



Bowness Resident Request on Bowness Barrier – Lack of Consultation

Presented by: David Chalack resident and owner 7020 Bow Cres NW





Consultation--Engagement

The City of Calgary has made two decisions on the Bowness barrier before adequate engagement:

As property owners on the river on Bow Cres—we were all completely shocked when gathered for “an information session” in January 2018 where we were made aware that the city had been working on plans

- 1) to complete a conceptual design of the barrier to be built on private property, and**
- 2) to move forward with a subsequent preliminary design**

The City’s own policy on engagement states:

“The City commits to conduct transparent and inclusive engagement processes that are responsive and accountable”

“Engagement at The City of Calgary is defined as purposeful dialogue between The City and citizens and stakeholders to gather information to influence decision making.”

Purpose & Requests to Committee

Given the Committee is now aware of how much consultation was performed with directly affected residents before decisions were made and its own documentation demonstrates direct engagement did not occur until well past the decision date, does this Committee believe the City fulfilled their own policy on consultation for this project, and specifically for the two decisions already made?

Consultation

The City of Calgary did not consult us or the vast majority of the persons DIRECTLY affected by the proposed Bowness barrier prior to either of these two decisions being made.

The City has indicated (from Calgary.ca and FOIP) they consulted city wide , and the consultation was for multiple flood projects. The City held 6 workshops with 140 in person participants. Our FOIP request indicates each person received the same standing in this consultation regardless of where they resided.

This project requires approx. 100 private properties to be built on. The broader flood fringe in Bowness where this project is located has approx. 400 homes on it..

When The City applied for Alberta Community Resilience Program (ACRP) funding, a requirement of the funding (from the provinces published criteria) is: *“Any works funded under this Program must be owned and operated/maintained by the applicant. The applicant must also own or obtain legal consent to access the lands upon which the project is constructed.”*

Requests

Policy:

We request the City change their consultation policy to explicitly require consulting of property owners for projects to be built on private lands, with clear questions on if projects should go forward, and results separated by those not actually affected, prior to decisions being made.

It should be noted that multiple requests to the Ward 1 office (Mar 1, Mar 20, May 6, May 9) to affect this change have not yielded any results.

Proper survey:

Given that consent is a key component of funding and the Water Act, consent is highly likely to affect schedule to implement as well as cost. Our request is to direct Water Services to conduct a proper survey of the property owners to determine if they will consent to a barrier being constructed. And the results of this survey be given to Council. And then Council to consider if there should be any more costs borne by this project.

Requests

Transparency:

The current individual property consultation form does not include a request to the homeowner to state a position on the barrier or even ask the property owner if they are alright with it. However we understand the City is internally compiling this information, inferring it from discussions with residents. We request the City be transparent and cease inferring support or non support and instead ask the explicit question in writing.

<http://www.calgary.ca/UEP/Water/Documents/Water-Documents/Riverfront-Bowness-Questionnaire.pdf>

Equality and Fairness:

We request the City review their groundwater, environmental and social costs studies & quantification, and perform them with the residents. And then allow the residents to review to ensure they are of the same weighting as those given to Elbow Park residents on the Elbow River

Consultation

On May 9, the City Engage unit indicated they fulfilled the City policy on engagement and when they performed a review of their engagement, they did not come up with any deficiencies.

The City in its internal update in document UCS2019-0653 indicates:

“The City initiated engagement on the Bowness flood barrier project starting in fall 2018”

We ask the question:

Doesn't this look like/sound like the failed consultation on **Trans Mountain Pipeline**—City needs to go back to stake holders???

Given the Committee is now aware of how much consultation was performed with directly affected residents before decisions were made and its own documentation demonstrates direct engagement did not occur until well past the decision date, does this Committee believe the City fulfilled their own policy on consultation for this project, and specifically for the two decisions already made?



Equality and Fairness for Bowness

Presented to May 15 SPC-UCS: Candace Truman, resident and owner on Bow Crescent NW

What we Would Like to Bring to Light - Requests to Committee

Bring up identified issues with the current Bowness Barrier project, and request changes to ensure the principles of **Equality and Fairness** are met

The FMMA states that the barriers would provide an **equitable level of service for the Bow River Communities as the Elbow River Communities**. When we consider risk and damage related to Ground Water, Stormwater, and Erosion, the barrier solution proposed for Bowness will result in much higher residual risk and damage to Bowness than the upstream mitigation solution implemented for the Elbow River.



Equality

The City of Calgary's report, "Calgary's Flood Resilient Future by Expert Management Panel on Flood mitigation" states:

"The Panel does not recommend - Building permanent or temporary flood barriers directly along the shore of the Elbow River residential areas because of challenges with private property."

- ❖ Why does the City believe the challenges are less in Bowness?
- ❖ Despite this recommendation, why did the City approve the FMMA without even consulting Bowness private property owners?
- ❖ Bowness has the same challenges with private property and groundwater, why does the FMMA recommend upstream mitigation for the Elbow River, and local barriers for the Bow River?

Equality – In Depth

- ❖ Residents of Elbow Park receive full ground water protection by virtue of SR-1 providing 1:200 yr flood prevention.
- ❖ River front residents on the Elbow River will be subject to a maximum flow rate of 180 m³/sec or **50%** of the 2005 flood rates. Bowness residents will be subject to 1230 m³/sec or **150%** of 2005 rates. Bowness properties will experience significantly more erosion and groundwater damage
- ❖ Information from the City is that constructing Bowness Barriers to bedrock as was done at the Calgary Zoo to prevent groundwater flooding is “cost prohibitive”
- ❖ The city has committed to **Sunnyside that their barrier will provide groundwater isolation** through a barrier that projects to bedrock and extensive groundwater dewatering capacity. The city has been unwilling to commit to offering even a design that meets this same level of service for Bowness.
- ❖ On Sept 25th 2018, the city staff communicated that Groundwater flooding is an acceptable outcome in Bowness and provided an overland flood barrier is in place, **Bowness residents can safely remain living in their homes with a flooded basement**
- ❖ Why does the City believe Elbow river, Sunnyside, and even the Hippo’s at the Zoo should receive better ground water protection than Bowness Residents?

Requests

1) Upstream Mitigation:

- ❖ Preliminary Engineering Phase Completed - put the Bowness Barrier Project on hold until an upstream reservoir for the Bow River has been identified and approved, and residual overland and groundwater flood risks are verified

2) Groundwater Protection

- ❖ Bowness be afforded the same protection against groundwater as Elbow River Communities in a 1:200 year event
- ❖ SR-1 requires no barriers, and SR-1 will prevent a 1:200 yr flood
- ❖ Elbow River front communities have no ground water flood risk nor have their properties exposed to higher erosion risk.
- ❖ As a primary stakeholder living on the Bow River, we request the same thorough upstream mitigation to 800cms to prevent ground water flooding



Bowness Barrier – Groundwater

Presented by Dr. Tadeusz Dabrowski P.Eng.

May 15, 2019

Dr. Tadeusz Dabrowski P. Eng.

- Active in Hydrogeology field for over 58 years
- Registered as a practicing Professional Engineer with APEGA
- Professional with extensive experience in
 - hydrogeological exploration in groundwater supply
 - civil engineering
 - mining
 - environmental/remediation
 - oil and gas in Canada and overseas
- Expert witness in regulatory hearings and litigation

Scope of Engagement with BRFM Society

- Like BFRM Society, I support any initiative that would protect human life and prevent property damages due to overland flooding and flooding from groundwater surface rise
- Retained by BRFM Society to provide advice regarding the City of Calgary plan to design and construct the Bowness Flood Barrier

Information Provided

- The following hydrogeological information was received from The City, through BRFM Society
 - Section 1.7 “Geotechnical and Hydrogeological...” forwarded from City of Calgary Bowness Barrier Project Manager
 - Drill Site Location Map (<https://www.calgary.ca/UEP/Water/Documents/Water-Documents/Groundwater-Monitoring-Study-Borehole-Drilling-Locations.pdf>)
- Purpose of, depth and completion details for each of the proposed wells were not provided

City of Calgary Groundwater 101 Video

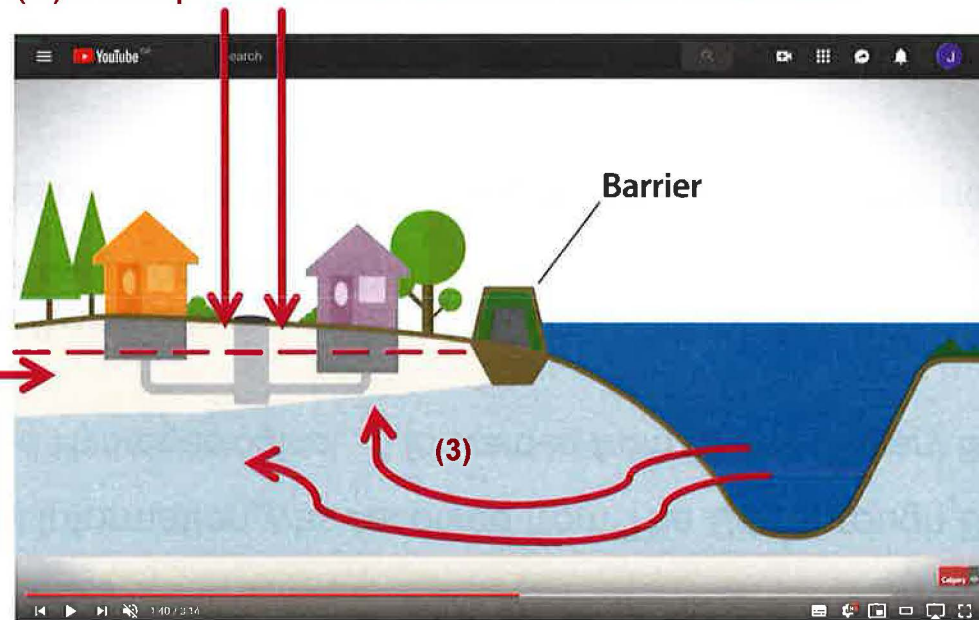
The video available on project website that is used to educate the public is missing 3 key components

Video shows that barriers lower groundwater surface BUT THEY DO NOT DO NOT

Drains DO lower groundwater surface

(2) Precipitation and runoff from the Paskapoo slopes in the south raises the level of the groundwater surface

(1) Precipitation and surface runoff infiltration



Components added by Tad Dabrowski



(3) River infiltration

<https://www.youtube.com/watch?v=SjGHGkmD190&list=PL5YHZqa82xajPnla3IRmDIRKWF1oIOgV6&index=4>

Closing Remarks

- The City scope of work relied on exploratory drilling to identify highly variable depth to bedrock and location of the buried fluvial channels. Much more effective in similar conditions is use of surface geophysics (ERT and seismic).
- Based on available information, in my opinion, the proposed scope of work is missing the following important components:
 - Surface geophysics
 - Borehole geophysics
 - Proper aquifer test (not slug test)
 - Hydrochemistry
- After today, further inquiries may be directed to the BRFM Society



May 2019 Resident Request on Bowness Barrier

Groundwater Issues
Presented by: David Burton

Groundwater Issues1

- Permeable alluvial sands and gravels are thicker in Bowness than anywhere else in Calgary.
- Water will move rapidly laterally into these deposits in 3 dimensions during a flood, raising the groundwater table by charging it both laterally and from the bottom up.
- The rate and areal extent of GW rise will be proportional to the increased river depth, the duration of increased depth and the permeability of the deposits being inundated (high in Bowness).
- A berm at surface, not rooted in the much less permeable Paskapoo Fm bedrock up to 20 meters below, will do little to impede the flow of subsurface flood waters into basements, sanitary sewers and storm sewers, particularly on Bow Crescent where the latter are decades old.
- Modeling work by Golder shows very little difference between river and groundwater elevations during a flood event proximal to a berm, resulting in flooded basements.

Similarly, later work done by Associated Engineering more graphically illustrated which properties in south Bowness would be flooded by groundwater with the barrier versus without the barrier:

Glacial Alluvial Deposits—unconsolidated, high permeability

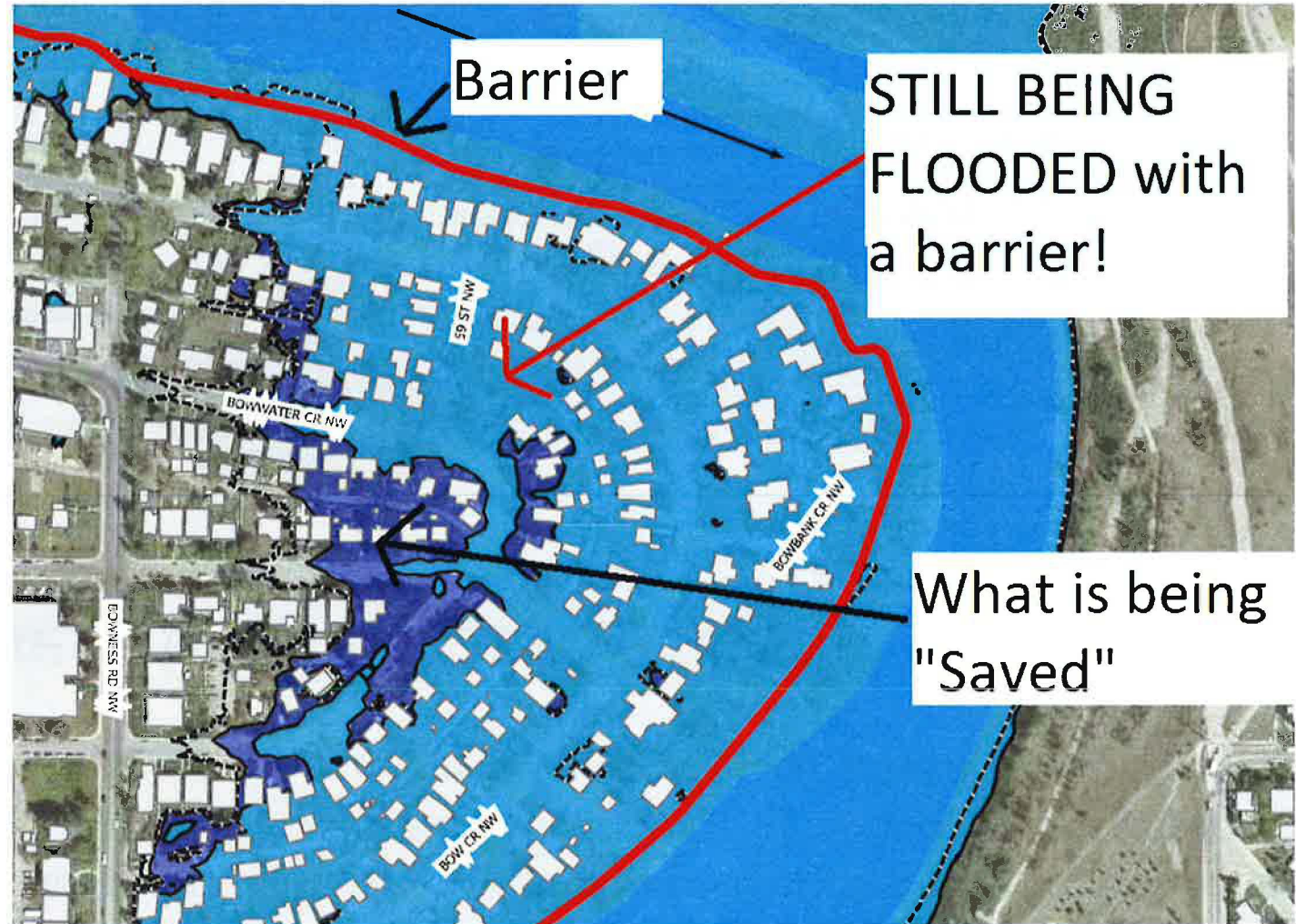


Paskapoo Formation—consolidated, low permeability bedrock



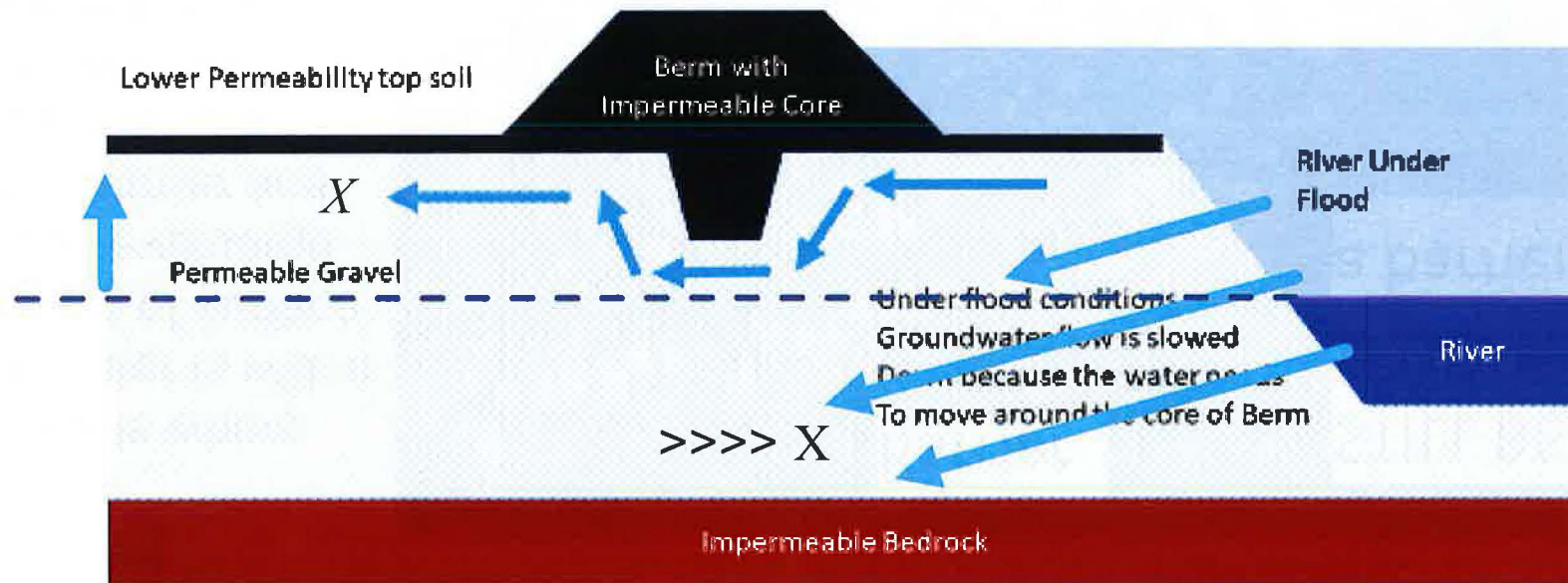
AE Report

- Blue area is where Groundwater is within 1.4 meters of surface
- Condition evaluated includes barrier and river level at 1230 m³/sec flow rate.
- Evaluation based on average or expected permeability. Actual permeability from Groundwater Study could be higher



During a flood, the aquifer will fill both laterally and from the bottom up. As the berm core is 2m thick and the underlying permeable deposits in Bowness many metres thicker, the effect of the berm on groundwater migration timing will be negligible!

Bowness Berm Cross Section



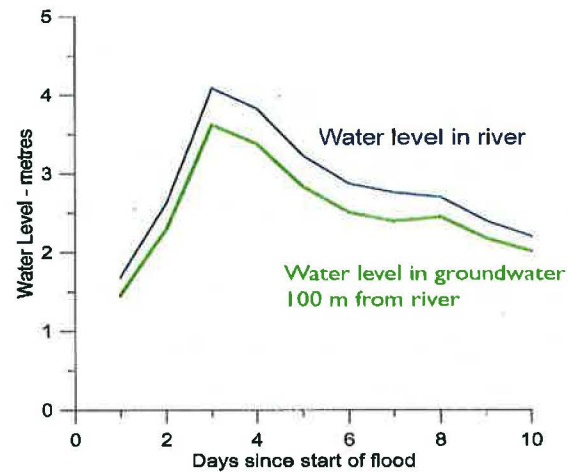
Groundwater Issues2

- There is evidence of groundwater flooding of basements in Bowness hundreds of meters from the river in 2013 (e.g. Bow Cycle)
- The City's current plan to flow the river at 1230 m³/s following barrier construction, a rate known to be 150% of that which will induce overland flooding locally, for longer durations, will increase the areal extent of the groundwater flooding, therefore affecting an even larger number of homes
- It was determined from studies on the Elbow that over 80% of flood damages were due to groundwater flooding and that berms would neither be physically nor economically effective, leading to the final recommendation that only *minimizing the flowrate through those neighbourhoods via upstream mitigation (SR-1)* would save the residents from future flood damage losses.
- The City is proposing the exact opposite for Bowness residents!
- If the current groundwater study being conducted in Bowness confirms BRFM society assertions about the magnitude of the groundwater flooding problem, will the City commit to either solving it or focussing with residents and the Province *exclusively* on the provision of upstream mitigation, affording us the same consideration as Elbow residents as recommended by the FMMA?

Groundwater Levels vs River Water Levels (Hugo, 2015)

-the two elevations are directly correlative

GROUNDWATER LEVELS 100 M FROM BOW RIVER DURING 2013 FLOOD



Hydrological (Surface Water) Concerns and Future City Liability

- The 2013 flood illustrated the importance in back yards along Bow Crescent of natural vegetative baffling in limiting dangerous flow rates, property damage and river bank erosion
- The proposed berm will remove hundreds of trees and shrubs with the future requirement for no vegetation rooted within the berm, effectively creating a flow 'highway' parallel to the river bank
- It is likely that considerable additional vegetation between the berm and the river bank will be lost owing to the destruction of unidirectional root systems, initiating bank erosion and loss of property
- When the berm is invariably breached (design is only 1:20 year naturalized flow rate), the result will be immediate high rate and volume flow into the adjacent properties, with high destructive potential
- Will this not leave the City liable to future class action suits such as are currently being undertaken in Quebec?
- ***The construction of this berm prior to the existence of upstream mitigation is exposing Bowness residents to more risk than currently exists with the undisturbed environment***



BRFM Tree Census

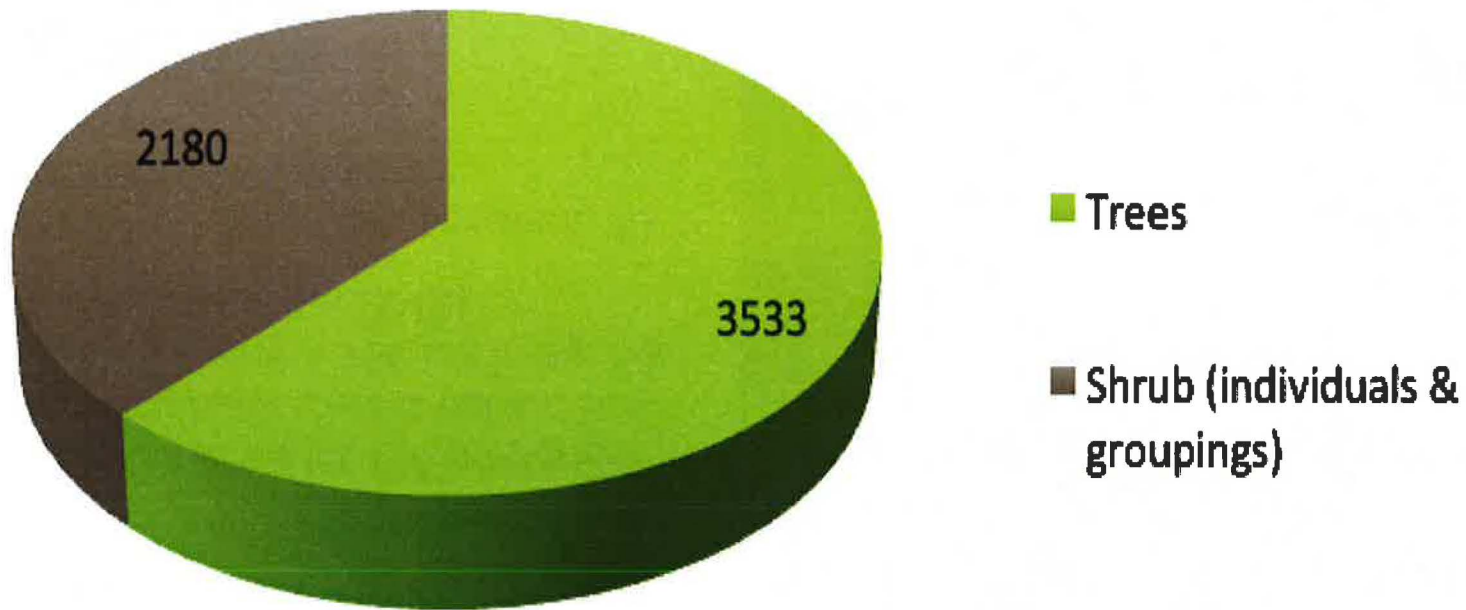
Presented to SPC-UCS by Jean Woeller, resident and owner of 6138 Bow Crescent NW
May 15, 2019

Why did BRFM Society undertake a tree census?

To objectively quantify the environmental effects of the proposed flood barrier in Bowness.

A DEVASTATING loss of trees, shrubs

5,713 individual trees, shrubs and shrub groupings lie inside the conceptual barrier alignment



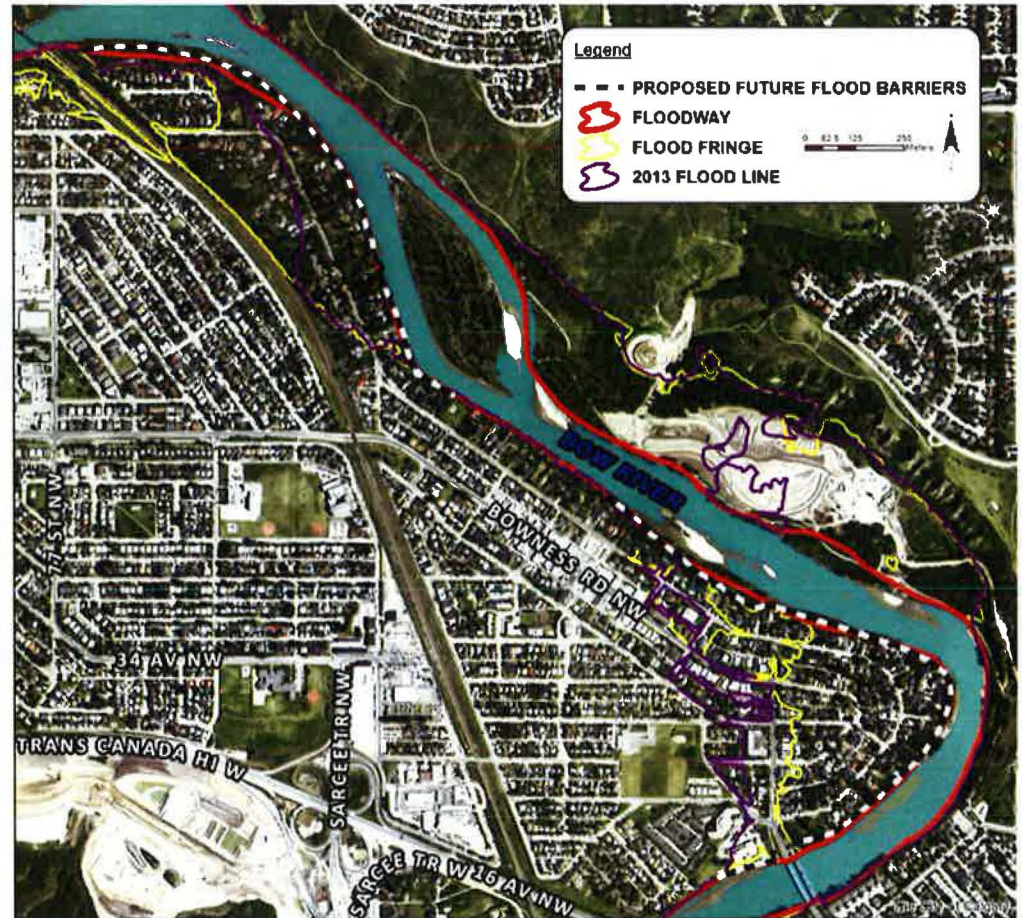
You could project a greater loss from disturbance of roots from construction

Tree Census Method

- We used the alignment of the barrier as depicted in the December 2017 City of Calgary Water Services info brochure & imported to Google Earth
- Volunteers visited about 130 properties on Bow Cres, Bowbank Cres & behind Bow Village Cres, logging > 250 hrs in the field (from May to November 2018)
- Trees & bushes along the alignment, 30 feet wide, were GPS located



Page 4



Tree census methods – measurements & species identified

- Tree trunk circumference measured at about breast height
- Shrubs / bushes and groupings were measured for height and width
- Species were identified in the field where possible or from pictures linked to waypoints



Korean Lilac



Honeysuckle



Poplars

Top 10 Species by Count – Demonstrates Diversity

60 unique tree species identified

Tree	Count	Shrub Species	Count
Saskatoon	854	Dogwood	367
Poplar	636	Saskatoon	345
Chokecherry	477	Wolf Willow	220
Wolf Willow	245	Snowberry	189
Spruce	153	Wild Rose	182
Multi-stem River Birch	131	Cotoneaster	118
Willow	99	Buffaloberry	108
Green Ash	77	Chokecherry	91
Manitoba Maple	61	Potentilla	67

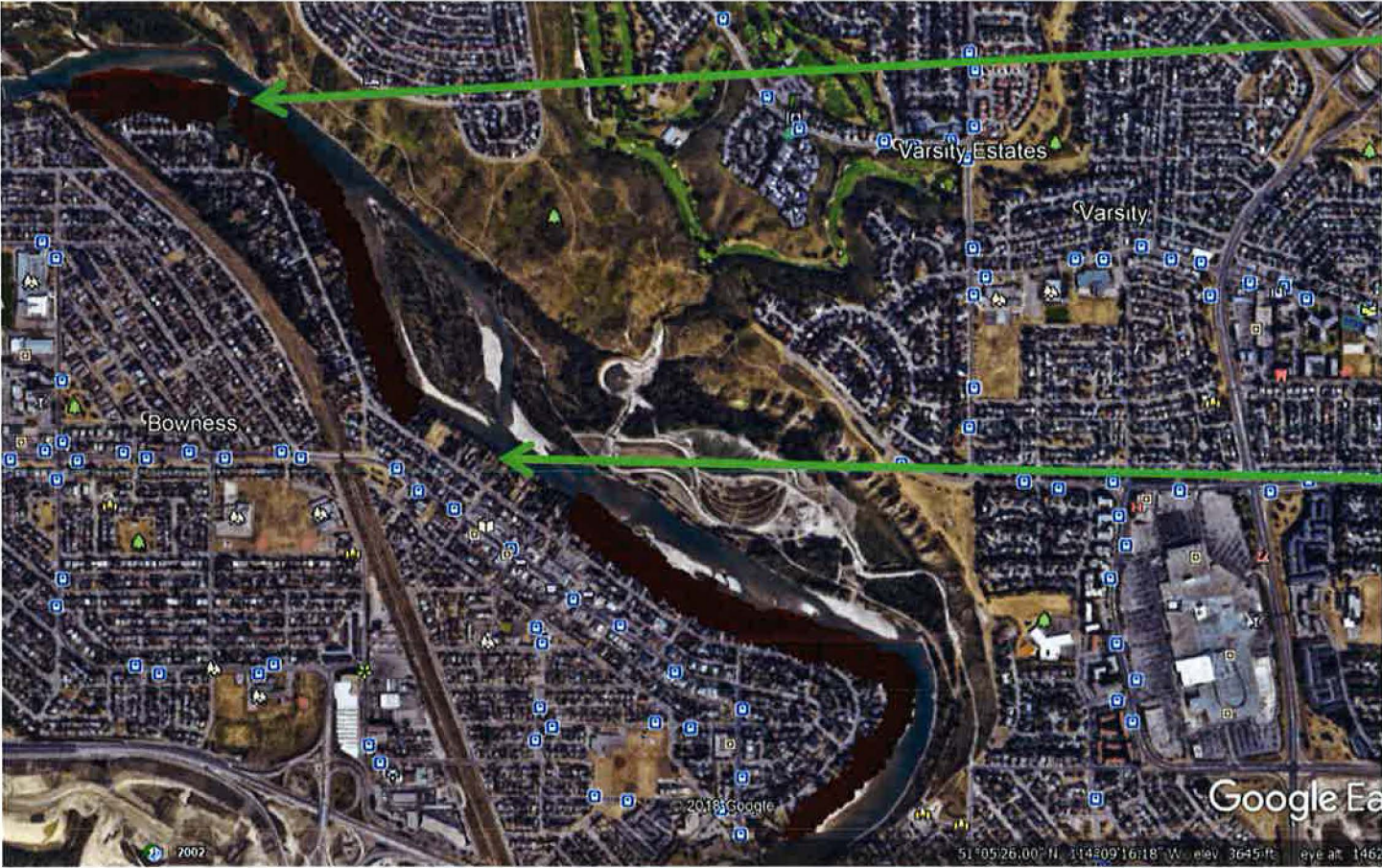
Top 10 by Max Trunk Circumference (inches)



Tree Species	Max	Min	Avg	Count
Poplar	195	1	38.7	636
Manitoba Maple	128	2	19.3	61
Willow	125	1	9.4	99
River Birch Multi-stem	93	1	8.4	131
Green Ash	85	2	21.2	77
Spruce	70	1	28.2	125
River Birch	63	3	10.6	27
Blue Spruce	62	2	32.5	38
Aspen	61	4	34	4

Demonstrates maturity

Mapping the location of trees and shrubs



1 very large property with a wetland was not included in the census

Conceptual design shows break in the barrier. This may change in design and affect tree count.

According to Experts: shrubs are important for wildlife

The Importance of Shrubs to Wildlife

Shrub	Big Game	Birds
Willows	1	2
Beaked Hazelnut	1	1
Swamp Birch	2	2
Alders	3	2
Gooseberries & Currants.....	2	1
Saskatoon Berry	1	1
Shrubby Cinquefoil	2	2
Pin Cherry	2	1
Choke Cherry	2	1
Rose	2	1
Raspberry	2	1
Wolf Willow	2	2
Canadian Buffalo-Berry.....	3	1
Red-Osier Dogwood.....	1	1
Labrador Tea	3	3
Blueberry	2	1
Honeysuckle	2	2
Buckbrush	2	1
Cranberry	1	1

Taken from the AEP publication: "Guide to the Common Native Trees and Shrubs of Alberta", By Wayne Inkpen and Rob Van Eyk

SCALE: 1 = very important
 2 = moderately important
 3 = not important

Table supplied by
 B. Stubbs, Alberta Fish & Wildlife

Environmental Importance of Urban Forest

- According to the City of Calgary interpretive signs in Bowmont Park,
 - “Balsam Poplar forests along the river help support wildlife and maintain water quality. Think of the river, forest and wildlife as part of a triangle. If one side disappears the whole thing collapses...”
 - Our urban forest is important to wildlife by providing food and shelter
 - Plant roots filter rain and melting snow, improving water quality
- Trees provide shade for fish & people while absorbing CO2

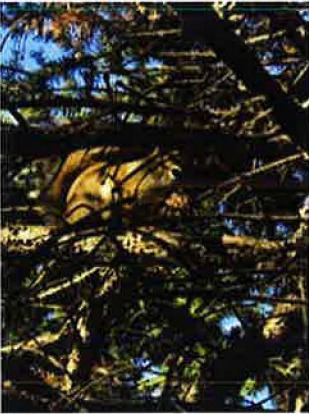


Environmental Impact Continued



- Trees help to slow the flow of the river during high water events, thereby reducing flood (a threat for people and buildings)
- The proposed barrier requires removal of the trees and vegetation that naturally provides some flood protection
- The City will not allow replacement of lost trees on or near the barrier because the roots may jeopardize the integrity of the structure

Habitat Loss



Bowness Wildlife Impacted by Construction



BRFM Nature Walk along proposed berm alignment

With lifelong naturalist Gus Yaki on May 11 2019



Request to Committee

Come to Bowness and walk the proposed barrier alignment to see for yourself what's at stake

Go no further until you

Complete the Biophysical Impact Assessment (BIA) before the preliminary design alignment is completed so that areas of environmental or archaeological significance can be protected.

Give us the opportunity to review and provide input to the design of any BIA studies.

Allow us to have input to the BIA before it is submitted to the Province who will decide on the requirement for a Environmental Impact Assessment (EIA).

Questions?

Contact:

Jean Woeller, Bowness Responsible Flood Mitigation Society

jwoeller@shaw.ca

Info@bownessrfm.ca

www.bownessrfm.ca

Become a member:

www.bownessrfm.ca/membership-join/

Supplemental slides

Background

City of Calgary proposed flood barrier in Bowness

3-4km between CP Rail tracks & Shouldice Bridge, along the Bow River, on approximately 100-130 private properties on Bow Crescent.

According to the City, barrier may range anywhere from 0.5 metres (1.6 feet) in height in some areas to 2.0 metres (6.5 feet) in height in other areas.

Findings – Top 10 Shrubs by Height (feet)

Shrub / Bush	Height (Ft)
Lilac	30
Saskatoon	25
Chokecherry	20
Honeysuckle	20
Willow	20
Lilac Hedge	20
Caragana Hedge	20
Buffalo Berry	18
Mock Orange	15
Dogwood	14



Bow Crescent Resident Animal Siting

Species	Common (C)	Occasional (O)	Burrow (B) Young Seen (Y)
Bat		O	
Beaver	C	O	B Y
Bobcat		O	
Coyote	C		Y
Fox, Red		O	Y
Porcupine		O	
Rabbit	C		
Raccoon		O	
Squirrel, Black, Gray & Red	C		B Y

Bow Crescent Resident Bird Siting (1)

Species	Common (C)	Seasonal (S) or Occasional (O)	Nesting (N) Young Sited (Y)
Blue Jay		S	
Bufflehead		S	
Canada Goose	C	S	N Y
Chickadee, Black Cap	C		N Y
Crow	C		N Y
Eagle, Bald		S	N Y
Falcon, Peregrine		O	
Finch, House		S	N
Flicker		S	N Y
Golden Eye		S	
Grebe, Red Necked		S	N Y
Gull, Franklin		S	

Bow Crescent Resident Bird Siting (2)

Species	Common (C)	Seasonal (S) or Occasional (O)	Nesting (N) Young Sited (Y)
Gull, Common		S	
Hawk, Cooper's		S O	N
Hawk, Ferruginous		O	
Hawk, Red Tail		O	
Hawk, Swainson's		S O	
House Wren		S	
Hummingbird		S	N
Junco, Dark-eyed		S O	
Kestrel		O	
Kildeer		S	
Kingfisher, Belted		S	
Kinglet, Ruby Crowned		S	

Bow Crescent Resident Bird Siting (3)

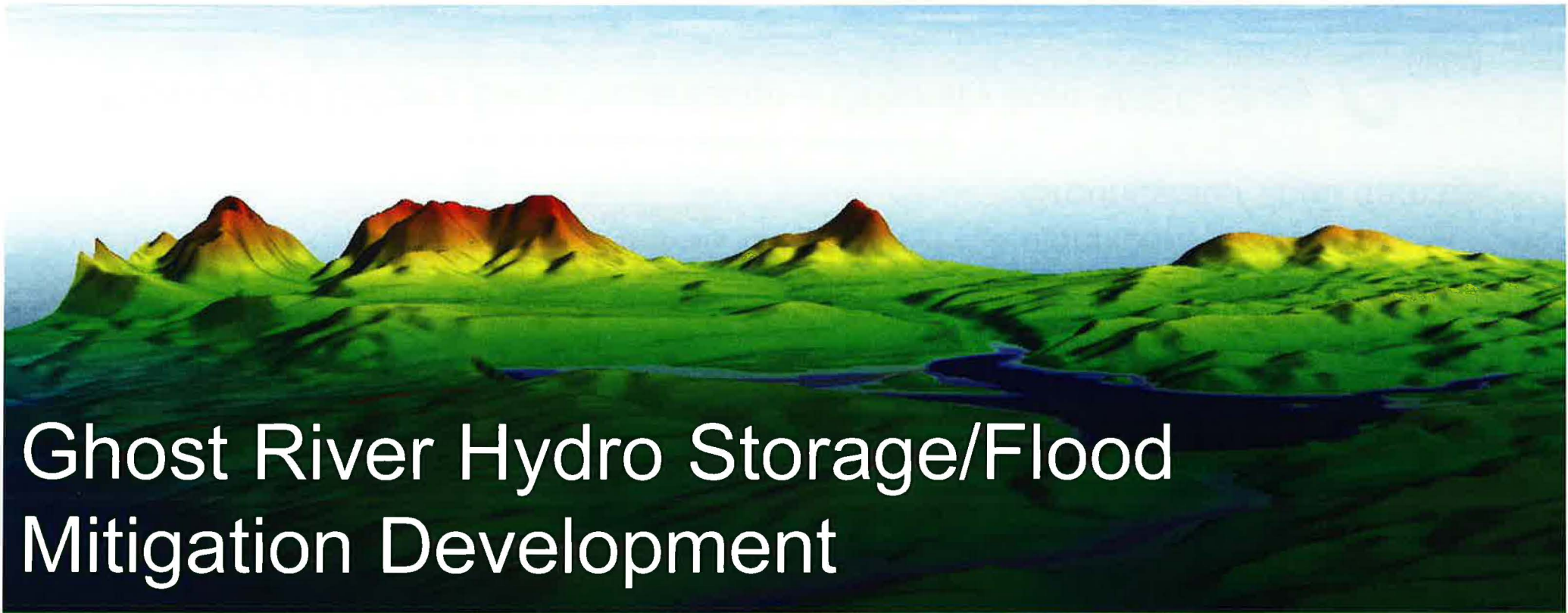
Species	Common (C)	Seasonal (S) or Occasional (O)	Nesting (N) Young Sited (Y)
Magpie	C		N Y
Mallard		S	N Y
Merganser, Common		S	N Y
Merlin		S O	
Nuthatch, Red Breast	C		N Y
Nuthatch White Breast	C		N Y
Oriole, Baltimore		S	
Osprey		S	N Y
Owl, Great Horned		O	N ?
Owl, Saw Whet		O	
Pheasant		O	
Pine Grosbeak		S	

Bow Crescent Resident Bird Siting (4)

Species	Common (C)	Seasonal (S) or Occasional (O)	Nesting (N) Young Sited (Y)
Pine Siskin		S	N Y
Raven	C	O	
Red Pole		S	
Robin	C		N Y
Sparrow, House	C		N Y
Sparrow, White Crested		S	
Sparrow, White Throat	C		N Y
Sandpiper, Black Stilted		S	
Sandpiper, Spotted		S	
Swallow, Tree		S	N Y
Swallow, Cliff		S	
Warbler, Yellow		S	N Y

Bow Crescent Resident Bird Siting (5)

Species	Common (C)	Seasonal (S) or Occasional (O)	Nesting (N) Young Sited (Y)
Waxwing, Bohemian		S	
Waxwing, Cedar		S	
Western Tanager		S	
Woodpecker, Downy		S	N
Woodpecker, hairy		S	N

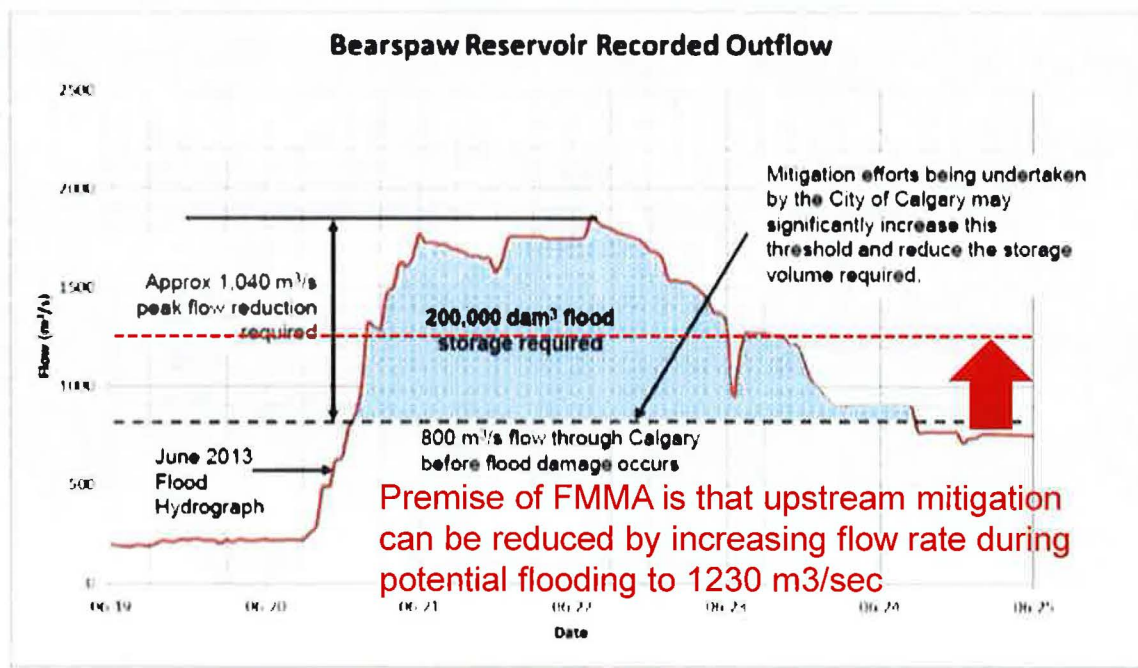


Ghost River Hydro Storage/Flood Mitigation Development

Presented by BRFM.

Storage Volumes Required to Mitigate 2013 Flood

Bow River Requirements to Mitigate the June 2013 Flood



FMMA solution involves increasing trigger flow rate for storage to 1230 m³/sec

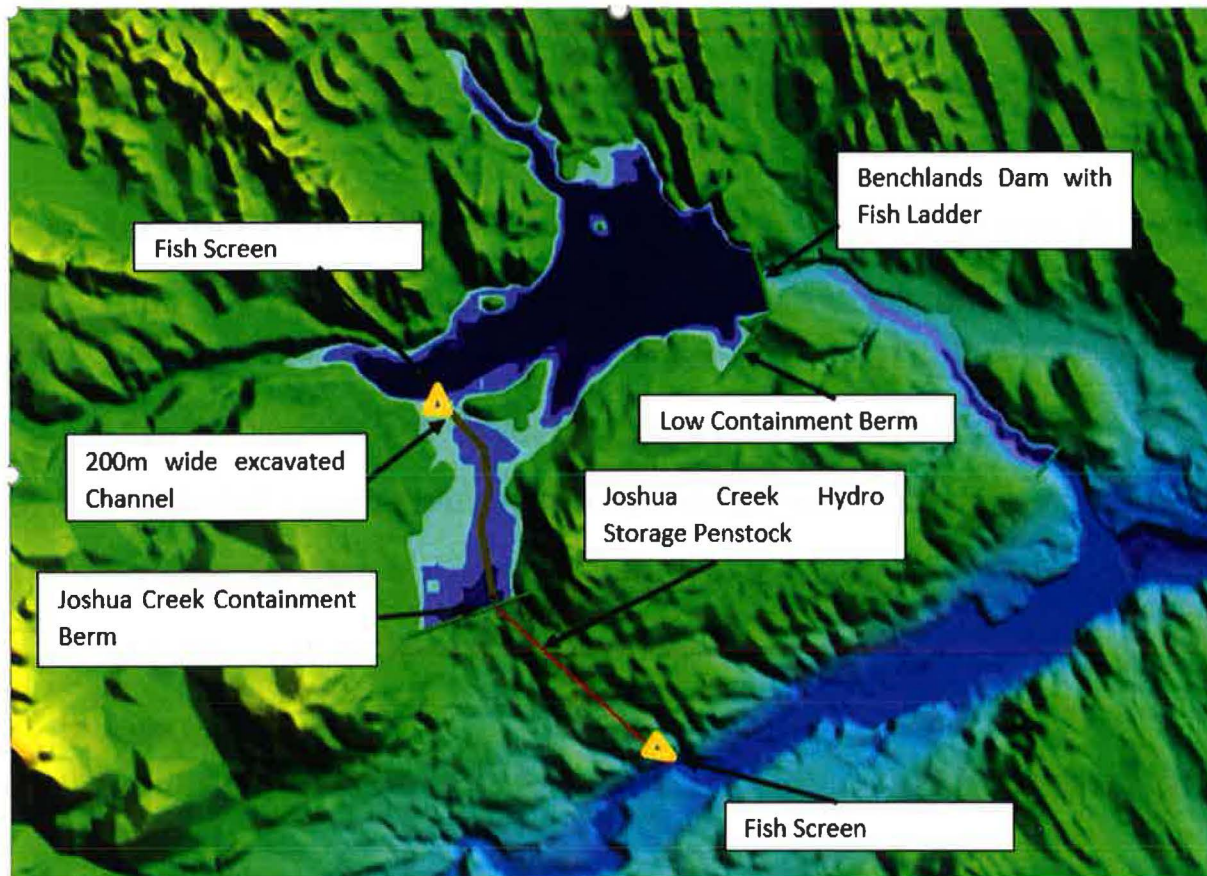
- BRFM Does not accept this option We have not been consulted on this
- There is no evidence provided that Bowness Barrier will facilitate flow of 1230 m³/sec without significant increased Groundwater flood damage

From City of Calgary Slide Presentation – Originally from AMEC Study

Storage Options

- In consultation and community presentation **City asserts that “upstream mitigation is the preferred option**
 - We can only expect to have one new upstream reservoir that holds about 75 MM m³
 - Glenbow Dam – Dry Dam with 70 MM m³ Storage on parkland donated by Harvie Family
 - Elevate Ghost Dam by 3m and lower minimum level by 3m. Increase storage by 60MM m³
 - Morley Reservoir ~150MM m³ of Live Storage (75MM for Flood Mitigation) – Native Land
 - The lessons from 2013 and Quebec Floods is that protection requires keeping the water out of the City. Restricting the River with Barriers is an unreliable solution - **Make Room For the River**
 - Why does the City need to limit the ask of the province to only one reservoir? We should ask for what we need.
- AMEC Foster Wheeler only looked at onstream solutions
 - Did not identify any offsite storage potential as they were evaluating gravity flow solutions only
 - **We are promoting an innovative solution which delivers much greater protection**

Ghost River Hydro-Storage One Dam Concept

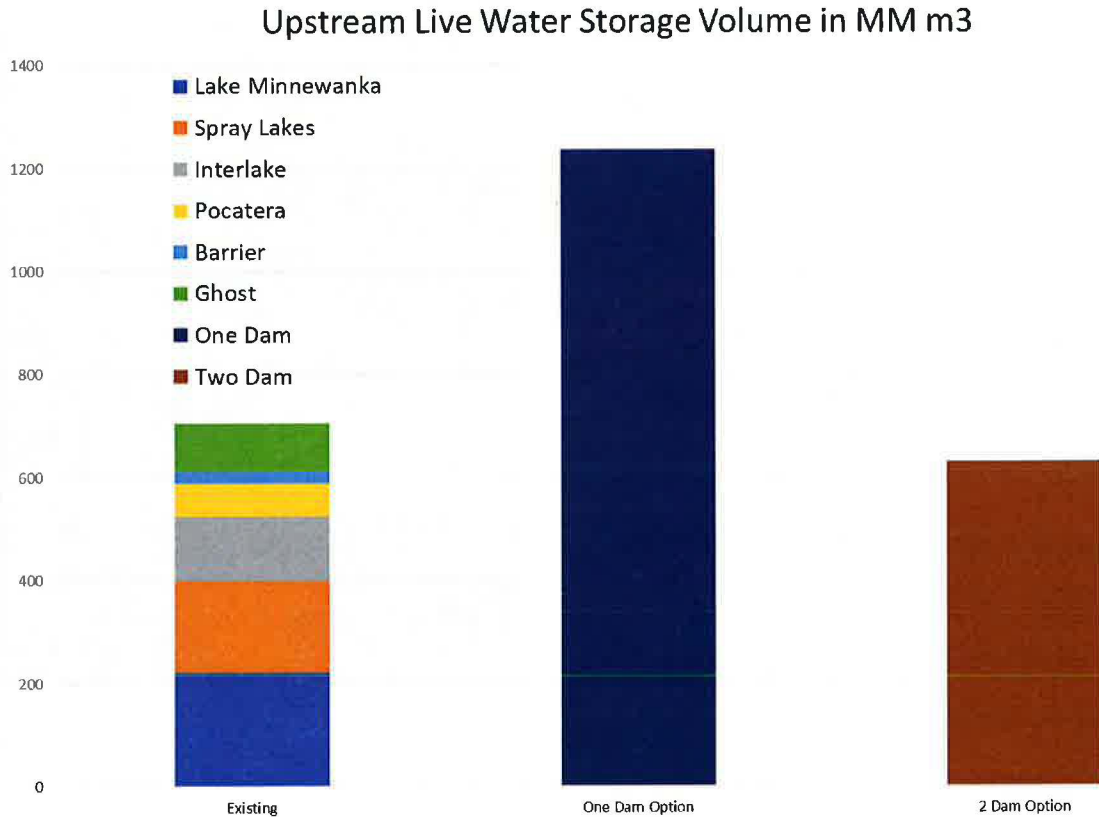


- Benchlands Dam downstream of Confluence of Ghost and Wiaparous Creek
- Maximum FSL of 1380m with minimum operating level of 1360m
- Floods Valley North of Morley on Mount Pringle at Headwaters of Joshua Creek
- 190m above Ghost Lake Res
- 5-7 km Horizontal Distance from Benchlands to Ghost Lake Reservoirs - Similar to Glenmore Diversion Tunnel

Volume of Benchlands Reservoir

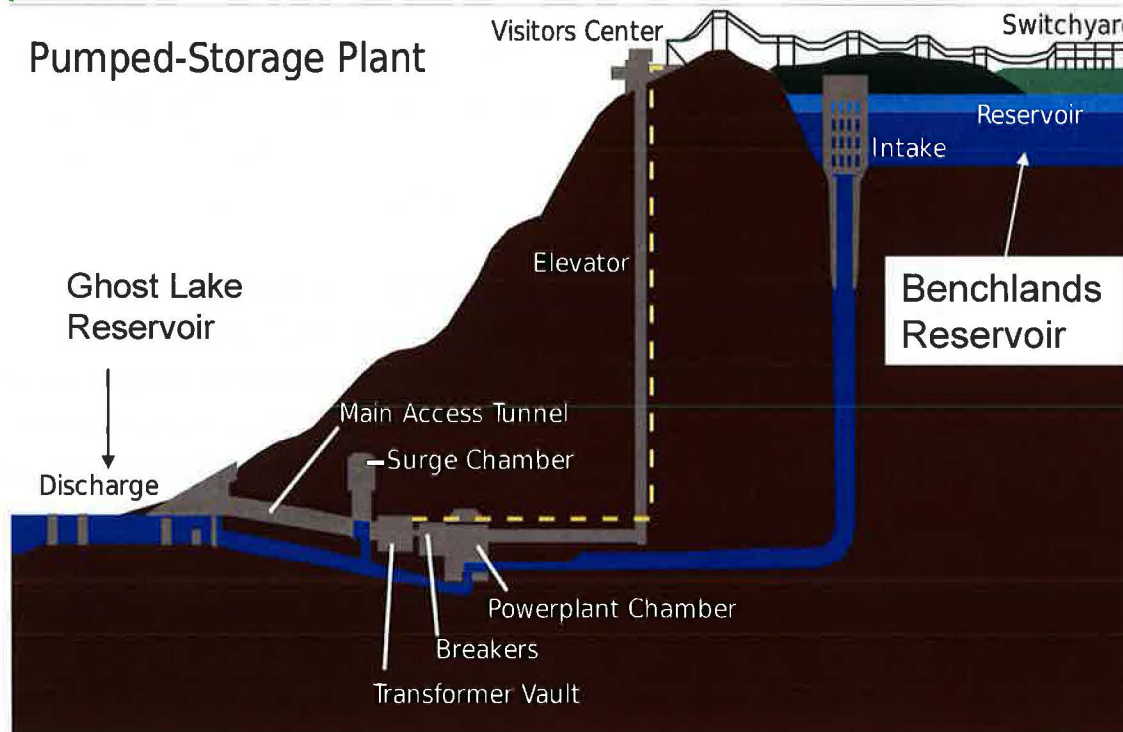
- Benchlands Reservoir at 1380 m FSL would provide 1236 m³ of Live Storage
- Benchlands Reservoir would double or Triple water storage in Upstream Bow River
- More than sufficient storage in one reservoir to provide Flood Attenuation Volumes to control 200 year return period event to less than 800 cms in Calgary

HUGE BENEFIT FOR WATER SECURITY AND DROUGHT MITIGATION WHICH IS A BIGGER LONG TERM CONCERN THAN FLOODING



Hydro Storage or Pumped Power

Option for Ghost River Offstream Reservoir



We Use Offstream Reservoir for Flood Storage

- Large Power Storage Device
- Buys offpeak power to pump water to higher reservoir and flows back to deliver power at peak demand
- Globally over 100 projects, Capacity up to 3.5 GW, Hydraulic Head of 100 – 500 m, Flow Rates of 200 – 2000 m³/sec
- Ghost project could deliver 1000 MW of peak power, control 200 year flood to <800 m³/sec

In Conclusion - BRFM Ask

- Partner with us to advocate for an upstream solution that provides the required protection
 - We need a solution that limits flow rate in Calgary to 800 m³/sec
 - We need a solution that provides more than only flood protection, we need drought protection, water security and technologies that foster transition to green power.
 - We need a solution that is part of a routinely operated system, not only once every 20 years
 - We need a solution that provides for economic growth through value adding infrastructure.
- After Preliminary Engineering, Suspend Bowness Barrier (and all flood mitigation projects on the Bow River) until the Upstream Mitigation solution is Identified, approved and the operating protocol has been confirmed This will determine what residual mitigation is required in Calgary
 - Until the upstream piece is in place, confirming design requirement for community barriers is not possible
 - We need to understand the influence of groundwater in Bowness before we can determine barrier design. To have a landscape architect working on this is like hiring the interior designer before we confirm that a foundation can be constructed.

Purpose & Requests to Committee

Bring up identified issues with the current Bowness Barrier project, and request changes to ensure accuracy and APEGA policy are met

Council Approval

The City of Calgary Council approved the Flood Mitigation Measures Assessment (FMMA) report. The report states:

“The Assessment confirmed that to provide an equitable level of service on the Bow as on the Elbow, a new reservoir on the Bow upstream of Calgary is recommended, along with complementary barriers in select communities and continuation of the Provincial-TransAlta operational agreement”

The Deputy Minister of Alberta Environment & Parks sent a letter to the City of Calgary in response to ACRP funding application for this project. It states:

*“I understand the city is developing its flood mitigation strategy under the assumption that a large scale storage structure will be built on the Bow River in the future; however, **it is premature to include this option in the current multi level approach.**”*

We spoke with the Deputy Minister the first week of January 2019 as well as yesterday. He indicates that letter is the current position of the Government

The FMMA report also states:

“if a new Bow Reservoir is not built, fortification of the Bow River by barriers is not desirable, as it would require higher barriers with large footprints along the length of the Bow River within Calgary, resulting in dramatic impacts on the community”

Council Approval

Request:

That the Committee and/or Council direct Water Services to wait until such time as the reservoir is committed to, prior to designing a barrier

The ARCP grant has as a requirement:

“The applicant must also own or obtain legal consent to access the lands upon which the project is constructed.”

The City indicates:

“The Bowness barrier is considered an eligible project under ACRP, but funding is not yet approved.”

Request:

The Committee direct Water Services to not state the project is eligible for funding as the requirement for consent is not yet met and the Deputy minister’s letter position is still valid. A more accurate statement would be, it may be eligible for funding in the future

Clarity of Information

The City of Calgary published information on its website and directs residents to engage through the website. The website stated:

"In Bowness, flooding can happen when the flow rate is approximately 850 cubic metres per second (m³/s), which has a 12 percent chance of occurring each year"

I asked the provincial government, What is the chance of overland flooding in Bowness in any given year. The Alberta Government answer: 5%

The City has provided multiple responses to the question of why they are advertising 12 percent, from "naturalized flow" to "infrastructure which reduces the flooding may fail".

However, the City when advertising the benefits of the berm alone indicates it will protect flooding against a 1 in 20 year flood:

"the construction of barriers in Bowness will help to protect Bowness from flood events up to 1200m³/s. This flow rate represents a one in 20 year flood, which there is a five percent chance of occurring each year"

Clarity of Information

If The City wants to use naturalized flow or produce worst case statistics (infrastructure failing), it be directed to do so equally, and publish that after the barriers are constructed, Bowness will still have a 12% chance of flooding (because the newly constructed infrastructure which have gates, could also fail). Assuming the dams will fail but that the proposed gates will not, is misleading, and not backed by either of the Permanent Flood Barrier Assessment Report (by Associated Engineering AE) or FMMA reports.

Request: That the Committee direct The City to state in plain English at the beginning of their resident feedback website and all other instances on the City's website, what the current overland flood risk is, from the Alberta Government, or from The City's own AE Report. I sent in a suggested rewording of ;

Prior to the Ghost Dam being built, the probability was of flooding in Bowness was 12%, after the Ghost damn was built and with the current operating agreement with Transalta in place, the current risk of flooding in Bowness is x%“

Instead The *City changed it to;*

Without upstream mitigation, there is a 12 per cent chance of this occurring each year

Still The City would not plainly state what the current overland flood risk is in Bowness. Instead the City states the risk without the dams(a condition from the early 1900s). *An update, after speaking with the new water services director, the Bowness Barrier website has been updated in the last few weeks, albeit 6 months after the initial request*

Clarity of Information

In The City's what we heard report, a citizen asked "How great is our risk to flood again". The response from The City was:

"It's true that Calgary has had several decades without a flood event, however, with a changing and warming climate, extreme rainfall and floods are expected to happen more frequently"

Request:

The City directly answer questions. For the above, an appropriate answer would be: *"With the current Transalta Agreement in place, the risk is 5%"*

Decisions

The City commissioned a conceptual report by Associated Engineering which I obtained through a FOIP request, after numerous attempts to have the City provide me with a proposed barrier elevation on my property and others failed.

The report has some interesting statements related to costs and benefits. The City has claimed a 1.4 Benefit Cost Ratio (BCR) for the Bowness barrier project

Benefit Cost Ratio (BCR)

AE - Benefit Cost Ratio for a number of scenarios. City decision to go to preliminary engineering referenced a case where the residual groundwater and stormwater damage was not considered in the benefit and the barrier cost did not include the cost of groundwater or stormwater mitigation.

- This is an unreasonably optimistic estimate which at 2.5% cost of Capital generated a BCR of 0.9 for Bowness North and 1.24 for Bowness South.

AE presented Option 3 where residual Groundwater damage deducted from the evaluated benefits without Groundwater mitigation and including stormwater mitigation cost

- Reasonable evaluation for case which does not attempt to protect Bowness from Groundwater, which at 2.5% cost of Capital generated a BCR of 0.23 for Bowness North and 0.61 for Bowness South.

AE presented case where full groundwater and stormwater mitigation was provided (similar to plan for Sunnyside)

- Full protection plan with 2.5% cost of Capital generated BCR of 0.28 for Bowness North and 0.68 for Bowness South.

BCR

Request:

The Committee review the BCR for the case where Bowness residents receive equal protection from groundwater, and make a decision on the published BCR of 0.28 for Bowness North and 0.68 for Bowness South

Request:

The Committee direct the City to recalculate all BCRs with the addition of excluded costs. A sample of excluded costs from the AE report: *“Negotiation costs for land acquisition were not included in the cost estimates, Environmental compensation (i.e., fish habitat compensation, tree replacement) and taxes are not accounted for in the cost estimates”*.

Request:

The Committee direct the City to recalculate all BCRs with using Land Compensation Board order 457 (Inglewood barrier case) as the compensation standard. The city, for estimates in Bowness, chose to simply take a percentage of land times assessment, and subsequent requests to provide a rationale for not heeding the LCB order have gone unfulfilled. When we took the most conservative reading of the LCB order and ran it for Bowness, we arrived at \$20 M. This is 60% more than what the City has budgeted (\$13M)

BCR

Request:

The City has verbally indicated that most properties' main floor are above the 1:100 level, but the AE report assumes main floors are 0.3M above grade. The AE report shows curves where the main floor damage is multiple times higher than basement flooding. This choice of assumption (0.3M) artificially inflates main floor damage in the event of a flood for those properties with 1:100 year flood elevations above 0.3M and consequently would artificially inflate the BCR for the barrier. For instance, for our property, the 1:100 yr flood level is 1.26M above grade. The report then assumes I would have main floor flood damage in the event of a flood. However, our main floor is 2.16M above grade. The report's assumptions are erroneous. The BCR should be rerun with the actual main floor flood elevations. There are only 100 properties.

Request:

The AE report chooses the shortest barrier path possible and cheapest type of barrier, whereas the barrier constructed by the City in Inglewood has 20% more barrier than a straight line to accommodate the property owners' choice of path, and is a mix of berm and wall. The AE costs do not account for more length or barrier type due to owner requests, further inflating the BCR. The BCR should be rerun based on historical design variance

BCR

Request:

The BCR is a ratio of monetary benefits divided by monetary costs. This means if a known cost is excluded, it artificially inflates the BCR. The AE reports stipulates an accuracy of +50%. The purpose of estimating projects to a degree of accuracy is to include all known and probable costs, because you are stating you can build it within the stated accuracy. Excluding costs, not providing estimates based on historically known costs, and stipulating a degree of accuracy while doing these types of caveats and exclusions is problematic project governance.

The request for the committee is to determine why the City would choose to:

1. Not include historically known costs
2. Not base estimates on previous designs
3. Not base land costs on the most relevant Land Compensation Board ruling

In a nutshell, why would the City not generate estimates and calculate BCRs on the most probable outcome? And if the City believes the estimates were done on the most probable outcome, where is the documented rationale for why the estimate deviated from the historically known costs?

City Cost

The City just recently rezoned portions of Bowness which were either flooded in 2013 or are in the flood mapping zone, to a higher density

All Flood reports state a desire to reduce flood damage.

Why would the City then change the zoning to increase density, resulting in increased damages? Or at a minimum, why wouldn't the City ensure there is no development below the 1:100 yr level?

The recently approved "Jake" building is a good example. Council approved rezoning to higher density, and the building has an approved development permit. This parcel was flooded in 2013. The development has a planned 2 storey underground parking garage with 73 stalls. If there are even 30 vehicles flooded at 15k per vehicle, the increase of flood damages due to vehicles alone, is \$450k.

This defacto decision to increase damages was a decision made by council which would seem contrary to the reports objective of reducing flood damage

Request:

The committee direct planning to not allow non waterproof basements for new developments in the flood zone

The committee advise council to not allow zoning changes to higher densities in the flood zone, or if they do, to not allow non waterproof developments below the 1:100 yr level