

2014-JUL-07

Our File No. 49-FOI-2014

Jeffrey Solomon  
655 Sixth Street  
Nanaimo, BC, V9R 1J7

Dear Mr. Solomon:

**RE: *Freedom of Information and Protection of Privacy Act***  
**Request for Records - Documentation regarding the Middle and Lower Chase River Dams also known as the Middle and Lower Collierly Dams. Specifically, I request notes of 3 meetings and a list of the people involved in each First Date is for a workshop that occurred on May 12, 2010 between the Public Works Dept. and the Dam Safety Branch. Second meeting occurred on March 16, 2012 at Beban Social Center involving Public Works, DSB, and emergency personnel. Lastly, there was a Dam Safety Table Top Exercise on Sept. 20 and 21, 2012 with the same people. Bill Sims and Scott Pamminger were the lead organizers from the City of Nanaimo.**

This letter is in response to your request for access to records dated 2014-JUN-10. Enclosed please find copies of the responsive records.

If you have any questions please feel free to contact me at 250-755-4494, or via email at [sheila.gurrie@nanaimo.ca](mailto:sheila.gurrie@nanaimo.ca).

Sincerely,



Sheila Gurrie  
FOI Coordinator  
Legislative Services Department  
City of Nanaimo

encl.

SG/ss



**BCWWA**  
BRITISH COLUMBIA WATER  
& WASTE ASSOCIATION

The BC Water & Waste Association is pleased to offer a one day Dam Inspection and Maintenance Workshop. This workshop is being presented by BCWWA in cooperation with Ministry of Environment, Water Stewardship Division.

Will Jolley, Dam Safety Section Head from Victoria and John Baldwin, Regional Dam Safety Officer will be the presenters at this workshop. The City of Nanaimo is assisting by providing the workshop facility and dams for the tour.

## Dam Inspection and Maintenance Workshop

<b>Course Information</b>	<b>Date</b>	May 12, 2010
	<b>Location</b>	Nanaimo Aquatic Centre 741 Third Street Nanaimo, BC V9R 2B7  **Workshop is held in room B**
	<b>Duration</b>	1 day, 8:30am – 4:30pm
	<b>Cost</b>	<ul style="list-style-type: none"> <li>◆ BCWWA members: \$275 + GST</li> <li>◆ Non-BCWWA members: \$340 + GST</li> </ul>

	Time	Module / Topic	Presenter	Description
<b>Preliminary Program</b>	8:30 – 8:45	Course Introduction	W.J.	Participant introduction and course material.
	8:45 – 9:00	Video and Discussion	W.J.	Video, "Cannon Creek Dam Failure"
	9:00 – 9:30	Introduction to Dams	W.J.	Dam terminology, Dam failures & Inspecting dams
	9:30 - 10:15	Provincial Emergency Program (PEP)	Nanaimo Fire Rescue	Overview of the Provincial Emergency Program, BC Emergency Management System and role of dam owners
	<b>10:15 – 10:30</b>	<b>Break</b>		
	10:30 – 11:00	Dam Safety Program	W.J.	Water Act; Dam Safety Regulations, Can. Dam Assoc. (CDA)
	11:00 - 11:30	Inspecting Dams	W.J.	Dam inspection, embankments, spillways, outlets, etc.
	11:45 - 12:00	Colliery Dams	WJ, RDSO & Nanaimo	Colliery Dams- history and rehabilitation.
	12:00 - 2:00	Lunch & Dam Inspection	W.J, RDSO & Nanaimo	Field trip to Colliery Dams; lunch provided
	2:00 - 3:00	Inspecting Dams (cont.)	W.J. & RDSO	Dam components, equipment required, frequency, engineering requirements
	<b>3:00 – 3:15</b>	<b>Break</b>		
	3:15 - 3:30	Dam Maintenance	W.J.	Reducing the potential for problems.
	3:30 - 4:00	Emergency Response Exercise (time permitting)	W.J. & RDSO	Short emergency response exercise using dam incident examples.
	4:00 - 4:30	Quiz and Wrap-up	W.J.	

**Presenters Contact Information:**

- ◆ Will Jolley, Dam Safety Section Head, Victoria: (250) 387-3263
- ◆ John Baldwin, Regional Dam Safety Office, Nanaimo: (250) 751-3179

**Course registration:**

- ◆ For more information or to register online, please visit [www.bcwwa.org](http://www.bcwwa.org)
- ◆ As space is limited, we encourage you to register early. Registration deadline for this workshop is April 29, 2010.

If you would like to assist in sponsoring a workshop at a venue in your area, please contact the Education & Training Coordinator, Wendy Szeto at: [wszeto@bcwwa.org](mailto:wszeto@bcwwa.org) or via telephone: 1-877-433-4389 ext. 224.

**NOTES FROM CHASE DAMS ROUNDTABLE MEETING  
HELD ON 2012-MAR-16 AT BEBAN PARK SOCIAL CENTRE**

---

**ATTENDEES:**

John Baldwin	FLNRO Nanaimo	Euan Wilson	City of Nanaimo
Maggie Henigman	FLNRO Nanaimo	Scott Pamminger	City of Nanaimo
Scott Silvestri	FLNRO Nanaimo	Ritchie Fulla	City of Nanaimo
Steve Voller	DFO	John Elliot	City of Nanaimo
Al Magnan	DFO	Bill Sims	City of Nanaimo
Mel Sheng	DFO	Susan Clift	City of Nanaimo
John Morgan	VIU	Tom Hickey	City of Nanaimo
Dan Fox	VIU	Richard Harding	City of Nanaimo
James Craig	BCCF	Jeff Ritchie	City of Nanaimo
Charles Thirkill	Harbour City River Stewards		

**1. Introductions**

- Introductions were made around the table.

**2. Purpose of Roundtable: Reservoir No. 1 Decommissioning**

- Bill gave a presentation and noted:
  - The need is to address whole Chase River system and not just Reservoir #1.
  - Existing Reservoir #1 is concrete lined.
- James asked what the discharge is from Reservoir #1 into Chase River. Ritchie suggested occasional 3/4" overflow; Mel said this equates to about 5 M/s.
- John suggested a student could evaluate the volume of water and compare Upper Chase River and spillway from Reservoir #1.
- Why decommission Reservoir #1?
  - Because the Water Treatment Plant (WTP) will produce potable water only and a new closed Reservoir #1 will be constructed to replace the existing one.
- Al asked for clarification on the need for a new Reservoir.
- James asked for clarification about distance of Water Treatment Plant from Reservoir #1 – 8 km.
- Bill described the piping systems.
- Coal and shale areas of rock exposed in the empty Reservoir are shot creted with concrete.
- Reservoir #1 is 12 ft. deep at the shallow end and up to 20 ft deep at the dam face.
- During cleaning process, sediment cleaned and contained in a sediment trap.
- James: is the Water Treatment Plant at a different drainage river and do these creeks run to the Chase River?
  - No, behind Water Treatment Plant is Berkley Creek but it does not go to Chase River.

**Dan Fox:**

- 40k average gallons used at hatchery per day. (Equivalent flow 1.75 ltrs/sec)
- The hatchery and overflow from Reservoir #1 enhances Chase River flow.
- City holds licences for all dams with "conservation" use.
- Capacity of hatchery 25,000 Coho salmon but usually is approximately 10,000 Coho salmon and these are released in May around Barsby High School at Howard / Park Ave. into the Chase River. (a 20 gram fish weight needs 7 litres/sec water minimum flow)
  - Minimum Chase River flow is 30k gallons/day.
- Chase River dries up in the summer – no flow into Upper dam, no flow leaving lower dam.

Any issues with Nanaimo River water in hatchery and Chase River water?

- At lower Chase dam, there is a waterfall barrier just above Howard Ave?
- Reroute upper Chase River through Reservoir #1 and restore original channel catchment

- Area above the Upper Chase dam is 30 sq.km.
- Public safety issues with existing structures.
- Dechlorinate new Reservoir #1 water and release in back into Chase River for the fish.
- Move hatchery to a new site adjacent to Water Treatment Plant.

### 3. Background and Risk Management:

- Angling / fishing option; 5000 angling days / year currently at Colliery Park dams, mostly upper (?):
  - All three dams are stocked; upper and middle most often stocked?
- Seismic assessment of the lower and middle dams - do not meet current standards and would fail with a small earthquake.
- Late 1970 the City applied for water licences.
- Every 7-10 years City undertakes a dam safety review.

#### Peak flows:

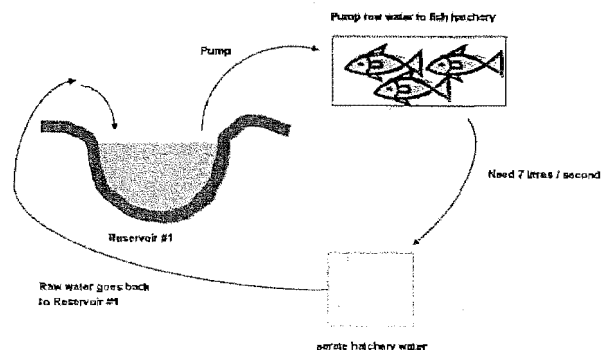
- 1993/97  $\cong$  35 cum/sec
- Lower spillway capacity: 25-30 com/sec
- Middle spillway capacity: 60 cum/sec

#### Risk Management:

- Evaluate dams on a consequence and risk of failure (bar chart)
- City currently doing an inundation downstream study of Colliery Park dams:
  - Looking at scenarios – breach / no breach
  - Need to go to Parks & Rec Commission and to Council
  - Need to educate public of results and consequences
- Chase dams – structurally deficient and hydrologically deficient.
- Colliery Park lakes – stocked with fish annually and are well fished.
- We could rebuild the dams at a cost of approximately \$12 - \$15 million each.
- Complete or partial decommissioning of dams with or without any part of the dams being left in place.
- Upper Chase dam is a lower consequence than middle and lower dams and culverts diverting the flow are undersized; ie. middle and lower dams have higher failure rates and greater consequence.
- Decommissioning approximately \$4 m each dam (x2) for middle and lower Chase dams.

### 4. Creative Brainstorming:

- Reroute upper Chase Reservoir through existing #1 Reservoir.
- Public swimming area.
- Pump water from Reservoir #1 into hatchery and aerate it back to Reservoir #1.
- Build facility at Westwood dam for new hatchery.
- Build facility at Bowen Park (water quality issues) for hatchery.
- A high temperature of water during summer months at low flows would endanger fish.
- Retreat treated water for fish use (i.e. remove chlorine)
- Hold smolts



- Move hatchery upstream of Water Treatment Plant.
- Skateboarding and BMX park
- Public safety issues at Reservoir #1 if fences removed.
- Use for fishing opportunity especially if Colliery Park dams are removed.
- Put in another small pipe in the twinning of potable water pipe to give raw water to Chase River from South Fork Dam (8 km away).
- Campsite
- Leave Chase River alone (don't mess with it), let it stabilize back to its natural condition (remove dams, put creek in natural channel).
- Relocate hatchery to lower dam and realign Chase River and supplement flow with de-chlorinated potable water.

#### 5. What Happens in 20 Years? (Vision)

- Viable fish hatchery and fish program somewhere, potential partnership with City over a visitor facility – near Millstone River?
- Science centre compatibility?
- Bowen Park side channel, science centre, hatchery there?
- SD68 Barsby High use river for environmental programs at school.
- Make Reservoir #1 more aesthetically pleasing.
- Floating wharfs, plants for anglers at Reservoir #1, but you need a supply of fresh water to compensate for loss of fishing at Colliery dams 1, 2 and 3?
  - Questionable, because where does upper Chase Dam get its current fresh water supply from? ➤ Currently upper Chase spillway dries up in summer.
- 6" of evaporation typical in summer without biological impact. Divert water from Chase River in winter but issues with summer flows. Morrell Lake may not have enough water.
- Concrete sides and bases on Reservoir #1 will produce a lot of heat in the summer if fish were added therefore water temperature will increase.
- Realign and naturalize Chase River through Reservoir #1, with or without the dams therefore two options
- How prevent Chase River from drying up in summer?
- Create a wetland pond area above Reservoir #1 to allow gas off from chlorine gas and the filter back into the Chase River (replenish with treated water?).
- Enhance trail networks.
- Combine Morrell Sanctuary and Harewood Mines Reservoir to provide additional flow to Chase River.
- Make a siphon from Westwood Lake to creek that runs through DND property.

#### Existing Capacities:

- Reservoir #1 storage - 59 ML; lower Chase Dam – 110 ML, and middle Chase Dam 112 ML.
  - Lower Chase Dam Height: 24 m
  - Middle Chase Dam Height: 12.5 m
- Partially fill lower and middle reservoirs with gravel to reduce evaporation from surface but does this meet with provincial dam standards and objectives?
  - No.

#### 6. Development of Ideas / Options

- No dams and Chase River returns to original state but will be dry in summer months (as it currently is).
- Improve base flows for fish.
- Loss of recreational amenity (fishing and swimming at middle and lower).
- Return river to its original state.
- Reduce risk to the public downstream.

- Obtain water from Morrell Sanctuary?
- Water crews no longer clean out 'v' notch from old Harewood dam (so no low flows from this source).
- Re-establish Chase River through Reservoir #1?
- What is condition of existing Reservoir #1?
  - High consequence but in good condition and already seismically upgraded in 1990's.
- \$1.3m to upgrade the upper dam spillway for a lower consequence dam. (Is this money well spent?)
- Harewood Mines dam - stocked?
  - This body of water has beavers and creek feeds Chase River below lower Chase dam. This dam not recently reviewed and has a spillway built in 1911. This is a low consequence dam rating.
- Maintain flows in Reservoir #1 and lose lower and middle dams.
- Multi pond system 2m deep along the length of Chase River to replace dammed Reservoir #1 (instead of naturalized river bed)
- Review lake versus river fish stocks.

**7. Timing:**

- New Reservoir #1 start 2013 and complete by Aug 2014; Water Treatment Plant end of 2014.
- Ideally Chase Dams future can be decided this Council session (by this fall) then public consultation thereafter.

**8. Next steps:**

- Review comments
- Run numbers
- Develop three or four consolidated ideas and draft plans then review (develop ideas) again and send to group for reconsideration.
- Determine other plant species / fish / amphibians.
- Pull data together.



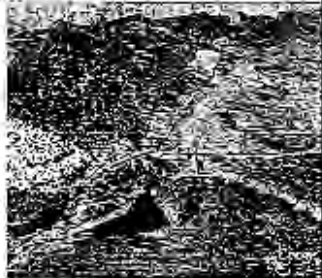
### Agenda

- Introduction
- Purpose of Roundtable: No 1 decommissioning
- Background
  - Number One Reservoir - new and old
- Creative exercise
- Realistic discussion
- Development of ideas
- Next steps
  - Chase (Colliery) Dams condition and future direction
  - Further thoughts for Number One?



### Existing Facility


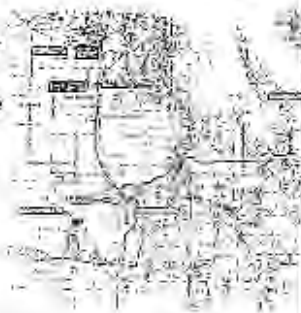
- Open reservoir
- Concrete lined
- 50 ML capacity
- Unreated water
- Filtration facility onsite
- Supplies City core by gravity



Water Treatment Plant

### Why Replace?


- Once the new South Park WTP is operating, all water reaching No 1 will be filtered and treated



- Open tank cannot be used for treated water storage, because of re-contamination

The existing reservoir needs to be decommissioned and replaced with an enclosed treated water reservoir

- Required capacity: 4 ML



Reservoir No. One Replacement  
Council Direction

- Council approved the proposed location of the new No 1 Reservoir
- Directed that ERCC examine opportunities to use the existing No 1 Reservoir property for recreational opportunities










**Lower and Middle Chase Dam Seismic Assessment**

- Completed a seismic hazard analysis of both the Lower and Middle Chase Dams earlier this year.
- Analysis determined the dams did not meet Dam Safety seismic requirements, and the report provided options for remediation.




Constructed around 1911 by Western Fuel Corporation, as part of coal mining works—used to wash coal on the wash float.

• Walls in the dams are some of the first structures constructed with concrete in Manitoba




**Chronology**

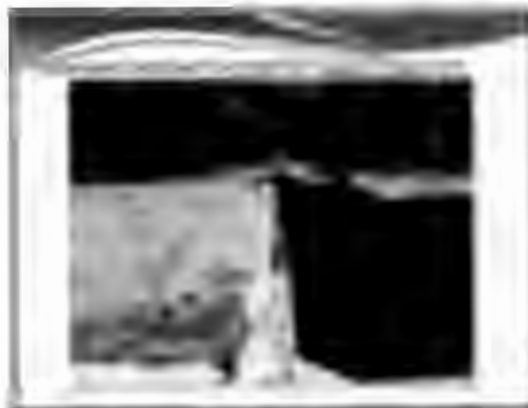
- Decline of coal mining in Manitoba led to increased use of dams as recreational structures.
- Late 1970s, City applied for Water Licenses for Dams
- 1978, rehabilitation of dams initiated with drilling investigation, followed by construction works to meet standards of the day.



**Chronology Don't**

- 2003 Dam Safety Review (2003/2012):
  - Dams should have seismic assessment
  - Spillways inadequate for large flood





What do we know?

- Dams at the end of their structural life
- Spillways are too small to pass large floods

Historical Concrete Construction

Concrete we build not have reinforcing steel and are poor quality

### Seismic Response Assessment

- **Middle Chase Dam**
  - The concrete wall will topple in an upstream direction during the design seismic event.
  - Uncontrolled discharge likely to occur during seismic event.
- **Lower Chase Dam**
  - Downstream slope will deform significantly.
  - Concrete wall will crack and leak more, possible short term stability issues.
  - Uncontrolled discharge of Middle Chase Dam will likely cause failure of Lower Chase Dam.


### Consequence Classification

- Consequence of failure rated as "High" according to the BC Dam Safety Regulation (potential for loss of life, extensive property damage)
- Recently up-rated to "VERY HIGH"

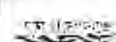
### Inundation – downstream consequence

- Currently under study
- Looking at different scenarios – breach/no breach
- Need to take findings to Council and Parks Commission
- Will likely begin a process of public education

### Dam risk issues



NativeFlow




**EXERCISE COLLIER COLLAPSE  
MASTER SEQUENCE OF EVENTS LIST  
SEPTEMBER 20, 2012**

Ser	Time	From	To	Input	Expected Action or Prompting Questions	Teaching Points
	1330					<p><b>Exercise Introduction:</b></p> <ul style="list-style-type: none"> <li>• Introduction and introduction of participants; Karen</li> <li>• Review of exercise goal, objectives and conduct; Bob</li> </ul> <p><u>Goal:</u> To develop a plan and series of triggers that can be incorporated into an Emergency Response Plan for the Chase Dams and to update ECC staff on the potential hazard of dam failure</p> <p><u>Objectives:</u> To review the following:</p> <ul style="list-style-type: none"> <li>• How Chase River water levels and potential flooding is monitored;</li> <li>• How flood warnings are transmitted to City staff and the public;</li> <li>• What are the triggers to activate the ECC;</li> <li>• What are the triggers to order evacuation; and</li> <li>• Coordination and communication between various ECC staff while planning a residential evacuation based on a potential flood.</li> </ul> <p><u>Conduct:</u> Exercise participants will occupy their positions in the ECC and will be organized by section. Staff will be presented with inputs and will be given time to consider their actions and response and then time will be allocated for section presentation and discussion.</p> <ul style="list-style-type: none"> <li>• Review the opening scenario:</li> </ul> <p><i>It is 1:30 PM, mid-November. Rainfall has been heavy and water levels in the reservoirs are at maximum levels. There has been a major snowfall at higher elevations that is rapidly melting due to increasing temperatures. Weather forecasts call for an extended period of heavy rainfall and City staff are concerned that reservoir levels may exceed dam capacity and approach PMF levels.</i></p> <p><b>Assumption:</b> ECC has not been activated. City engineering staff is aware of the rising flood threat and are carefully monitoring the situation.</p>

Ser	Time	From	To	Input	Expected Action or Prompting Questions	Teaching Points
	1345	<p>City Engineering and Public Works (EPW) staff will give a presentation on the hazard related to the Chase River dams, based on the July 12 Chase River Dam Breach Flood Inundation Study. They should review:</p> <ul style="list-style-type: none"> <li>• The background to the construction of the dams</li> <li>• The various flooding and seismic hazards; and</li> <li>• Impact of flooding (extents and warning times).</li> </ul> <p>EPW staff will provide a "start-state" indicating the reservoirs are full and that they are monitoring the situation.</p>				
1	1400	Environment Canada	All	Rain, at times heavy, is predicted for the east coast of Vancouver Island, including Nanaimo.	EPW staff should lead a discussion regarding how water levels are monitored and what the triggers will be to issue a flood alert.	<ul style="list-style-type: none"> <li>• Triggers to issue a flood alert</li> <li>• Who the alert is issued to</li> <li>• What is the public information plan</li> </ul>
2	1420	EPW	ECC Dir	We have now reached the trigger point where we are concerned the dams may fail. Suggest you activate the ECC and issue the appropriate public warnings.	<ul style="list-style-type: none"> <li>• ECC should be activated</li> <li>• What will the ECC Action Plan look like? First operational period? Second operational period?</li> <li>• Public warnings should be issued</li> <li>• A press release should be issued</li> <li>• A Declaration of Local Emergency should be issued</li> </ul>	<ul style="list-style-type: none"> <li>• To what level is the ECC activated</li> <li>• When does control of the event pass from EPW to ECC</li> <li>• How is the public warned</li> <li>• How is the school warned</li> <li>• How will the media be involved at this stage</li> <li>• Is a Declaration of Local Emergency required at this time</li> </ul>
3	1440	ECC Dir	Mayor	We feel the collapse of the Chase River dams is a distinct possibility and we want to Declare a State of Local Emergency and evacuate residents in the possible flood plain.	<ul style="list-style-type: none"> <li>• Mayor will ask why this is being recommended</li> </ul>	<ul style="list-style-type: none"> <li>• Need to develop briefing for Policy Group/Sr Leadership</li> </ul>
4	1500	ECC Dir	ECC Staff	Evacuate possible inundation areas	<ul style="list-style-type: none"> <li>• Issue evacuation order</li> <li>• Execute the evacuation</li> <li>• Implement DSS plan for evacuees</li> </ul>	<ul style="list-style-type: none"> <li>• Who is responsible to evacuate residents</li> <li>• How will they be evacuated</li> </ul>

Ser	Time	From	To	Input	Expected Action or Prompting Questions	Teaching Points
						<ul style="list-style-type: none"> <li>• How will the evacuation order be issued</li> <li>• Where will reception centers be established</li> </ul>
5	1530	<p>The Exercise Facilitator will lead a discussion of what actions should be taken as a result of the lessons observed during the exercise, including to:</p> <ul style="list-style-type: none"> <li>• Dam mitigation (removal, upgrade)</li> <li>• Flood monitoring actions</li> <li>• Public warnings (when, who and how)</li> <li>• Should the public be advised of the situation now? Liabilities? Affect on property values?</li> <li>• Pre-Alert activities – public communication of potential hazards and precautions that can be taken by individuals.</li> </ul>				
6	1615	Questions and Discussion				
7	1630	<b>ENDEX</b>				

Invitee List for Master Sequence of Events -  
September 20, 2012

All Attendees	
<input checked="" type="checkbox"/>	Brenda Krastel
<input checked="" type="checkbox"/>	Al Kenning
<input checked="" type="checkbox"/>	Bill Sims
<input checked="" type="checkbox"/>	Brian Clemens
<input checked="" type="checkbox"/>	Craig Richardson
<input checked="" type="checkbox"/>	Dean Ford
<input checked="" type="checkbox"/>	Douglas Holmes
<input checked="" type="checkbox"/>	Gary Franssen
<input checked="" type="checkbox"/>	Jan Kemp
<input checked="" type="checkbox"/>	Jan Mongard
<input checked="" type="checkbox"/>	Joan Harrison
<input checked="" type="checkbox"/>	Karen Lindsay
<input checked="" type="checkbox"/>	Kelly Broos
<input checked="" type="checkbox"/>	Lorrie Coates
<input checked="" type="checkbox"/>	Mark Demecha
<input checked="" type="checkbox"/>	Maurice Mauch
<input checked="" type="checkbox"/>	Norm McPhail
<input checked="" type="checkbox"/>	Per Kristensen
<input checked="" type="checkbox"/>	Randy Churchill
<input checked="" type="checkbox"/>	Richard Harding
<input checked="" type="checkbox"/>	Rick Kroeker
<input checked="" type="checkbox"/>	Ritchie Fulla
<input checked="" type="checkbox"/>	Ron Lambert
<input checked="" type="checkbox"/>	Susan Clift
<input checked="" type="checkbox"/>	Ted Swabey
<input checked="" type="checkbox"/>	Terry Hartley
<input checked="" type="checkbox"/>	Toby Seward
<input checked="" type="checkbox"/>	Greg Norman
<input checked="" type="checkbox"/>	Philip Cooper

Invitee List for Master Sequence of Events -  
September 21, 2012

All Attendees	
<input checked="" type="checkbox"/>	Brenda Krastel
<input checked="" type="checkbox"/>	Adam Coronica
<input checked="" type="checkbox"/>	Al O'Donnell
<input checked="" type="checkbox"/>	Andrew Tucker
<input checked="" type="checkbox"/>	Bob Prokopenko
<input checked="" type="checkbox"/>	Charlie Galan
<input checked="" type="checkbox"/>	Dale Lindsay
<input checked="" type="checkbox"/>	Deborah Duncan
<input checked="" type="checkbox"/>	Deena Keller
<input checked="" type="checkbox"/>	Gail Gibson
<input checked="" type="checkbox"/>	Gary Franssen
<input checked="" type="checkbox"/>	Guillermo Ferrero
<input checked="" type="checkbox"/>	Jeff Ritchie
<input checked="" type="checkbox"/>	Jeremy Orton
<input checked="" type="checkbox"/>	John Elliot
<input checked="" type="checkbox"/>	John Horn
<input checked="" type="checkbox"/>	Kara Williamson
<input checked="" type="checkbox"/>	Karen Lindsay
<input checked="" type="checkbox"/>	Kurtis Felker
<input checked="" type="checkbox"/>	Lynn deVries
<input checked="" type="checkbox"/>	Rob Lawrance
<input checked="" type="checkbox"/>	Ron Lambert
<input checked="" type="checkbox"/>	Steve Ricketts
<input checked="" type="checkbox"/>	Steve Stinson
<input checked="" type="checkbox"/>	Toby Seward
<input checked="" type="checkbox"/>	Tom Kraft
<input checked="" type="checkbox"/>	Philip Cooper