

25 July 1979:

810653

AM: Meet with  
P. Taggart, Newt Cornish,  
Dave Goodall & Murray  
Hampton RE: Vangorda Ck  
Diversion

PM: to town to buy  
stuff.

Vangorda Ck water  
Sample station marked.

Attempted to get to  
B 3 and B 4 sites  
but couldn't get  
across Blind Ck.

Sample S3: small  
swampy creek north of  
adit - possible camp  
water supply.

26 July

Site B-3 - Swim Creek  
at Blind Creek 9:30 AM

Channel  $\sim$  1 m deep by  
1 m wide, swift flowing.  
Appears to run through  
partial conduit in  
permafrost for much of  
distance after it enters  
Blind Creek valley

Site B-4: Blind Creek  
above Swim Creek 10:00 AM

Width  $\sim$  10 m, average  
depth  $\sim$  0.4 m,  
meanders over sand  
and gravel bottom.

Both stations accessible  
from chopper landing spot  
 $\frac{1}{2}$  way between.

Sample site V7: 10:45 AM

Swift mountain creek  
running on bedrock

Photo 3

Sample site B-2 - creek  
draining Dy 11:45 AM

Photo 4

Small swift stream  
1 m wide by a few  
cm deep. Gravelly  
bed with many large  
boulders.

↙ photo 5

Site V-6 - Creek ~ 3m  
wide by average of 20cm  
deep, running over  
bouldery gravel bed.

Slight turbidity due to  
cat work and 2 drills  
working on Vangarda. 1:30 PM

STN V5 - Shrimp Ck

1 m wide by 20 cm deep,  
swift flowing on  
gravel in narrow channel.

Photo 6

2:00 PM

STN B1 - Blind Creek

at former stream gauging  
station 100 m upstream  
from bridge.

Photo 7 - burn on

Blind Ck road

Fire weed

Scoulers willow?

Yarrow

Stn V-4: Vengorda Ck

above West Fork Ck

~ 3 m wide, 20cm deep

Swift running over

gravel bottom. 3:45 PM

Stn V1: Vengorda Ck

at mouth (50 m. above  
bridge to Pumphouse No 1)

4:00 PM

Stn V2: West Fork Ck

above main road

to mine (upstream

end of culvert)

~ 2 m x 15 cm deep

Swift flowing on gravel

bottom. 4:15 PM

Site S-2: Sample From

From exploratory adit  
to investigate quality  
as comp drinking water  
supply.

27 July

Drafted surficial materials map (ME) onto 1:50,000 base

Wrote Env. Assessment of Tailings Pond

28 July

PLANT PLOT #1

Subalpine forest above  
Vangorda

TREE STRATUM

<u>SPECIES</u>		CBH	abh
—	af		40 cm
bark 2 cm	"		32
(diameter)	"		33
—	"	core →	44
—	WS		79
bark 2 cm	"		86
(diameter)	"		99
—	"	CORE →	217 cm

10 m 1.0 m 30°

2015 m 1.5 m 35°

REGENERATION

af 33

slate junco (Junco hyemalis)



## SHRUB STRATUM 1

Betula glandulosa 60%

Ledum groenlandicum 30%

Salix<sup>①</sup> glauca? ← whitish leaves, hairy beneath

Vaccinium uliginosum? 50%

Potentilla fruticosa 10%

Salix<sup>②</sup> ← green glaucous leaves, not hairy beneath

Betula papyrifera

## SHRUB STRATUM 2

"crowberry" Empetrum nigrum 30%

Salix reticulata 10%

unident - low trailing shrub with "willow" leaves and green berries

~~two flowers~~  
~~Fraxinophytos~~?

Vaccinium vitis-idaea

## HERB LAYER

grass? Parnassia Parnassia palustris  
yellow compositae Senecio lugens?

just outside plot

Pinus contorta  
Pedicularis verticillata?

Plot is well watered and  
well drained with dark  
brown soil. Slope  $\sim 5^\circ$  to south  
4400 FT Elevation

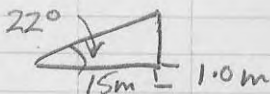
Plot 2: Level site at  
4150 FT elevation,  
Thin poor lite brn soil  
developed on thin veneer  
of morainal material over  
bedrock.

TREE STRATUM:

<u>species</u>	<u>CBH ob</u>
W.S.	33 cm
	57 CORE
	40
	52

regeneration:

a.f. 3



Spruce grouse

Tall shrub stratum:

B. glandulosa 80%

Salix glauca? 10%

Ledum groenlandicum 60%

Vaccinium uliginosum

Low shrub stratum:

Empetrum nigrum 40%

Vaccinium vitis-idaea 10%  
(mountain cranberry)

HERB STRATUM

none

Photo 8 Salix glauca  
(close up)

9 - Plot 2

- variety of lichens and  
mosses

outside plot

*Pinus contorta*  
*Cornus canadensis*

PLOT 3 : Elev 4300 FT,

wet seepage meadow  
near Firth Creek.

Photo 9 - plot 3

Many sedges and grass-like  
species cannot be identified  
without better references.

NO TREES

TALL SHRUB STRATUM:

B. glandulosa 10%

P. fruticosa 10%

Salix arbusculoides? 10%

Ledum groenlandicum

LOW SHRUB STRATUM:

Salix reticulata 50%

some "salix like" low shrub  
with berries as at plot 1

Geocaulon lividum

HERB STRATUM

Agrostis sp?

sedges and sedge like spp.

Polemonium acutiflorum

Pedicularis (yellow)

Aconitum delphinifolium

Rubus arcticus

Sedum rosea

Parnassia

Epilobium angustifolium

Several other species  
unidentifiable until in  
flower or better books

Susamp gentian?

Gentian scptum

29 JULY :

AM - TRIP TO ROSS FOR  
ACID ETC

PM

Plot 4 - Natural revegetation  
on Vangorda AIRSTRIP

Very well drained  
morainal veneer over  
bedrock. Level site  
with pale brown, stoney  
soil.

TREE REGENERATION

		HT
pine	7	.33 → 1.4 m
a. f.	5	4cm → 80cm
ws	2	~ 20cm
aspen	numerous	90 cm max



TALL SHRUB STRATUM :

Salix sp

Salix sp glauca

Betula glandulosa

Ledum groenlandicum

LOW SHRUB STRATUM

Empetrum nigrum -

Part of <sup>non</sup> plot on disturbed

Vaccinium vitis-idaea

Vaccinium uliginosum

## HERB STRATUM

*Epilobium angustifolium*  
*Achillea millefolium*  
*Agrostis* sp.

2 or 3 unidentifiable plants

plot covers edge  
of airstrip from  
recently traveled  
road edge to essentially  
undisturbed area, ∴  
% coverage data is  
not meaningful

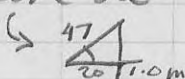
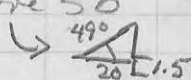
Order of colonization  
is probably:

- ① *Epilobium* / *Achillea* / *Agrostis*
- ② mosses + lichens
- ③ willows
- ④ *Betula* g / *Vaccinium* sp / *V. v.*
- ⑤ *P. contorta* / *Picea* / a.f.

PLOT 5: Mature white  
Spruce Forest in  
Shrimp Lk valley. No evidence  
of any forest fire.

Elevation 3500 FT, slope  
22° WSW

TREE STRATUM:

	DBH (D)	CBH	ob
W.S.	3cm	139	core 5a
"	2cm	85	↳ 
"	2cm	78	
"	3cm	150	core 5b
"	3	134	↳ 
"	2	54	
"	3	129	
"	3	137	
"	2	61	

REGENERATION:

W S

3

## TALL SHRUB STRATUM

*Populus trichocarpa* 1 (dead)

*Salix glauca*? 50%

*Shepherdia canadensis* 10%

*Rosa* sp

## LOW SHRUB STRATUM

*Empetrum nigrum* 20%

*Linnaea borealis* 20%

*Ledum groenlandicum* 10%

*Vaccinium uglinosum*

*Vaccinium vitis-idaea*

Unident shrub with leaves  
something like *Vaccinium membranaceum*.

Unident "Salix" like  
low mat shrub with  
green berries (as at Plot 1)

HERB STRATUM

yellow compositae  
Solidago sp?

Pedicularis labradorica

Pyrola Secunda

Pyrola asarifolia

Epilobium angustifolium

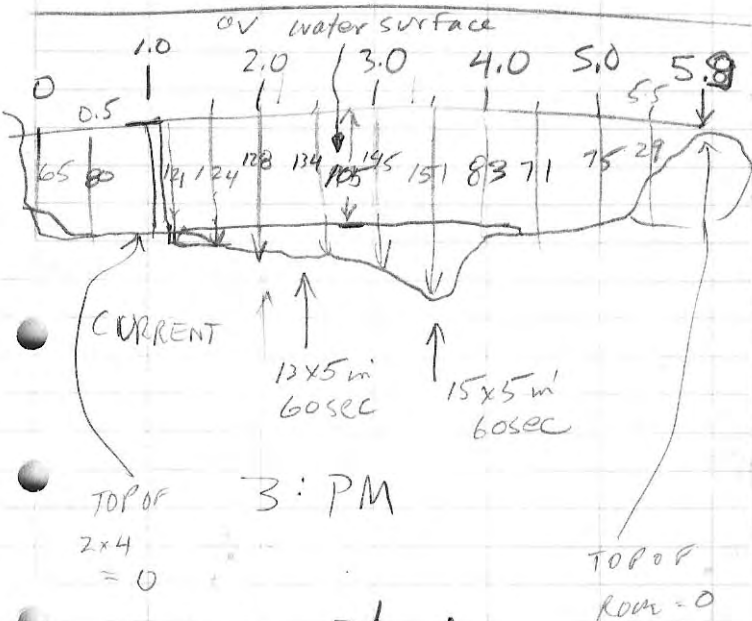
Moneses uniflora

unident plant with  
"Fragaria" leaves (but  
not *F. virginiana*  
perhaps *vesca*?)

30 July

AM - monthly report  
+ prelim orvil  
range recommended environ-  
mental work report

PM - Stream gauging  
Station at V-7



35.73 m<sup>3</sup>/min  
or 7859.5 Imp gal/min

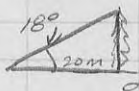
PLOT 6 : Upper Vengorda  
Creek close to V7

Old burn with some alpine  
fir and spruce regeneration

Photo 11: general view of plot.

TREE STRATUM: CBH  $\times$  B

a.f.	35
"	41 CORE
"	32
"	36



REGENERATION

a.f.	2
WS	3
aspen	2

Tall Shrub stratum

Salix sp. (glauca?) 10%

Betula glandulosa 40%

Ledum 40%

## Low shrub stratum

Cornepetrum nigrum 50%  
Vaccinium uliginosum 20%  
Vaccinium vitis-idaea  
Rosasp.

## HERB STRATUM

Cornus canadensis  
Lupinus sp  
grass

## MOSS/LICHEN STRATUM

50%

Lycopodium



Plot 7: • old burn - flat  
well drained site on  
road to Dy. Elev:

Photo 12 Location only approx till  
new photography is available

TREE STRATUM :

P.C.

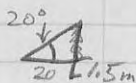
"

WS

70 CORE

61

34



REGENERATION :

WS

11111 6

P.C

~~11111~~ 7

af

111111 6

*Populus tremuloides* 2 ~ 6m high

## Tall shrub stratum

Salix glauca? 20%

~~Populus tremula~~

Ledum sp

10%

Betula glandulosa

## Low shrub stratum

Empetrum nigrum 30%

Vaccinium uliginosum 10%

low "Salix" like beast  
(as per plot 1) Geocaulon  
lividum

Arctostaphylos uva-ursi

Vaccinium vitis-idaea 10%

Herb stratum

Lupinus sp

Cornus canadensis

Pedicularis labradorica

Lycopodium sp

Selaginella sp

grass

Pyrola secunda

MOSS/LICHEN STRATUM

coverage ~ 20%

31 JULY

Wasted most of day looking for Newt, who forgot about our 10 AM meeting. Finally found him & set up meeting for 2:30 PM.

This time he showed up but we only had 10 minutes to talk before we were interrupted by 2 General Enterprises people & I was "dismissed".

Got water license and "down valley" tailing scheme proposal from him.

August

Sampled water sites:

- V3 (Firth)
- R10 (Upper Rose)
- R9 (Rose at Reservoir)
- R8 (Rose at Pump house)
- R5 (North Fork at road)
- R12 (Decant)
- R13 (seepage zone)
- and R4 (2 km below decant)

In afternoon flew down Rose Creek with Witham (DDU) to get water samples at:

- R1 - (mouth of Anvil Ck)
- R3 - (Rose at Anvil)
- R2 - (Anvil above Rose)

R 7 (North Fork above  
Favock diversion)

Collected the following

Silt samples:

EAGD-2 - at site R2

- 1 - at 10 km below  
decant

- 3 - polluted soil  
at 10 km below decant

EAGD-4 - SITE V3

5 - SITE B2

6 - SITE V7

Tailings spill  
in 1975 has killed  
vegetation at a  
number of sites along

Rose Creek between  
10 km point and  
the decant. Trees  
also are dying in  
these blanketed  
areas, producing  
ugly scars along  
valley sides. Red,  
scummy seepage zones  
indicate that tailings  
are oxidizing and  
producing acid  
seepages. Rose  
creek itself is turbid  
and gravel beds are  
coated with fine silt

2 August:

Silt sample EAGD-7 -  
6 km below decant on  
Rose Creek

Areas covered by  
1975 tailings spill are  
marked by dead and  
dying vegetation, and  
by rusty, extremely  
acid seepages. Rose  
Creek gravel beds are  
choked with fine silt,  
and waters are turbid.  
Emergent sord and gravel  
bars are rust stained.  
There is some evidence  
that tailings are poisoning  
trees as much as 3 m  
above creek level.

Water sample S4-79-1  
is of rusty seepage  
from area of tailings.

Silt sample EAGD-8 is  
at R4



In afternoon I ran through all Federal

legislation to see what laws we are violating.

We appear to be violating Environmental Contaminants Act, Fisheries Act, Northern Inland waters Act, and Territorial Lands Act.

also perhaps Clean Air Act.

3 August:

EA9D-9: Vongorda Creek  
just below deposit.

Stream at this point is  
extremely polluted and  
stinks of diesel from  
drill rig upstream.

Rocks are rust stained.

EA9D-10: Down Vongorda  
300 m below ingress of  
Grum drainage

EA9D-11: AT V6

EA9D-12: AT V5

Vongorda still turbid  
at this point

Resampled R13  
in afternoon - pH  $\approx$  8

also R12 and S4

(all 79-2's)

2 Oct 1979

Stn V3

Temp  $3.5^{\circ}\text{C}$

R10 -  $3.5^{\circ}\text{C}$

R9 -  $3.5^{\circ}\text{C}$

R5 -  $4.0^{\circ}\text{C}$

R8 - North Fork

Diverted into Rose Ck  
above this stn.

Temp  $4.0^{\circ}\text{C}$

R4 - Note: mine  
not operating due to  
strike  $3.5^{\circ}\text{C}$

R13 - Seepage zone  
still flowing at  
normal rate despite  
mine shutdown.

Stn. V7 - Temp  $3.5^{\circ}\text{C}$

Stn B-2 - Temp  $3.5^{\circ}\text{C}$

PM: Drove to RR

to get boxes for shipping anemometer, chainsaw, etc. to Vancouver. Packed some.

S4 - surface runoff from spilled tailings 200 m. below proposed dam

S-2 - ADIT WATER

3 Oct:

•  $\frac{\text{Str V5}}{\times}$   
•  $\frac{\text{V6}}{\text{---}}$  } Temp 3.5°

• B1 - Temp 4.0°C

V4 - Temp 3.5°C

V1 - Temp 3.5°C

V2 - Temp 3.5°C

## Sampling with chopper:

B3 : 3.5°C

B4 3.5°C

R2

R3\*

R1\*

} 3.5°C

\* NOTE: MINE NOT

Operating, no decant.

S5 - Grumcamp well  
water.

Miscellaneous notes:

- ① Lotsa vabbits (saw  
3 on circuit around  
V5 and V6.

② Most plants have  
dropt leaves

③ Just Freezing at  
night at Grom -  
snowing at night,  
raining during the  
day.

④ Lolium multiflorum  
(FJA - p 180) is  
common grass  
around Grom Camp.

Hordeum jubatum L.  
(FJA - p 192)

- common along roadsides

Phleum pratense L.  
(FJA - p 89)

Common around  
Grom Camp on roadsides  
(possibly Alopecurus pratensis)  
(same p)



*Calamagrostis lapponica*  
p106

*Festuca arundinacea*  
p166

Carex aquatilis Wahlenb.  
(F&A p 250)

- wet swampy areas around Grum camp.

Luzula parviflora <sup>ss p. parviflora</sup>  
(Ehrh.) Desv.  
(F&A p 298)

- wet boggy areas around Grum camp.

Carex Bebbii (F&A p 234)

(possibly C. Bauxbaumii p 257)

- bogs close to Grum

Juncus castaneus Sm

ss p. leucochlamys (Zinz.) Hult.

(F&A p 289)

- bogs close to Grum