

2001 Dam Safety Inspection Reports

PUB 1.2
Attachment H

Cape Broyle/Horse Chops Developments

NEWFOUNDLAND POWER

January 11, 2002

Memorandum From: G. Humby

To: S. LaCour

Subject: 2001 Dam Safety Inspection Reports
Cape Broyle / Horsechops Developments

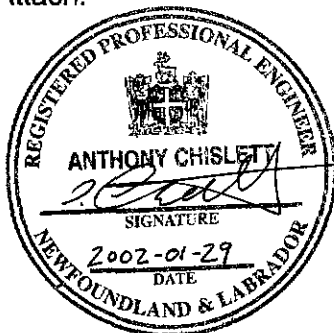
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Attached is a copy of the Dam Safety Inspection Report for structures located in the Cape Broyle and Horsechops Hydroelectric Developments. In general, the structures in this system are in good condition and should operate safely with some minor repairs/maintenance and capital improvements.

Some of the more important items noted in the report include:

- Heavy vegetation at some structures,
- Deterioration of rip rap and/or rockfill at various structures,
- Deterioration of concrete abutments at Fourth Blackwoods Control structure,
- Continued monitoring of seepage at West Ragged Hills Dam/Spillway,
- Continued monitoring of seepage at various Horsechops structures,
- Deterioration of concrete at Cape Broyle Spillway.

TC/pp
Attach:



A handwritten signature in black ink, which appears to read 'Gary Humby'.

EMBANKMENT DAM

Structure :	<u>Northwest Blackwoods Freeboard Dam</u>	Date/Time :	<u>2001-11-29</u>
Inspected by :	<u>IK, PP, KH</u>	Water Level :	<u>Very Low</u>
Weather :	<u>Sunny, Cold, -5°C</u>	Releases :	<u></u>

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap noted as being irregular but stable.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Considerable amount of water ponded near the downstream toe that should be drained.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Good.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest noted as being uneven, and appears to be low in the middle.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Ponded water, with no evidence of flowing water observed.

Remarks

EMBANKMENT DAM

Structure : Northwest Blackwoods Diversion Dam Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : Very Low
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap noted as irregular but stable.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Some ponding of water noted, as well as some sparse large vegetation (Trees) present.

Downstream slope appears steep but stable.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Good condition.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Some ponding of water evident, but no flow of water observed.

Remarks

ROCKFILL OVERFLOW SPILLWAY

Structure : Northwest Blackwoods Spillway Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : Very Low
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Other*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Stilling Basin (*Debris, Walls movement/settlement/joints/erosion*)

Stilling basin was OK.

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris in water, Stoplogs condition/operation*)

N/A

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

No problems observed.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

No problems observed.

Approach Channel (*Slides above channel, Stability of side slopes, Log boom, Debris, Slope protection*)

Approach channel was OK.

Remarks

New structure, built in 2000.

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #1 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : Very Low
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap noted as sparse but OK. Suspected that the structure does not see much water.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

None observed.

Remarks

Vegetation should be cut and cleared.

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #2
Inspected by : IK, PP, KH
Weather : Sunny, Cold, -5°C

Date/Time : 2001-11-29
Water Level :
Releases :

Upstream Face (*Slide movements, Slope protection, Erosion—beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap noted as steep but stable.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

None observed.

Remarks

ROCKFILL OVERFLOW SPILLWAY

Structure :	East Blackwoods Spillway	Date/Time :	2001-11-29
Inspected by :	IK, PP, KH	Water Level :	30" Below FSL
Weather :	Sunny, Cold, -5°C	Releases :	

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap was small but no movement was noted. Some minor settlement noted along the sheet pile.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Other*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Stilling Basin (*Debris, Walls movement/settlement/joints/erosion*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris in water, Stoplogs condition/operation*)

Not well defined immediately downstream of the dam.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK. Minor settlement noted along the sheet pile.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Minor seepage was noted along downstream toe, approximately 1L/s.

Approach Channel (*Slides above channel, Stability of side slopes, Log boom, Debris, Slope protection*)

Channel was OK.

Remarks

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #4 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : _____
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap noted as sparse, but slope seems stable.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

None observed.

Remarks

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #5 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : _____
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion—beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Very steep in places, but slope seems stable. Monitor for movement.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Steel culvert was present for unwatering. Culvert was in poor condition but no longer required.

Remarks

EMBANKMENT DAM

Structure : <u>East Blackwoods Freeboard Dam #6</u>	Date/Time : <u>2001-11-29</u>
Inspected by : <u>IK, PP, KH</u>	Water Level : _____
Weather : <u>Sunny, Cold, -5°C</u>	Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Minor ponding noted, no flow observed.

Remarks

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #7 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : _____
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK. Riprap was steep but stable.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK. Slope was steep but stable.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

OK

Remarks

EMBANKMENT DAM

Structure : East Blackwoods Freeboard Dam #8 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : _____
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK. Riprap was small.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

OK

Remarks

Riprap was small.

EMBANKMENT DAM

Structure :	<u>East Blackwoods Freeboard Dam #9</u>	Date/Time :	<u>2001-11-29</u>
Inspected by :	<u>IK, PP, KH</u>	Water Level :	<u> </u>
Weather :	<u>Sunny, Cold, -5°C</u>	Releases :	<u> </u>

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK. Riprap ends before the left abutment. Vegetation present.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Downstream face was OK.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK. Low areas noted near the right abutment, allowing water to flow into the adjacent pit.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

OK, with minor ponding noted.

Remarks

EMBANKMENT DAM

Structure : Fourth Blackwoods Freeboard Dam #1
Inspected by : IK, PP, KH
Weather : Sunny, Cold, -5°C

Date/Time : 2001-11-29
Water Level : 725.6
Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion-beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Badly eroded by wave action, with very little riprap remaining.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Heavy to moderate amounts of vegetation was present.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was generally OK, with some rutting noted.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Location of the toe was difficult to determine.

Remarks

EMBANKMENT DAM

Structure : Fourth Blackwoods Freeboard Dam #2 Date/Time : 2001-11-29
Inspected by : IK, PP, KH Water Level : 725.6
Weather : Sunny, Cold, -5°C Releases : _____

Upstream Face (*Slide movements, Slope protection, Erosion—beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Riprap was poorly graded, but seemed stable. Some vegetation was present.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Unusual conditions*)

Heavy to moderate amounts of vegetation was present.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Abutments were OK.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

Crest was generally OK, with some rutting noted.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

Location of the toe was difficult to determine. Vegetation prevented observation of any seepage.

Remarks

Good condition overall.

ROCKFILL OVERFLOW SPILLWAY

Structure :	<u>Fourth Blackwoods Spillway</u>	Date/Time :	<u>2001-11-29</u>
Inspected by :	<u>IK, PP, KH</u>	Water Level :	<u></u>
Weather :	<u>Sunny, Cold, 5°C</u>	Releases :	<u></u>

Upstream Face (*Slide movements, Slope protection, Erosion—beaching, Cracks, Sinkholes, Settlement, Displacement, Debris, Unusual conditions*)

Upstream face was OK.

Downstream Face (*Slide movements, Signs of movements, Cracks, Seepage or wet areas, Other*)

Riprap noted as being small and poorly graded. Slope was steep but stable.

Abutments (*Seepage, Cracks/joints/bedding planes, Slides, Signs of movement*)

Right abutment requires riprap, but appears stable.

Stilling Basin (*Debris, Walls movement/settlement/joints/erosion*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris in water, Stoplogs condition/operation*)

Outlet channel crosses a road immediately downstream.

Crest (*Surface cracking, Settlement, Lateral movement, Camber*)

No angle iron used during construction. Sheet pile appears to be OK.

Seepage and Drainage (*Locations(s), Estimated flow(s), Color (staining), Toe drain and relief wells*)

None observed.

Approach Channel (*Slides above channel, Stability of side slopes, Log boom, Debris, Slope protection*)

Channel was OK.

Remarks

Infrequent spill.

OUTLET WORKS

Structure : <u>Fourth Blackwoods Control Structure</u>	Date/Time : <u>2001-11-29</u>
Inspected by : <u>IK, PP, KH</u>	Water Level : <u>725.6</u>
Weather : <u>Sunny, Cold, 5°C</u>	Releases : _____

Intake (*Trash rack, Concrete*)

N/A

Outlet Conduit (*Metal work*)

N/A

Control Facilities (*Gatehouse, Crane, Gate/Controls—description/condition, Operation, Mechanical items, Ventilation, Lighting, Stoplogs condition/seals*)

Concrete abutments are showing deterioration, and serious cracking. Steel requires scraping and paint.

Structure still appears to be OK.

Chute (*Debris, Walls movement/settlement/joints/cracks/backfill*)

N/A

Floor (*Movement, Settlement, Joints, Drains, Cracks, Condition of concrete, Settlement, Stress cracks, Movement*)

N/A

Stilling Basin (*Debris in basin, Walls movement, Walls settlement*)

N/A

Outlet Channel (*Slope protection, Stability of side slopes, Vegetation/obstructions, Debris*)

N/A

Remarks

Good condition overall. Planks were OK. Two tier of Stop logs on site.
