

Canadian Dam Association Annual Conference 2011

Surveillance and Safety

**Fredericton, New Brunswick, Canada
15-20 October 2011**

ISBN: 978-1-61839-782-9

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2011) by the Canadian Dam Association
All rights reserved.

Printed by Curran Associates, Inc. (2012)

For permission requests, please contact the Canadian Dam Association
at the address below.

Canadian Dam Association
3-1750 The Queensway Suite 1111
Toronto ON
Canada M9C 5H5

Phone: (416) 255-7076

dbutcher@cda.ca

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TECHNICAL PAPERS

PLENARY SESSION 1: *(Monday, October 17, 8:30 – 10:00)*

KEYNOTE ADDRESS / CONFÉRENCIER D'HONNEUR

CDA Guidelines – More Peaks to Climb

Tony Tawil, Senior Geotechnical Consultant, Hatch

N/A

SESSION 1A: *(Monday, October 17, 10:30 – 12:00)*

PETITCODIAC DAM DECOMMISSIONING / MISE HORS SERVICE DU BARRAGE PETITCODIAC

Petitcodiac Dam Decommissioning – Opening of Causeway Gates and Construction of Dykes

A. Small, J. Paynter, M. French & K. Peck

2

**Monitoring of Physical Changes Associated with the Opening of the Gates at the Petitcodiac
River Causeway, Moncton, NB**

D. DeMerchant, P. McNeil, A. DeMerchant & D. Bray

14

SESSION 1B: *(Monday, October 17, 10:30 – 12:00)*

DAM SAFETY ASSESSMENT / ÉVALUATION DE SÉCURITÉ DES BARRAGES

New Approach Object Rules for Safety Dam Assessment System

F. Oudjehane & C. Ghayad

N/A

Application of the US FEMA Publication 94 for IDF Evaluations on High Hazard NRCS Dams

J. Bellini

35

What's the Risk? – Understanding Public Perception of Risks Associated with Dams

N. Griesbrecht, T. Bennett & R. Schmidt

50

SESSION 2A: *(Monday, October 17, 10:30 – 12:00)*

DAMS AND THE ENVIRONMENT / BARRAGES ET ENVIRONNEMENT

Consideration of Environmental Losses for Dam Classification

S. Eagen & G. Geenaway

65

Observations Made on a 300 Year Old Acadian Dyke

C. Gräpel & K. Leopold

74

**Coastal Erosion and Sea Level Rise – Assessment and Phase I Mitigation, Indian Island First
Nation, New Brunswick, Canada**

J. Sims, H. MacQuade, W. Jones, K. Barlow & V. Kelbie

87

SESSION 2B: (Monday, October 17, 13:00 – 14:45)

**INSTRUMENTATION AND MONITORING PROGRAMS / PROGRAMMES
D'INSTRUMENTATION ET DE CONTRÔLE**

- Overcoming Challenges with Instrumentation Installation at Highland Valley Copper L-L Dam** 107
D. Willms, N. Singh, T. Martinson & C. Flemming
- Reliability and Efficiency of Dam Deformation Monitoring Schemes** 119
A. Chrzanowski, A. Szostak-Chrzanowski & R. Steeves
- Tsankov Kamak Double Curved Concrete Arch Dam Practical Considerations to Implement an Instrumentation Program** 134
J. Brehe, M. Dupuis & S. Thivierge
- Dam Safety Review: New Concrete Quality Designation Based on Ultrasonic Pulse Velocity** 150
F. Saint-Pierre & A. Philibert

PLENARY SESSION 2: (Tuesday, October 18, 8:30 – 10:00)

KEYNOTE ADDRESS / CONFÉRENCIER D'HONNEUR

- Vale Dam Safety Program** N/A
Trevor Ross, Dam Safety, Vale

SESSION 3A: (Tuesday, October 18, 10:30 – 12:00)

MINING DAMS / EXTRAIRE BARRAGES

- Evaluating Pore Pressure Buildup in Upstream Tailing Dams** 160
B. Saad, H. Mitri & T. Hamade
- Managing Short Term Risks at Kerr Mine Tailings Impoundment** N/A
Priscu, Trollope, Slater, Kaczmarek & Verma
- Diavic Dikes – 10 Years On – A Performance Review** N/A
A. Rattue
- Update on CDA Mining Dams Bulletin** N/A
A. Small

SESSION 3B: (Tuesday, October 18, 10:30 – 12:00)

**HYDROLOGY AND DESIGN FLOOD / L'HYDROLOGIE ET LA CONCEPTION DES
INONDATIONS**

- Quantifying Hydraulic Capacity of Flow-Through Rockfill Spurs - Preliminary Methods** 173
A. Roshanfekar & D. Hansen
- Flood Frequency Analysis of the Mersey River, Nova Scotia, using Bivariate Extreme-Value Distribution** 174
Z. Zakeria & P. Mitchelmore
- Potential Problems Created by the New CDA Inflow Design Flood Determination Methodology** 186
R. Zhou, C. R. Donnelly, D. Judge & J. Hiscock

SESSION 4A: (Tuesday, October 18, 13:00 – 14:45)

CONSTRUCTION CASE STUDIES / ÉTUDES DE CAS DE CONSTRUCTION

The Ashlu Hydroelectric Project: A Case Study of a Run-of-River Hydroelectric Project in Southwest BC	197
<i>R. Humphries, C. Tremblay, C. Harrison, C. Chartrand & R. Blanchet</i>	
The Design of Eight Run-of-River Hydroelectric Projects Constructed and Commissioned in British Columbia Over the Last Three Years	204
<i>S. Mottram & E. Sherman</i>	
Responsible Dam Ownership Safety and Surveillance	219
<i>V. Latour & P. Mitchelmore</i>	
Grand Falls Generating Station Restoration - After the Great Flood of 2008	228
<i>D. Gaudet, P. Rozzini & F. Harriman</i>	

SESSION 4B: (Tuesday, October 18, 13:00 – 14:45)

REHABILITATION CASE STUDIES / ÉTUDES DE CAS EN RÉHABILITATION

Kearney Lake Dam - IDF Upgrade using a Buried Weir	244
<i>G. Snyder, B. Parker & M. Laycock</i>	
Rehabilitation of the George H Nichols Multi Purpose Dam using Articulated Concrete Blocks	252
<i>J. Bellini</i>	
Pinawa Diversion Dam - Rehabilitation Design, Evaluation and Construction	267
<i>K. Matusiewicz, K. Bannister & D. Dubois</i>	
Évaluation des risques et modélisation à l'aide d'une analyse par éléments finis d'un barrage affecté par une importante érosion de sa structure en béton	275
<i>É. Auzolles, L. Degueldre & C. Semler</i>	

SESSION 5A: (Tuesday, October 18, 15:15 – 16:30)

INVESTIGATION AND REPAIR OF DAMS / INVESTIGATION ET LA RÉPARATION DES BARRAGES

Injection de la jonction de deux digues en terre	283
<i>M. Lauzon, M. Lizotte & S. Lopez</i>	
Eliminating Leaky Joints: Buried Conduit Design at the Tower Road Reservoir	N/A
<i>T. Lahti</i>	
The Use of Sonic Drilling in Support of a Double-Line Grout Curtain at Wolf Creek Dam	299
<i>S. Bratton</i>	

SESSION 5B: *(Tuesday, October 18, 15:15 – 16:30)*

**INNOVATIONS IN INSTRUMENTATION / INNOVATIONS DANS
L'INSTRUMENTATION**

A Study of the Use of GPS Sensors for Structural Monitoring of the Mactaquac Dam "526"
J. Bond, D. Kim & J. Fletcher

MEMS-Array Monitoring of a Dam "53;"
L. Danisch, T. Patterson & J. Fletcher

Borehole Radar Investigations at the Mactaquac Dam "554"
B. Giroux, K. Butler & D. B. McLean

PLENARY SESSION 3: *(Wednesday, October 19, 8:30 – 10:00)*

KEYNOTE ADDRESS / CONFÉRENCIER D'HONNEUR

The Lower Churchill Project – Changing the Energy in Atlantic Canada "PIC"
Gilbert Bennett, Vice President of Lower Churchill Project

SESSION 6A: *(Wednesday, October 19, 10:30 – 12:00)*

LOWER CHURCHILL PROJECT / PROJET DU BAS-CHURCHILL

Special session presented by the Lower Churchill Project "PIC"
Session spéciale présentée par le Projet du Bas-Churchill

SESSION 6B: *(Wednesday, October 19, 10:30 – 12:00)*

DAM SAFETY / SÉCURITÉ DES BARRAGES

Special session presented by the Dam Safety Committee of CDA "PIC"
Session spéciale présentée par le Comité de sécurité des barrages

SESSION 7: *(Wednesday, October 19, 13:00 – 14:45)*

STRUCTURAL SABILITY / STABILITÉ STRUCTURELLE

NDT Monitoring of Sliding Surfaces in Concrete Dams "569"
Z. Moradian, E. Taillet, A. Millet, P. Rivard, G. Ballivy & J. Lataste

Characterization of the Roughness: Statistic Study of the Interfaces of Dams "579"
B. Rousseau, P. Rivard, G. Ballivy, J. Riss & A. Marache

**Earthquake Safety Evaluation of the Keban Dam As Based on New Seismo-Tectonic
Model of Turkey** "596"
H. Tosun

**The Effect of Construction Induced Strains on the Permeability of Plastic Concrete
Cut Off Walls Below Dams** "PIC"
S. Hinchberger & J. Weck

SESSION 8: (*Wednesday, October 19, 15:15 – 16:45*)

**MITIGATION OF ALKALI AGGREGATE REACTION / ATTENUATION DE
RÉACTION ALCALINE DES AGRÉGATS**

**An International Review of the Occurrence and Status of Long Term Expansive
Chemical Reactions in Dams and Hydropower Plants** "5: 9"

R. Charlwood & K. Scrivener

Eliminating Alkali-Aggregate Reaction from New Dams "5; 8"

I. Sims, P. Nixon & B. Godart

Methods for Preventing Expansion due to Alkali-Silica Reaction in Concrete Dams "629"

S. Hayman & M. Thomas