

Drumheller Resiliency and Flood Mitigation Office

Lehigh Comprehensive Flood Mitigation Analysis Study

Community Information Session

Feb 3, 2022



Agenda

Welcome everyone, I'm Kathryn Kolaczek the Communications Lead and event host. Today's agenda is as follows:

- Land Acknowledgement
- Introduction of the team
- Introduction of the presenters
- Presentation
- Question and answer period

Agenda

- Personal information, including appraisals, will not be discussed at this meeting.
- We will be presenting the numerous flood mitigation measures assessed for the community of Lehigh and the resulting mitigation measure that will be implemented based on the evaluation.
- The flood mitigation measures presented this evening are the same measures that were presented at the January 6th meeting, with the addition of conveyance improvements (straightening the river).

Land Acknowledgement

The Town of Drumheller respectfully acknowledges that we are on Treaty 7 territory, the ancestral and traditional territory of the Blackfoot Confederacy: Kainai, Piikani, and Siksika, as well as the Tsuut'ina First Nation, the Stoney Nakoda First Nation and Metis Nation Region 3. We recognize the land as an act of reconciliation and gratitude to those on whose territory we reside.

Please Be Considerate

- Please respect your fellow neighbours and today's speakers. Abuse will NOT be tolerated. Any disrespectful behaviour will result in being removed from the meeting.
- The focus of today's meeting is the Lehigh Flood Mitigation Study, and this is the team of experts we have in the meeting. We will not be covering questions or content on other projects. Stay tuned to our website for information on future open houses specific to other projects.
- Virtual questions will be answered via the Q&A tool after the presentation.

Today's Panelists

Deighen Blakely, P. Eng, Project Director

Liv Hundal, M. Eng, P. Eng, Wood

Mayor Heather Colberg

Robyn Andrishak, M.Sc., P. Eng. Northwest Hydraulic Consultants

Colin Blair, Executive Director, Recovery Branch, Alberta Emergency Management Agency

Paul Lawson, Land Agent, Scott Land & Lease Ltd.

Darryl Drohomerski, CAO, Town of Drumheller

Kathryn Kolaczek, Communications Lead, Alchemy Communications

Today's Team

In attendance at this evening's session is Mayor Colberg & Council

Mayor Heather Colberg

Councillor Patrick Kolafa

Councillor Lisa Hansen-Zacharuk

Councillor Crystal Sereda

Councillor Tony Lacher

Councillor Stephanie Price

Councillor Tom Zariski

Today's Team

In attendance at this evening's session is the Community Advisory Committee

Cate Samuels

Tony Miglecz

Harvey Saltys

Wayne Powell

Keith Hodgson

Irv Gerling

Today's Presenters

Mayor Heather Colberg

Deighen Blakely, P. Eng, Project Director

Liv Hundal, M. Eng, P. Eng, Wood

Colin Blair, Executive Director, AEMA

Mayor Heather Colberg

Deighen Blakely, P. Eng, Project Director

Lehigh Flood Mitigation - Background

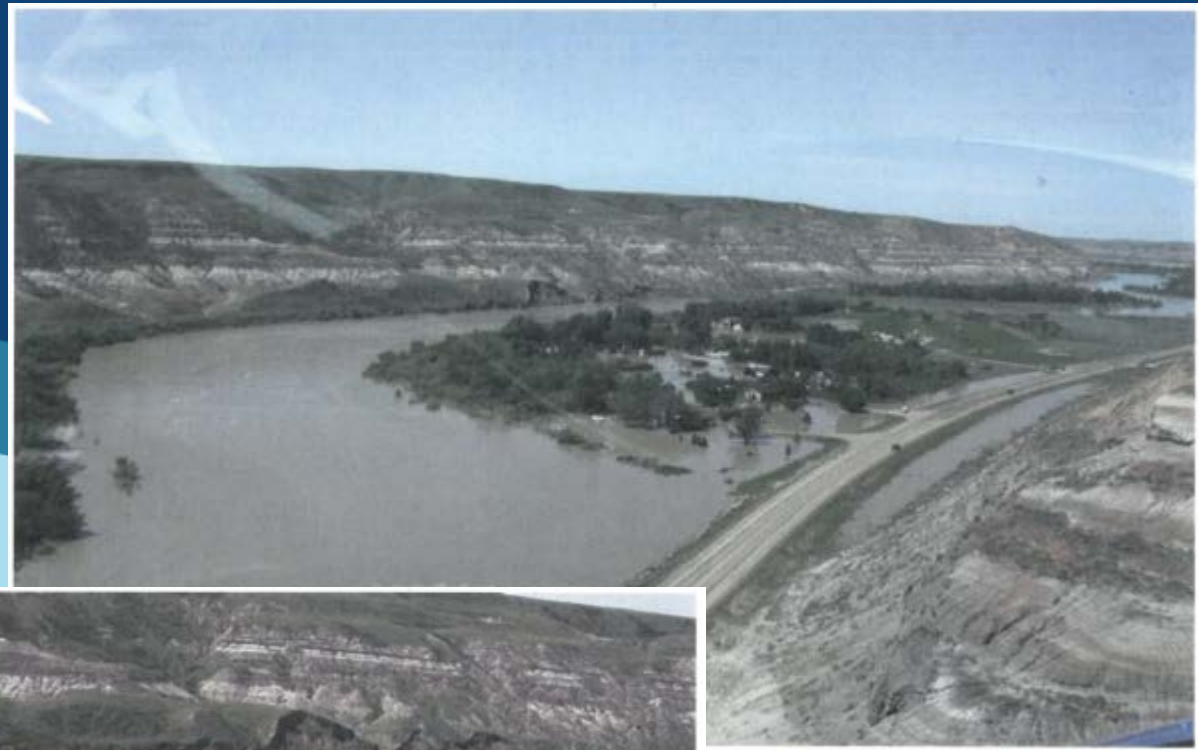
- Lehigh is a community at significant risk of flooding
- The area has flooded twice in the past two decades
- The Town needs to keep people and property safe for the larger floods anticipated in the future



Red Deer River Flooding
at 1,850 m³/s

June 2005 Flood Drumheller

- Red Deer River Peak Flow Rate at 1450 m³/s



2005 Flooding
in Lehigh

June 2013 Flood Drumheller

- Red Deer River
Peak Flow Rate
at 1250 m³/s



2013 Flooding in
Drumheller Valley

Lehigh Flood Mitigation - Background

- The Town applied for Provincial funding to build a flood berm at Lehigh in 2014 and 2015
- Berm funding requests were rejected – the estimated cost to build the berm was more than the value of property protected
- In 2016, Province and Town informed Lehigh residents at an open house that no berm would be built, and buyouts would be sought once funding was available

The Drumheller Mail

Lehigh berm proposal denied by province

16 May 2016



Tweet

Like 0

Share



The residents of Lehigh can now rest easy after news that the proposal for the construction of a berm through parts of the community for flood mitigation has been squashed.

On Monday, May 9 Drumheller town council, including the mayor, CAO, and officials from the Alberta government and engineering firm Stantec, met with Lehigh residents to discuss the town's strategy and current progress in securing flood mitigation funds from the province for the community which was devastated by floods in 2005 and 2013.

Lehigh Flood Mitigation - Background

- 2019 – Town of Drumheller receives grant funding, appoints Flood Mitigation Office
- November 2020 – updated draft Provincial Flood Maps released
- January 2021 – Engineering Firms Hired to Complete Design Work

The Drumheller Mail

Town of Drumheller Appoints Flood Mitigation Office

Category: Local News

Published: Thursday, 28 November 2019 05:30

Written by Allie Ruckman



Drumheller Town Council

On Monday November 25th Council approved Bylaw 15.19 which establishes the Drumheller Resiliency and Flood Mitigation Office.

Lehigh Flood Mitigation - Background

- Buyout of 12 homes and 20 properties in Lehigh is a significant community impact
- Summer 2021 – based on citizen and Council feedback, Flood Office undertakes additional study of flood mitigation measures for Lehigh
- January 2022 - study findings complete, buyouts remain only feasible measure to protect people and property in Lehigh

Lehigh Comprehensive Flood Mitigation Analysis Report

Drumheller Flood Mitigation
Lehigh, AB
Project # CW238408

Prepared for:

Drumheller Resiliency & Flood Mitigation Office
224 Centre Street
Drumheller, AB, T0J 0Y4

Prepared by:

Wood Environment and Infrastructure Solutions
a Division of Wood Canada Limited
401, 1925 – 18th Avenue NE
Calgary, AB, T2E 7T8
Canada
T: +1 403-248-4331

31 January 2022

wood.

Liv Hundal, M. Eng, P. Eng

Lehigh Flood Risk Profile

- Properties are located in Floodway
- Floodway is deep (>1m), fast flowing water
- The Red Deer spills its banks at 720 to 869 m³/s, at Lehigh which has a 5 – 10% chance of occurring in any year
- The Provincial design flood flow of 1,850 m³/s has typical flood depths on the ground in Lehigh of 1.1 to 1.7 m (3.5 ft – 5.5 ft deep flow)



Red Deer River Flooding
at 1,850 m³/s

Lehigh Seepage and Groundwater Issues

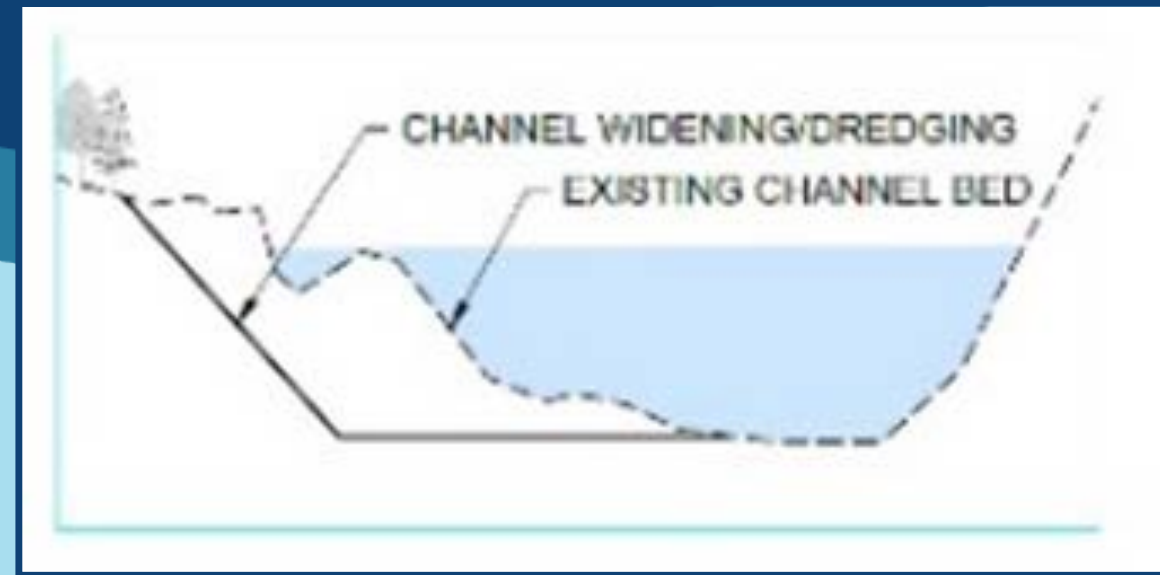
- The height of ground in Lehigh above the normal river level is much lower than in other areas of Drumheller
- The ground Lehigh is built on is much more permeable than other areas of Drumheller
- Flood waters seep into the soils at Lehigh at a much faster rate than other places in Drumheller

Lehigh Flood Mitigation Measures Evaluated

- Mitigation Measure #1: Flow Conveyance Improvements (Dredging, Channel Widening, River straightening)
- Mitigation Measure #2: Permanent Berm
- Mitigation Measure #3: Temporary Berms or Barriers
- Mitigation Measure #4: Raising Residential Structures and Critical Utilities
- Mitigation Measure #5: Buyouts
- Status Quo (Do Nothing)

Mitigation Measure #1: Conveyance Improvements (Dredging/Channel Widening)

- Excavate channel bed or bank to increase flow area
- Significant excavation volume required
- Minimal change in flood level (10 cm) achieved
- Would not be approved by Alberta Environment and Parks nor by Fisheries and Oceans Canada
- Not sustainable over the long term
- Provincial and Federal funding is not available

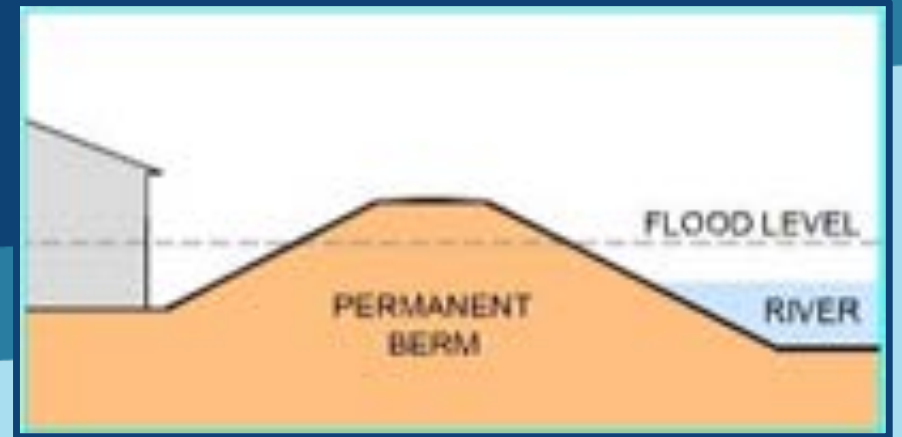


Mitigation Measure #1 Cont'd: Conveyance Improvements (Straightening)

- Cut off meander bend downstream Lehigh
- Huge excavation volume required
- Minimal change in flood level (10 cm)
- Would not be approved by Alberta Environment and Parks nor by Fisheries and Oceans Canada
- Much more costly than a berm
- Provincial and Federal funding is not available



Mitigation Measure #2: Permanent Berm Structure



- Berm would need to be 3 m high and 1250m long
- With gravelly soils and high seepage, groundwater would quickly flood nearby basements, and water would seep up to the ground surface, impacting nearby properties
- The berm would not effectively protect all properties from flooding
- The cost of the berm, estimated to be \$4.8M is greater than the value of property in Lehigh
- Provincial and Federal funding is not available for a berm

Mitigation Measure #3: Temporary Berms or Barriers

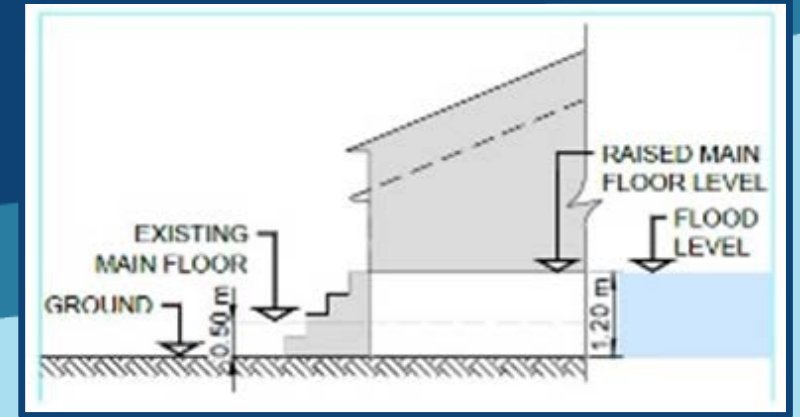
- Temporarily installed in advance of a flood
- Dirt placement, sandbags, aquadams or flood walls
- Unlikely to be enough warning time to build for 1,850m³/s flood
- Temporary berm, like permanent berm, would not prevent groundwater leaking to above surface
- Provincial and Federal funding is not available for a purchase of temporary measures



Military personnel help with the placement of a Tiger Dam on Sunday night (Nov. 28) across Highway 1 near Cole Road in Abbotsford. (PHOTO: Abbotsford Police Department)

*Temporary response measures
used in Abbotsford 2021 Flood
- Revelstoke Review Nov 28, 2021*

Mitigation Measure #4: Raising Residential Structures/Utilities



- Achieve by (1) use stilts or columns to jack up houses; or (2), raise up the ground (e.g., by placing houses on mounds)
- Risk to public safety remains, including the potential for injuries and fatalities
- Homes still susceptible to damage from flood water and debris
- Other property still at risk of flood damage (vehicles, garages, outbuildings, shops, etc.)
- Access/egress to evacuate blocked
- Dangerous to emergency services to provide response, logistical challenges
- Provincial and Federal funding is not available

Mitigation Measure #5: Buyouts

- Purchase of properties and moving or demolition of buildings and infrastructure
- Removes flood impact risk to people and property
- Removes risk to emergency responders
- Provincial funding currently available

Status Quo (Do Nothing)

- Area is zoned as Floodway by Alberta Environment and Parks (Conveyance Zone under Town Bylaw based on Provincial mapping) - limiting future development
- Changes to Disaster Recovery Program (DRP) limit future flood recovery funding
- DRP funding is only available for "extraordinary" events, greater than 1,850m³/s for Drumheller - floods the size of the 2005 and 2013 would not qualify for DRP in future
- Funds available under DRP are only to repair to damages pre-flood conditions, it is not a buyout program
- Risk to public safety and property damage remains
- Town the size of Drumheller could not fund future flood damage repairs for Lehigh



2005 Flooding in Lehigh

Study Conclusions

- Based on the range of Flood Mitigation Measures studied, buyouts are the only viable measure to prevent future flood damage to people and property in Lehigh
- The level of risk to Lehigh residents and their property is not acceptable to the Town nor to the Province of Alberta. Residents remaining in Lehigh put themselves and others (emergency services) at risk. Funding is available now to remove the risk, so the Flood Mitigation Program is undertaking buyouts.

Deighen Blakely, P. Eng, Project Director

Lehigh Flood Mitigation - Implications

- Action needs to be taken for the community of Lehigh, otherwise
 - Citizens are at risk of injury during flood events
 - Town is required under legislation to provide emergency response for Lehigh during frequent flood events into the future
 - Cost of future flood damage will be borne by the individual landowners - the Town and taxpayers in a community the size of Drumheller can't bear the cost of flood damage recovery expenses
 - Property continues to be at risk of damage

Lehigh Flood Mitigation Buyouts

- The buyout Flood Mitigation Measure has been confirmed by Wood's study, approved by the Province and will be actioned by the Flood Mitigation Office as the go-forward mitigation measure for Lehigh
- Buyout removes the risk to people in Lehigh
- Buyout removes the risk to property in Lehigh and provides the opportunity for Lehigh residents to relocate
- Buyout removes the risk to emergency services
- But buyout will have a big impact to the citizens of Lehigh, we will need to work together on this

Lehigh Flood Mitigation Buyouts

- Land purchase will be completed using the Province of Alberta's 18GRSTR41 grant funding
- Under the grant funding, buyout land must be designated as environmental reserve, in perpetuity
- Grant allows for buyouts at current market values (i.e. the greater of appraised or assessed value)
- More than half of the properties have been appraised to date, on average, appraised values are 50% greater than assessed values
- Buyout will be sought first – allows for a negotiated agreement, unlike expropriation where third party decides on awards

Lehigh Flood Mitigation – Timelines

- Jan 6, 2022 landowner meeting
- Feb 3, 2022 public information session
- January to June 2022 – landowner 1:1 follow up meetings, discussions
- Present to June 2023 – land negotiations
- July to December 2023 – landowner relocation
- Spring 2024 – property reclamation to environmental reserve/
floodplain area

Colin Blair, Executive Director, Recovery Branch
Alberta Emergency Management Agency

Disaster Recovery Program Changes

Alberta Emergency Management Agency
Recovery Branch
February 3, 2022

Colin Blair
Executive Director, Recovery Branch
Alberta Emergency Management Agency
Municipal Affairs

colin.blair@gov.ab.ca



Agenda

- Background
- Context for change
- Program changes

Disaster Recovery Programs

- Provides financial assistance for uninsurable loss and damage caused by a disaster
- Disasters eligible for DRP are:
 - Considered an extraordinary event
 - Not covered by insurance that is reasonably or readily available for the type of disaster
 - Have caused widespread damage to property



To be considered extraordinary

- Rainfall – rainfall measures at least
 - 1 in 25-year level for urban areas, and
 - 1 in 50-year level for rural areas
- Streamflow – flooding caused by a waterway exceeds a 1 in 100-year level
- Ice jams – winter and ice levels are reviewed and compared to previous data before they can be considered extraordinary

Disaster Insurance Coverage

- Coverage is readily and reasonably available in Alberta for:
 - wildfire
 - tornadoes and high winds
 - snow, hail and ice storms
 - earthquakes
- Coverage is not readily and reasonably available for:
 - Overland flooding – however it is becoming increasingly available

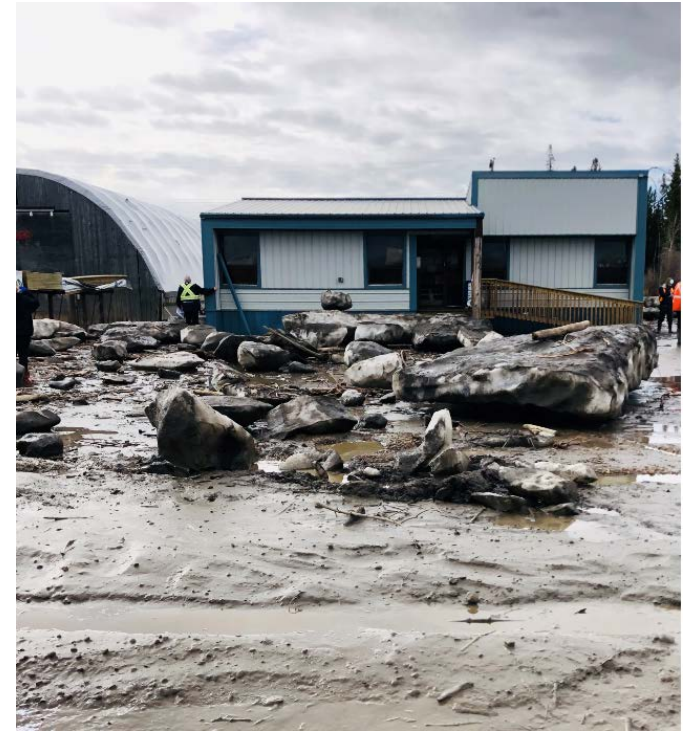
Disaster Recovery Programs

- Restores the basic essentials of life to pre-disaster functional condition/capability :
 - damaged homes
 - small businesses including agricultural operations
 - public works and essential community services
- Does not provide “full value” replacement



Context for change

- Disasters are increasing in frequency and cost
- Federal changes have increased liability on Alberta
- Further development in flood prone areas increases liability



Disaster frequency and cost

- Disaster Recovery Program payouts
 - At least one every consecutive year since 1999
 - \$240 million - average annual DRP cost since 2010
- Disaster Insurance payouts
 - Six of the top ten costliest Canadian natural disasters have occurred in Alberta
 - \$7.5 billion in the last five years
 - \$3.6 billion - 2016 Fort McMurray wildfire
 - \$1.2 billion - 2020 Calgary region hailstorm

Disaster Recovery Program Changes

In effect in 2021 and onwards.

These changes are not retroactive to programs prior to 2021

For homeowners

One-time assistance limit per property with a \$500,000 funding cap

- One-time funding
 - The limitation is applied to the property and not the owner
- \$500,000 limit
 - Applied per homeowner application and is not cumulative
 - Average residential DRP payout in Drumheller in 2013 was \$4,300 per home
- Property addresses that receive assistance will be posted online

For municipalities and all private sector applicants

90:10 cost-sharing arrangement for all DRP eligible costs between the GoA and the applicant

Outcomes

- Reduced disaster recovery costs borne by Alberta taxpayers
- Risk reduction efforts create safer, more sustainable communities
- Long-term resiliency and risk reduction is achieved through community preparation and mitigation measures

Thank You!



floodreadiness.drumheller.ca

floodreadiness@drumheller.ca

floodcommittee@drumheller.ca



FAQs

Questions?

Q: Why is the community of Lehigh at such high risk?

A: The height of ground in Lehigh above the normal river level is much lower than in other areas of Drumheller, and flood waters are deep (1.1 to 1.7m during the design flood).

Questions?

Q: What other measures were considered for Flood Mitigation in Lehigh?

A: Because the impact of a buyout is so significant for Lehigh, a range of both structural and non-structural flood mitigation measures were examined for the community. The structural measures examined include conveyance improvement, a permanent berm, temporary berms or barriers, and raising residences. The non-structural measures examined include buyouts and status quo.

Questions?

Q: Why can't we widen or straighten the river to protect Lehigh?

A: Widening or straightening the river does not reduce the flood depth at Lehigh by very much (~ 10cm), and it is not permitted by the regulators. The cost of straightening is significant.

Questions?

Q: Why is a permanent berm not feasible for the community of Lehigh?

A: A berm at Lehigh would be significantly more leaky than the berms proposed for other areas of Drumheller, due to the permeable soils at Lehigh. A berm also costs more to build than the value of the properties protected and therefore funding is not available for this measure.

Questions?

Q: Why are temporary berms or barriers not feasible for the community of Lehigh?

A: Like a permanent berm, temporary berms would also be leaky. Based on the volume of dirt required to protect Lehigh, there is unlikely to be time to build a temporary berm between notification of the flood and the peak flow arrival.

Questions?

Q: Why is raising residences not feasible for the community of Lehigh?

A: Protecting the main floor of homes is not the only consideration. Even when houses are raised, public safety is at risk and property can still be damaged. Access and egress is cut off by flood waters, and emergency response is problematic. No funding is currently available for this measure.

Questions?

Q: Why can't Lehigh residents just stay and take their chances?

A: We understand that buyouts is not the ideal solution for Lehigh residents; however, the level of risk to Lehigh residents and their property is not acceptable to the Town nor to the Province of Alberta. Residents remaining in Lehigh is not an option as they will be putting themselves and others (emergency services) at risk. Funding is available now to remove the risk, so the Flood Mitigation Program is undertaking buyouts.

Questions?

Q: Why is buyouts the selected mitigation for the community of Lehigh?

A: Buyouts eliminates the risk of flood impacts to the people and property of Lehigh. The other measures examined were deemed to not be feasible. Provincial funding is currently available for buyouts.

Questions?

Q: Why were other Dikes in Drumheller made a priority over Lehigh?

A: The Drumheller Flood Mitigation program is a large, multi-year, multi-million-dollar program. Project delivery for the program needs to be spread out over the coming years. Work has been prioritized based on how many people each berm protects and how quickly the work could be implemented – Downtown Dike, for example, protects dozens of residents, businesses and community buildings used by residents every day. That being said, the study for Lehigh was advanced early in the program, starting in the summer of 2021, and the mitigation measure of buyouts will be implemented in the coming months.

Questions?

Q: Didn't the Aquatic Environment Assessment for Lehigh show that a berm would have minimal impact on the aquatic environment?

A: It is important to the Town to protect people, the environment and property. The aquatic and terrestrial studies were undertaken for the project areas to provide a better understanding of potential impacts. For the range of mitigation measures examined at Lehigh, the channel conveyance measures were discounted on the basis of significant aquatic habitat impact without an adequate reduction in water level. Other mitigation measures like the berm were understood to have minimal aquatic impact but were deemed to be inappropriate on the basis of groundwater seeping to above ground levels and the high cost compared to the assets protected.

Questions?

Q: If the berms in other areas are not being designed to prevent groundwater seepage, why is groundwater such an issue in Lehigh?

A: The soils in Lehigh are different from other areas of Drumheller. They are very porous and groundwater travels quickly through the soils. During a flood event, the groundwater will seep under a berm and appear above the ground surface, having the potential to cause impacts to properties.

Questions?

Q: Scott Land and Lease have been hired by the Flood Mitigation Office for land appraisals and buyouts. Is it true that they're mandated to purchase Lehigh properties for the least amount of money possible?

A: Scott Land and Lease's mandate is to comply with the terms of the Provincial Grant Funding Agreement and the Town's Land Acquisition Policy in negotiation land purchases. There is no other mandate around the purchase price of properties needed to implement the flood mitigation program. Appraisals will be completed by an independent third-party appraisal company, coordinated by Scott Land on behalf of the Flood Office.

Questions?

Q: Why is the Town not covering any extra costs that will be incurred by property owners if they don't go to expropriation?

A: Past Provincially-funded buyout programs in Alberta (i.e., Calgary, High River, Fort McMurray) have been completed at assessed value for the property. As we understand the tremendous significance of buyouts for Lehigh residents, the Town has negotiated with the Province to pay appraised value for buyout properties, which has been found to be well above the assessed value for Lehigh. Under an expropriation situation, the property value will be determined by a third party, along with the value of damages.

Questions?

Q: Would removal of the spurs/groynes adjacent to Hwy 10 reduce flood levels?

A: No, upstream water levels are not expected to be affected by the spurs during a flood event. Alberta Transportation constructed these in 1992 to protect the highway embankment. The design drawings for the spurs indicate that the right (south) bank was excavated back to maintain channel capacity. These structures appear to have functioned as designed, stabilizing the river bank and promoting bed scour near the tips of each structure.

Questions?

Q: Has the operation of Dickson Dam during flood events worsened flooding in Drumheller?

A: No, The Dickson Dam provides a significant level of flood protection to the Town of Drumheller. The Red Deer River 100-year design flood flow rate was reduced from 2,260 m³/s to the regulated discharge of 1,850 m³/s, by taking into account the operation of Dickson Dam.

Questions?

Q: Has the construction of Dickson Dam resulted in sediment deposition, resulting in a narrower/shallower channel which has worsened flooding in Drumheller?

A: No, based on a comparison of the 1984 and 2018 river bed elevation profile surveys, there has been no significant change along the Drumheller reach, and some general lowering of the river bed profile was actually noted in the area of Lehigh. Channel width has tended to decrease slightly through Drumheller since 1950, largely as a result of lateral deposition and vegetation encroachment along the river. Conditions at Lehigh were observed to be consistent with trends elsewhere in the valley

Questions?

Q: With all the information provided, if Lehigh residents still want to remain in their homes, can they?

A: No, buyout will be proceeding to eliminate the risk to people and property in Lehigh as well as remove future risk to emergency responders and liability to the Town.

Questions?

Q: During the preparation of the study, why is it that Lehigh residents were not contacted for their concerns?

A: Lehigh residents have been spoken to multiple times over the years about the high flood risk in this area. Since June, our communications team has spoken to individual residents, multiple times, using multiple tools, phone, email, mail, social media etc. Personal on-site meetings have also been held. The most recent Flood Mitigation Analysis Study for the community of Lehigh was initiated as a result of community input. This was not a part of the original Flood Mitigation Scope; it was added to ensure that every reasonable avenue for flood mitigation had been investigated.

Questions?

**Q: Where/how many boreholes were drilled to characterize ground conditions?
How come there were no boreholes drilled on my property?**

A: Three boreholes were drilled for the berm assessment study on public land or Town-owned land. Additionally, we had access to the water well records for two groundwater wells, which also helped us to characterize ground conditions. These boreholes and wells provided broad and sufficient coverage across Lehigh.

Questions?

Q: When will the Lehigh Comprehensive Flood Mitigation Analysis Study Report be officially completed?

A: The Lehigh Comprehensive Flood Mitigation Analysis Study Report has been completed and has been posted on the floodreadiness.drumheller.ca website.

Questions?

Q: The changes to the Disaster Recovery Program have been emphasized on numerous occasions, why is that?

A: The changes to the Disaster Recovery Program are incredibly important for residents to understand. We want to ensure residents are informed on future available (or unavailable) funding for their homes in the event of a flood.

floodreadiness.drumheller.ca

floodreadiness@drumheller.ca

floodcommittee@drumheller.ca

