

Ghost Hydropower Plant Outage

A Case for More Government Oversight to Protect River Recreation

Abstract:

The Bow River water management policy consists of a working relationship between all primary water users and the Government of Alberta (GoA). Upstream of Calgary, Transalta has control over all reservoir capacity and water flows out of their hydroelectric power plants. The City of Calgary and the irrigation districts downstream have water allocation rights within federal water licenses and the GoA. Water is released or held back within the Bow River Basin reservoirs to meet projected demand. The Ghost Hydroelectric Power Plant is one of several Bow River power plants employing a practice referred to as “hydropeaking” that allows Transalta to ramp up water discharge from the reservoir to increase electrical power supply during high seasonal and daily demands. The Beaspaw Reservoir downstream acts as a cushion from the hydropeaking effects and stabilizes water flows within and downstream of Calgary giving rise to safe, and expanding river recreation opportunities.

On July 21, 2023, the Transalta Ghost Reservoir Hydroelectric Power Plant received a lightning strike knocking out the operation of the power plant, and flows through the turbines stopped. When the operating system was corrected two hours later, an immediate discharge of 110 cms of water resumed putting paddlers at risk when a wall of water over one meter in height went down the river. An event of this nature should fit into a protocol where federal and provincial authorities are immediately informed, and the remedial action that the holder of the license will take to improve safety, protect the ecology of the river, and improve safety. Both Transalta, the power plant operator, and Alberta Environment & Protected Areas were contacted for comment on the event. CRUA was hoping for guidelines that would alleviate a similar situation happening again.

Transalta Response: *“...We share your concern about what might have happened, and we appreciate your efforts to engage us about it”. And, “...TransAlta understands its responsibilities as a hydro operator on the Bow River system and takes these responsibilities extremely seriously. Despite our efforts to manage the safety of our operations, we also appreciate that maintaining public safety where we operate is a shared responsibility”.*

Alberta Environment & Protected Area Response: *“...TransAlta holds an Environment and Protected Areas (EPA) water license for the reservoir, and they are expected to follow the terms and conditions within that license. TransAlta’s water license at the Ghost Reservoir has no conditions that require TransAlta to report or notify the Government of Alberta prior to any events*

CRUA Comments: What is clear from our engagement on this event is that Transalta is not restricted in the quantity, and speed of water released from the reservoir. The only caveat under the Ghost Reservoir and Power Plant federal water license dates back to 1929, is to provide clean drinking to downstream communities. In addition, the Alberta Government does not have any oversight legislation under the Alberta Water Act to intervene in Transalta’s water management practices in the interest of protecting the fishery, and human safety. But rather concede to the historical Ghost Reservoir license from 1929 that was enshrined into the Alberta Water Act as having precedence over the act itself.

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Overview of Transalta Bow River Operations:

The Bow River water management policy consists of a working relationship between all primary water users and the Government of Alberta (GoA). Upstream of Calgary, Transalta has control over all reservoir capacity and water flows out of their hydroelectric power plants. The City of Calgary and the irrigation districts downstream also have water allocation rights within federal water licenses and the GoA. Water is released or held back within the Bow River Basin storage capacity to meet projected demand. There is a total of 9 reservoirs within the Bow River Basin of which 7 have regulated capacity to store water for year-round operation of Transalta's power generation plants. The largest storage capacity is maintained at Cascade and Spray Reservoirs which account for 60% of the total basin storage. Both Upper Kananaskis and Ghost Reservoirs each account for approximately 15% of the total. Storage levels in each of the reservoirs are at their lowest in the spring and reach their upper limits of capacity by the end of July. Water is subsequently released from each reservoir to meet hydroelectric demand throughout the year. Electrical power generation is the highest at Spray (103 MW) followed by Ghost on the Bow River (54 MW) and Rundle on the Kananaskis River (50 MW). A total of 329 MW of electrical power capacity can be generated within the Bow River Basin, representing 5% of TransAlta's total Alberta generating capacity.

The Ghost Hydroelectric Power Plant is one of several Bow River power plants employing a practice referred to as "hydropeaking" that allows Transalta to ramp up water discharge from the reservoir to increase electrical power supply during high seasonal and daily demands. The Beaspaw Reservoir downstream acts as a cushion from the hydropeaking effects of the Ghost Power Plant. The current water management practice stabilizes water flows within and downstream of Calgary giving rise to safe, and expanding river recreation opportunities.

Ghost Power Plant Outage:

Calgary River Users Alliance (CRUA) was made aware of a potentially catastrophic flow event on the Bow River immediately below the Transalta Ghost Reservoir Hydroelectric Power Plant on the evening of July 21, 2023. Although normal flows were reestablished within a few hours, there was a human safety risk that took place. In addition, fish were most likely stranded by the lack of flows during a time slot of 7 to 10 pm.



Water discharge from the Ghost Reservoir does vary according to the electrical power demands within Alberta. Flows will often increase in the late afternoon when electrical power needs are at their highest, and drop down to normal operational flows later in the evening. But on July 21, 2023, a lightning strike knocked out the operation of the power

plant, and flows through the turbines stopped. When the operating system was repaired two hours later, a discharge of 110 cms of water resumed.

CRUA reached out to the paddling community to get a better understanding of what exactly took place during this event. It became evident that paddlers were stranded for some time and when the water was turned back on a wall of water of over one meter in height went down the river with some of the paddler's equipment and supplies lost, or later recovered downstream.



Phil J. Comments: *I was on the river that day. It was devastating to see it this way. Any people near the water, especially kids playing could have easily been swept away and worse when they opened the dam. I was at the edge and 20 seconds later the river was blown out and turbid worse than run-off. Boaters were stranded and when they opened the dam were swept away. I hope no one was hurt. A picture of after they opened the dam in a slow-moving section that never gets this high.*

It became evident that this event and any similar catastrophic events of a similar nature have the potential for a far more catastrophic outcome with possible loss of life.

It was our understanding that any event of this nature fits into a protocol where federal and provincial authorities are immediately informed, and the remedial action that the holder of the license, in this case Transalta, will take to improve safety, and protect the environment and improve safety. What is unclear is why CRUA, as a principal recreational river use stakeholder, was not informed by the dam operator and government agencies of the event.

Both Transalta, the power plant operator, and Alberta Environment & Protected Areas were contacted for comment on the event.

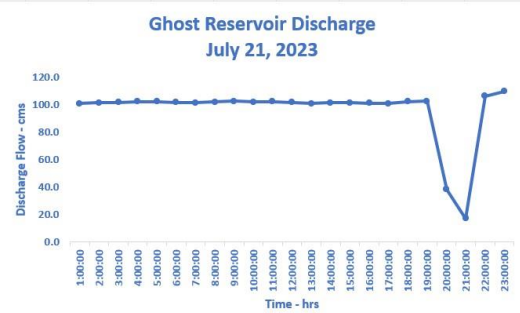
Transalta Communications:

To Transalta – September 20, 2023:

After repeated emails to various contact points with Transalta, CRUA sent another request emphasizing the critical nature of our concerns. :

Although the sudden drop in flows was unavoidable, the reestablishment of 100 cms discharge was not. It is our understanding that Transalta's internal operations guidelines are to work with a 15 cms/hour ramping of flows. This did not take place with a wall of water of over one meter in height flowing down the river. Our human safety concerns were expressed in the September 06, 2023, email. But equally important is that if a similar incident were to take place below Bearspaw Reservoir during the summer months when there are large numbers of rivercraft and floaters on the river, loss of life is a real possibility:

On the evening of July 21, 2023, there was a rapid drop in the Ghost Reservoir discharge and an equally rapid rise in flows after approximately 2 ½ hours of almost no flows. The attached chart illustrates the timeline and recorded flows. Calgary River Users Alliance (CRUA) has been trying to get some explanation of exactly what happened and what remedial action has been taken to ensure human safety and fish survival are not compromised in the future. We have been in contact with TransAlta’s Scheduling Department but have not received a response to our concerns.



CRUA is a principal river recreation stakeholder within the Bow River Basin. Our concerns related to this unfortunate issue are focused on the safety of river users:

- We appreciate that from a water and power generation license perspective there are limited constraints within the original license that only protect water supply to the City of Calgary. This constraint within the license appears to not have been compromised with the events that took place on July 21, 2023. But TransAlta also has a responsibility to operate the Ghost Power Plant in a way that protects recreational river use downstream of the plant. This did not take place during the July 21 incident.
- There was an important human safety issue between 7 and 10 PM on July 21, 2023. It appears that a power outage at the plant started a chain of events that saw the river flows drop from 100 cms to less than 10 cms and continued at the low level for approximately 2 ½ hours. When the power to the plant was reinstated, flows of 100 cms were immediately released and a wall of water went down the river. Although there are reports of paddling equipment and supplies being lost, it was fortunate that no lives were lost. A more gradual ramping up of the flow should have taken place to allow river users to take appropriate action to avoid the rapid change in flow.
- To date, the Calgary River Users Alliance (CRUA) has not received any documented explanation of the events that caused the failure of the plant and remedial action that has been put in place to eliminate a possible occurrence of it happening again. CRUA is not asking for involvement in the decision-making process for water management operations within the Bow River Basin. But we do believe that as a stakeholder in river recreation activities, we should be informed of catastrophic events and remedial actions that are planned for an event such as took place below the Ghost Reservoir Dan on July 21, 2023.

This is unacceptable considering both the fish population and human life were at risk. The river rose by over a meter in minutes.

The Response – Transalta Media Relations – September 21, 2021:

As you know, on July 21, 2023, at about 6 pm, our Ghost Hydro Facility was taken offline as a result of a lightning storm. The facility was down for about 2 hours. During that time, water flows below the dam slowed considerably. Our site team responded to the event and managed to bring the Ghost facility back up at approximately 8:00 pm.

We share your concern about what might have happened, and we appreciate your efforts to engage us about it. We were concerned to learn that the resumption of operations at the Ghost Facility may have caused a brief surge in water flows. We appreciate that this event may have been a surprise for anyone on the river below the Ghost facility.

Thank you for bringing your concern to our attention. Public safety is paramount, and after any material event, similar to the lightning storm on July 21, we investigate to determine risk to public safety and any required corrective actions are implemented.

Our facilities are a critical component of Alberta's power generation fleet. Our hydro operations often provide power to bolster the reliability of the provincial grid at critical times. Beyond generating power, our hydro facilities also provide flood control and drought relief. Resuming operations after an outage as quickly and as safely as possible is crucial.

TransAlta understands its responsibilities as a hydro operator on the Bow River system and takes these responsibilities extremely seriously. Despite our efforts to manage the safety of our operations, we also appreciate that maintaining public safety where we operate is a shared responsibility. Although we invest considerable resources in promoting awareness of the risks that accompany recreating in and around our dams through local signage and public safety campaigns, river users must also be vigilant about protecting themselves against the risks of using the Alberta River systems. Again, public safety is a shared responsibility.

CRUA Response -September 22, 2023

Certainly, the Ghost Hydro incident on July 21, 2023, will require remedial action to ensure that the resumption of flows does not risk recreation activities in the future. As we have stated in several communications with TA Hydro Operations staff, the resumption of flows within this incident should not have been an immediate return to 100 cms, but rather in increments of 15 to 20 cms.

Certainly, the safety of river recreation activities is a shared responsibility. We acknowledge that Transalta is generally doing its part with the safe operation of the power plant within the terms of the water license agreement. We also recognize that the supply of water to downstream communities and irrigation districts while generating electrical power for the grid is also important. But this incident does highlight what is potentially a very serious public safety issue. As it happened, it is our understanding that most people who were on the river during the timelines 6 to 8 pm on July 21 were experienced river users and took action to protect themselves from a surge of water release from the power plant. But this would not be the case if a similar event was to take place during an earlier time in the day, or below the Bearspaw Reservoir where large numbers of inexperienced floaters are on the river during the summer months.

Alberta Environment & Protected Areas Communications

To Alberta EPA -August 20, 2023

CRUA became aware of a potentially catastrophic low-flow event on the Bow River immediately below the Ghost Reservoir electrical power plant on the evening of July 21, 2023.

Although normal flows were reestablished within a few hours, there appear to have been fish stranded by the lack of flows during a time slot of 7 to 10 pm. We have been in contact with TransAlta for a possible explanation for the problem that caused the cessation of river flows when they were at their lowest from 8-9 pm.

It is our understanding that any event of this nature fits into a protocol where federal and provincial authorities are immediately informed of the event and the remedial action that the holder of the license will take to protect the environment. What is unclear to CRUA as a principal recreational river user stakeholder, is why we were not informed by the dam operator and government agencies of the event. Recreation rivercraft users were stranded for some time and when the water was turned back on, some of their equipment and supplies were lost.

Alberta EPA, Regulatory Assurance Division REsponse

The initial request was for Alberta Environment & Protected Area's position on this event was sent to the Bow River Fishery Stewardship Branch and Water Management Policy Group in Edmonton. It became evident that our request for information as it relates to the Alberta Water Act and human safety issues would require a detailed analysis of the Government of Alberta's regulatory function with this event. The Bow River Regulatory Assurance Division responded to our request:

As you mentioned in your email, you were concerned about low flows that stranded fish and recreation rivercraft users between 7 pm to 10 pm on July 21, 2023, on the Bow River immediately below the Ghost Reservoir. TransAlta holds an Environment and Protected Areas (EPA) water license for the reservoir, and they are expected to follow the terms and conditions within that license. TransAlta's water license at the Ghost Reservoir has no conditions that require TransAlta to report or notify the Government of Alberta prior to any events

CRUA Response to Alberta EPA Regulatory Assurance Division:

- *We appreciate that from a water and power generation license perspective there are limited constraints within the original license that only protect water supply to the City of Calgary. And this constraint within the license was not compromised with the events that took place on July 21, 2023.*
- *However, some issues related to the Alberta Water Act. Specifically, the impact on the ecology of the river and fish survival have not been addressed. We would like to believe that appropriate measures have been taken to prevent a similar incident from taking place in the future.*
- *The Government of Alberta would appear to have oversight responsibility to assure that TransAlta follows "good management practices" of the Ghost Power Plant to ensure the safe operation of the plant. It is our understanding that the thunderstorm that knocked out power to the plant also impacted the backup systems. This would suggest that a review of the operational procedures is needed to ensure that it does not happen again.*

- *There is also an important human safety issue with what took place between 7 and 10 PM on July 21, 2023. At the time of the power outage river flows dropped from 100 cms to less than 10 cms and continued at the low level for approximately 2 hours. When the power to the dam was reinstated flows of 100 cms were immediately reinstated. It is our understanding that a wall of water went down the river. Although there are reports of paddling equipment and supplies being lost, it was fortunate that no lives were lost.*
- *To date, the Calgary River Users Alliance (CRUA) has not received any documented explanation of the events that caused the failure of the plant and remedial action that has been put in place to eliminate a possible occurrence of it happening again.*

CRUA Comments:

Details of the exchange of communications with both Transalta and Alberta Environment & Protected Areas have been covered in this document. What is clear from our engagement on this event is that Transalta is not restricted in any way in the quantity, and speed of water released from the reservoir. The only caveat under the Ghost Reservoir and Power Plant federal water license dates back to 1929, is to provide clean drinking to downstream communities.

In addition, the Alberta Government does not have any oversight legislation under the Alberta Water Act to intervene in Transalta's water management practices in the interest of protecting the fishery, and human safety. But rather concede to the historical Ghost Reservoir license from 1929 that was enshrined into the Alberta Water Act as having precedence over the act itself.

Certainly, the failure of the Transalta Ghost Power Plant operations on July 21, 2023, and the subsequent re-establishment of operational flows once the problem had been fixed is a reason for concern. Recreation river activities were compromised by the cessation of water discharge from the reservoir. Human safety was at risk when a rapid increase in flows took place when the power plant operation was put back online. There is little comfort in Transalta's commitment to a review of operations and safety concerns after such a serious incident. Hopefully, we will see a further release from Transalta on the corrective measures that will be taken to alleviate a similar event.