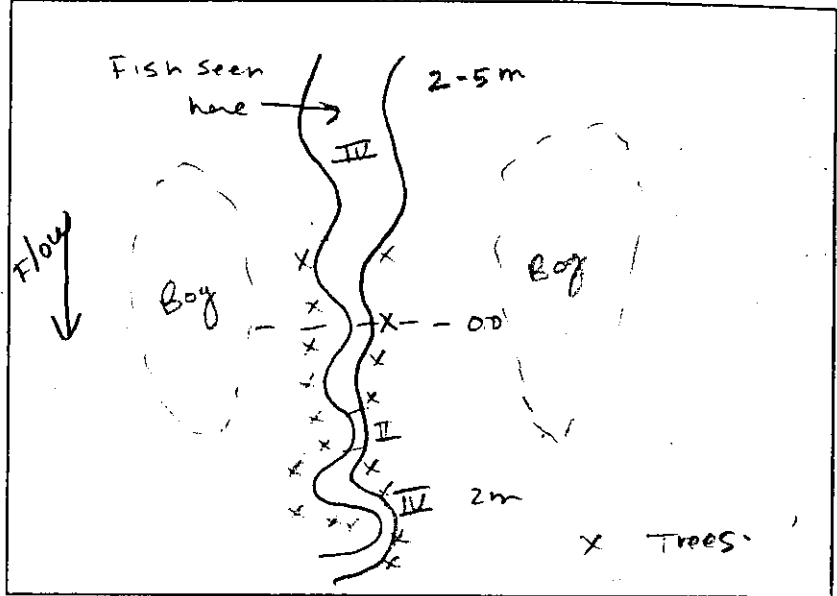
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>		
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover %	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input checked="" type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#66

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

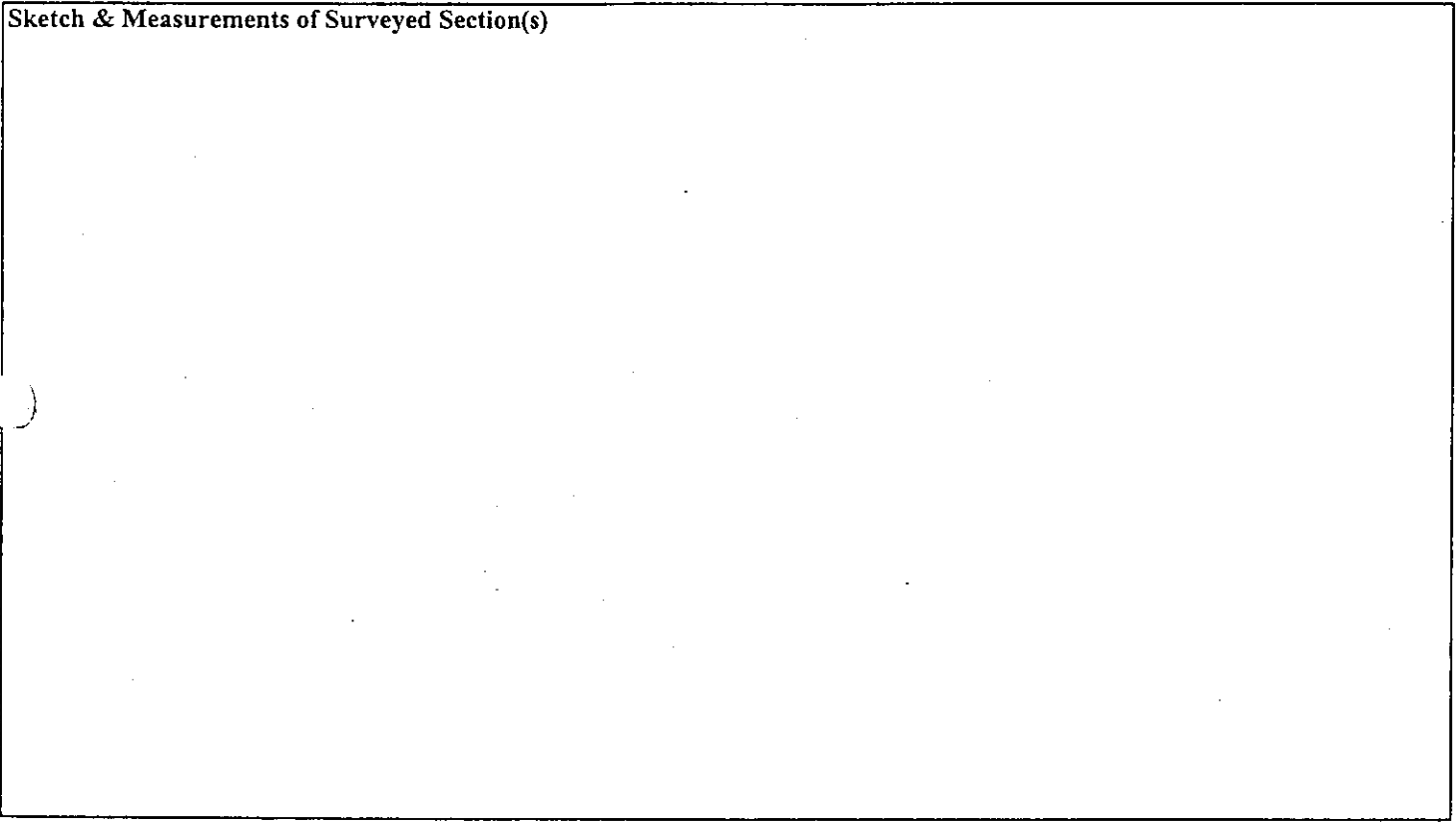
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

100

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

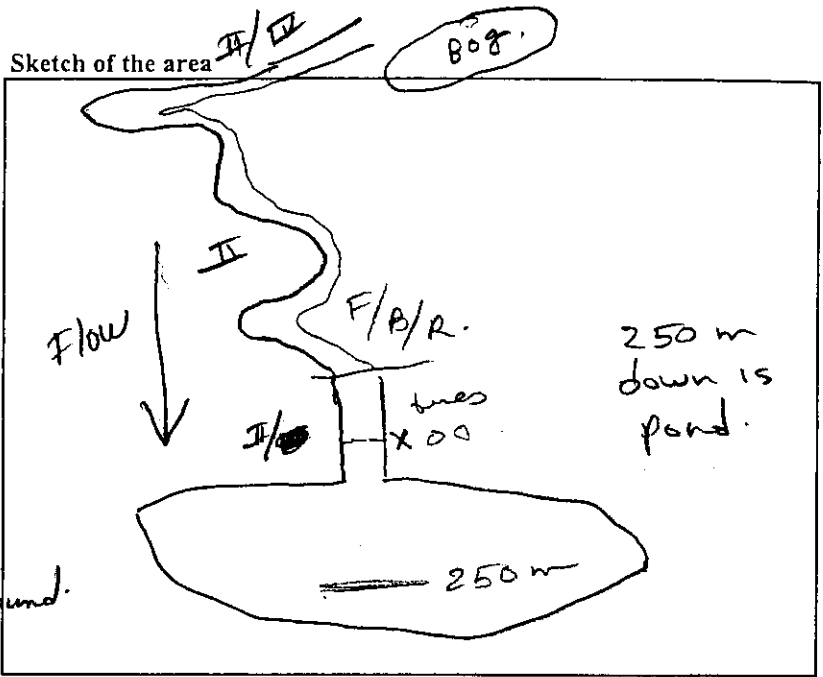
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{50%}	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm gravel 2mm - 3 cm pebble 3 - 5 cm cobble 6-13 cm rubble 14-25 cm boulder 26 cm and up	Shallow gully 1 m Medium gully 2-3 m Deep gully ≥4 m Forest stream see over Flood plain see over Bog/Fen see over	Instream submergent/emergent vegetation Overhang grasses/shrubs within 1 m of water Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed yes

Temperature 4.60

pH 7.72

Conductivity 9.2

Dissolved Oxygen 12.57

Turbidity 7.8

Surface velocity 80 cms/min
31 cm / center of stream

Water Samples collected yes

Gradient (inclinometer) 2%

Ground Survey not Completed

Crossing less than 2 km² (on DWST list)

Bog drainage

Type IV (steady) flow

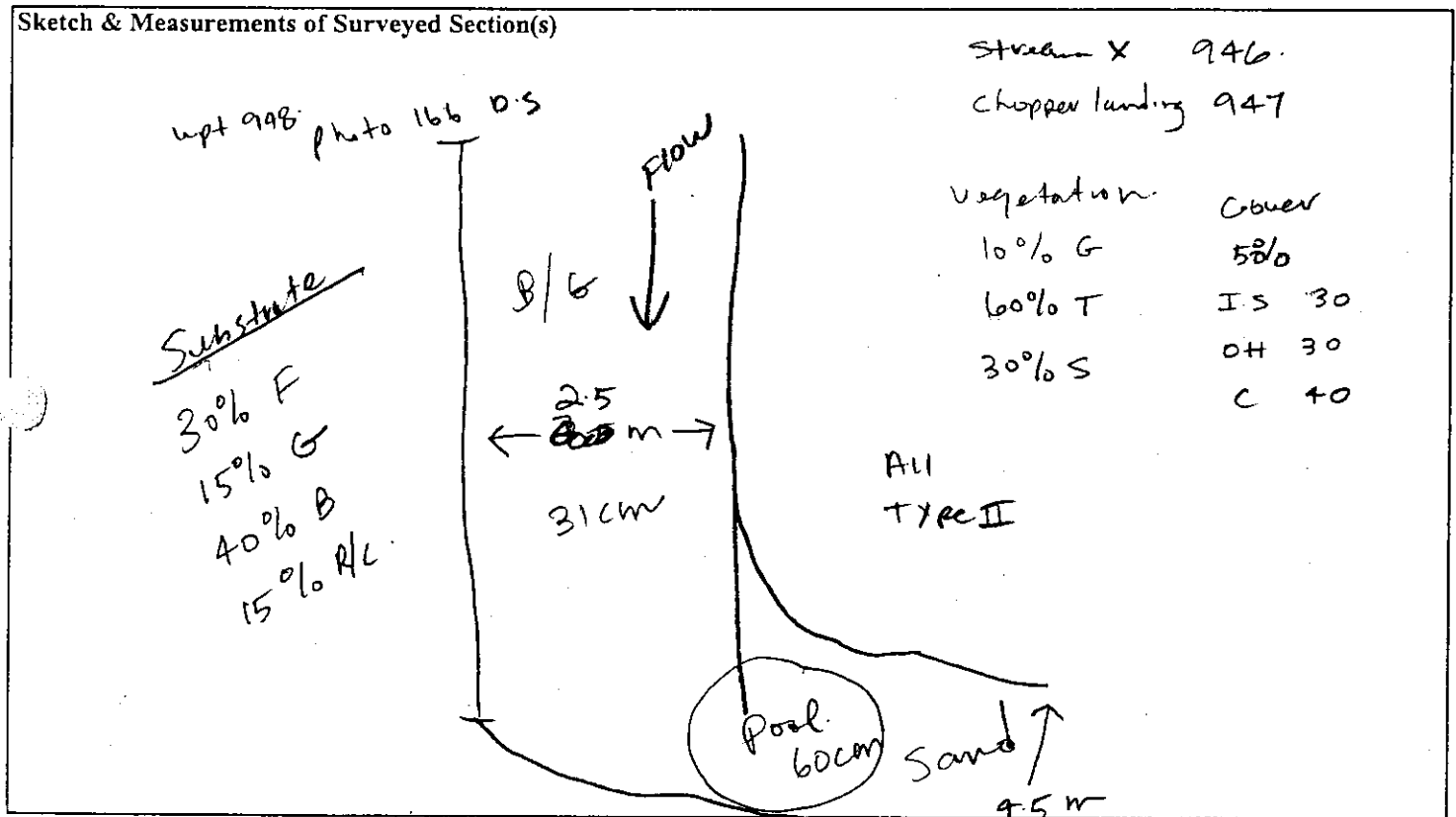
Type III (cascade/rapids) flow

No accessible by helicopter

Other: _____

Landing site 200 m

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

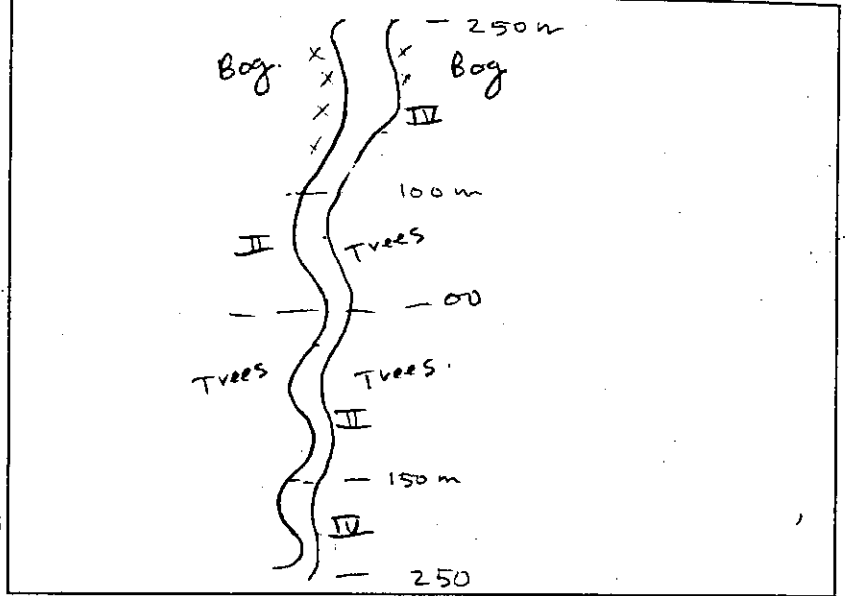
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input checked="" type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover 70	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#68

landing site ≈ 260

Ground survey completed

Ground Survey not Completed

Temperature 4.29

Crossing less than 2 km² (on DWST list)

pH 7.06

Bog drainage

Conductivity 7.5

Type IV (steady) flow

Dissolved Oxygen 10.81

Type III (cascade/rapids) flow

Turbidity 2.2

No accessible by helicopter

Surface velocity 104 Rev/min

Other: _____

middle of stream / 29 cm

Water Samples collected Yes

Gradient (inclinometer) 6%

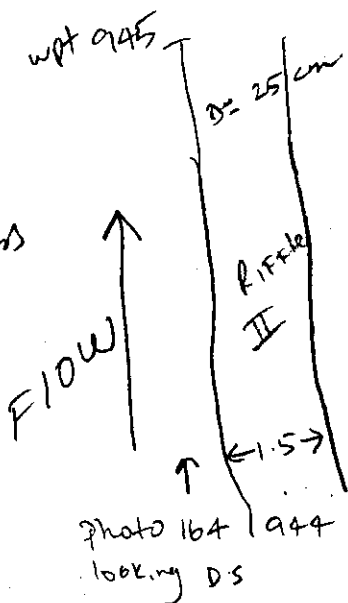
Sketch & Measurements of Surveyed Section(s)

Sept 30/02

942 Stream crossing

943 Helicopter landing site

60 Trees
30 Shrubs
10 Grass



Cover 70%
I.S. 40
C. 40
O.H. 20
B-60
R-10
G-5
Fines 25

Riffle flow throughout

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

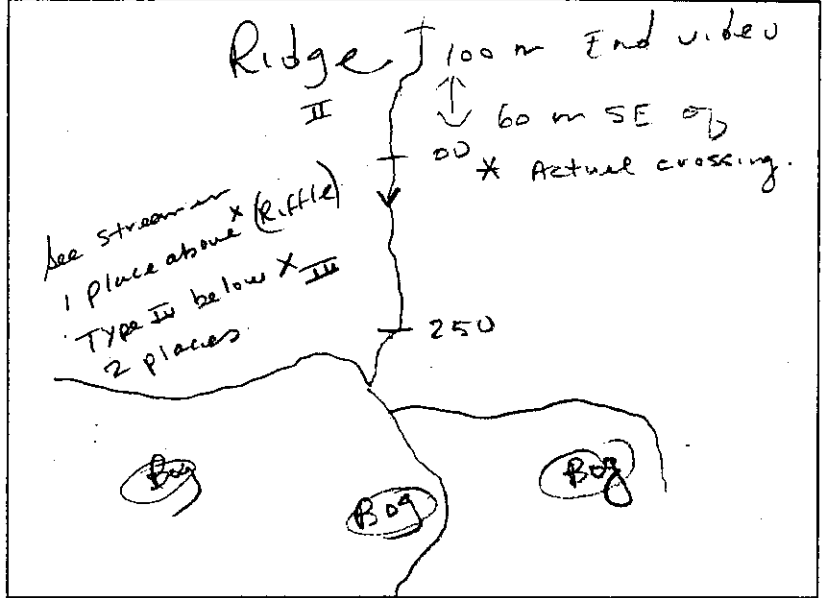
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input checked="" type="checkbox"/> 50	Riffle <input checked="" type="checkbox"/> 50	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 50	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 50	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/> 100	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/> 30	Trees <input checked="" type="checkbox"/> 70	
Cover %	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/> 30	Canopy <input checked="" type="checkbox"/> 70	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/> None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#69.

Ground Survey

Ground survey completed

Ground Survey not Completed ND

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow *not fish habitat*

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

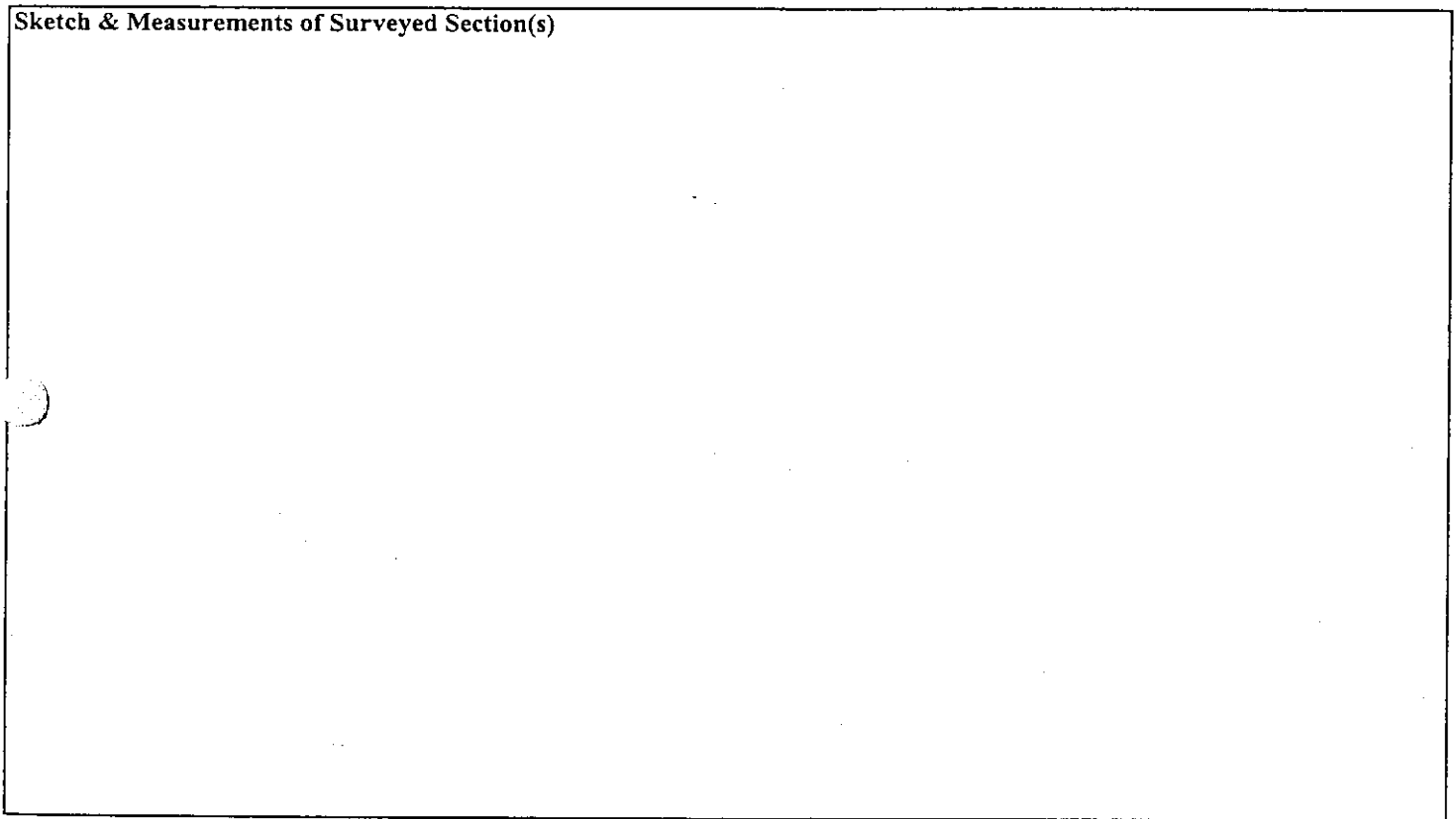
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 70

Date Sept 25/02

Surveyed by Bw/mH/Hm/Hm

Watershed Sagle

GPS Co-ord. See list

Aerial Photo #

Map Number 13 B/15

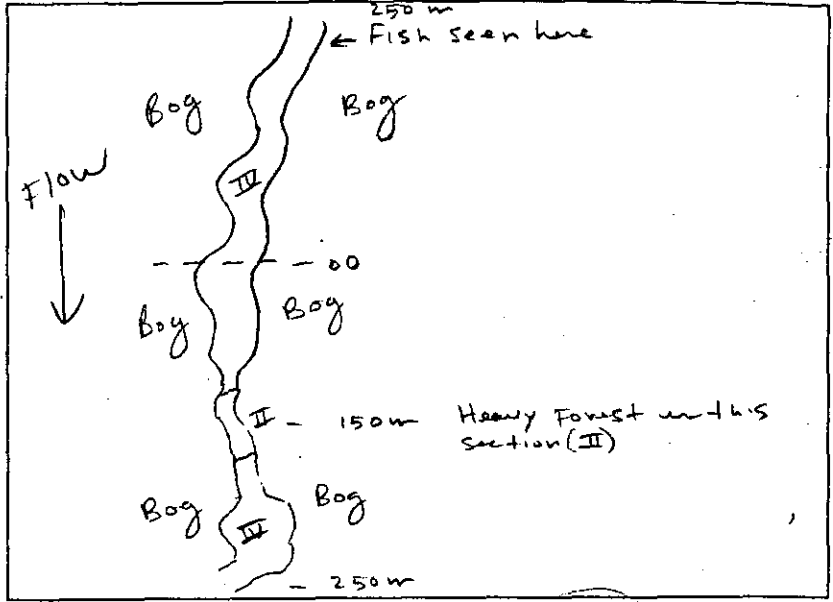
Photo Numbers 102

Video yes

Area Surveyed 500 m aerial

Water Samples NO

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>	
Flow Type	Steady <input checked="" type="checkbox"/> 80	Riffle <input checked="" type="checkbox"/> 20	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>	
Substrate Type	Fines <input checked="" type="checkbox"/> 60	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/> 20	Boulder <input checked="" type="checkbox"/> 20	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 20	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 80	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/> 20	Flood Plain <input type="checkbox"/> Bog/Fen <input checked="" type="checkbox"/> 80
Bank Vegetation	Bog <input checked="" type="checkbox"/> 40	Grasses <input checked="" type="checkbox"/> 20	Shrubs <input checked="" type="checkbox"/> 20	Trees <input checked="" type="checkbox"/> 20	
Cover	20% Instream <input checked="" type="checkbox"/> 20	Overhang <input checked="" type="checkbox"/> 50	Canopy <input checked="" type="checkbox"/> 30	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate

- finer less than 2 mm
- gravel 2mm - 3 cm
- pebble 3 - 5 cm
- cobble 6-13 cm
- rubble 14-25 cm
- boulder 26 cm and up

Backslope

- Shallow gully 1 m
- Medium gully 2-3 m
- Deep gully ≥4 m
- Forest stream see over
- Flood plain see over
- Bog/Fen see over

Cover

- Instream submergent/emergent vegetation
- Overhang grasses/shrubs within 1 m of water
- Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#70 Landing site on site

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

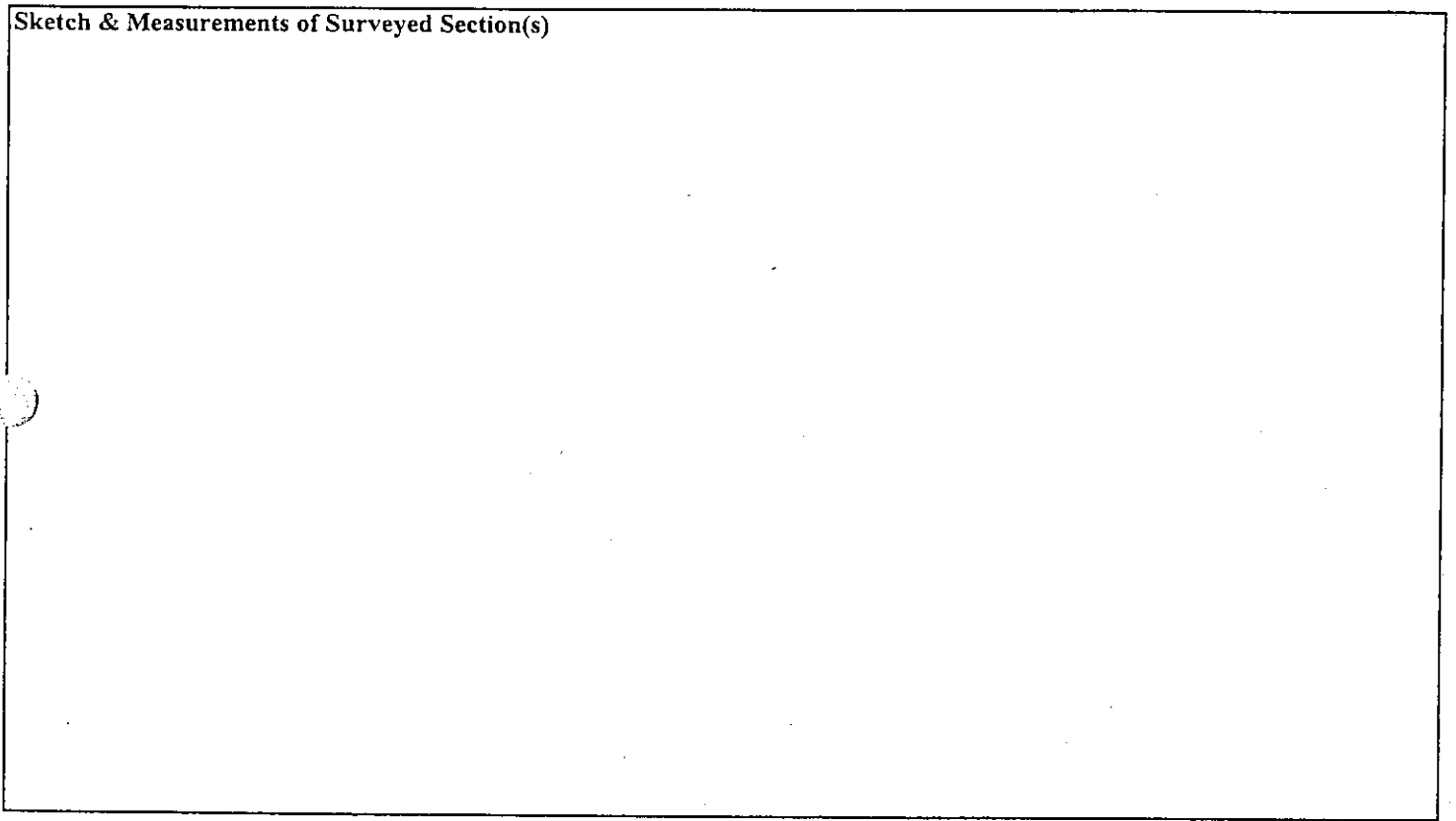
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

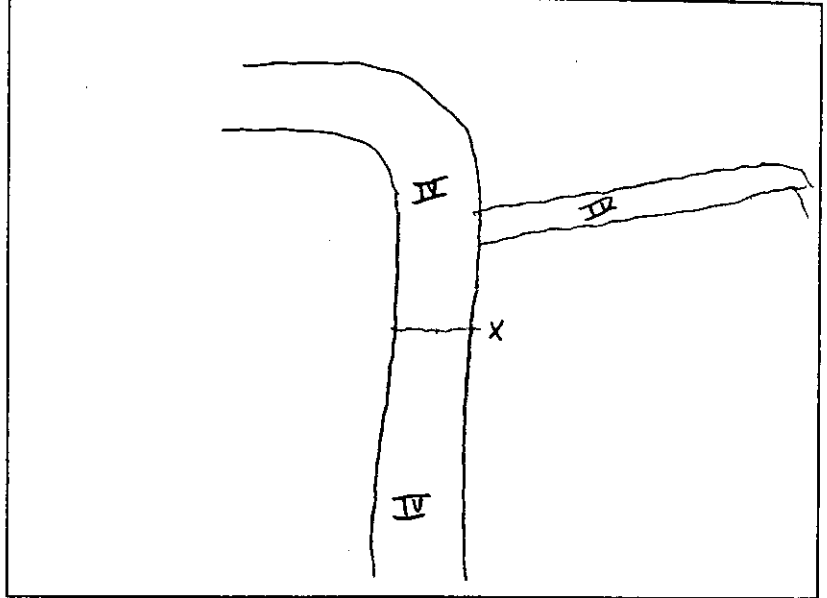
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox" value="80"/>	>20 m <input type="checkbox" value="20"/>		
Flow Type	Steady <input type="checkbox" value="95"/>	Riffle <input type="checkbox" value="5"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox" value="60"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="20"/>	Boulder <input type="checkbox" value="20"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox" value="5"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox" value="95"/>		
Bank Material	Fines <input type="checkbox" value="60"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="20"/>	Boulder <input type="checkbox" value="20"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="60"/>	Trees <input type="checkbox" value="40"/>		
Cover ^{5%}	Instream <input type="checkbox" value="60"/>	Overhang <input type="checkbox" value="30"/>	Canopy <input type="checkbox" value="10"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	'Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#71

Swamp Pt on River

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

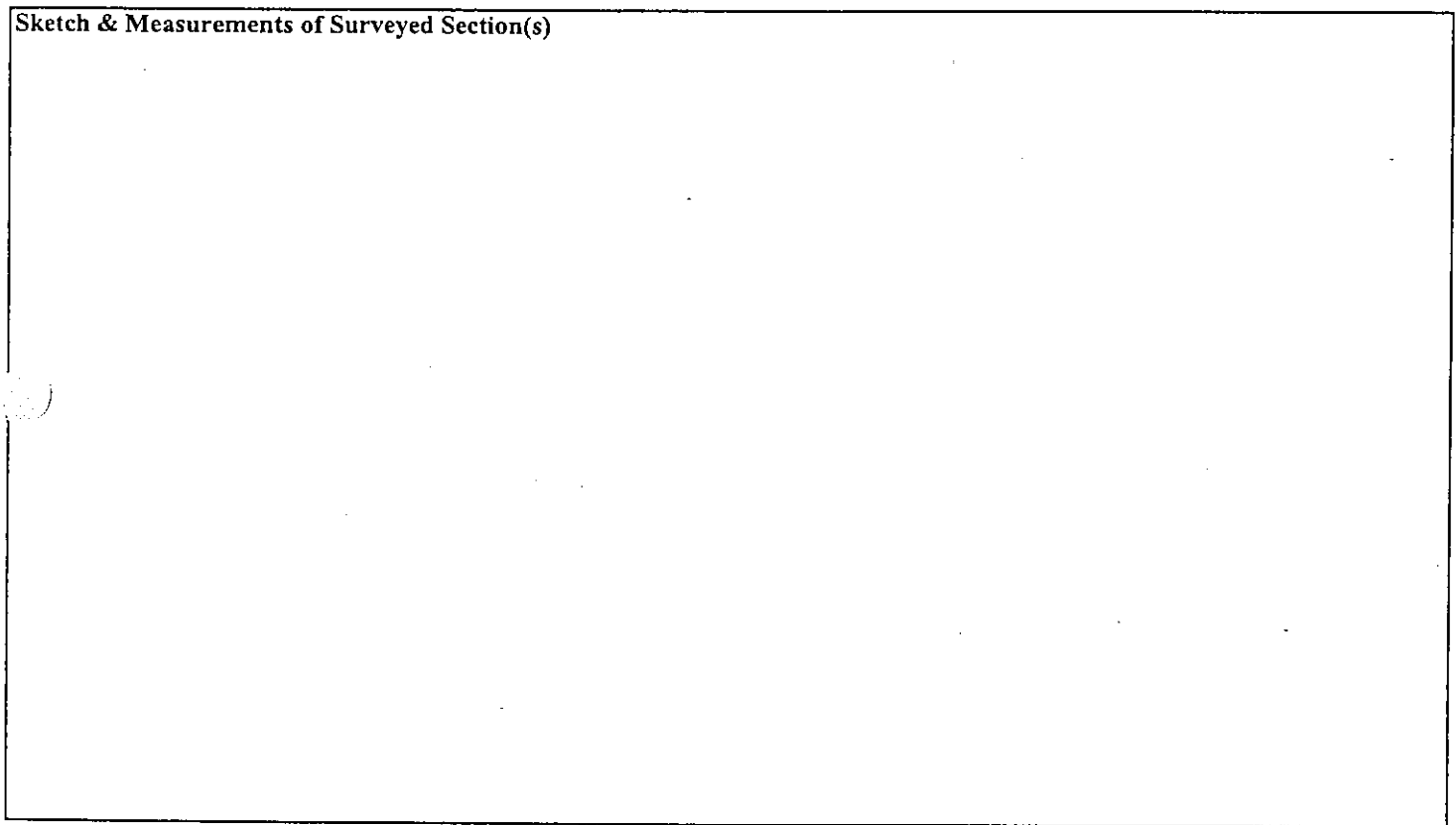
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

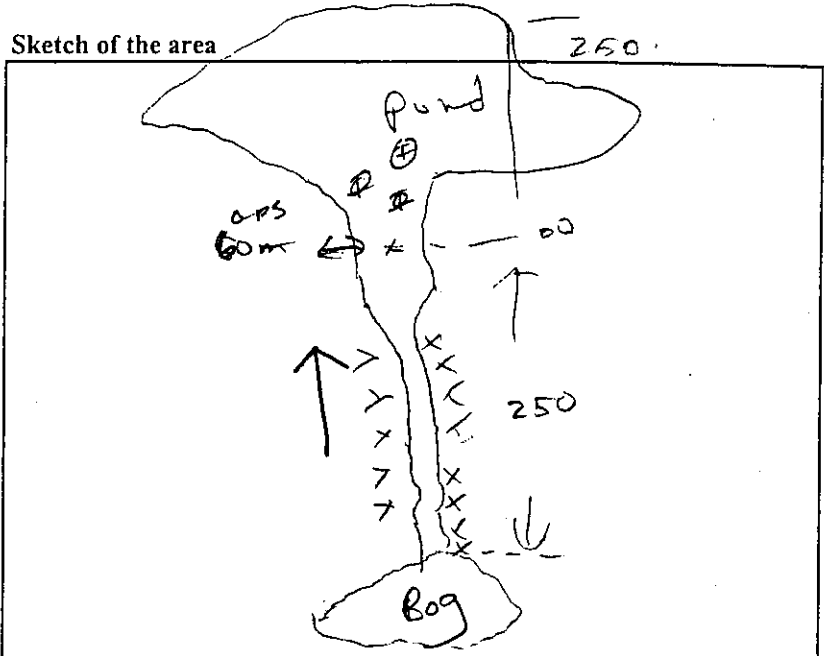
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



						Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="text" value="80"/>	2 - 5 m <input type="text" value="20"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="text" value="100"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="text" value="80"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="text" value="10"/>	Boulder <input type="text" value="10"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="text" value="100"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="text" value="20"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="text" value="80"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="text" value="10"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="50"/>			
Cover ^{55%}	Instream <input type="text" value="10"/>	Overhang <input type="text" value="40"/>	Canopy <input type="text" value="50"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

72

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

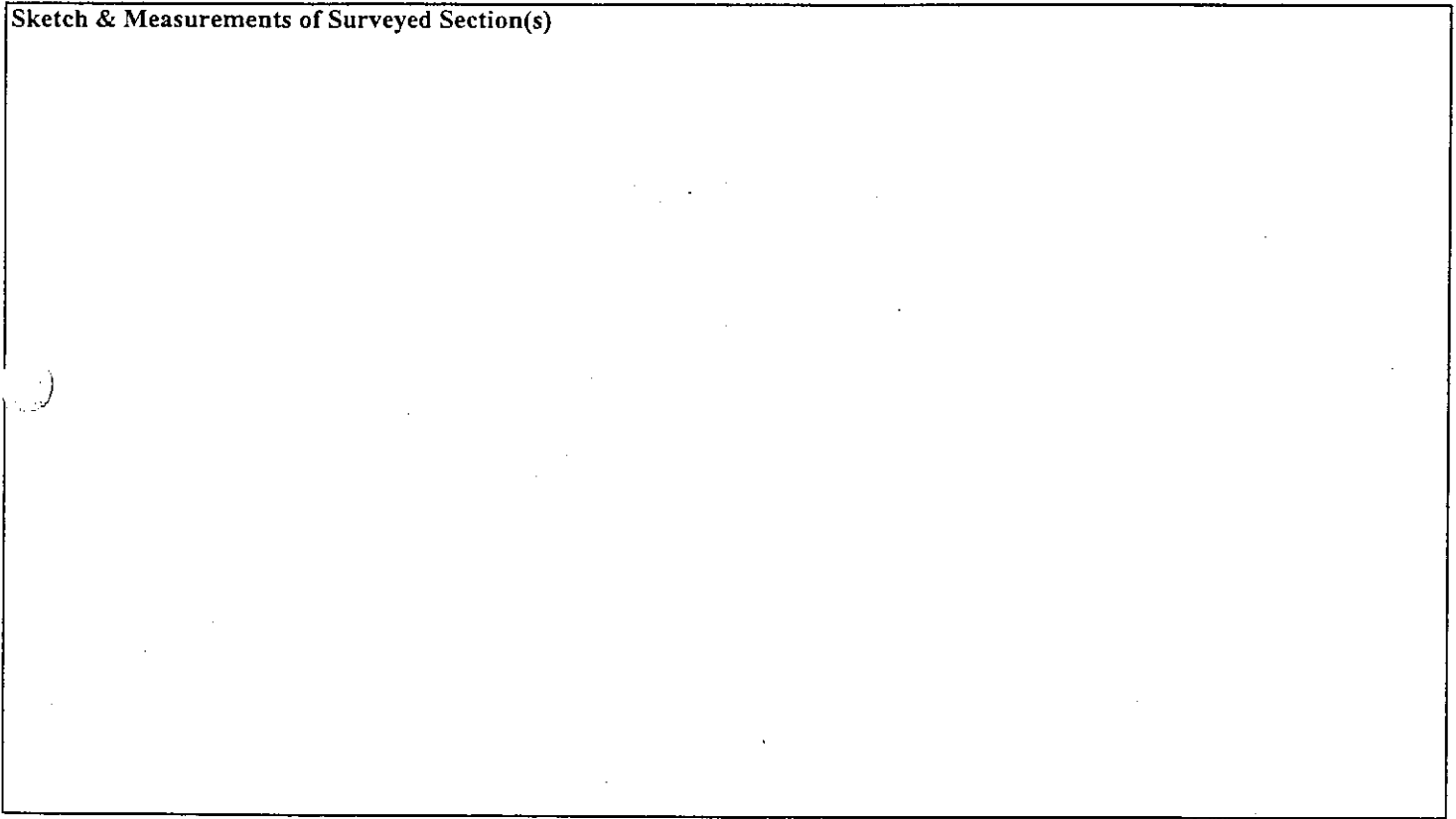
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

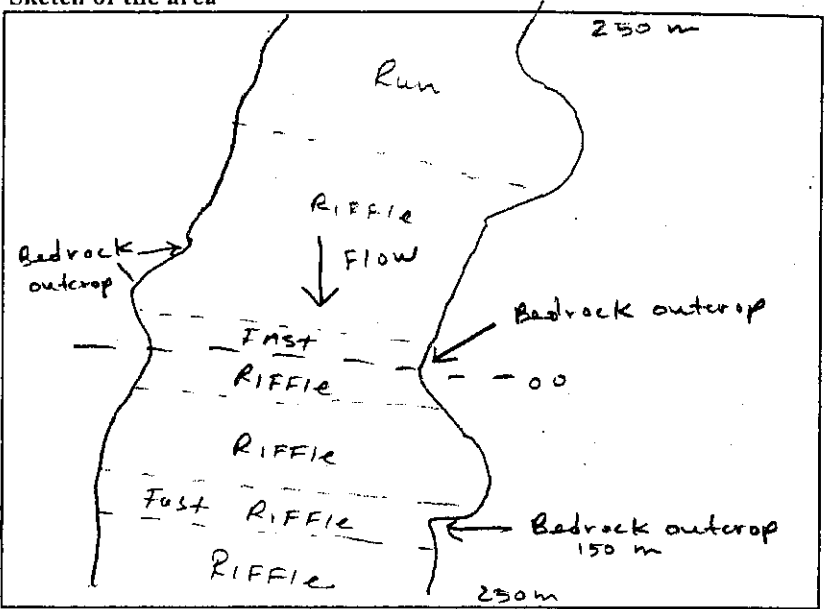
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox" value="50"/>	>2 m <input type="checkbox" value="50"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input checked="" type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox" value="100"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="30"/>	Boulder <input type="checkbox" value="60"/>	Bedrock <input type="checkbox" value="10"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox" value="20"/>	Boulder <input type="checkbox" value="60"/>	Bedrock <input type="checkbox" value="20"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input checked="" type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox" value="10"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="50"/>			
Cover ^{50%}	Instream <input type="checkbox" value="95"/>	Overhang <input type="checkbox" value="5"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed **yes**

Ground Survey not Completed

Temperature **6.09**

Crossing less than 2 km² (on DWST list)

pH **7.51**

Bog drainage

Conductivity **5.6**

Type IV (steady) flow

Dissolved Oxygen **10.72**

Type III (cascade/rapids) flow

Turbidity **9.2**

No accessible by helicopter

Surface velocity **120 Revs/Min**

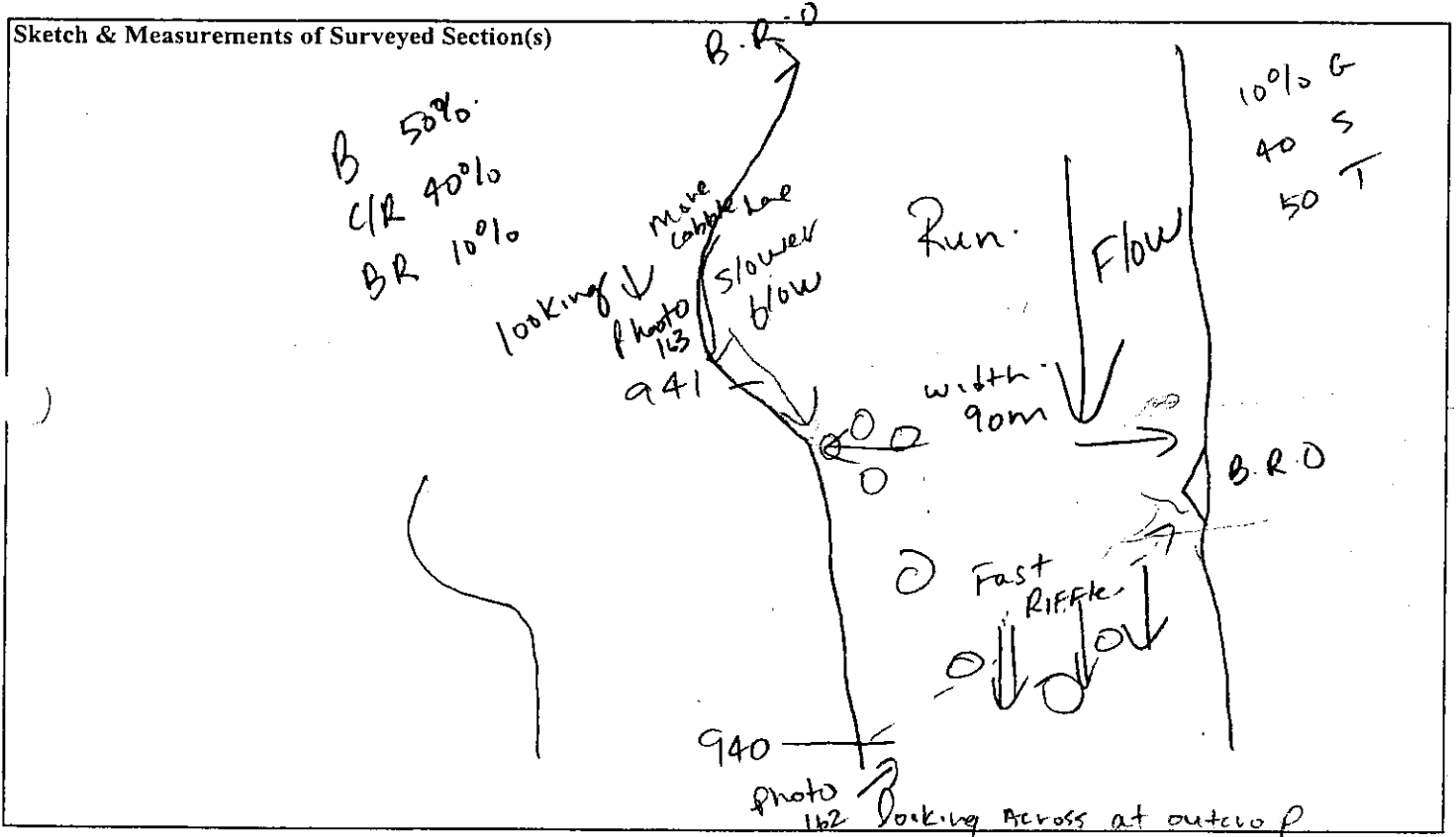
Other: _____

42 cm / 3 meter FROM SHORE
Water Samples collected **yes**

Gradient (inclinometer) **1.5%**

73. *Can Land on River*

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

Could not see stream well enough to classify.

Comments

Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox" value="40"/>	Trees <input type="checkbox" value="60"/>		
Cover %	Instream <input type="checkbox"/>	Overhang <input type="checkbox" value="40"/>	Canopy <input type="checkbox" value="60"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope	Cover
fines less than 2 mm gravel 2mm - 3 cm pebble 3 - 5 cm cobble 6-13 cm rubble 14-25 cm boulder 26 cm and up	Shallow gully 1 m Medium gully 2-3 m Deep gully ≥4 m Forest stream see over Flood plain see over Bog/Fen see over	Instream submergent/emergent vegetation Overhang grasses/shrubs within 1 m of water Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#74

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

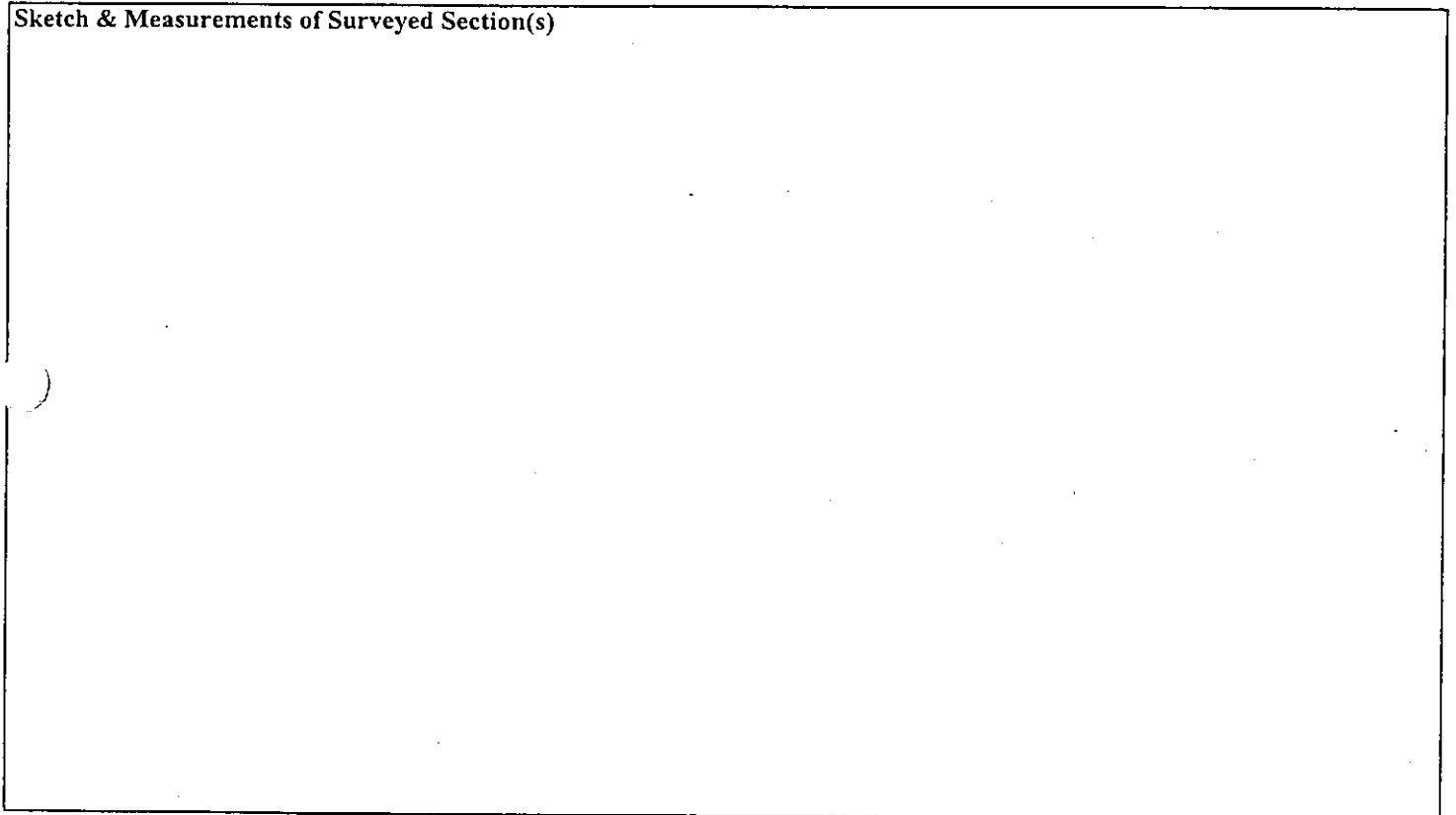
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 75

Date Sept 25/02

Surveyed by Bw/mH/Hm/DJ

Watershed Eagle

GPS Co-ord. See list

Aerial Photo #

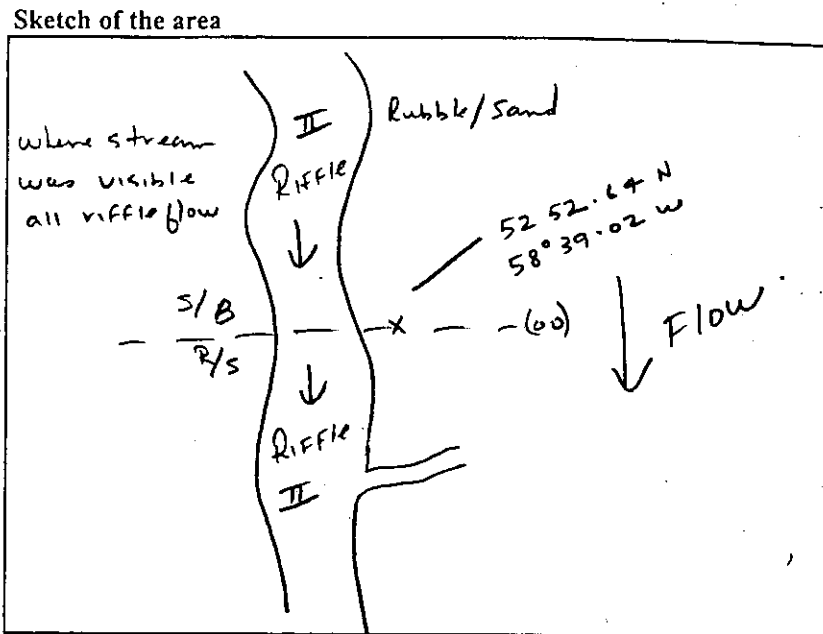
Map Number 13 B/15

Photo Numbers 108

Video Yes

Area Surveyed 500m aerial.

Water Samples NO



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>		
Cover	90% Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#75

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

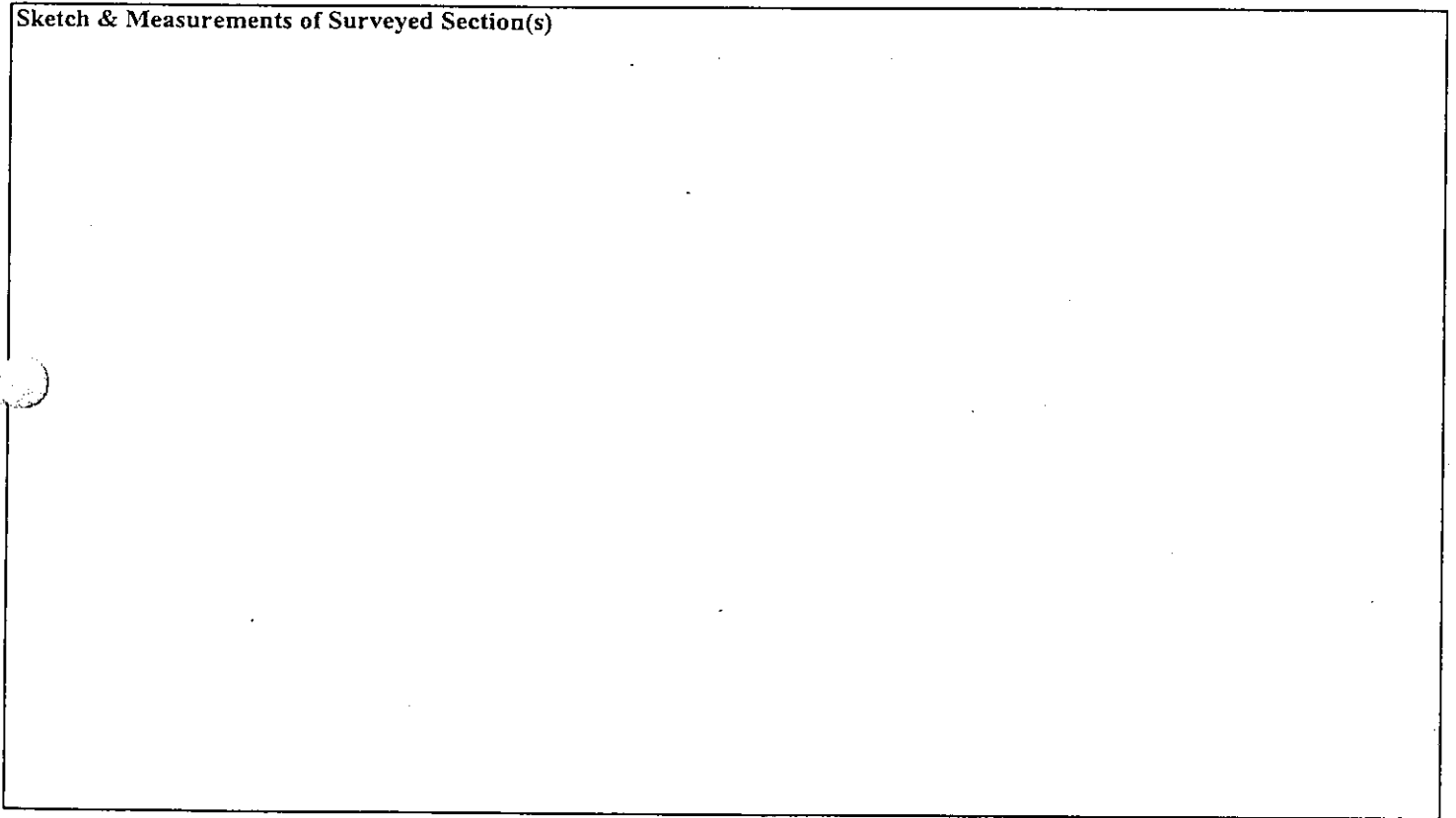
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

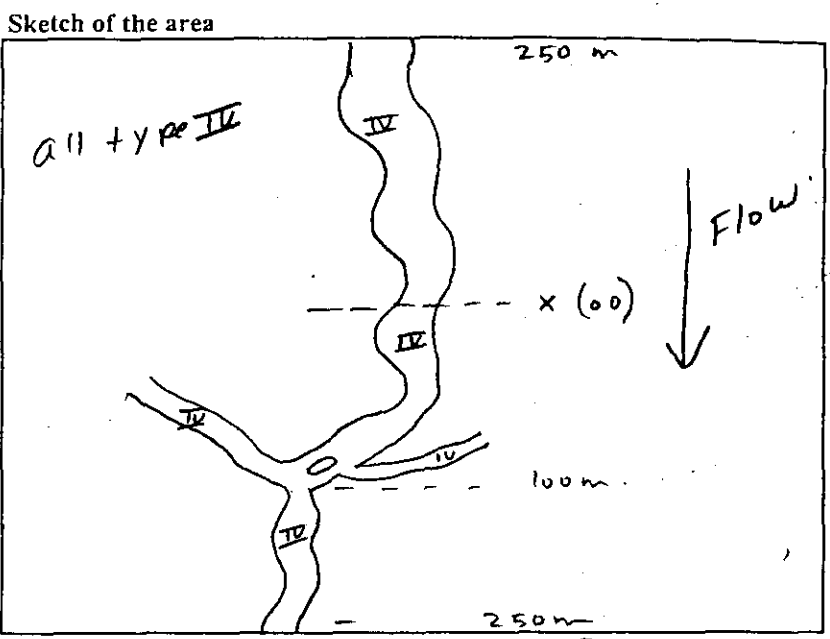
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



					Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>		
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover	10% Instream <input type="checkbox"/>	50 Overhang <input type="checkbox"/>	40 Canopy <input type="checkbox"/>	10 None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1% <input type="checkbox"/>	1 - 3% <input type="checkbox"/>	3 - 5% <input type="checkbox"/>	>5% <input type="checkbox"/>		

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#76

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

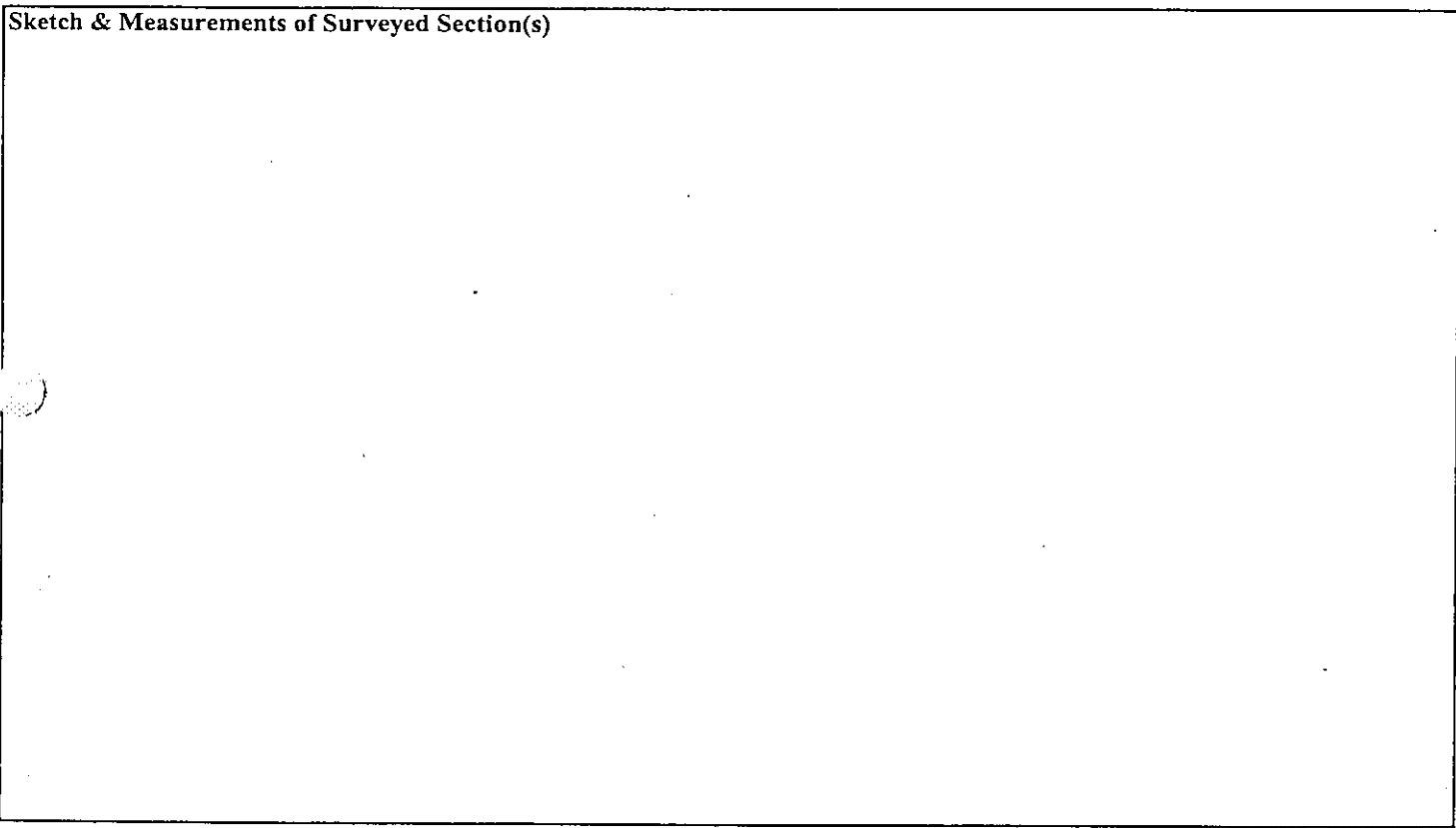
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 77

Date Sept 25/02

Surveyed by BW/mH/HM/PJ

Watershed Eagle

GPS Co-ord. See list

Aerial Photo #

Map Number 13 B/15

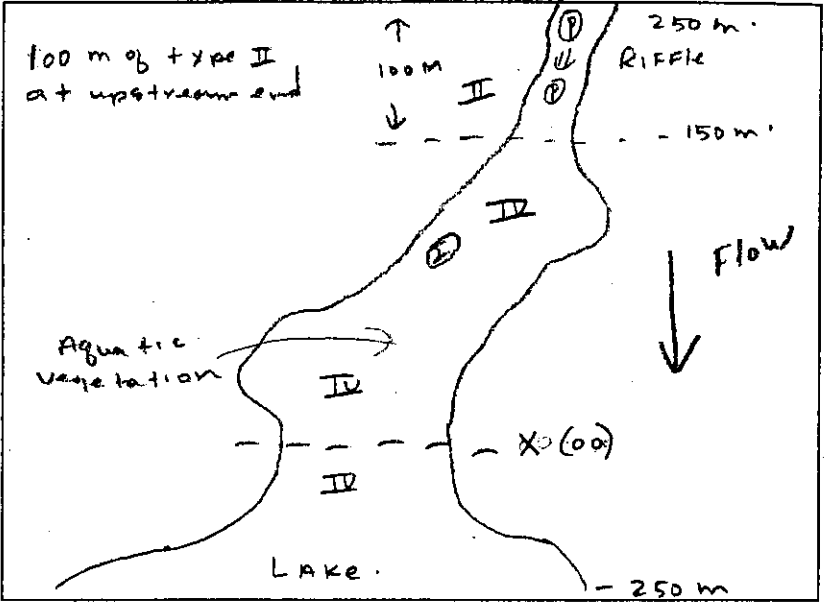
Photo Numbers 110

Video Yes

Area Surveyed 500m aerial

Water Samples NO

Sketch of the area



						Comments	
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover <u>15%</u>	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Temperature

pH

Conductivity

Dissolved Oxygen

Turbidity

Surface velocity

Water Samples collected

Gradient (inclinometer)

#27.

Ground Survey not Completed NO

Can land on site
but mostly Type I?

Crossing less than 2 km² (on DWST list)

Bog drainage

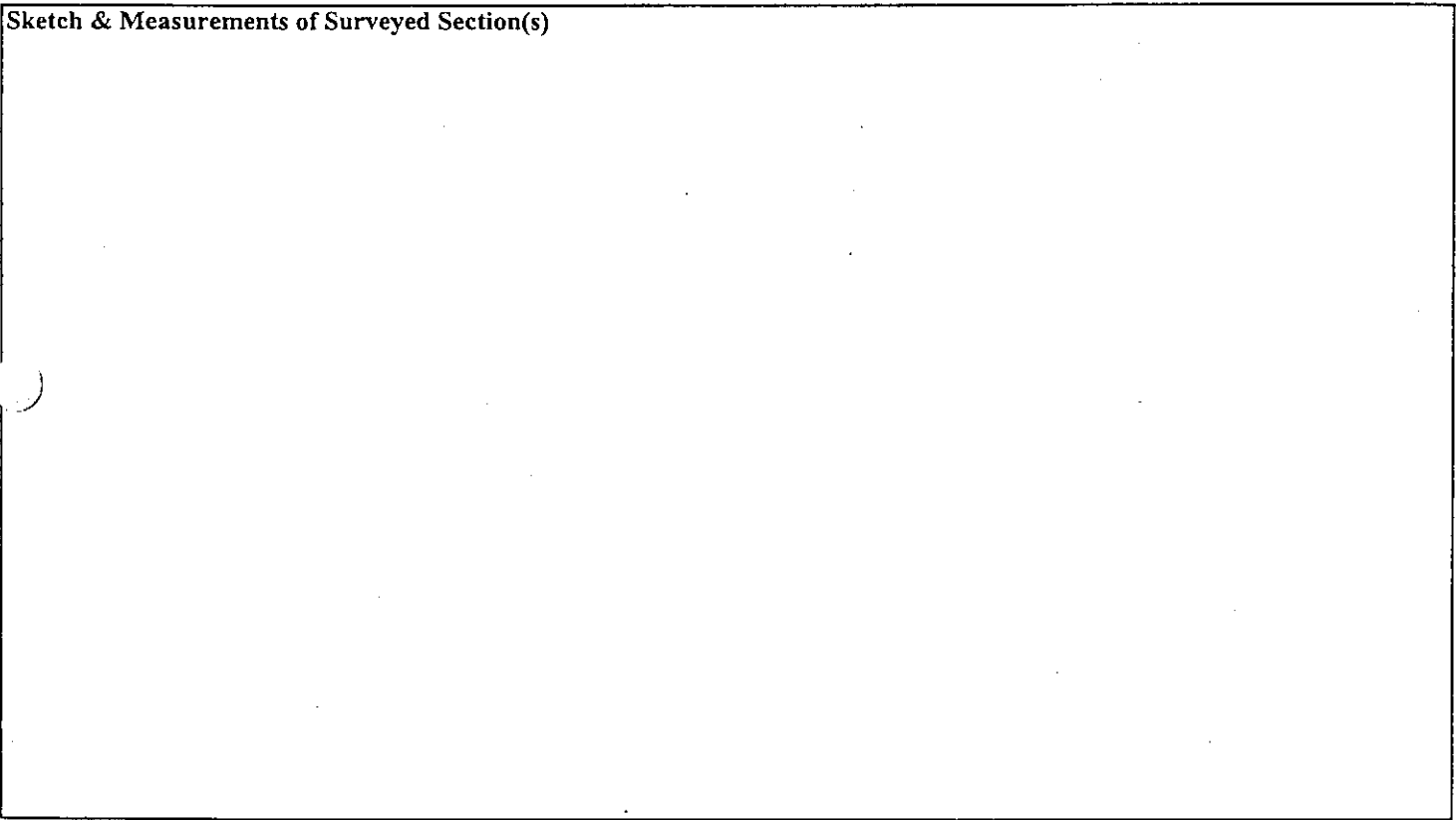
Type IV (steady) flow

Type III (cascade/rapids) flow

No accessible by helicopter

Other: _____

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

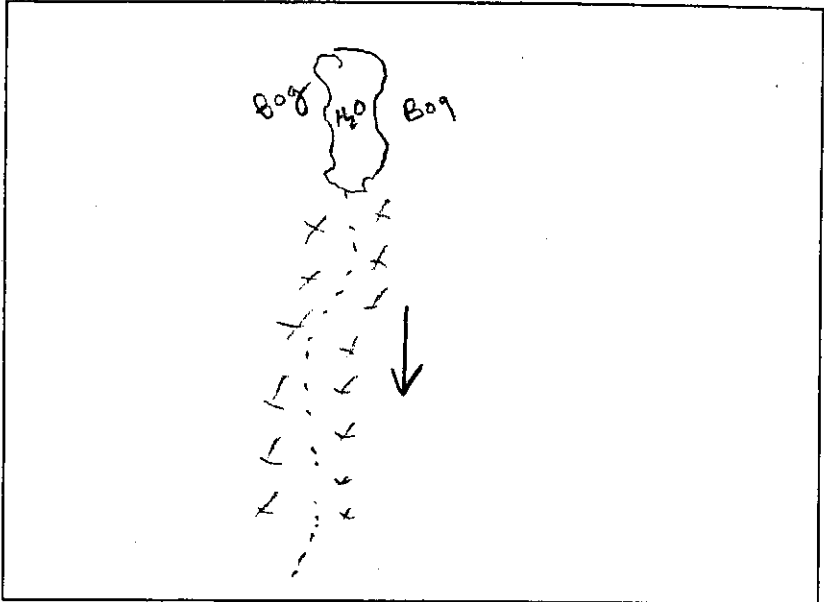
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{ab}	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate: fines less than 2 mm, gravel 2mm - 3 cm, pebble 3 - 5 cm, cobble 6-13 cm, rubble 14-25 cm, boulder 26 cm and up

Backslope: Shallow gully 1 m, Medium gully 2-3 m, Deep gully ≥4 m, Forest stream see over, Flood plain see over, Bog/Fen see over

Cover: Instream submergent/emergent vegetation, Overhang grasses/shrubs within 1 m of water, Canopy trees > 1m above water can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

78

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

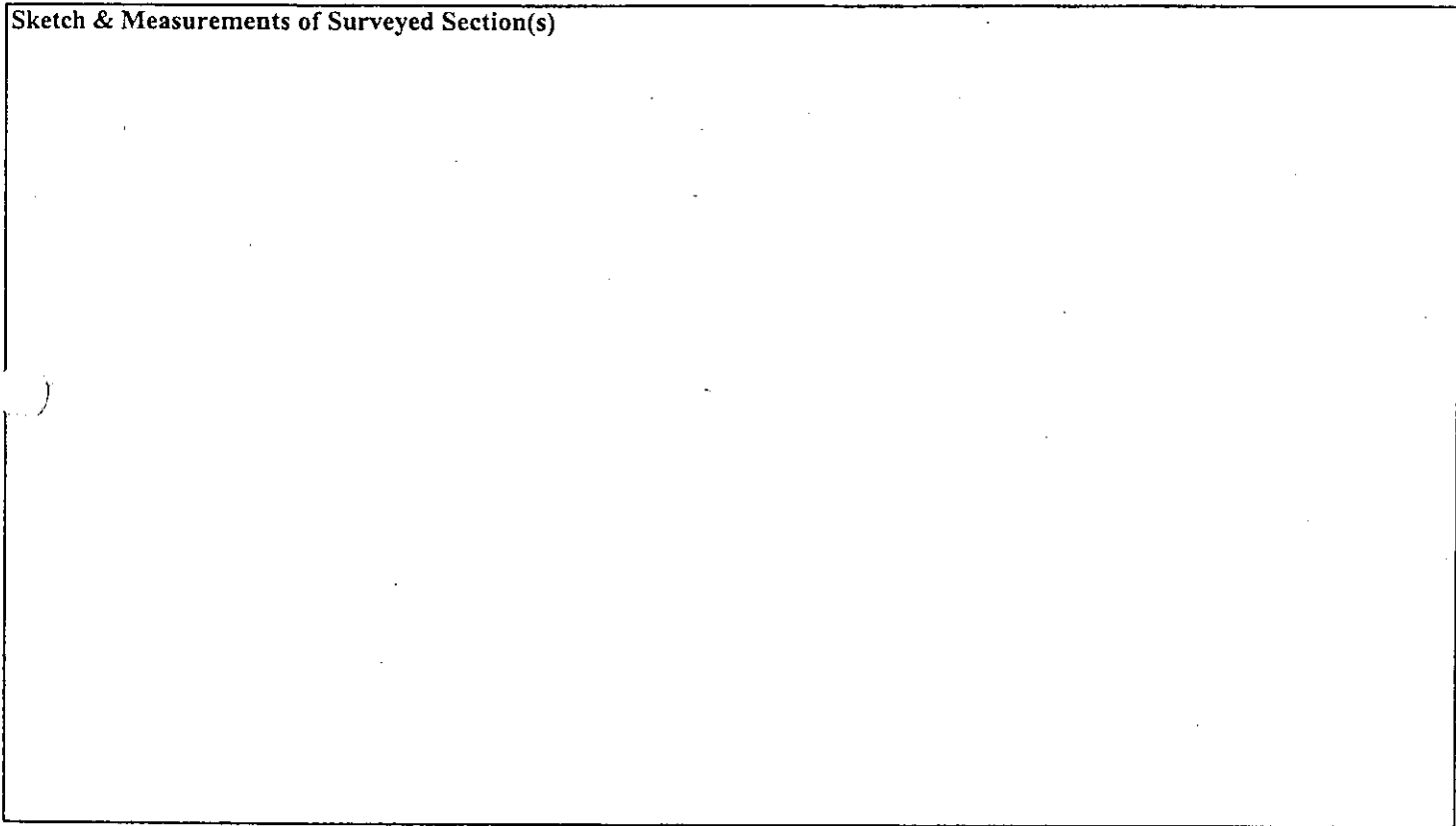
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

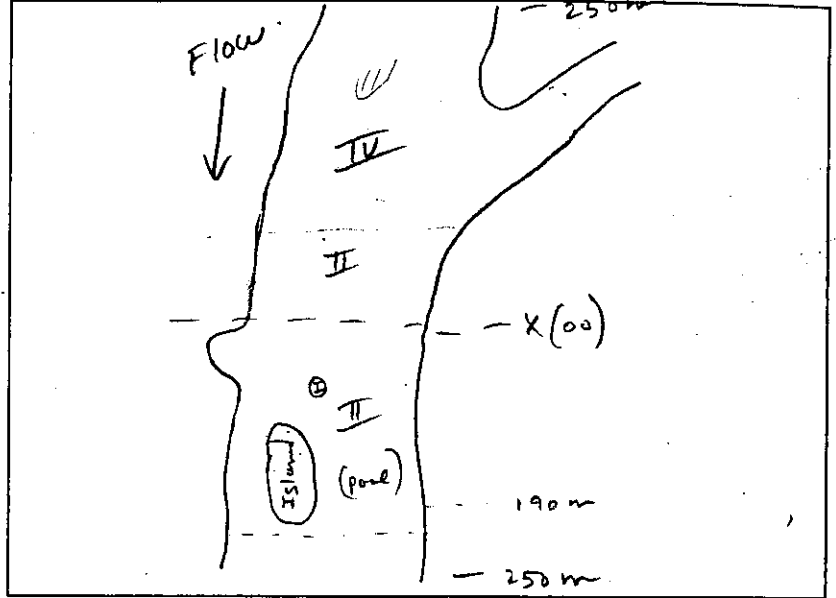
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input type="text" value="30"/>	1 - 2 m <input type="text" value="30"/>	>2 m <input type="text" value="40"/>	Unknown <input type="text"/>	
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text"/>	5 - 20 m <input type="text"/>	>20 m <input checked="" type="checkbox"/>	
Flow Type	Steady <input type="text" value="50"/>	Riffle <input type="text" value="40"/>	Rapids <input type="text"/>	Pools <input type="text" value="10"/>	
Substrate Type	Fines <input type="text" value="30"/>	Gravel <input type="text"/>	Cobble/Rubble <input type="text" value="40"/>	Boulder <input type="text" value="30"/>	Bedrock <input type="text"/> Unknown <input type="text"/>
Bank Habitat	Type I <input type="text"/>	Type II <input type="text" value="50"/>	Type III <input type="text"/>	Type IV <input type="text" value="50"/>	
Bank Material	Fines <input type="text"/>	Gravel/Pebble <input type="text"/>	Cobble/Rubble <input type="text"/>	Boulder <input type="text"/>	Bedrock <input type="text"/> Unknown <input type="text"/>
Backslope	Shallow Gully <input type="text"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input type="text"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/> Bog/Fen <input type="text"/>
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text" value="10"/>	Shrubs <input type="text" value="30"/>	Trees <input type="text" value="60"/>	
Cover (5)	Instream <input type="text" value="60"/>	Overhang <input type="text" value="20"/>	Canopy <input type="text" value="20"/>	None <input type="text"/>	
Potential Obstruction	Falls <input type="text"/>	Rapids <input type="text"/>	Chute <input type="text"/>	Cascade <input type="text"/>	Intermittent <input type="text"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="text"/>	1 - 3 % <input type="text"/>	3 - 5 % <input type="text"/>	>5 % <input type="text"/>	

Substrate

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE

79.

(Can land on River)

Ground Survey

Ground survey completed YES

Ground Survey not Completed

Temperature 5.16

Crossing less than 2 km² (on DWST list)

pH 7.09

Bog drainage

Conductivity 2.4

Type IV (steady) flow

Dissolved Oxygen 10.90

Type III (cascade/rapids) flow

Turbidity 8.9

No accessible by helicopter

Surface velocity 58 RPM

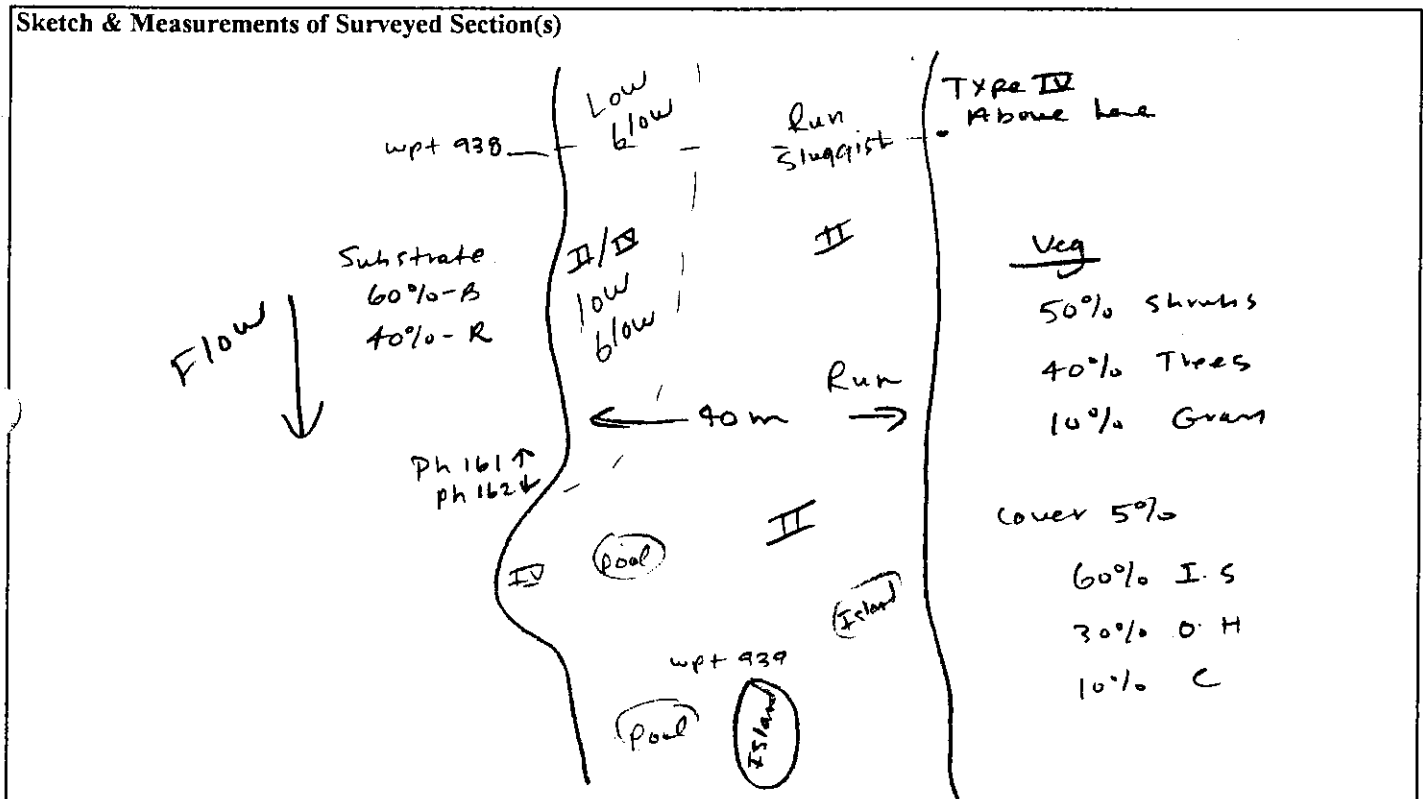
Other: _____

35 cm center of stream

Water Samples collected YES

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

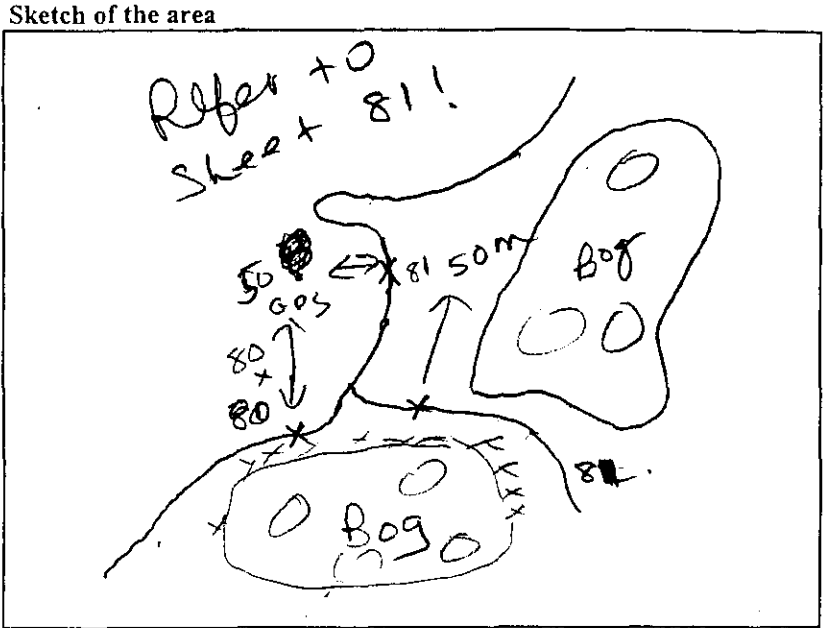
Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 80
 Date Sept 25/02
 Surveyed by BW/mH/HM/PJ
 Watershed Geagle
 GPS Co-ord.
 Aerial Photo #
 Map Number
 Photo Numbers 113
 Video Yes
 Area Surveyed 500 m aerial
 Water Samples NO



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow <input type="checkbox"/>	Medium <input type="checkbox"/>	Deep <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{80%}	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#80

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)

LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

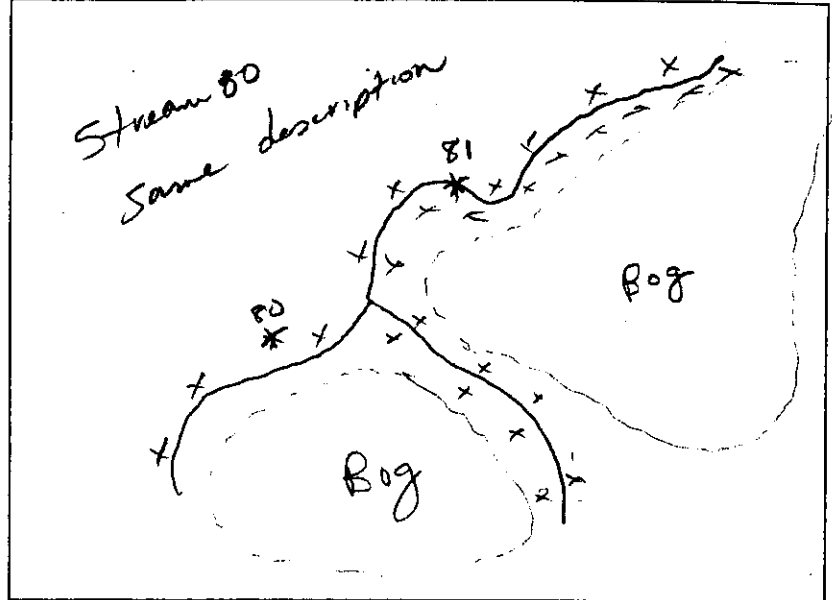
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ^{80%}	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope
fines less than 2 mm	Shallow gully 1 m
gravel 2mm - 3 cm	Medium gully 2-3 m
pebble 3 - 5 cm	Deep gully ≥ 4 m
cobble 6-13 cm	Forest stream see over
rubble 14-25 cm	Flood plain see over
boulder 26 cm and up	Bog/Fen see over

Cover	
Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water
	can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#81

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

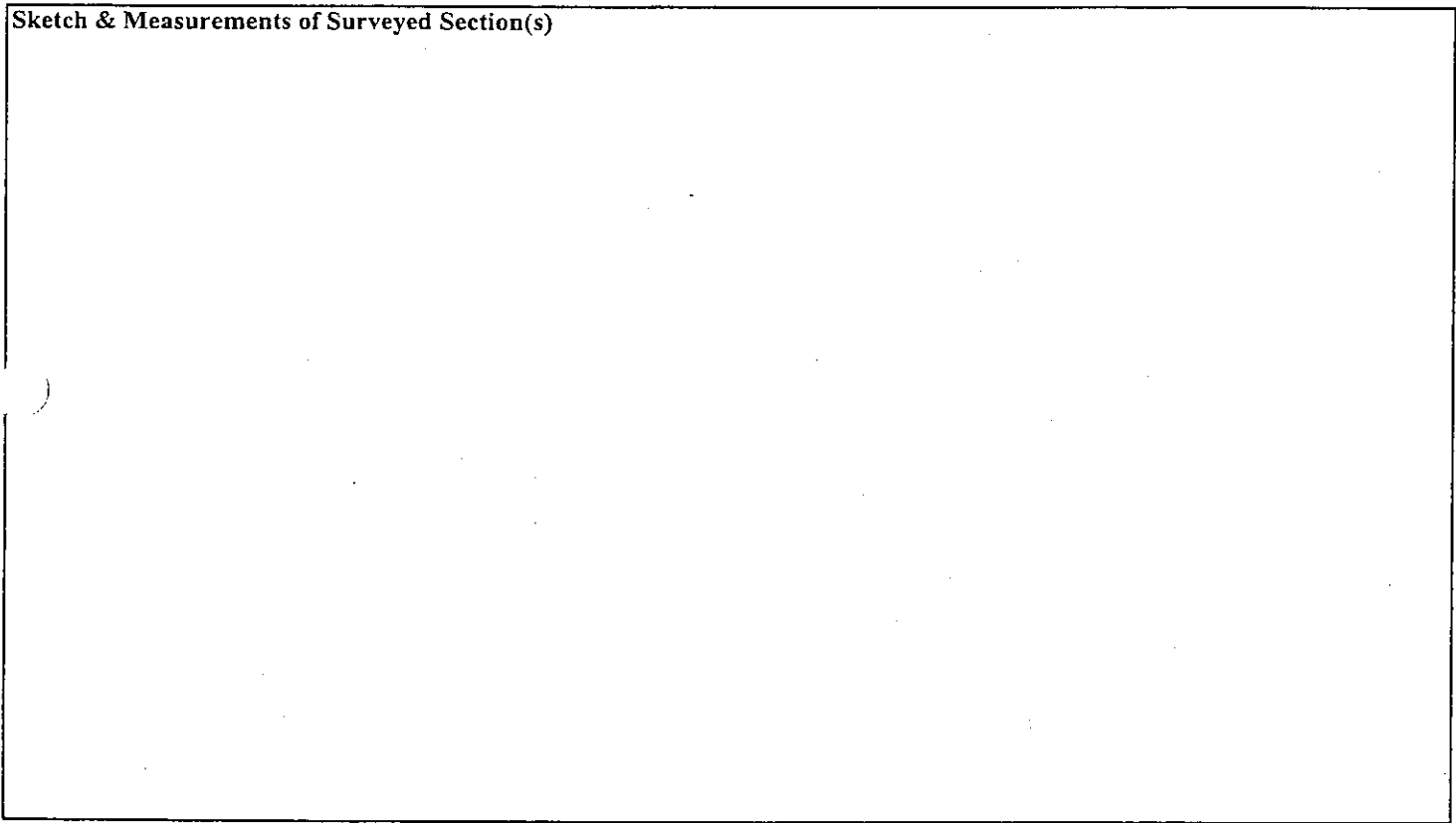
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

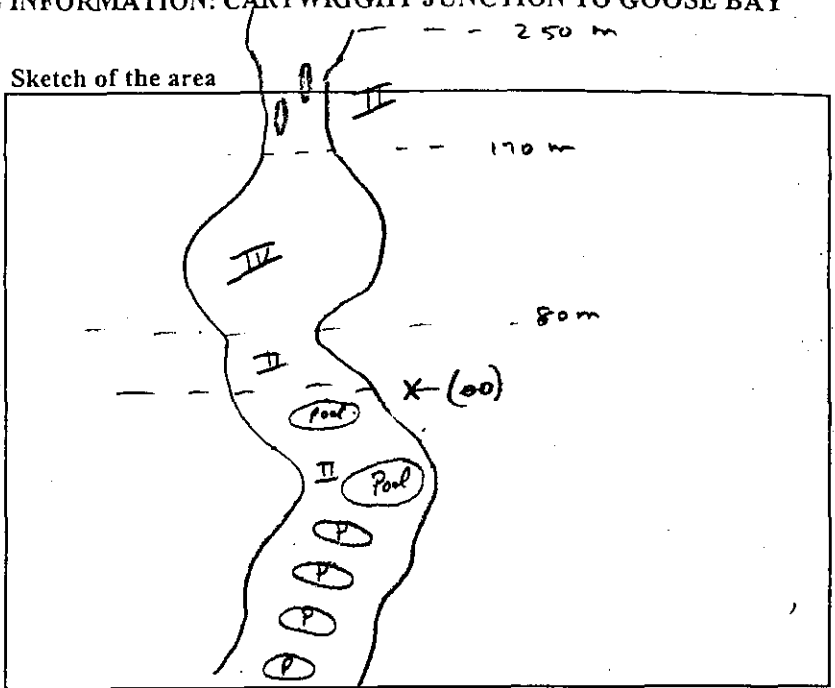
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input type="text" value="70"/>	1 - 2 m <input type="text" value="30"/>	>2 m <input type="text"/>	Unknown <input type="text"/>			
Channel Width	0 - 2 m <input type="text"/>	2 - 5 m <input type="text" value="90"/>	5 - 20 m <input type="text" value="10"/>	>20 m <input type="text"/>			
Flow Type	Steady <input type="text" value="15"/>	Riffle <input type="text" value="50"/>	Rapids <input type="text"/>	Pools <input type="text" value="35"/>			
Substrate Type	Fines <input type="text" value="10"/>	Gravel <input type="text"/>	Cobble/Rubble <input type="text" value="50"/>	Boulder <input type="text" value="40"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Bank Habitat	Type I <input type="text"/>	Type II <input type="text" value="80"/>	Type III <input type="text"/>	Type IV <input type="text" value="20"/>			
Bank Material	Fines <input type="text" value="10"/>	Gravel/Pebble <input type="text"/>	Cobble/Rubble <input type="text" value="50"/>	Boulder <input type="text" value="40"/>	Bedrock <input type="text"/>	Unknown <input type="text"/>	
Backslope	Shallow Gully <input type="text"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input type="text"/>	Forest Stream <input type="text"/>	Flood Plain <input type="text"/>	Bog/Fen <input type="text"/>	
Bank Vegetation	Bog <input type="text"/>	Grasses <input type="text" value="10"/>	Shrubs <input type="text" value="40"/>	Trees <input type="text" value="50"/>			
Cover	Instream <input type="text" value="30"/>	Overhang <input type="text" value="40"/>	Canopy <input type="text" value="30"/>	None <input type="text"/>			
Potential Obstruction	Falls <input type="text"/>	Rapids <input type="text"/>	Chute <input type="text"/>	Cascade <input type="text"/>	Intermittent <input type="text"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="text"/>	1 - 3 % <input type="text"/>	3 - 5 % <input type="text"/>	>5 % <input type="text"/>			

Substrate

finer less than 2 mm

gravel 2mm - 3 cm

pebble 3 - 5 cm

cobble 6-13 cm

rubble 14-25 cm

boulder 26 cm and up

Backslope

Shallow gully 1 m

Medium gully 2-3 m

Deep gully ≥ 4 m

Forest stream see over

Flood plain see over

Bog/Fen see over

Cover

Instream submergent/emergent vegetation

Overhang grasses/shrubs within 1 m of water

Canopy trees > 1m above water can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#82

Very close landing site

Ground survey completed Yes

Ground Survey not Completed

Temperature 3.07

Crossing less than 2 km² (on DWST list)

pH 7.10

Bog drainage

Conductivity 3.1

Type IV (steady) flow

Dissolved Oxygen 11.16

Type III (cascade/rapids) flow

Turbidity 8.3

No accessible by helicopter

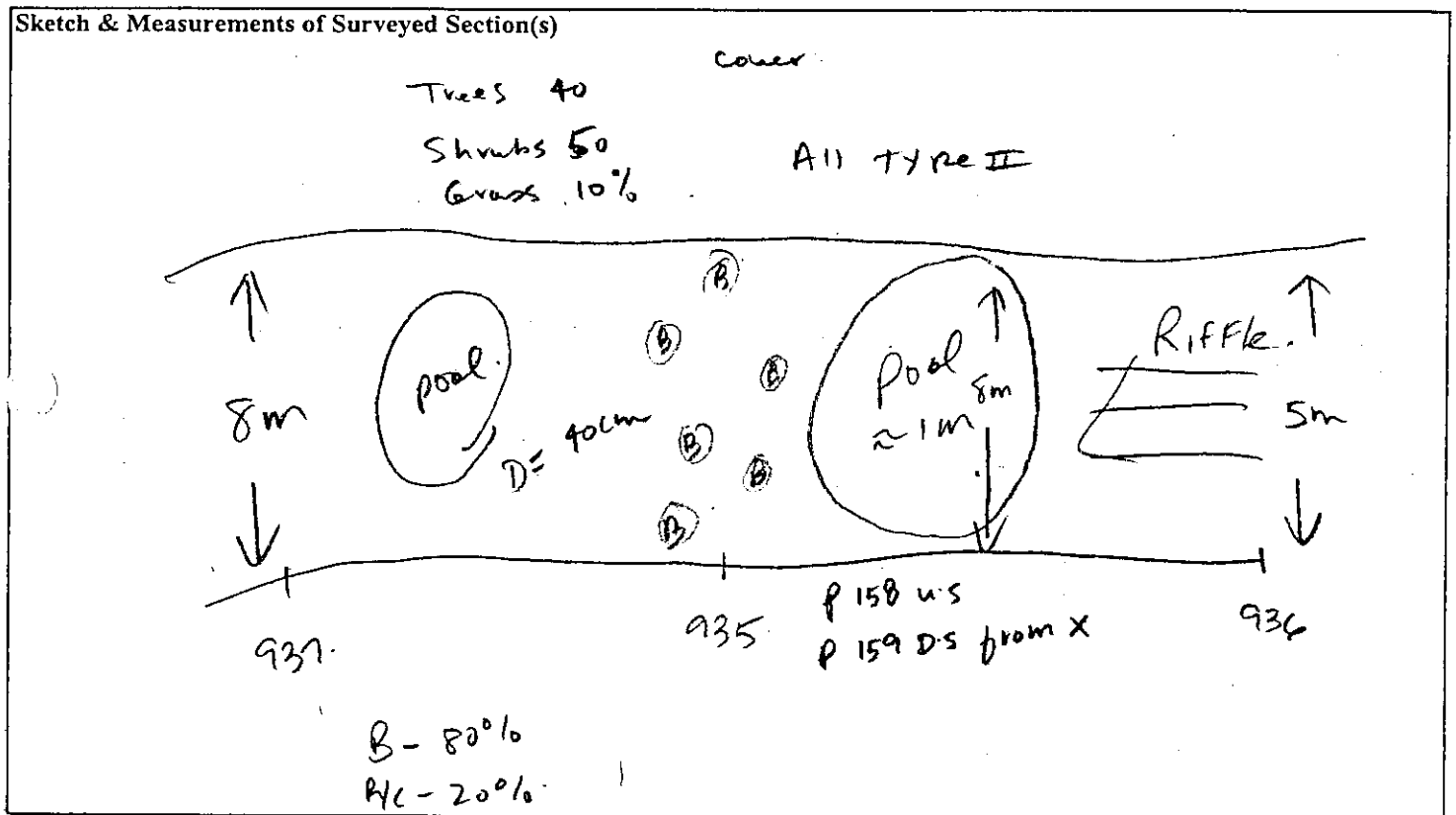
Surface velocity 42 Revs/min
28 cm / middle of stream

Other: _____

Water Samples collected Yes

Gradient (inclinometer) 2%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

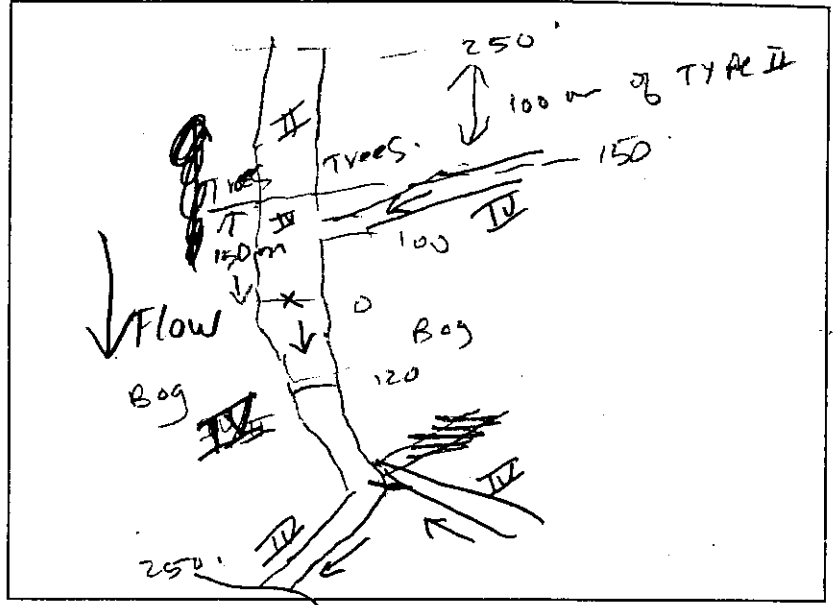
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox" value="100"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox" value="80"/>	Riffle <input checked="" type="checkbox" value="20"/>	Rapids <input checked="" type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox" value="80"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox" value="40"/>	Boulder <input checked="" type="checkbox" value="80"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox" value="20"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox" value="80"/>			
Bank Material	Fines <input checked="" type="checkbox" value="80"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox" value="10"/>	Boulder <input checked="" type="checkbox" value="10"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox" value="40"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox" value="60"/>	
Bank Vegetation	Bog <input checked="" type="checkbox" value="50"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox" value="20"/>	Trees <input checked="" type="checkbox" value="30"/>			
Cover 30%	Instream <input checked="" type="checkbox" value="60"/>	Overhang <input checked="" type="checkbox" value="20"/>	Canopy <input checked="" type="checkbox" value="20"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm gravel 2mm - 3 cm pebble 3 - 5 cm cobble 6-13 cm rubble 14-25 cm boulder 26 cm and up	Shallow gully 1 m Medium gully 2-3 m Deep gully ≥4 m Forest stream see over Flood plain see over Bog/Fen see over	Instream submergent/emergent vegetation Overhang grasses/shrubs within 1 m of water Canopy trees > 1m above water can be expressed as % cover

09.

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed NO

perfect landing site

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

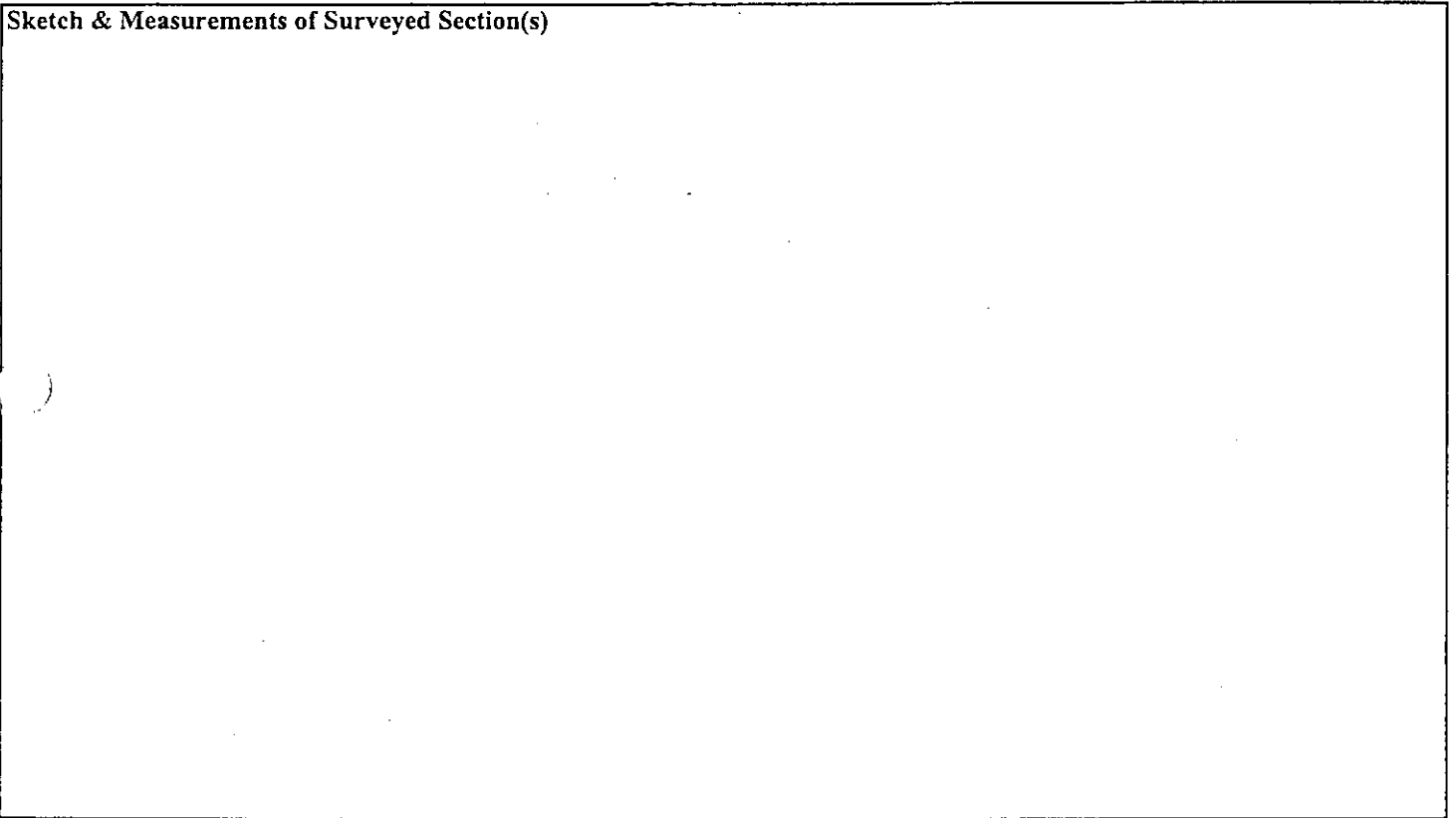
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

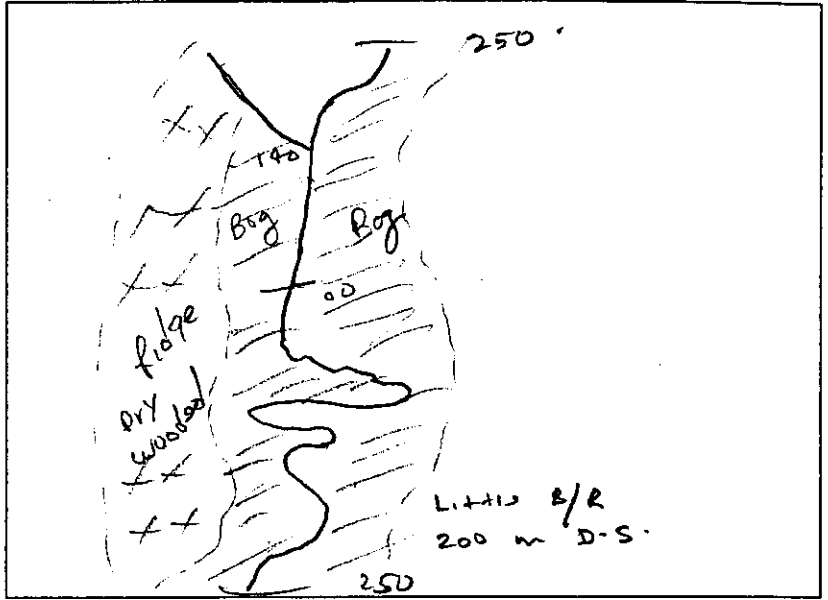
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 84
 Date Sept 26/02
 Surveyed by BW/mH/Hm/pJ
 Watershed Paradise
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 A/13
 Photo Numbers 117
 Video Yes
 Area Surveyed 500 m aerial
 Water Samples NO

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input checked="" type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover <u>40</u>	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

#84

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

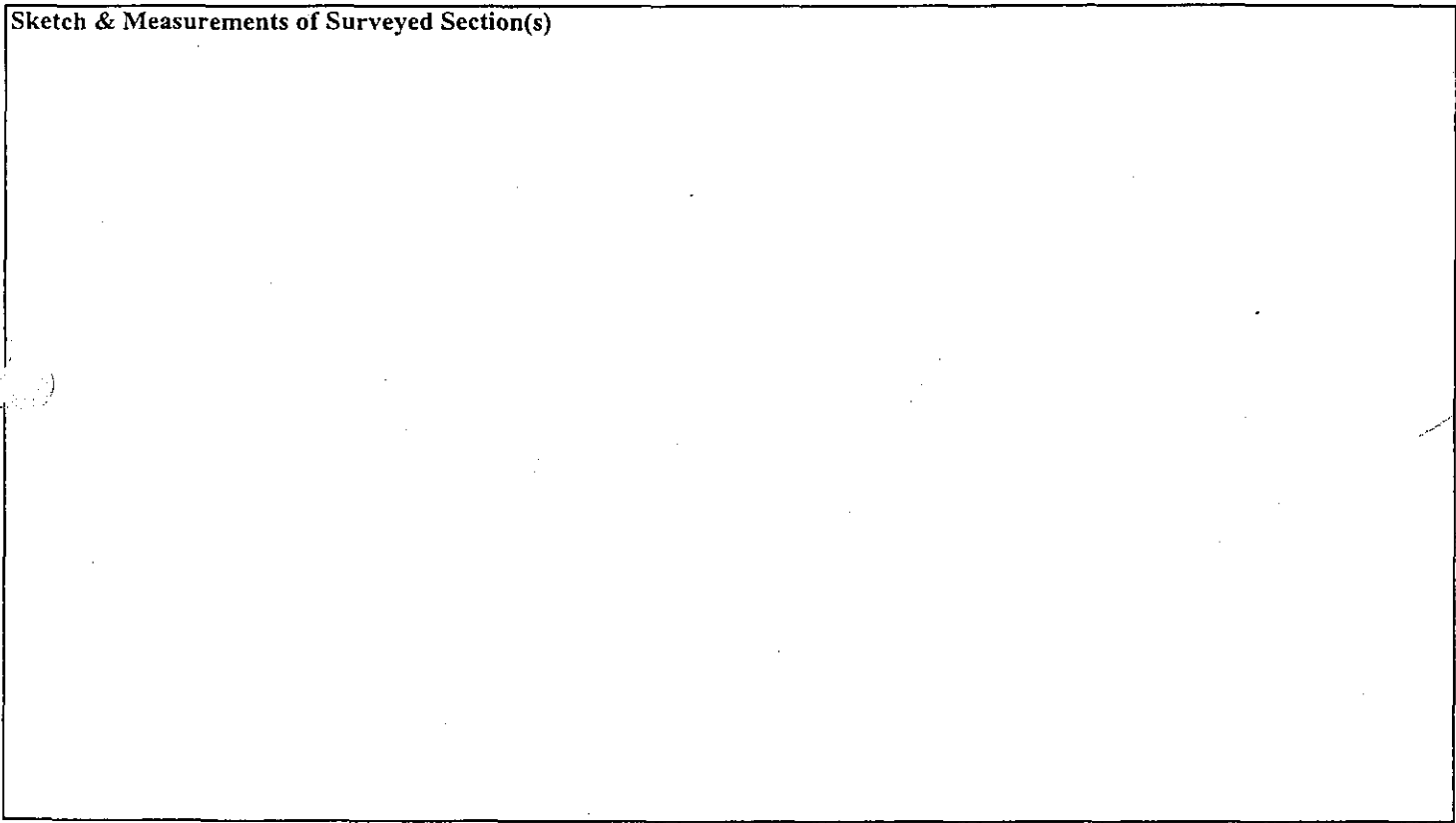
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area

NO identifiable stream at this location.
 appears to be the ~~lower~~ upper portion of drainage from ridge nearest pond several kilometers away
 Site is an extremely wooded ridge

						Comments
Depth	0 - 1 m <input type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

905

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

no stream

Dissolved Oxygen

Type III (cascade/rapids) flow

identified.

Turbidity

No accessible by helicopter

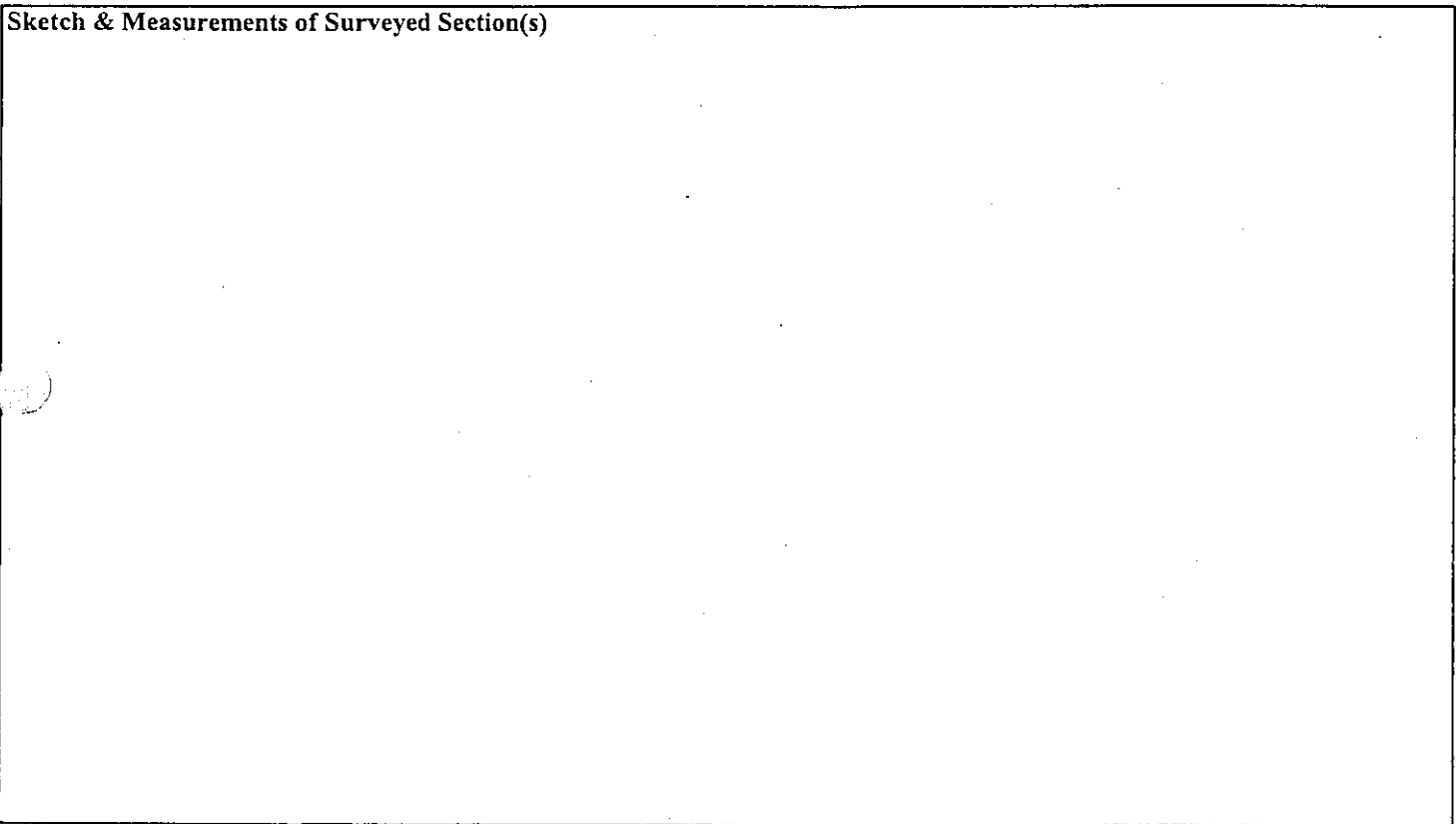
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

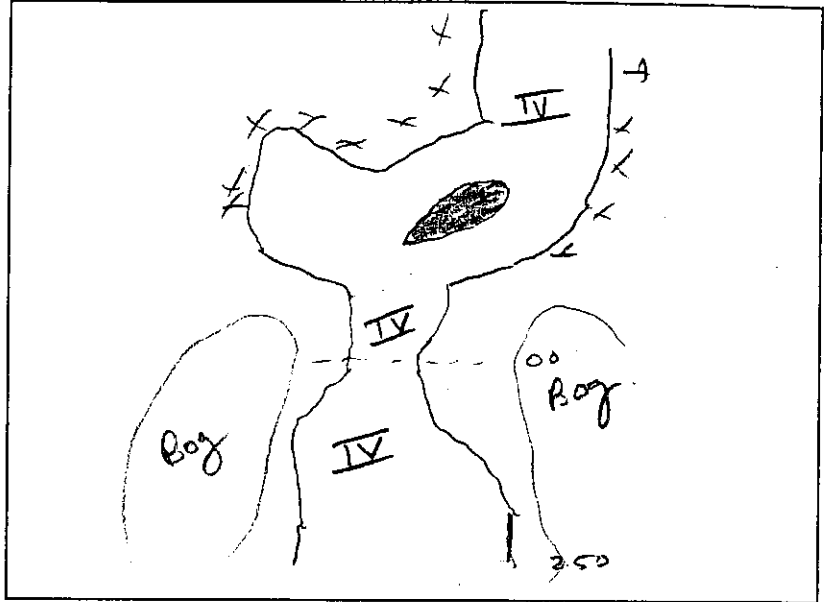
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



					Comments		
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input checked="" type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/>			
Bank Material	Fines <input checked="" type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/>	Grasses <input checked="" type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>			
Cover ²⁰	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input checked="" type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

86.
Ground Survey not Completed NO

Although
good
landing
site.

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

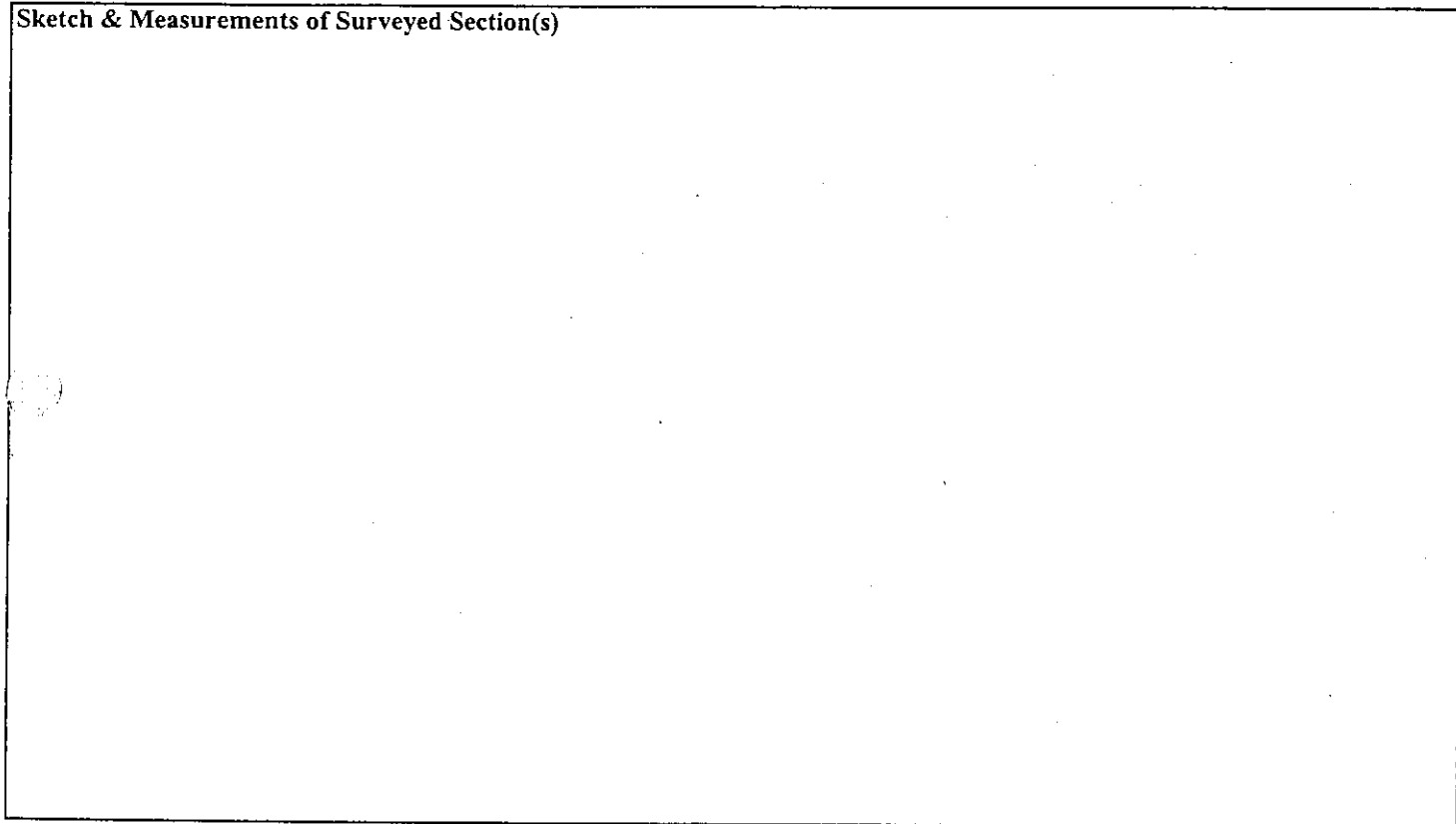
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

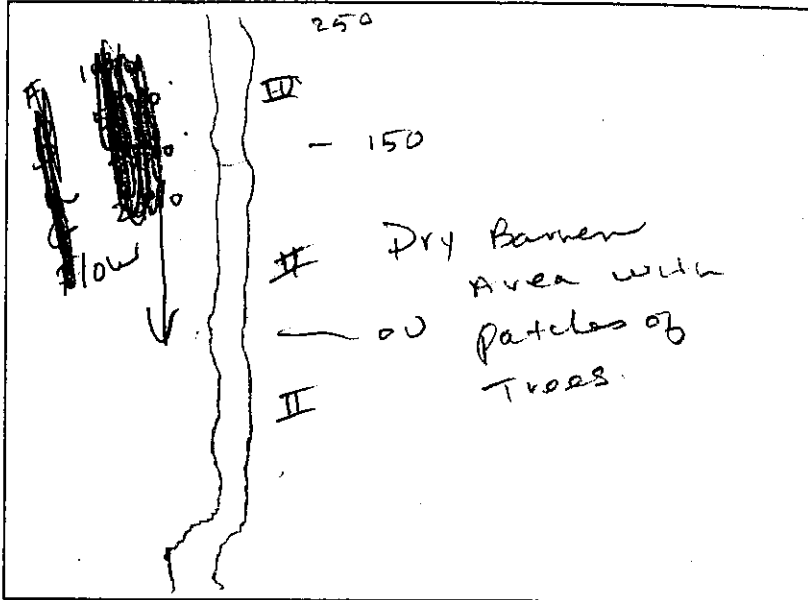
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/> 30	Riffle <input type="checkbox"/> 70	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/> 30	Gravel <input type="checkbox"/> 10	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/> 10	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/> 30		
Bank Material	Fines <input type="checkbox"/> 30	Gravel/Pebble <input type="checkbox"/> 10	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/> 40	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/> 80	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/> 20
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/> 20	Shrubs <input type="checkbox"/> 60	Trees <input type="checkbox"/> 20		
Cover ^{60%}	Instream <input type="checkbox"/> 20	Overhang <input type="checkbox"/> 60	Canopy <input type="checkbox"/> 20	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate	Backslope	Cover
finer less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

87

Good landing.

Ground Survey

Ground survey completed Yes

Ground Survey not Completed

Temperature 3.67

Crossing less than 2 km² (on DWST list)

pH 6.05

Bog drainage

Conductivity 5.6

Type IV (steady) flow

Dissolved Oxygen 12.90

Type III (cascade/rapids) flow

Turbidity 3.4

No accessible by helicopter

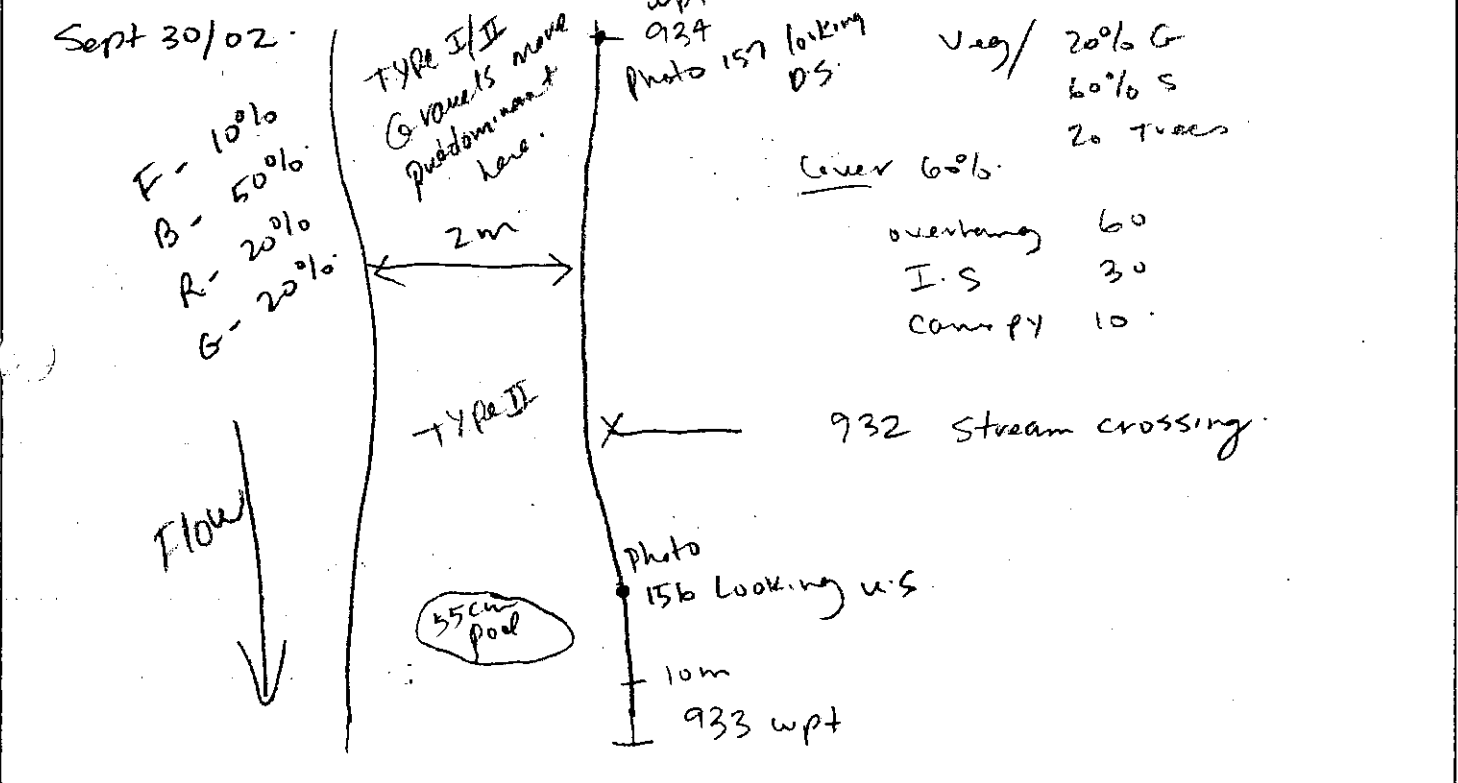
Surface velocity 81 cm/min
12 cm / middle of stream

Other: _____

Water Samples collected Yes

Gradient (inclinometer) 4%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

mostly Type II throughout 10m section at top which had ~ 60% gravel. NO Fish Seen

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

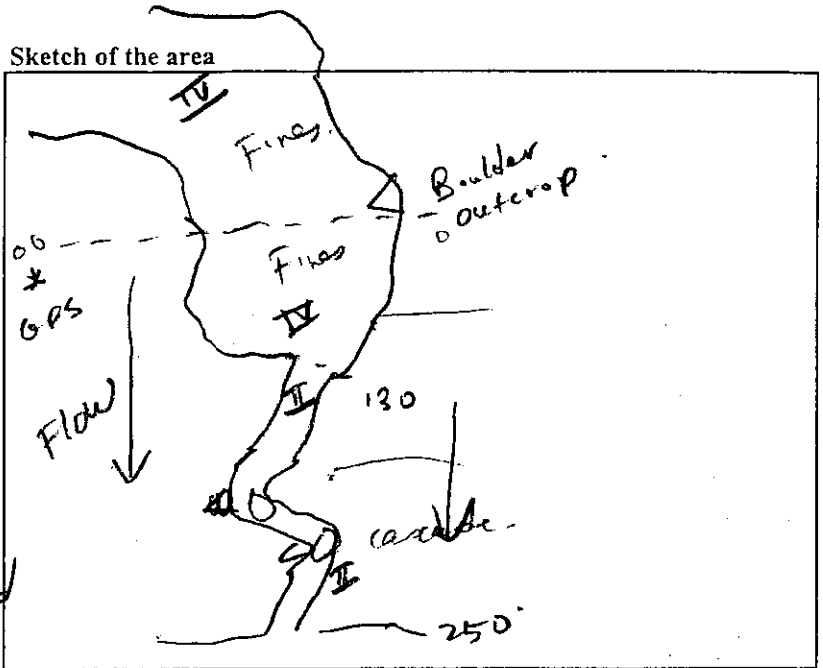
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input checked="" type="checkbox"/>	5 - 20 m <input checked="" type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input checked="" type="checkbox"/> 60	Riffle <input checked="" type="checkbox"/> 40	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input checked="" type="checkbox"/> 60	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 10	Boulder <input checked="" type="checkbox"/> 30	Bedrock <input type="checkbox"/> 10	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 30	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 60			
Bank Material	Fines <input checked="" type="checkbox"/> 40	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/> 20	Boulder <input checked="" type="checkbox"/> 30	Bedrock <input type="checkbox"/> 10	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input checked="" type="checkbox"/> 20	Grasses <input type="checkbox"/> 10	Shrubs <input checked="" type="checkbox"/> 60	Trees <input type="checkbox"/> 10			
Cover ²⁵	Instream <input checked="" type="checkbox"/> 10	Overhang <input checked="" type="checkbox"/> 25	Canopy <input checked="" type="checkbox"/> 5	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input checked="" type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

#88

Good Landing

Ground survey completed Yes

Ground Survey not Completed

Temperature 3.36

Crossing less than 2 km² (on DWST list)

pH 6.03

Bog drainage

Conductivity 4.8

Type IV (steady) flow

Dissolved Oxygen 11.51

Type III (cascade/rapids) flow

Turbidity 6.7

No accessible by helicopter

Surface velocity 74 Revs/min

Other: _____

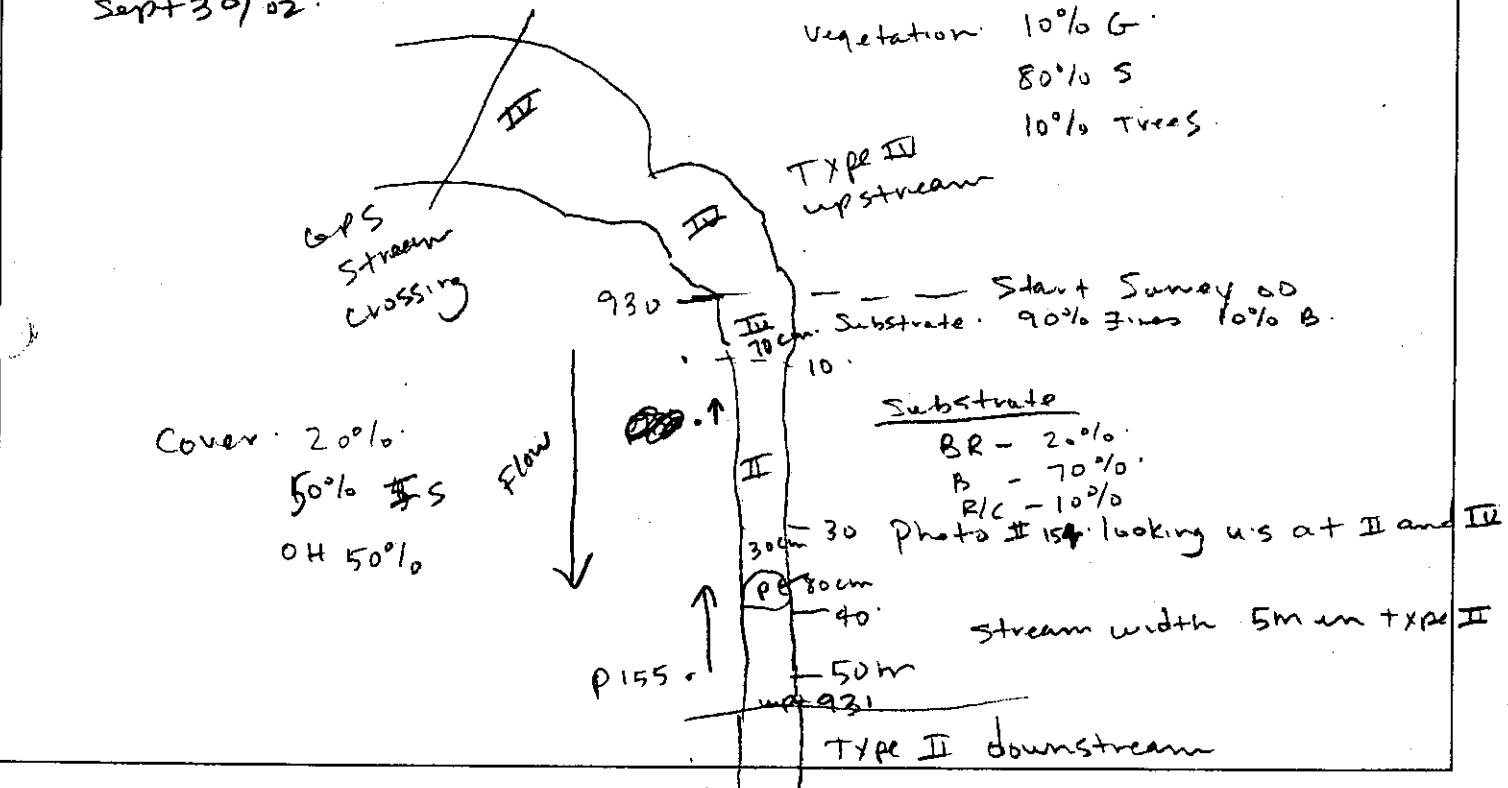
middle of stream / 27cm

Water Samples collected Yes

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)

Sept 30/02



LEGENDS / NOTES

crossing indicated in TYPE IV Habitat 130m u/s of Survey Area.

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 89.

Date Sept 26/02

Surveyed by BW/mH/Hm/PJ

Watershed Paradise

GPS Co-ord. See list

Aerial Photo #

Map Number 13 H/4

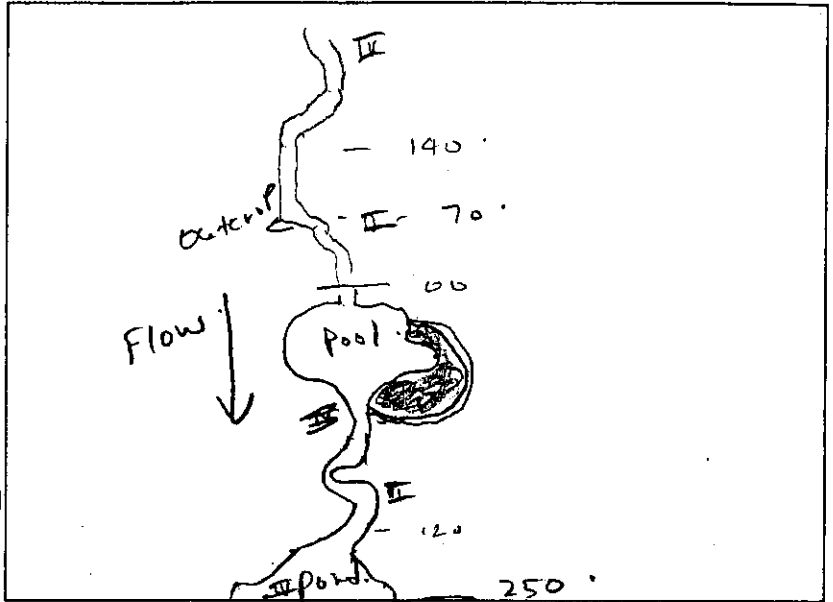
Photo Numbers 121

Video Yes

Area Surveyed 500 m aerial, 50 m ground

Water Samples Yes

Sketch of the area



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>		
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow <input type="checkbox"/>	Medium <input type="checkbox"/>	Deep <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

89.

Good Landing

Ground survey completed

YES

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

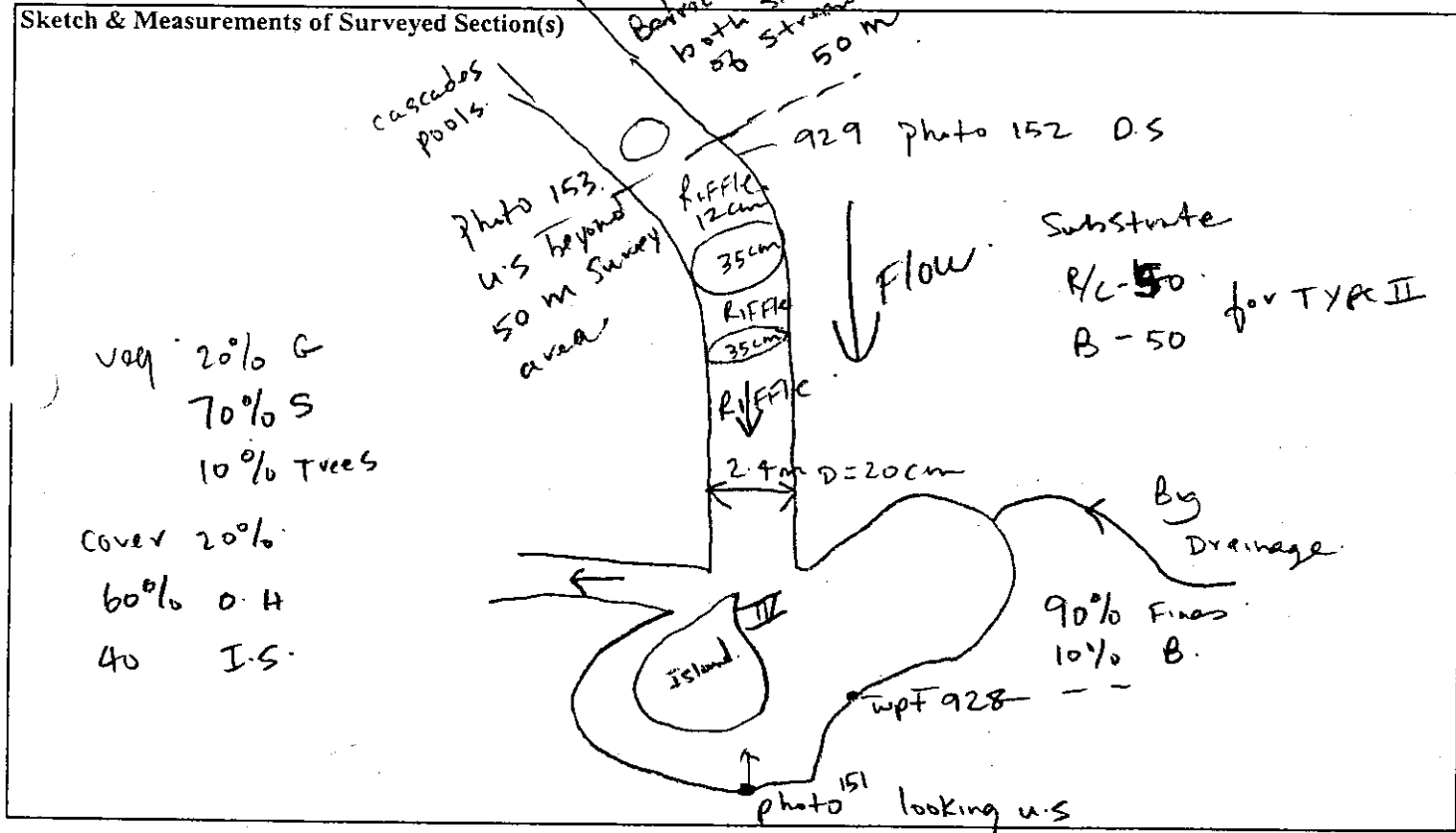
Other:

middle of stream / 12cm

Water Samples collected YES

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

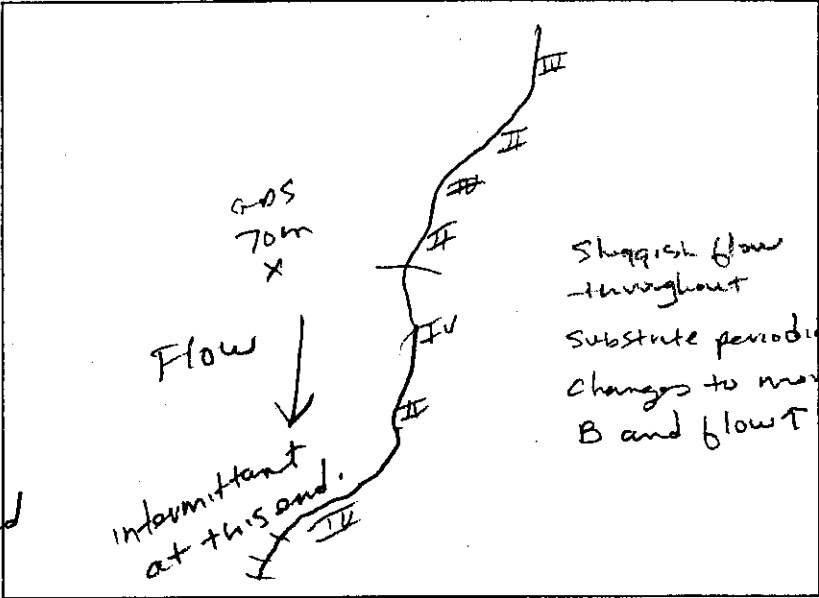
Photo Numbers

Video

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input checked="" type="checkbox"/> 60	Riffle <input checked="" type="checkbox"/> 40	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input checked="" type="checkbox"/> 60	Gravel <input type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/> 10	Boulder <input checked="" type="checkbox"/> 30	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/> 40	Type III <input type="checkbox"/>	Type IV <input checked="" type="checkbox"/> 60		
Bank Material	Fines <input checked="" type="checkbox"/> 80	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input checked="" type="checkbox"/> 20	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/> 30	Trees <input checked="" type="checkbox"/> 70		
Cover %	Instream <input type="checkbox"/>	Overhang <input checked="" type="checkbox"/> 30	Canopy <input checked="" type="checkbox"/> 70	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees >.1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

Surface velocity

Other: _____

Water Samples collected
 Middle of stream / 10cm

Gradient (inclinometer)

#90

can land if we want

Sketch & Measurements of Surveyed Section(s)

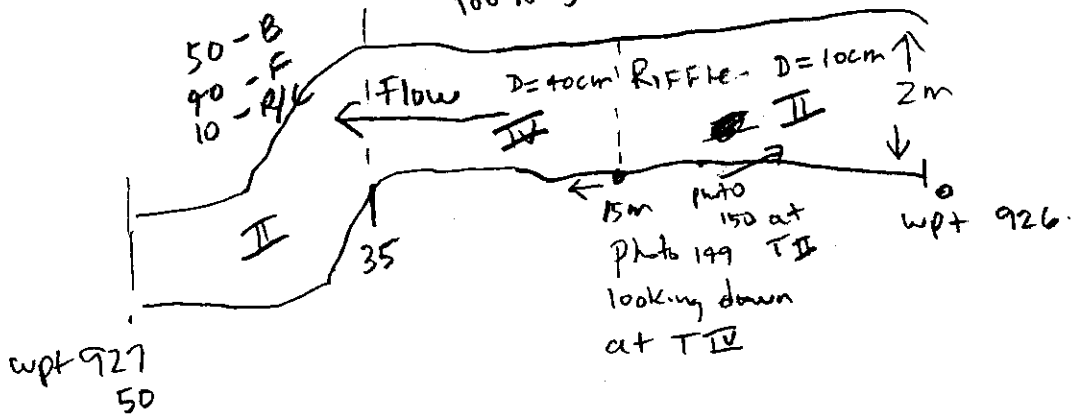
Sept 30/02

Vegetation
Trees/
Shrubs.

Cover 100%
I.V = 30%
Overhang 40
Cany 40
100% trees.

Crossing wpt 924
Helicopter landing - wpt 925

B - 50%
F - 35%
H/C - 14%
G - 1%



LEGENDS / NOTES

Sept 30/02. Started and Stream 90 and working towards Goose Bay.

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

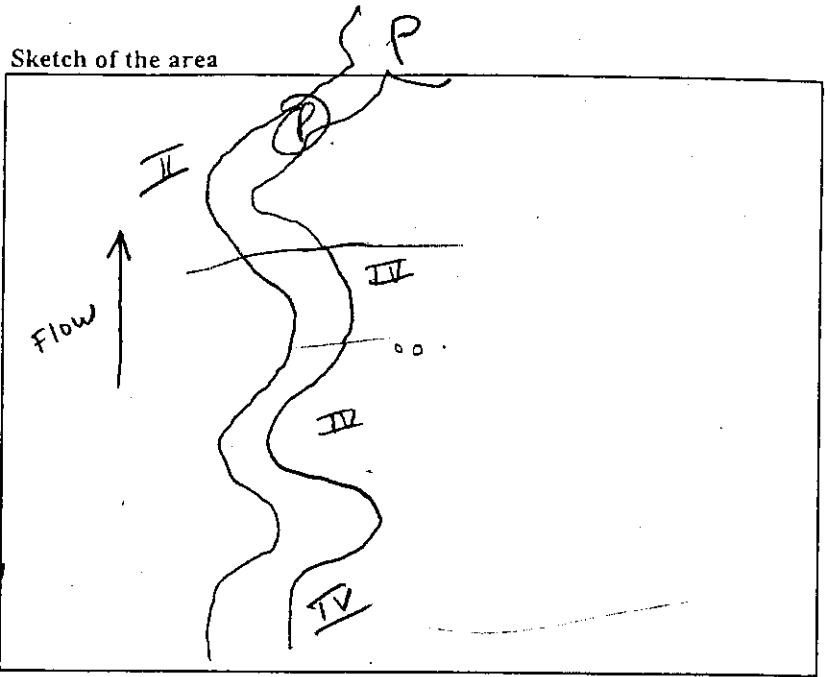
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="text" value="40"/>	5 - 20 m <input type="text" value="60"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="text" value="70"/>	Riffle <input type="text" value="20"/>	Rapids <input type="checkbox"/>	Pools <input type="text" value="10"/>		
Substrate Type	Fines <input type="text" value="70"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="10"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="text" value="30"/>	Type III <input type="checkbox"/>	Type IV <input type="text" value="70"/>		
Bank Material	Fines <input type="text" value="70"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="text" value="20"/>	Boulder <input type="text" value="10"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input checked="" type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="text" value="10"/>	Shrubs <input type="text" value="60"/>	Trees <input type="text" value="30"/>		
Cover <input type="text" value="30"/>	Instream <input type="text" value="60"/>	Overhang <input type="text" value="20"/>	Canopy <input type="text" value="20"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥ 4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

91

Ground Survey

Ground survey completed

Ground Survey not Completed

Temperature 11.40

Crossing less than 2 km² (on DWST list)

pH 6.41

Bog drainage

Conductivity 4.1

Type IV (steady) flow

Dissolved Oxygen 8.91

Type III (cascade/rapids) flow

Turbidity 0.5

No accessible by helicopter

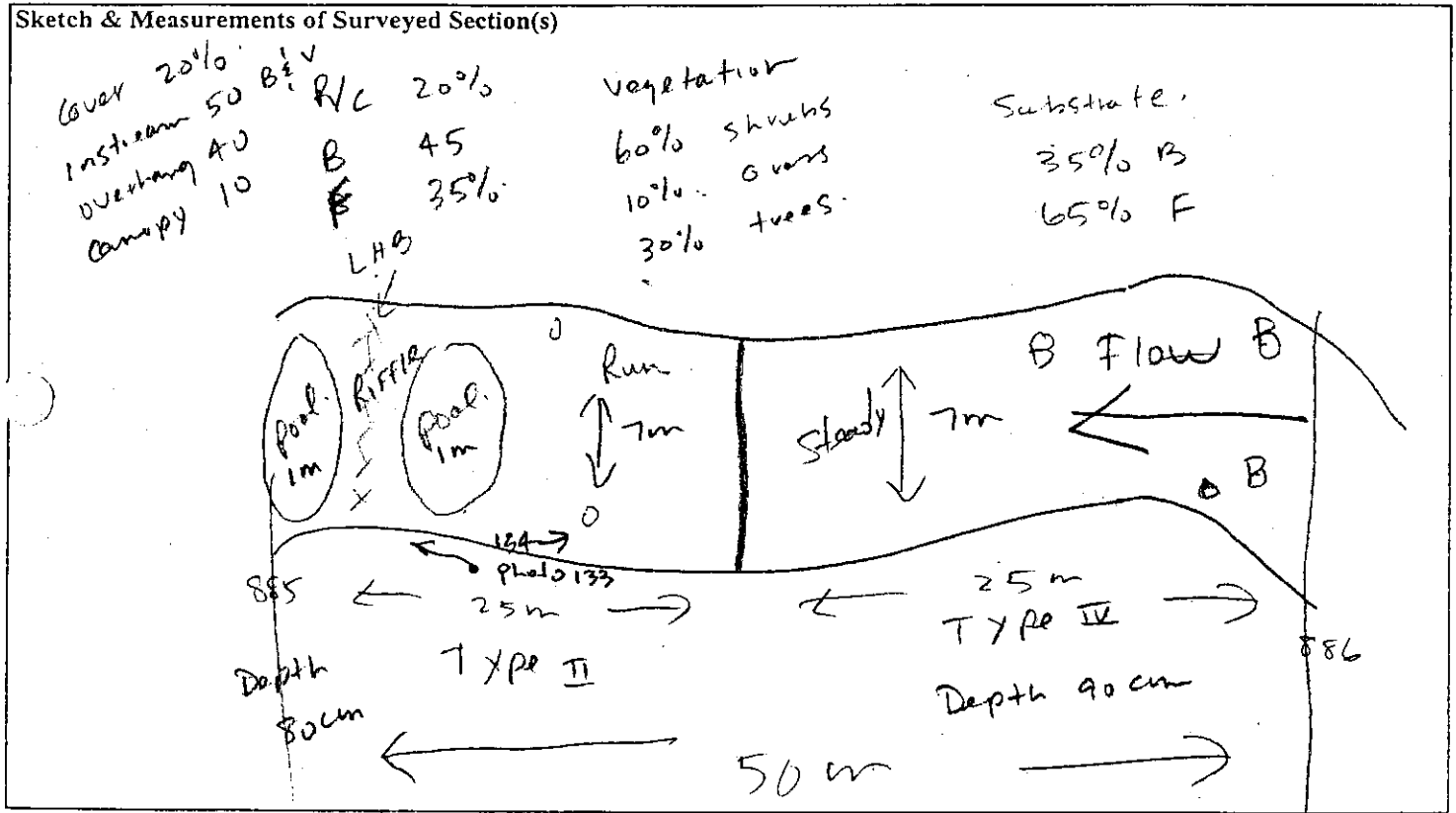
Surface velocity 33 RPM
85 cm

Other: _____

Water Samples collected 2

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

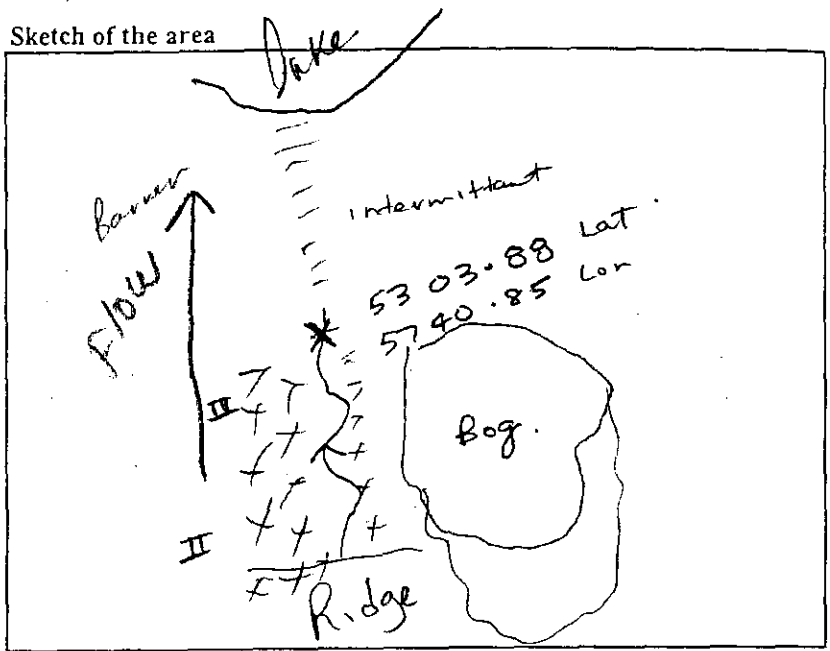
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



						Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>		
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>		
Flow Type	Steady <input type="checkbox"/> 50	Riffle <input type="checkbox"/> 50	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>		
Substrate Type	Fines <input type="checkbox"/> 70	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/> 10	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	Not Fish Habitat	
Bank Material	Fines <input type="checkbox"/> 80	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/> 20	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>		
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>		
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>		

Substrate

finer	less than 2 mm	Shallow gully	1 m
gravel	2mm - 3 cm	Medium gully	2-3 m
pebble	3 - 5 cm	Deep gully	≥ 4 m
cobble	6-13 cm	Forest stream	see over
rubble	14-25 cm	Flood plain	see over
boulder	26 cm and up	Bog/Fen	see over

Cover

Instream	submergent/emergent vegetation
Overhang	grasses/shrubs within 1 m of water
Canopy	trees > 1m above water

can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Ground Survey

92

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

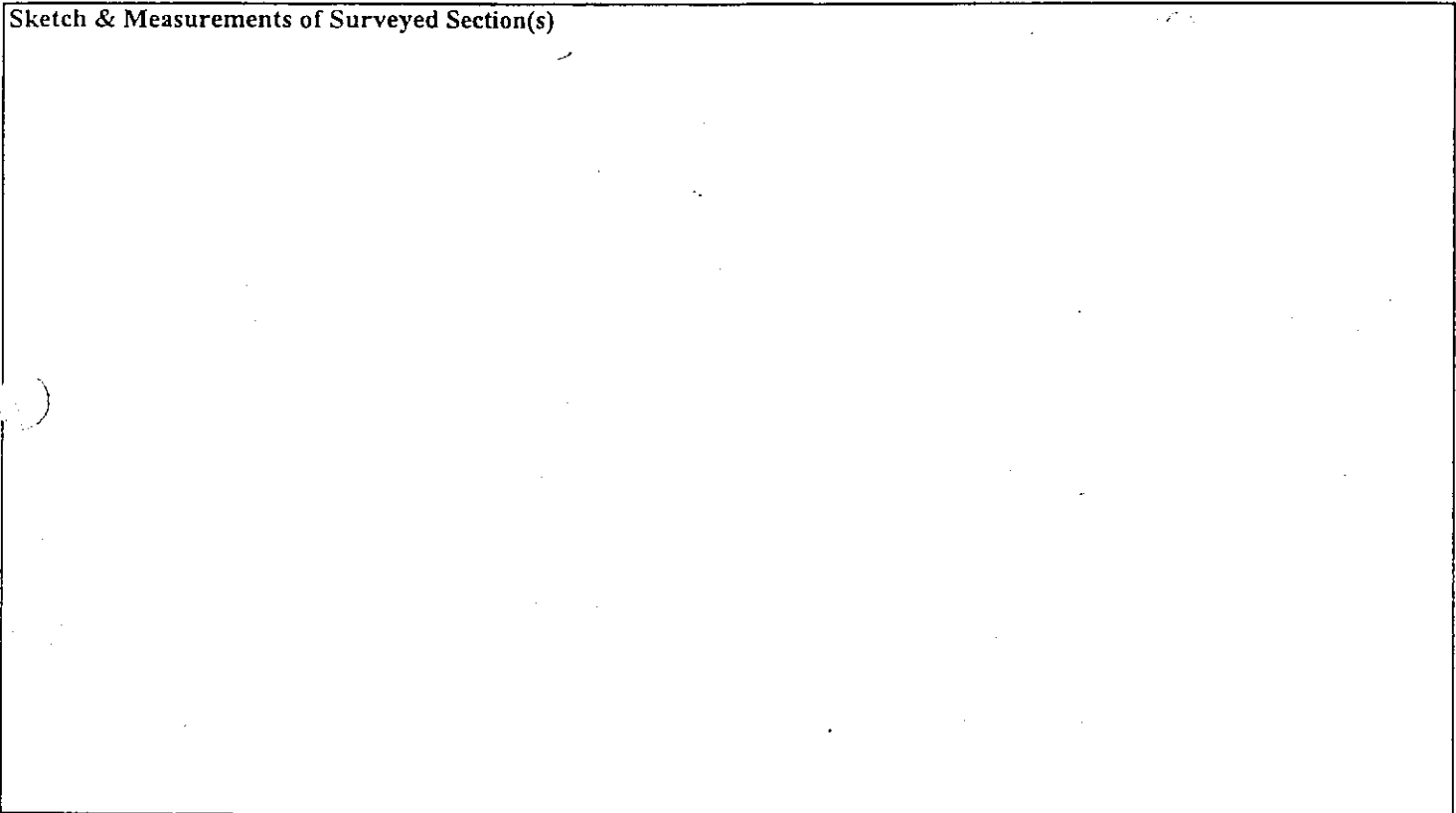
Surface velocity

Other: intermittant near pond not accessible to fish

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

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Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

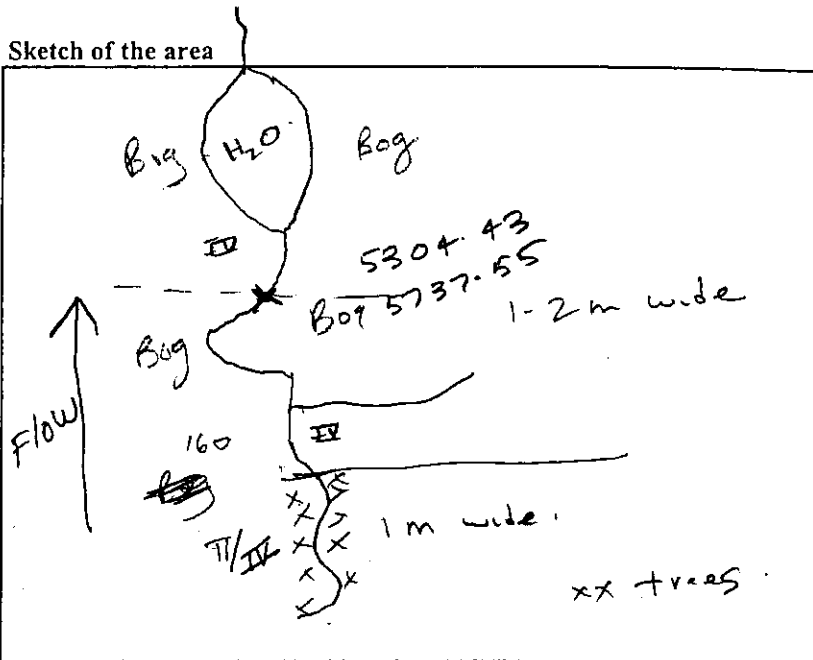
Map Number

Photo Numbers

Video

Area Surveyed

Water Samples



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate	Backslope	Cover
fines less than 2 mm	Shallow gully 1 m	Instream submergent/emergent vegetation
gravel 2mm - 3 cm	Medium gully 2-3 m	Overhang grasses/shrubs within 1 m of water
pebble 3 - 5 cm	Deep gully ≥ 4 m	Canopy trees > 1m above water
cobble 6-13 cm	Forest stream see over	can be expressed as % cover
rubble 14-25 cm	Flood plain see over	
boulder 26 cm and up	Bog/Fen see over	

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

93

Ground Survey

Ground survey completed

Ground Survey not Completed NO

Temperature

Crossing less than 2 km² (on DWST list)

pH

Bog drainage

Conductivity

Type IV (steady) flow

Dissolved Oxygen

Type III (cascade/rapids) flow

Turbidity

No accessible by helicopter

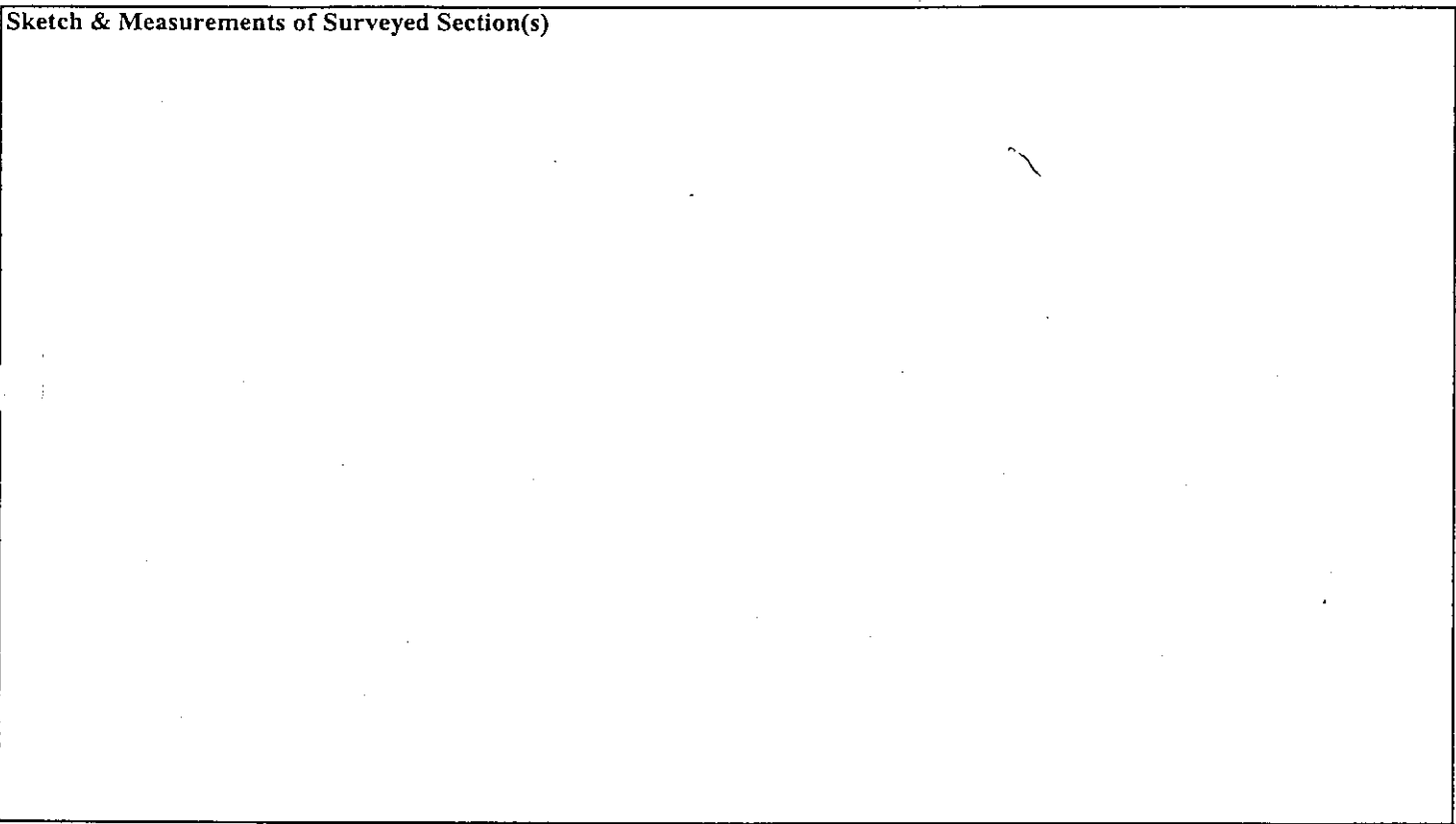
Surface velocity

Other: _____

Water Samples collected

Gradient (inclinometer)

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Backslope

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No.

Date

Surveyed by

Watershed

GPS Co-ord.

Aerial Photo #

Map Number

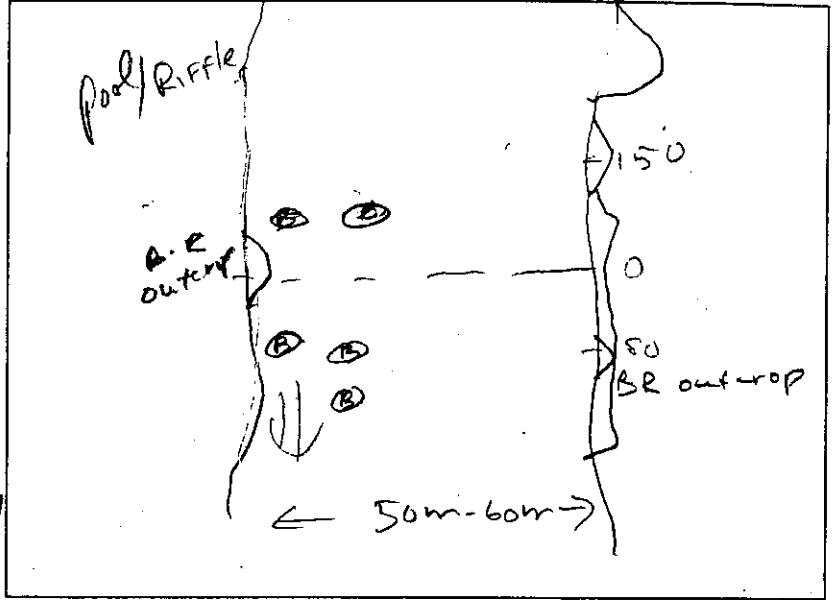
Photo Numbers

Video Yes

Area Surveyed

Water Samples

Sketch of the area



Comments

Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input checked="" type="checkbox"/>	>2 m <input checked="" type="checkbox"/>	Unknown <input type="checkbox"/>	
Channel Width	0 - 2 m <input type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input checked="" type="checkbox"/>	
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input checked="" type="checkbox"/>	
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/> Unknown <input type="checkbox"/>
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>	
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input checked="" type="checkbox"/>	Cobble/Rubble <input checked="" type="checkbox"/>	Boulder <input checked="" type="checkbox"/>	Bedrock <input checked="" type="checkbox"/> Unknown <input type="checkbox"/>
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input checked="" type="checkbox"/>	Deep Gully <input checked="" type="checkbox"/>	Forest Stream <input type="checkbox"/>	Flood Plain <input type="checkbox"/> Bog/Fen <input type="checkbox"/>
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input checked="" type="checkbox"/>	Trees <input checked="" type="checkbox"/>	
Cover %	Instream <input checked="" type="checkbox"/>	Overhang <input checked="" type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>	
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/> None <input checked="" type="checkbox"/>
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>	

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

Page number

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

94

Ground Survey

Ground survey completed YES

Ground Survey not Completed NO

Temperature 10.92

Crossing less than 2 km² (on DWST list)

pH 8.09

Bog drainage

Conductivity 5.7

Type IV (steady) flow

Dissolved Oxygen 10.35

Type III (cascade/rapids) flow

Turbidity 0.1

No accessible by helicopter

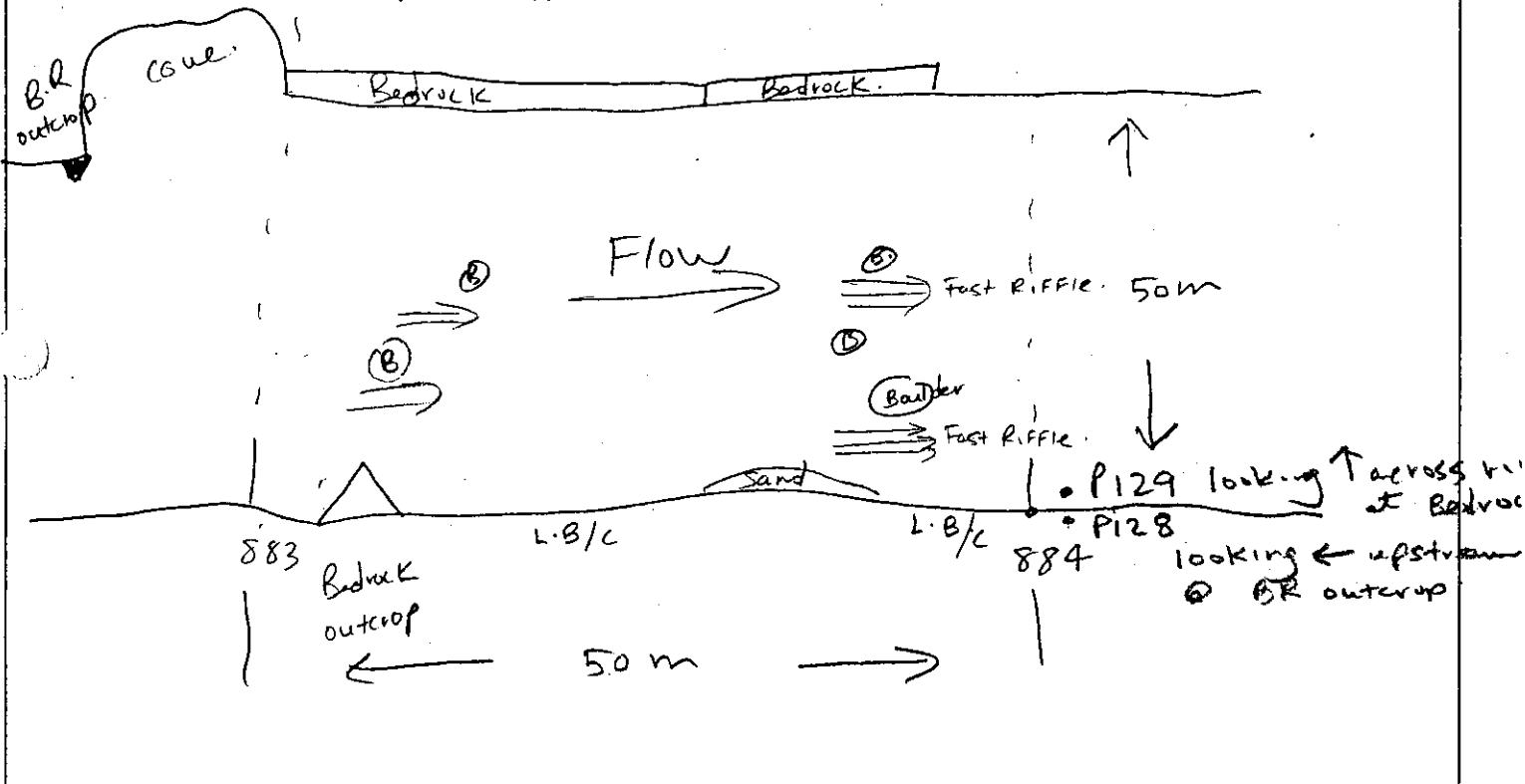
Surface velocity 7.9 rpm

Other: _____

Water Samples collected 2

Gradient (inclinometer) 1%

Sketch & Measurements of Surveyed Section(s)



LEGENDS/NOTES

Surface velocity taken 2m from stream bank
flow significantly greater as center stream is approached.

Backslope

Gullies are typically well defined steep sided channels which contain spordic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

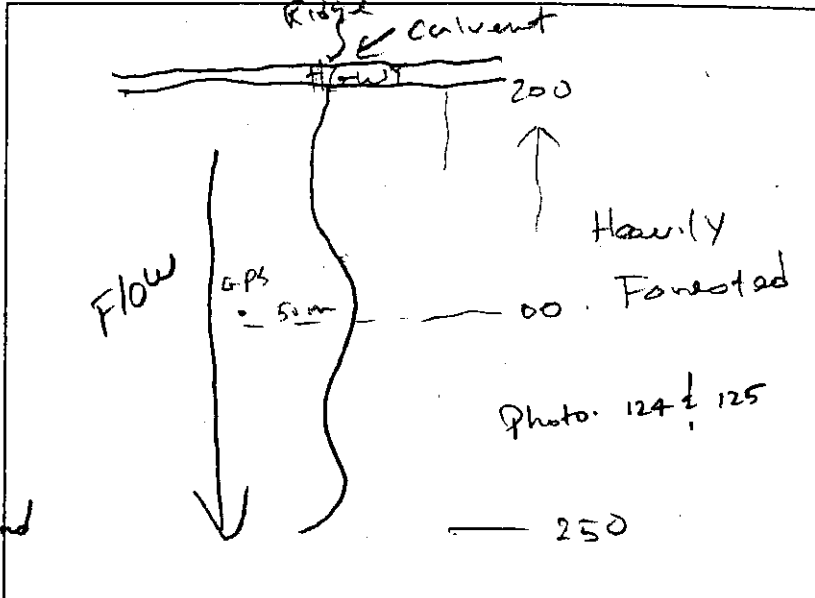
Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

Stream No. 95
 Date Sept 26/02
 Surveyed by Bw/mH/Hm/PJ
 Watershed Paradise
 GPS Co-ord. See list
 Aerial Photo #
 Map Number 13 H/4
 Photo Numbers 123
 Video Yes
 Area Surveyed 500 m aerial, 50 m ground
 Water Samples Yes

Sketch of the area



							Comments
Depth	0 - 1 m <input checked="" type="checkbox"/>	1 - 2 m <input type="checkbox"/>	>2 m <input type="checkbox"/>	Unknown <input type="checkbox"/>			
Channel Width	0 - 2 m <input checked="" type="checkbox"/>	2 - 5 m <input type="checkbox"/>	5 - 20 m <input type="checkbox"/>	>20 m <input type="checkbox"/>			
Flow Type	Steady <input type="checkbox"/>	Riffle <input checked="" type="checkbox"/>	Rapids <input type="checkbox"/>	Pools <input type="checkbox"/>			
Substrate Type	Fines <input type="checkbox"/>	Gravel <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input type="checkbox"/>	
Bank Habitat	Type I <input type="checkbox"/>	Type II <input checked="" type="checkbox"/>	Type III <input type="checkbox"/>	Type IV <input type="checkbox"/>			
Bank Material	Fines <input type="checkbox"/>	Gravel/Pebble <input type="checkbox"/>	Cobble/Rubble <input type="checkbox"/>	Boulder <input type="checkbox"/>	Bedrock <input type="checkbox"/>	Unknown <input checked="" type="checkbox"/>	
Backslope	Shallow Gully <input type="checkbox"/>	Medium Gully <input type="checkbox"/>	Deep Gully <input type="checkbox"/>	Forest Stream <input checked="" type="checkbox"/>	Flood Plain <input type="checkbox"/>	Bog/Fen <input type="checkbox"/>	
Bank Vegetation	Bog <input type="checkbox"/>	Grasses <input type="checkbox"/>	Shrubs <input type="checkbox"/>	Trees <input type="checkbox"/>			
Cover	Instream <input type="checkbox"/>	Overhang <input type="checkbox"/>	Canopy <input type="checkbox"/>	None <input type="checkbox"/>			
Potential Obstruction	Falls <input type="checkbox"/>	Rapids <input type="checkbox"/>	Chute <input type="checkbox"/>	Cascade <input type="checkbox"/>	Intermittent <input type="checkbox"/>	None <input checked="" type="checkbox"/>	
Est. Gradient	0 - 1 % <input type="checkbox"/>	1 - 3 % <input type="checkbox"/>	3 - 5 % <input type="checkbox"/>	>5 % <input type="checkbox"/>			

Substrate
 fines less than 2 mm
 gravel 2mm - 3 cm
 pebble 3 - 5 cm
 cobble 6-13 cm
 rubble 14-25 cm
 boulder 26 cm and up

Backslope
 Shallow gully 1 m
 Medium gully 2-3 m
 Deep gully ≥4 m
 Forest stream see over
 Flood plain see over
 Bog/Fen see over

Cover
 Instream submergent/emergent vegetation
 Overhang grasses/shrubs within 1 m of water
 Canopy trees > 1m above water
 can be expressed as % cover

TRANS-LABRADOR HIGHWAY STREAM CROSSING INFORMATION: CARTWRIGHT JUNCTION TO GOOSE BAY

95

Ground Survey

Ground survey completed YES

Ground Survey not Completed

Temperature 5.90

Crossing less than 2 km² (on DWST list)

pH 7.81

Bog drainage

Conductivity 8.1

Type IV (steady) flow

Dissolved Oxygen 12.27

Type III (cascade/rapids) flow

Turbidity 0.1

No accessible by helicopter

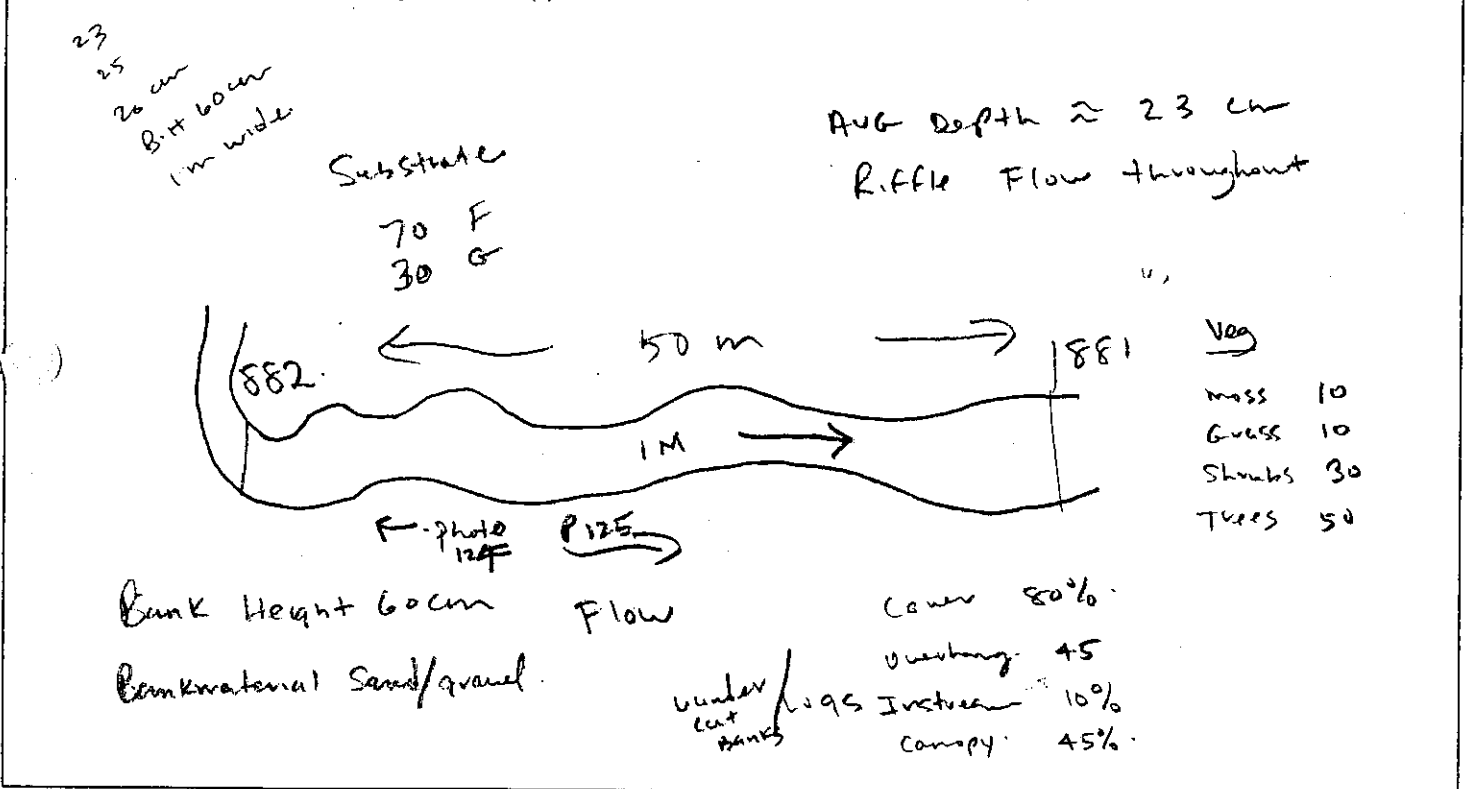
Surface velocity 60 rpm @ 28 cm

Other: _____

Water Samples collected 2

Gradient (inclinometer) 0.5

Sketch & Measurements of Surveyed Section(s)



LEGENDS / NOTES

Streams done in Reverse order 91-96.
order 91, 95, 94, 93, 92, 91. Landing done at

Backslope

(34) on Sept 26/02.

Gullies are typically well defined steep sided channels which contain spodic flooding but may suffer bank erosion depending on bank material

Forest Stream has low to medium gradient and a well defined channel with some spilling over the banks - erosion may occur due to reduced stability of forest soils

Flood Plain is a wide shallow course with narrow channel(s) in middle - flooding occurs onto grasses with little lasting

Bog/Fen - with few permanent narrow cut channels and auxillary intermittent channels - periodic flooding causes no lasting impact

APPENDIX 3

PHOTOGRAPHS

APPENDIX 3 PHOTOGRAPHS

LEGEND

The location of watercourse crossings are shown on Figure 1.1.

Photos are listed in sequence from 035 - 196, which represents the camera frame number and the order in which photos were taken in the field. These numbers correspond to photo numbers listed on field data sheets contained in Appendix 2.

Aerial photographs are designated by the 3 digit frame number followed by the crossing #.

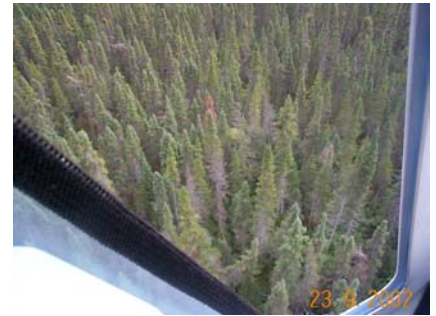
Ground photos are designated by the 3 digit frame number, the crossing # and (Gr).



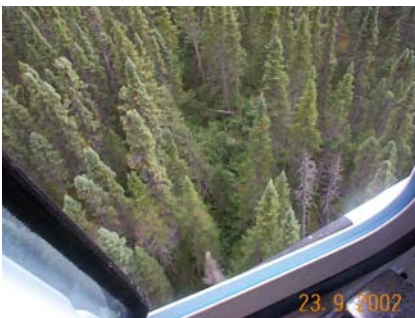
035 Crossing #1



036 Crossing #2



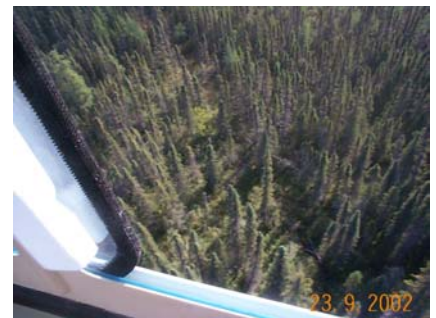
037 Crossing #3



038 Crossing #4



039 Crossing #5



040 Crossing #6



041 Crossing #7



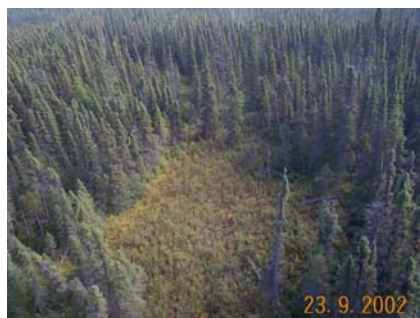
042 Crossing #8



043 Crossing #9



044 Crossing # 10



045 Crossing # 10



046 Crossing # 11

Photographs of TLH-Phase III Stream Crossings



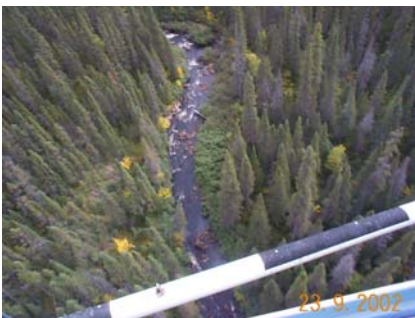
047 Crossing # 12



048 Crossing # 13



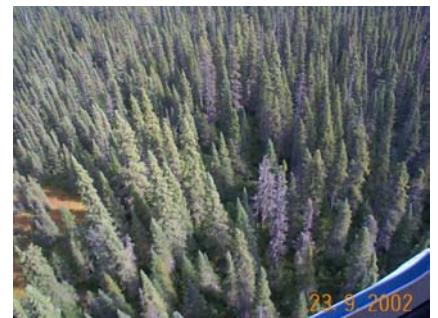
049 Crossing # 14



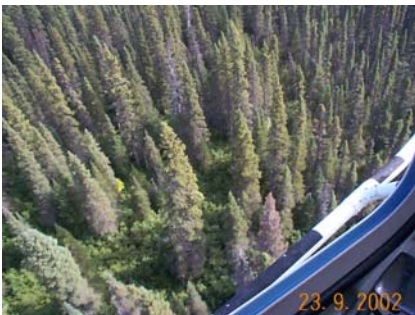
050 Crossing # 15



051 Crossing # 16



052 Crossing # 17



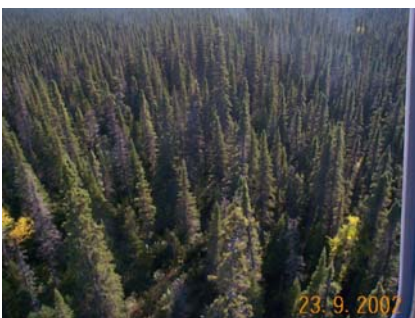
053 Crossing # 18



054 Crossing # 19



055 Crossing # 20



056 Crossing # 21



057 Crossing # 22



058 Crossing # 23

Photographs of TLH-Phase III Stream Crossings



059 Crossing # 24



060 Crossing # 25



061 Crossing # 26



062 Crossing # 27



063 Crossing # 28



064 Crossing # 29



065 Crossing # 30



066 Crossing # 31



067 Crossing # 32



068 Crossing # 33



069 Crossing # 34



070 Crossing # 36

Photographs of TLH-Phase III Stream Crossings



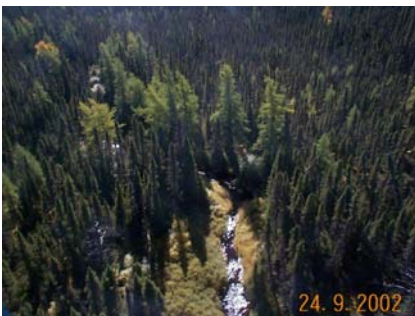
071 Crossing # 37



072 Crossing # 38



073 Crossing # 39



074 Crossing # 40



075 Crossing # 41



076 Crossing # 42



077 Crossing # 43



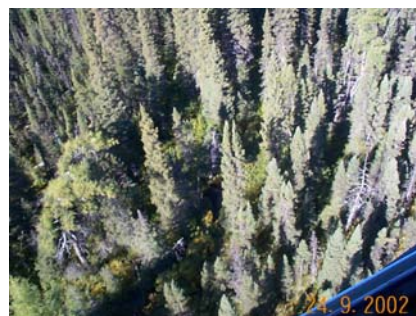
078 Crossing # 44



079 crossing # 45



080 Crossing # 46



081 Crossing # 47



082 Crossing # 48

Photographs of TLH-Phase III Stream Crossings



083 Crossing # 49



084 Crossing # 50



085 Crossing # 51



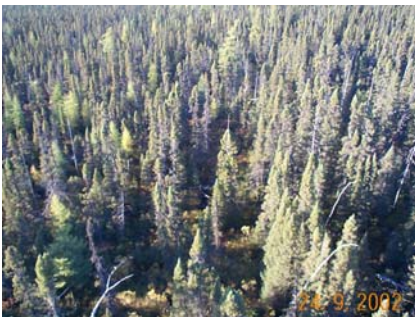
086 Crossing # 52



087 Crossing # 53



088 Crossing # 55



089 Crossing # 56



090 Crossing # 58



091 Crossing # 59



092 Wrong Stream



093 Crossing # 60



094 Crossing # 62

Photographs of TLH-Phase III Stream Crossings



095 Crossing # 63



096 Crossing # 64



097 Crossing # 65



098 Crossing # 66



099 Crossing # 67



100 Crossing # 68



101 Crossing # 69



102 Crossing # 70



103 Crossing # 61



104 Crossing # 71



105 Crossing # 72



106 Crossing # 73

Photographs of TLH-Phase III Stream Crossings



107 Crossing # 74



108 Crossing # 75



109 Crossing # 76



110 Crossing # 77



111 Crossing # 78



112 Crossing # 79



113 Crossing # 80



114 Crossing # 81



115 Crossing # 82



116 Crossing # 83



117 Crossing # 84



118 Crossing # 86

Photographs of TLH-Phase III Stream Crossings



119 Crossing # 87



120 Crossing # 88



121 Crossing # 89



122 Crossing # 90



123 Crossing # 96



124 Crossing # 96 Gr.



125 Crossing # 96 Gr.



126 Crossing # 95



127 Crossing # 94



128 Crossing # 94 Gr.



129 Crossing # 94 Gr.



130 Crossing # 93

Photographs of TLH-Phase III Stream Crossings



131 Crossing # 92



132 Crossing # 91



133 Crossing # 91 Gr.



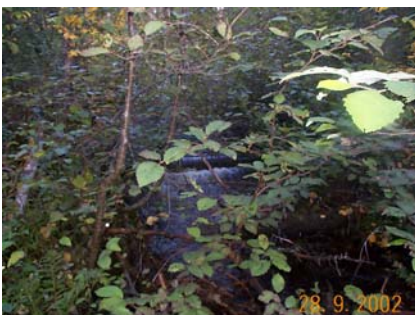
134 Crossing # 91 Gr.



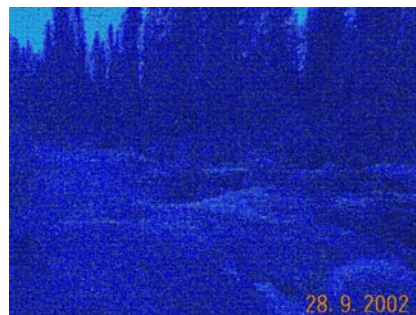
135 Crossing # 8 Gr



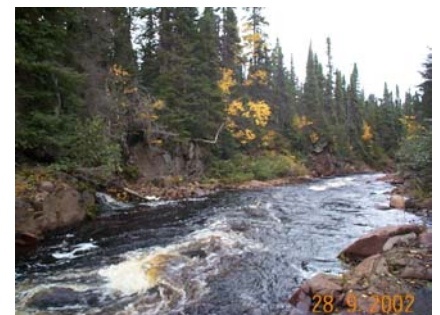
136 Crossing # 9 Gr



137 Crossing # 13 Gr



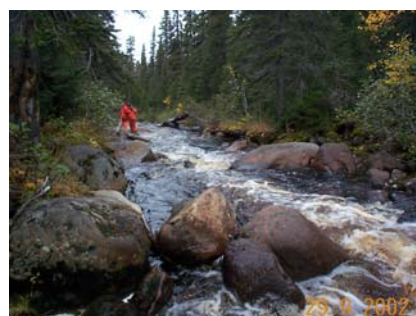
138 Crossing # 16 Gr



139 Crossing #22 Gr



140 Crossing # 23 Gr.



141 Crossing # 24 Gr



142 Crossing # 28 Gr

Photographs of TLH-Phase III Stream Crossings



143 Crossing # 28 Gr



144 Crossing # 36 Gr



145 Crossing # 36 Gr



146 Crossing # 37 Gr



147 Crossing # 38 Gr



148 Crossing # 38 Gr



149 Crossing # 90 Gr



150 Crossing # 90 Gr



151 Crossing # 89 Gr



152 Crossing # 89 Gr



153 Crossing # 89 Gr



154 Crossing # 88 Gr

Photographs of TLH-Phase III Stream Crossings



155 Crossing # 88 Gr



156 Crossing # 87 Gr



157 Crossing # 87 Gr



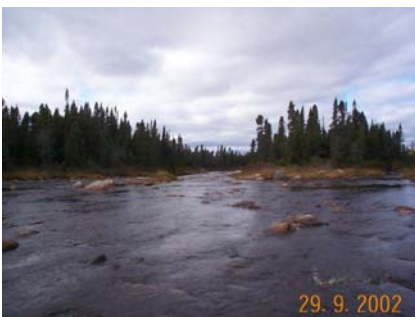
158 Crossing # 82 Gr



159 Crossing # 82 Gr



160 Crossing # 79 Gr



161 Crossing # 79 Gr



162 Crossing # 73 Gr



163 Crossing # 73 Gr



164 Crossing # 68 Gr



165 Crossing # 68 Gr

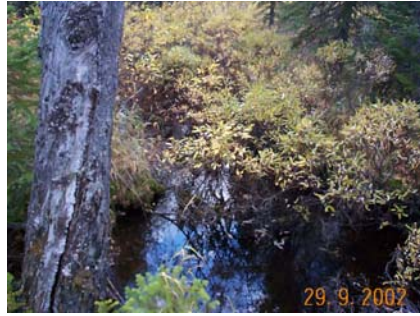


166 Crossing # 67 Gr

Photographs of TLH-Phase III Stream Crossings



167 Crossing # 67 Gr



168 Crossing # 65 Gr



169 Crossing # 65 Gr



170 Crossing # 64 Gr



171 Crossing # 64 Gr



172 Crossing # 61 Gr



173 Crossing # 61 Gr



174 Crossing # 56 Gr



175 Crossing # 56 Gr



176 Crossing # 55 Gr



177 Crossing # 55 Gr



178 Crossing # 55 Gr

Photographs of TLH-Phase III Stream Crossings



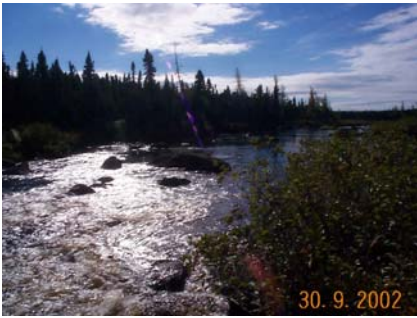
179 Crossing # 53 Gr



180 Crossing # 53 Gr



181 Crossing # 52 Gr



182 Crossing # 52 Gr



183 Crossing # 52 Gr



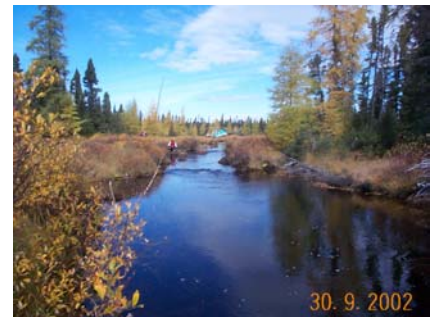
184 Crossing # 52



185 Crossing # 52



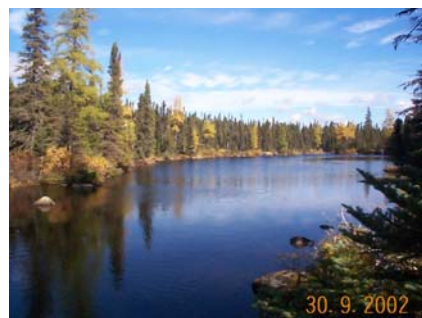
186 Crossing # 51 Gr



187 Crossing # 51 Gr



188 Crossing # 48 Gr



189 Crossing # 48 Gr



190 Crossing # 48 Gr

Photographs of TLH-Phase III Stream Crossings



191 Crossing # 42 Gr



192 Crossing # 42 Gr



193 Crossing # 41 Gr



194 Crossing # 41 Gr



195 Crossing # 40 Gr



196 Crossing # 40 Gr

Photographs of TLH-Phase III Stream Crossings

APPENDIX 4

**FIELD AND LABORATORY
WATER QUALITY RESULTS**

Appendix 4 - TLH-Phase III, Fish Habitat Component Study Water Quality

Parameters	Method	EQL	Units	Stream Crossing Number								
				#8	#9	#13	#16	#22	#23	#24	#28	#36
Field Measurements												
Temperature	Hydrolab		°C	7.79	7.83	5.49	5.42	5.39	5.81	5.88	6.33	6.72
pH	Hydrolab		units	7.99	8.76	8.6	8.5	8.17	8.53	7.97	7.73	8.6
Conductivity	Hydrolab		µS/cm	7.1	9.9	7	5.4	5.5	5.5	5.9	5.6	8.6
Dissolved O ₂	Hydrolab		mg/L	10.14	9.28	12.67	11.56	11.11	11.04	11.23	12.72	10.86
Turbidity	Hydrolab	0.1	NTU	0.8	3.3	4.4	4.1	1.5	1.4	2.4	9.7	0.6
Laboratory Analysis												
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	8	11	9	6	7	7	7	7	11
Total Dissolved Solids	Grav.	10	mg/L	40	50	30	40	30	40	50	30	30
Aluminum	ICP-MS	10	µg/L	310	240	200	220	190	150	210	210	110
Antimony	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Arsenic	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium	ICP-MS	5	µg/L	12	22	14	10	10	11	10	9	8
Beryllium	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bismuth	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Boron	ICP-MS	5	µg/L	11	9	5	< 5	< 5	< 5	< 5	< 5	< 5
Cadmium	ICP-MS	0.3	µg/L	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Chromium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Cobalt	ICP-MS	1	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Copper	ICP-MS	2	µg/L	2	5	2	3	2	2	2	2	2
Iron	ICP-MS	20	µg/L	890	470	150	610	640	770	940	820	520
Lead	ICP-MS	0.5	µg/L	< 0.5	0.8	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Manganese	ICP-MS	2	µg/L	12	20	2	7	8	13	20	28	10
Molybdenum	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Nickel	ICP-MS	2	µg/L	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2
Selenium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	ICP-MS	5	µg/L	14	22	24	16	17	17	17	14	19
Thallium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Tin	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Titanium	ICP-MS	2	µg/L	8	2	2	3	3	3	4	6	2
Uranium	ICP-MS	0.1	µg/L	< 0.1	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Vanadium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ICP-MS	2	µg/L	6	4	3	5	3	3	2	2	2
Stream Velocity												
Stream Velocity	Gurley		m/s	0.11	0.07	0.49	0.51	0.33	0.44	0.28	0.49	0.24
Gradient	Inclinometer		degrees	1	1	4	2	2.5	1.5	4	1	1

Appendix 4 - TLH-Phase III, Fish Habitat Component Study Water Quality

Parameters	Method	EQL	Units	Stream Crossing Number									
				#37	#38	#40	#41	#42	#48	#51	#52	#53	
Field Measurements													
Temperature	Hydrolab		°C	6.95	5.84	5.21	4.58	6.44	5.52	5.71	3.71	4.25	
pH	Hydrolab		units	8.39	7.74	7.48	7.72	7.39	7.59	7.22	7.54	7.14	
Conductivity	Hydrolab		µS/cm	4.6	6.6	6.9	6.1	4.9	4.9	6	4.9	7.7	
Dissolved O ₂	Hydrolab		mg/L	8.93	11.52	10.3	11.16	9.35	12.19	11.55	11.54	11.24	
Turbidity	Hydrolab	0.1	NTU	6.1	0.5	1	1.1	1.5	3.2	2	2.1	2	
Laboratory Analysis													
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	6	8	9	8	7	6	6	9	34	
Total Dissolved Solids	Grav.	10	mg/L	30	20	20	20	20	10	30	30	30	
Aluminum	ICP-MS	10	µg/L	120	150	110	100	80	100	110	100	150	
Antimony	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Arsenic	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Barium	ICP-MS	5	µg/L	7	8	12	19	10	5	< 5	< 5	5	
Beryllium	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Bismuth	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Boron	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Cadmium	ICP-MS	0.3	µg/L	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Chromium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Cobalt	ICP-MS	1	µg/L	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Copper	ICP-MS	2	µg/L	2	< 2	< 2	< 2	< 2	< 2	2	< 2	2	
Iron	ICP-MS	20	µg/L	3200	450	220	190	110	440	460	540	830	
Lead	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Manganese	ICP-MS	2	µg/L	100	6	4	3	4	7	6	9	11	
Molybdenum	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Nickel	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Selenium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Silver	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Strontium	ICP-MS	5	µg/L	11	17	18	15	12	10	11	10	14	
Thallium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Tin	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Titanium	ICP-MS	2	µg/L	2	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Uranium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Vanadium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Zinc	ICP-MS	2	µg/L	4	2	3	3	2	2	3	2	8	
Stream Velocity	Gurley		m/s	0.14	0.36	0.30	0.52	0.16	0.24	0.22	0.16	0.16	
Gradient	Inclinometer		degrees	<1	1.5	1	1	0.5	2	1.5	1	0.5	

Appendix 4 - TLH-Phase III, Fish Habitat Component Study Water Quality

Parameters	Method	EQL	Units	Stream Crossing Number								
				#55	#56	#61	#64	#65	#67	#68	#73	#79
Field Measurements												
Temperature	Hydrolab		°C	3.27	4.57	4.16	3.92	4.14	4.6	4.29	6.09	5.16
pH	Hydrolab		units	7.4	6.49	7.8	7.61	7.33	7.72	7.06	7.51	7.09
Conductivity	Hydrolab		µS/cm	6.4	3.9	8.2	7.2	8	9.2	7.5	5.6	2.4
Dissolved O ₂	Hydrolab		mg/L	10.65	10.95	11.16	10.97	9.61	12.57	10.81	10.72	10.9
Turbidity	Hydrolab	0.1	NTU	2.5	3.1	1.4	3.5	4.1	7.8	2.2	9.2	8.9
Laboratory Analysis												
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	9	< 5	9	8	9	10	7	6	< 5
Total Dissolved Solids	Grav.	10	mg/L	30	20	20	20	40	40	40	30	30
Aluminum	ICP-MS	10	µg/L	90	170	120	90	90	80	150	120	100
Antimony	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Arsenic	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Barium	ICP-MS	5	µg/L	< 5	5	< 5	< 5	< 5	< 5	6	8	5
Beryllium	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bismuth	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Boron	ICP-MS	5	µg/L	< 5	< 5	< 5	6	< 5	< 5	< 5	< 5	< 5
Cadmium	ICP-MS	0.3	µg/L	< 0.3	< 0.3	< 0.3	0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Chromium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Cobalt	ICP-MS	1	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Copper	ICP-MS	2	µg/L	2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2
Iron	ICP-MS	20	µg/L	520	1800	150	250	520	290	390	920	900
Lead	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Manganese	ICP-MS	2	µg/L	10	71	6	13	31	7	7	18	18
Molybdenum	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Nickel	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Selenium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Silver	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Strontium	ICP-MS	5	µg/L	11	10	13	13	17	16	18	15	7
Thallium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Tin	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Titanium	ICP-MS	2	µg/L	< 2	2	< 2	< 2	< 2	< 2	< 2	3	2
Uranium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Vanadium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Zinc	ICP-MS	2	µg/L	3	6	2	4	2	2	2	3	6
Stream Velocity	Gurley		m/s	0.36	0.36	0.53	0.25	0.09	0.39	0.51	0.59	0.28
Gradient	Inclinometer		degrees	2	5	1	1	0.5	2	6	1.5	1

Appendix 4 - TLH-Phase III, Fish Habitat Component Study Water Quality

Parameters	Method	EQL	Units	Stream Crossing Number								
				#82	#87	#88	#89	#90	#91	#94	#96	
Field Measurements												
Temperature	Hydrolab		°C	3.07	3.67	3.36	2.82	5.78	11.4	10.43	5.9	
pH	Hydrolab		units	7.1	6.05	6.03	5.72	7.56	6.41	8.09	7.81	
Conductivity	Hydrolab		µS/cm	3.1	5.6	4.8	4.5	4.8	4.1	5.7	8.1	
Dissolved O ₂	Hydrolab		mg/L	11.16	12.9	11.51	11.6	10.19	8.91	10.35	12.27	
Turbidity	Hydrolab	0.1	NTU	8.3	3.4	6.7	4.2	4.7	0.5	0.1	0.1	
Laboratory Analysis												
Alkalinity (as CaCO ₃)	COBAS	5	mg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	7	
Total Dissolved Solids	Grav.	10	mg/L	30	50	50	40	30	30	40	30	
Aluminum	ICP-MS	10	µg/L	90	310	330	370	260	280	150	130	
Antimony	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Arsenic	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Barium	ICP-MS	5	µg/L	6	9	10	10	11	9	7	6	
Beryllium	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Bismuth	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Boron	ICP-MS	5	µg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	
Cadmium	ICP-MS	0.3	µg/L	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
Chromium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Cobalt	ICP-MS	1	µg/L	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Copper	ICP-MS	2	µg/L	< 2	< 2	< 2	2	2	< 2	2	< 2	
Iron	ICP-MS	20	µg/L	2300	780	940	800	440	450	650	420	
Lead	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Manganese	ICP-MS	2	µg/L	16	12	15	14	5	9	8	8	
Molybdenum	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Nickel	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Selenium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Silver	ICP-MS	0.5	µg/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Strontium	ICP-MS	5	µg/L	9	11	12	10	13	9	13	16	
Thallium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Tin	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Titanium	ICP-MS	2	µg/L	< 2	4	5	5	3	3	2	2	
Uranium	ICP-MS	0.1	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	
Vanadium	ICP-MS	2	µg/L	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Zinc	ICP-MS	2	µg/L	2	4	4	3	8	3	4	4	
Stream Velocity												
Stream Velocity	Gurley		m/s	0.21	0.40	0.36	0.34	0.12	0.16	0.36	0.29	
Gradient	Inclinometer		degrees	2	4	1	2	0.5	1	1	0.5	