1999 Dam Safety Inspection Reports

PUB 3.2
Attachment D

Lockston Development

NEWFOUNDLAND POWER
A FORTIS COMPANY

NEWFOUNDLAND POWER

April 26, 2000

Memo From: J. P. Halliday

To: M. C. Hunter

Subject: 1999 Dam Safety Inspection Reports
Lockston Development

File: 401.01.03.30.01

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Attached are the Dam Safety Inspection reports for structures located in the Lockston Development. In general, structures in this development are in good condition and should operate safely with minor repairs and maintenance.

The woodstave penstock, however, is in poor condition, and consideration should be given to replacement in the near future.

Attach:

REGISTERED PROFESSIONAL ENGINEER
GARY K. HUMBY
SIGNATURE
2000/04/26
DATE
PROVINCE OF NEWFOUNDLAND

PROVINCE OF NEWFOUNDLAND
PERMIT HOLDER
This Permit Allows
NEWFOUNDLAND POWER INC.

To practice Professional Engineering in Newfoundland and Labrador.
Permit No. as issued by APEGN J0066
which is valid for the year 2000

DAM SAFETY INSPECTION

Trinity Pond Dam, Spillway & Outlet

Dam Type: Concrete Buttress

Date & Time of Examination: 99-11-30

Operational Status at Time of Examination:

Reservoir Water surface elevation	Approximately 8' below crest of outlet
Releases	None
Weather Conditions	Cloudy, 0°C
Water in storage	
Recent Seismic Events	None

Examining Party

P. Halliday
G.Humby
D. Laing

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream Face

Cracks	None Observed
Joint Offsets	None observed

Downstream Face

Cracks	None observed
Joint Offsets	None observed
Seepage on downstream face	None observed

Downstream Toe

Cracks	Gate opened approximately 1' at time of inspection.
Undercutting(from erosion)	None observed

Crest

Roadway	N/A
Walks	Good
Parapet Wall	N/A
Lighting, etc.	N/A

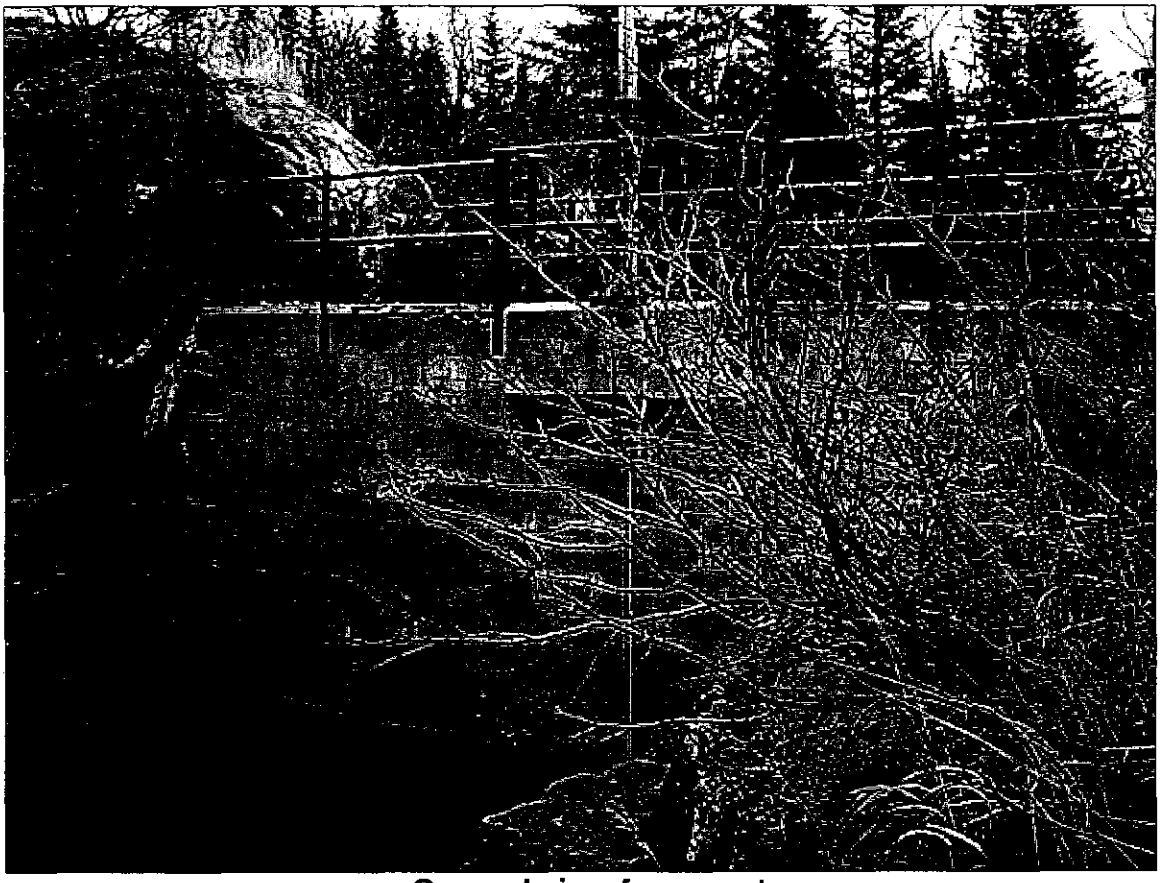
Foundation at Downstream Toe of Dam

Seepage around dam

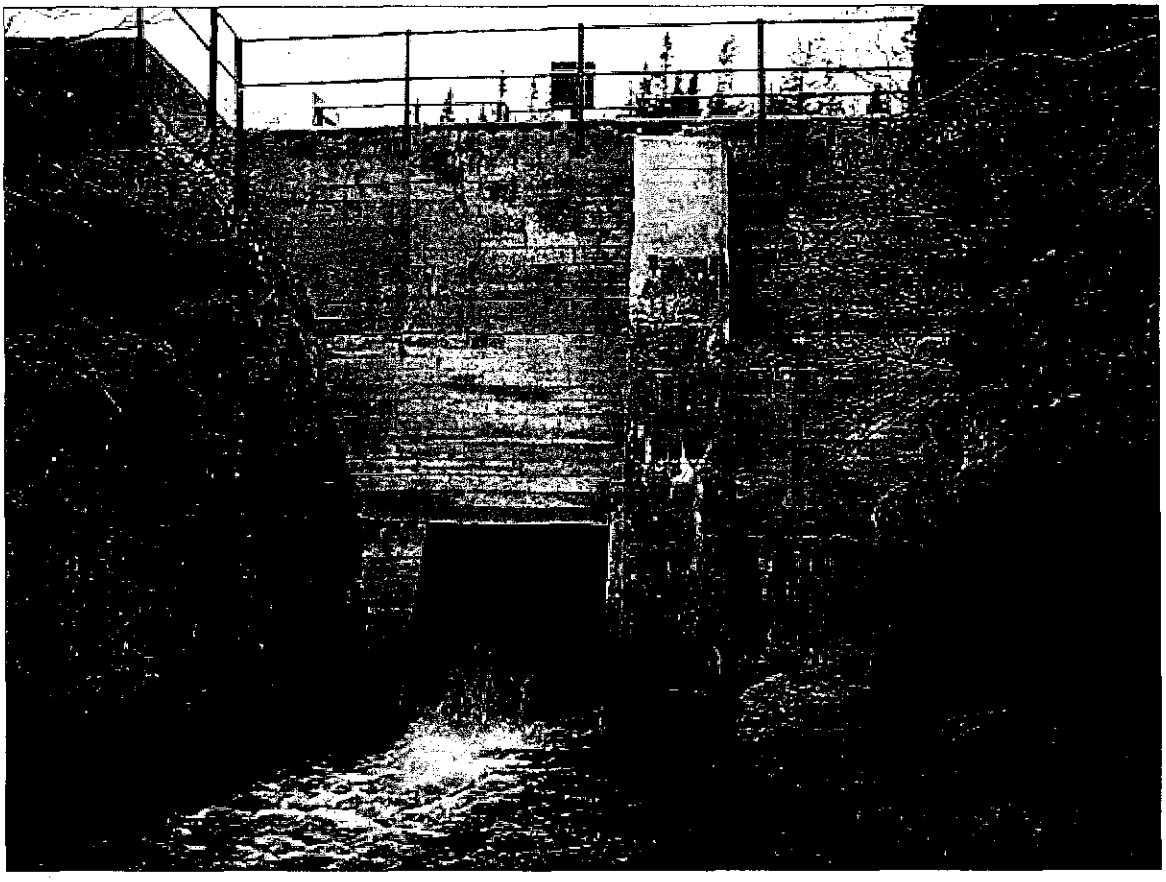
Location	None observed
Amount	
Measurement	

Remarks: Structure is in good condition. Handrailing along crest appears low and should be raised 6"

Development: Lockston
Structure: Trinity Pond Outlet



General view from upstream



General view from downstream

DAM SAFETY INSPECTION

Rattling Pond Dam, Spillway & Outlet

Dam Type: Concrete

Date & Time of Examination: 99-11-30

Operational Status at Time of Examination:

Reservoir Water surface elevation	F.S.L
Releases	None
Weather Conditions	Cloudy, 0°C
Water in storage	
Recent Seismic Events	None

Examining Party

P. Halliday
G.Humby
D. Laing

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream Face

Cracks	Some minor spalls.
Joint Offsets	None observed

Downstream Face

Cracks	Few minor cracks
Joint Offsets	None observed
Seepage on downstream face	Minor seepage at toe near canal entrance.

Downstream Toe

Cracks	Leaking in few areas
Undercutting(from erosion)	None observed

Crest

Roadway	N/A
Walks	N/A
Parapet Wall	N/A
Lighting, etc.	N/A

Foundation at Downstream Toe of Dam

Seepage around dam

Location	At toe near canal entrance.
Amount	Minor
Measurement	

Remarks: Gate mechanism has been replaced. Some minor seepage through sluice gate. Need to complete walkway and handrailing. Handrailing or safety fence should also be installed on dam section.

SPILLWAY

Control Structures

Crest	N/A
Orifices	N/A

Gates and Controls

Type of Gate	N/A
General condition	N/A
Operation of gates at time of examination	N/A

Approach Channel

Debris	None observed
Slides over channel	None observed
Channel side slope stability	Good
Slope protection	Good

Walkway

Condition of Piers	N/A
Condition of decking and beams	N/A
Condition of rails	N/A

Stilling Basin

Debris	None observed
Walls movement	None observed
Walls settlement, etc	None observed

Outlet Channel

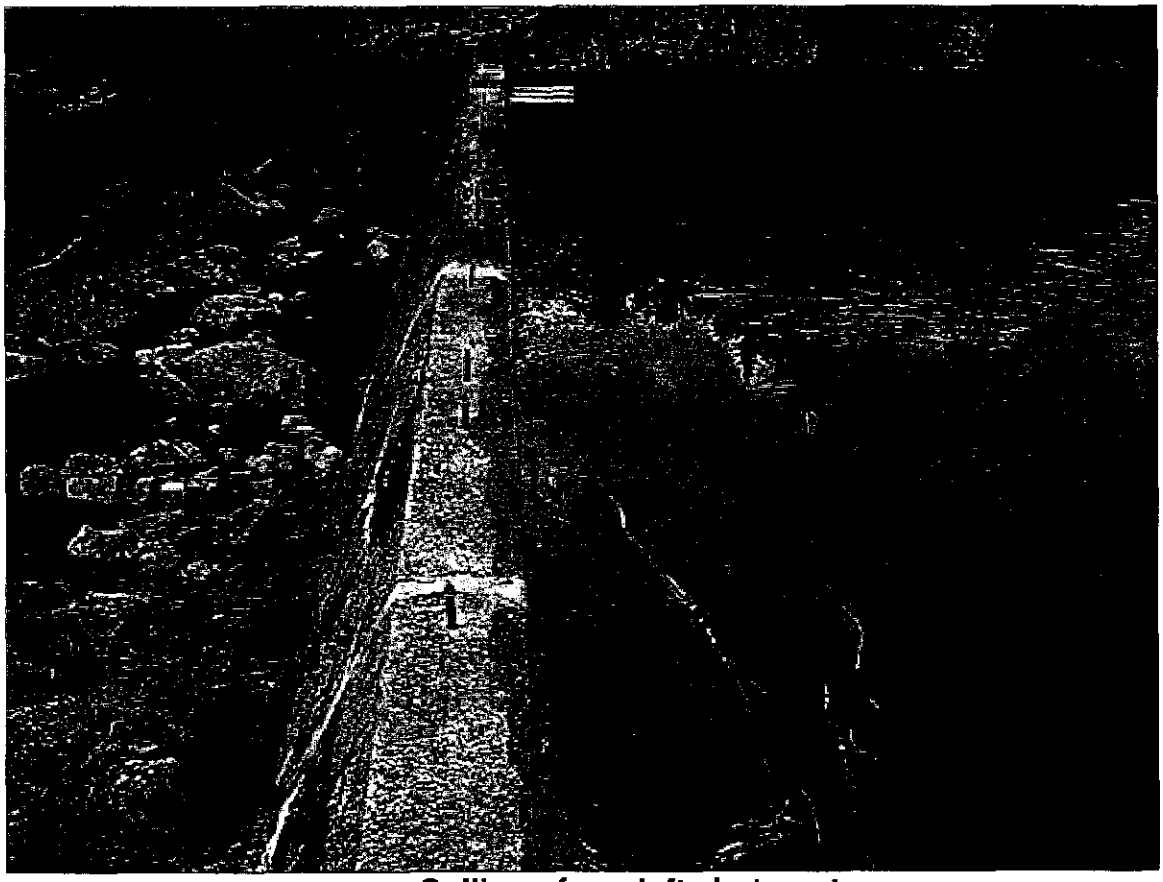
Slope Protection	O.K
Stability of Slopes	O.K
Vegetation and other obstructions	None observed
Other	

Flashboards

Condition	N/A
Operation	N/A

Remarks: Concrete in good condition. Minor undercutting D/S on left abutment. Also very minor seepage in this area, and through expansion joints

Development: Lockston
Structure: Rattling Pond Dam

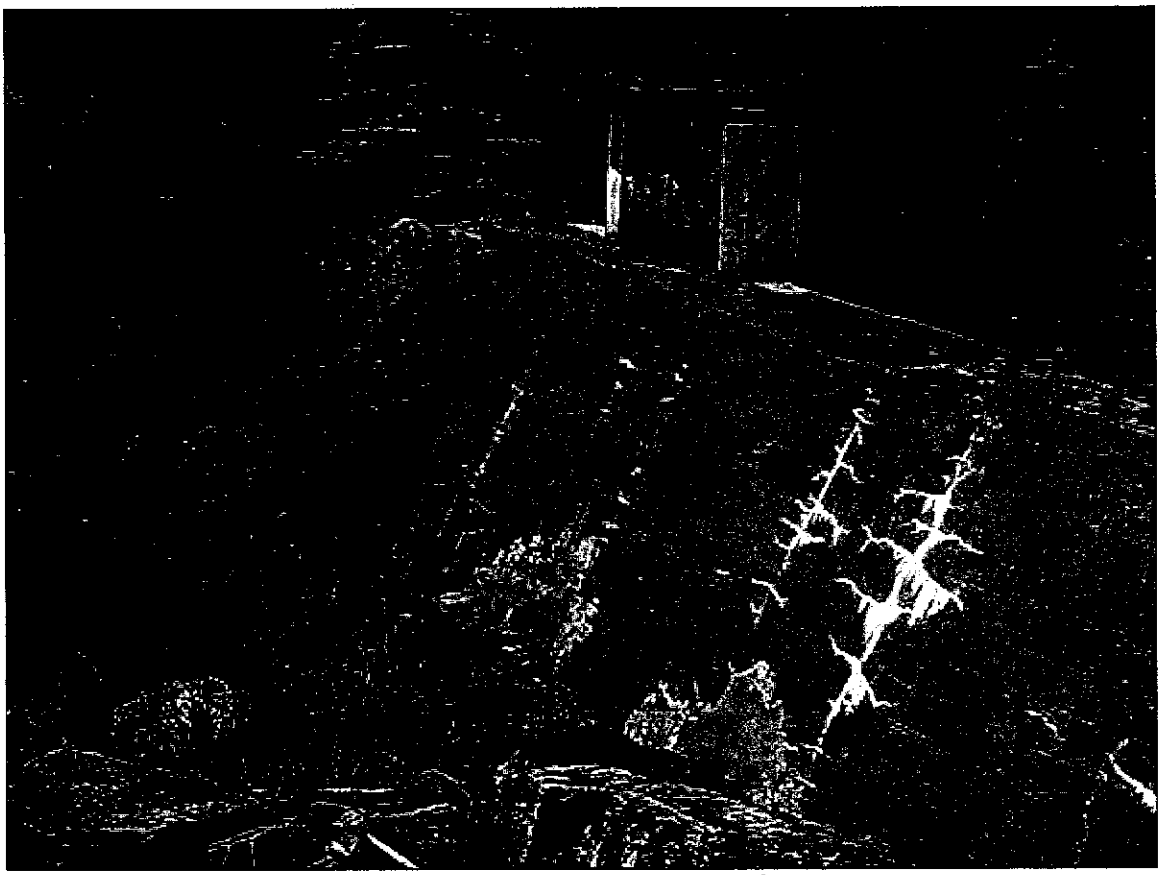


Spillway from left abutment

Upstream showing canal entrance

Development: Lockston
Structure: Rattling Pond Dam

Upstream at canal gate



Sluice gate to right of canal entrance

DAM SAFETY INSPECTION

Lockston Canal, Intake & Penstock

Dam Type: Concrete

Date & Time of Examination: 99-11-30

Operational Status at Time of Examination:

Reservoir Water surface elevation	F.S.L
Releases	None
Weather Conditions	Cloudy, 0°C
Water in storage	
Recent Seismic Events	None

Examining Party

P. Halliday
G.Humby
D. Laing

INSPECTION CHECKLIST FOR CONCRETE DAM

DAM

Upstream Face

Cracks	Several cracks and areas of spalled concrete along canal. Intake concrete in good condition.
Joint Offsets	None observed

Downstream Face

Cracks	Few minor cracks
Joint Offsets	None observed
Seepage on downstream face	Several areas with minor leakage . Significant leak through valve near intake.

Downstream Toe

Cracks	Minor cracks
Undercutting (from erosion)	None observed

Crest

Roadway	N/A
Walks	O.K
Parapet Wall	N/A
Lighting, etc.	N/A

Remarks: Concrete in fair condition. Several audible leaks all along canal but should be stable due to rockfill. Canal has little vegetation. Several areas along canal, and intake have been repaired/patched in recent years.

OUTLET WORKS

Intake

Trash rack	Clear
Concrete	See concrete section.

Outlet Conduit

Metal work	N/A
Penstock	See Penstock Section Attached

Control Facilities

Gatehouse	Fair-Poor condition. Needs work on roof and exterior.
Crane	N/A
Gate and controls (description)	New Armtec gate & lift
General condition	Good
Operation at time of examination	Open
Control System Mechanical items	Good condition
Ventilation	O.K
Lighting	O.K
Stop logs	
General condition	N/A
Seals	

Remarks: - Rakes for cleaning trash rack not working. Not sure if they are ever used, as they appear obsolete. Maybe they should be removed.
- Electrical service may need upgrading for water level controls.

PENSTOCK

Right of way

Vegetation	Some minor vegetation along penstock bed, especially in upstream section
Drainage ditches	Drainage poor
Culverts	N/A

Condition of Penstock Bed — Bed Stable – however, drainage poor & several support cradles undetermined.

Alignment	O.K, some areas of settlement, however they don't appear recent.
Settlement	Few areas

Penstock Type

Condition	Wood in poor condition, especially in lower section where staves are crushed.
Cracks	Several cracks in lower section.
Stresses	Several staves crushed, probably due to stresses in pipe or overtightening bands.
Other	

Penstock Supports

Cradles	Fair Condition
Saddles	Fair Condition

Anchor blocks

Condition of concrete	Fair-Good with some minor leaching.
Settlement	None observed
Stress cracks	None observed
Movement	None observed

Expansion Joints

Leaks	N/A
Stress cracks	N/A

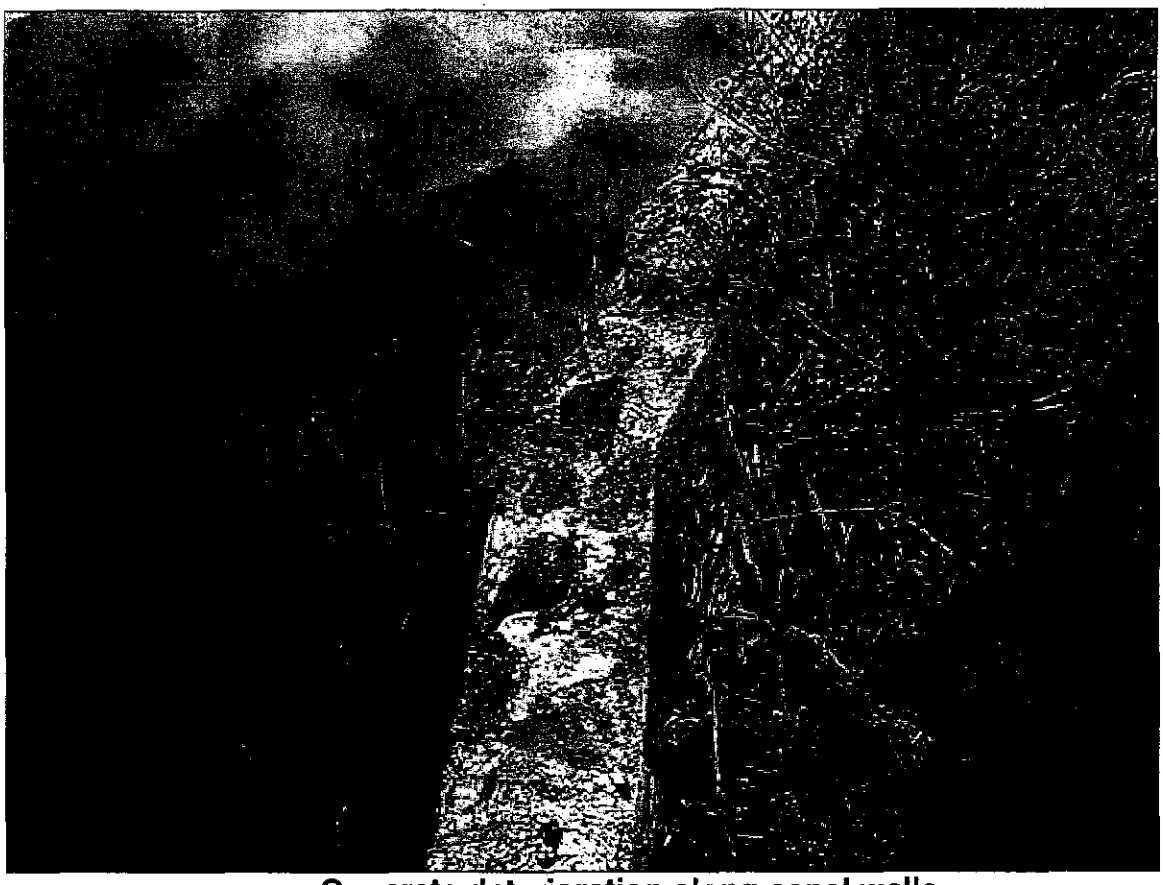
Penstock Cover

Condition of backfill	N/A
Slope Stability	N/A

Remarks: Penstock in poor condition with several staves crushed and/or rotted. Cradles and penstock supports are in fair condition, with several undermined. Considerable work has gone into repairs to leakage.

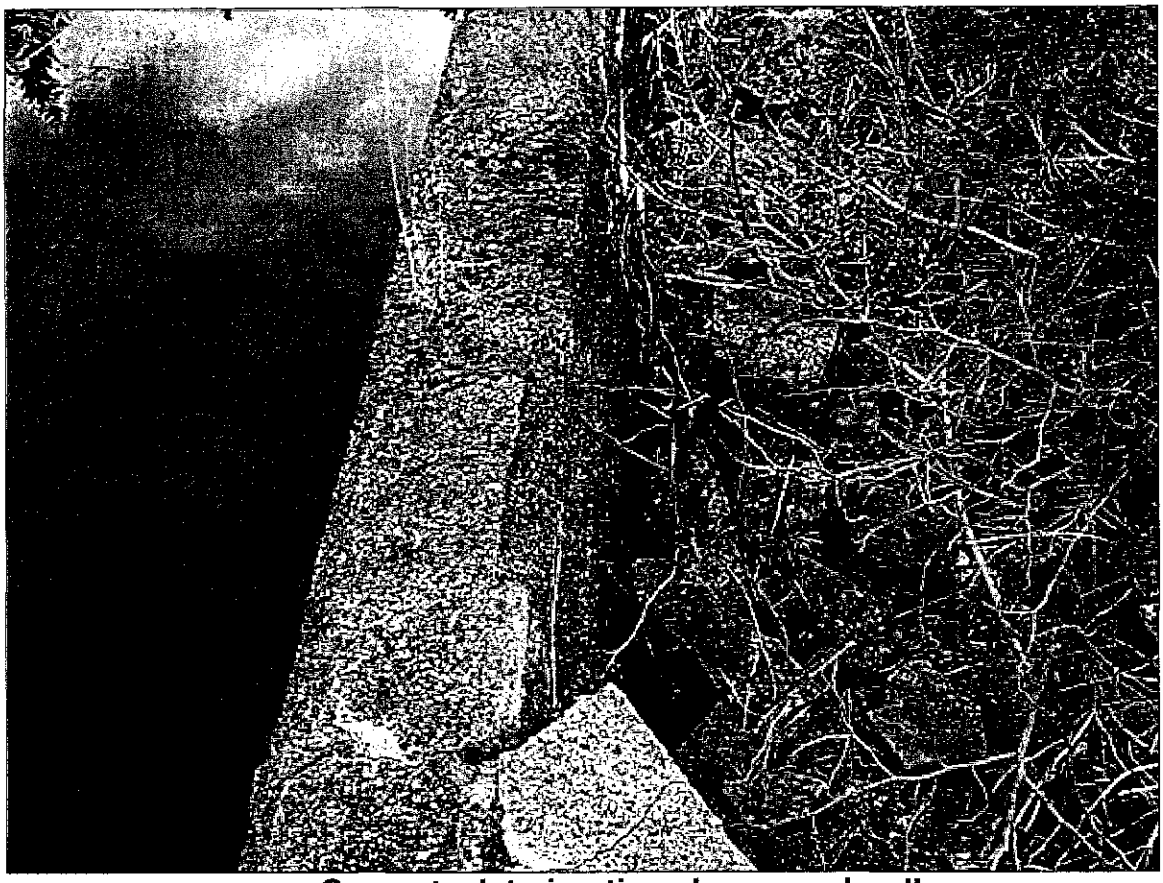
Development: Lockston
Structure: Lockston Power Canal

Canal embankment looking upstream



Concrete deterioration along canal walls

Development: Lockston
Structure: Lockston Power Canal



Concrete deterioration along canal walls

Concrete deterioration along canal wall

Development: Lockston
Structure: Lockston Power Canal

Leakage through canal wall near intake

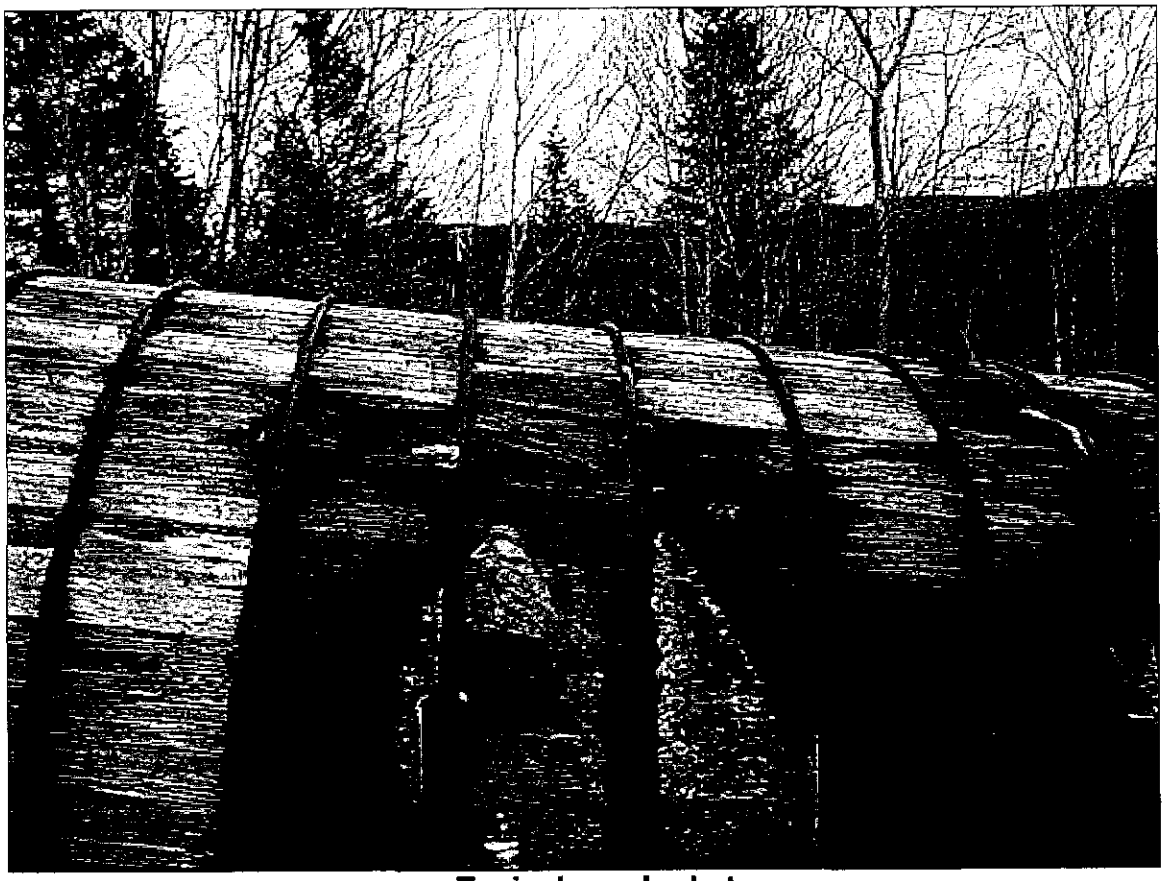
Development: Lockston
Structure: Lockston Intake

Downstream slope to right of intake

View from downstream

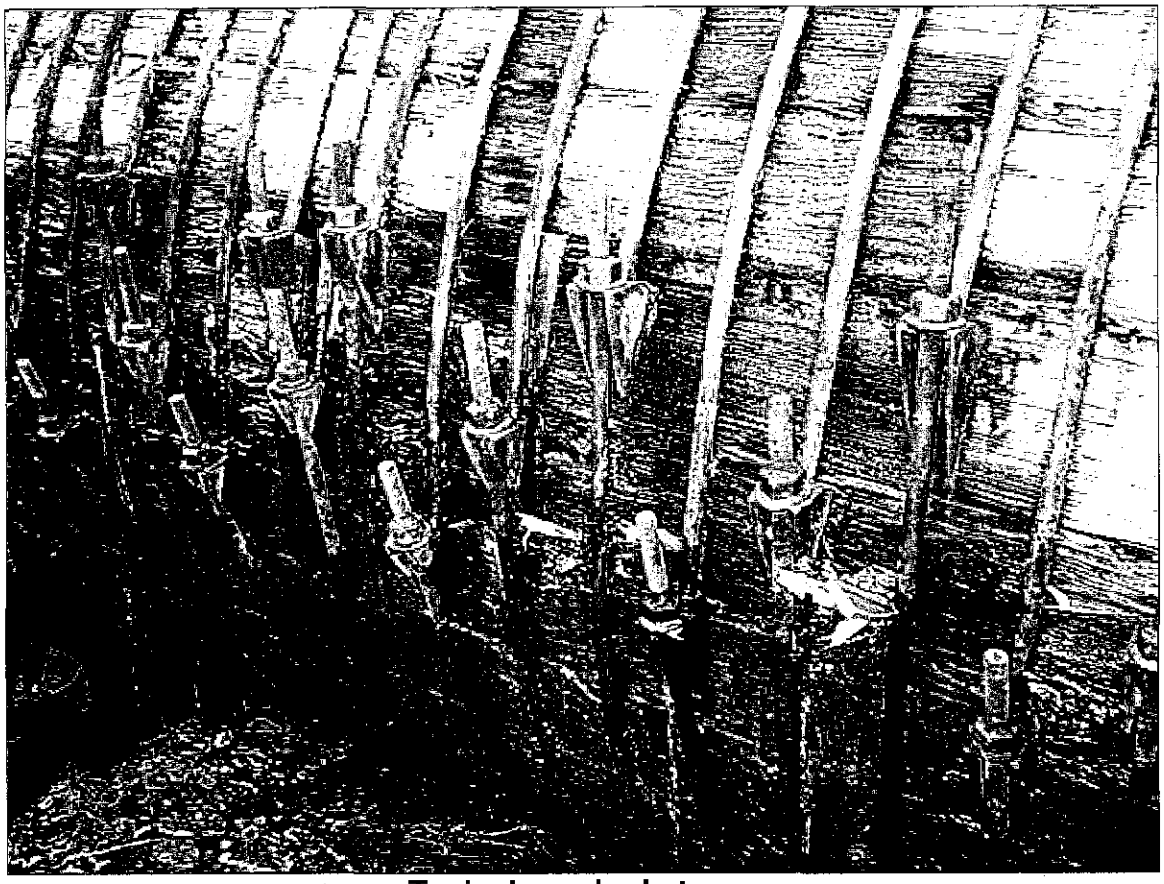
Development: Lockston
Structure: Lockston Penstock

Looking downstream near intake



Typical crushed staves

Development: Lockston
Structure: Lockston Penstock



Typical crushed staves

Looking downstream showing leakage along bedding and access road

Development: Lockston
Structure: Lockston Penstock

Looking downstream from access road

Looking downstream towards powerhouse