To:	WEI Meeting Participants
From:	Brodie Smith and Rahul Ray
Date:	October 12, 2021
Re:	Final Rio Tinto WEI Table Meeting 23 (Videoconference) Summary, September 27, 2021

A videoconference for the Rio Tinto Water Engagement Initiative (WEI) was held on Wednesday, September 27, 2021, from 9:00 am to 2:00 pm. The videoconference was held instead of an in-person Main Table meeting to promote social distancing in response to COVID-19, while making progress on aspects of the WEI.

This document is a summary of the videoconference and not word-for-word "meeting minutes". The information presented highlights the topics raised, key discussions, and identified action items.

The facilitator was Rahul Ray (RR) from EDI. Brodie Smith, also from EDI, took notes during the meeting and prepared this summary. Jayson Kurtz (JK) and Jennifer Carter (JCa) from Ecofish Research participated as the Technical Working Group (TWG) coordinators. Michael Harstone (MH) from Compass Resource Management participated as a decision analyst. Clayton Schroeder (CS), also from Compass Resource Management, participated as technical support.

Andrew Czornohalan (AC), Operations Director - Power and Services, Kitimat and Kemano participated as a WEI Table member. Andy Lecuyer (AL), Senior Environmental Advisor, and Devrie Sanghera (DS), Communities & Social Performance Advisor, from Rio Tinto, participated in the videoconference as support.

A draft agenda was included in the invitation, and outlined the anticipated meeting topics:

- Meeting summary comment review
- Action items from Meeting 21
- Rio Tinto Update
    - Labour strike update
    - Operational update
    - High level update on First Nation discussions
    - Other updates
- Technical Working Group (TWG) update
    - TWG update
    - Status of scoping/screening of draft objectives/performance measures
    - Discussion of proposed approaches for addressing specific topics
- Strategic process considerations
- Brief HydroViz demonstration

- Rio Tinto Operations 2021/2022
- Next steps and meeting dates

At the meeting, WEI Participants reviewed the draft agenda. RR requested the following additions:

- WEI efforts on World Rivers Day
- Get Involved Nechako website format
- Southside update, including Mike Robertson, update on the Umam netting project

Table 1 lists the participants that were involved in the videoconference and the organizations they represent.

Table 1. September 27, 2021 - WEI Videoconference Participants

Individual	Organization
John Alderliesten	Public participant
Lyla Brophy	Nechako Regional Cattlemen's Association
Gerd Erasmus	Public participant
Curtis Helgesen	Regional District of Bulkley Nechako
James Jacklin	BC Government-FLNRORD
Jennifer Howell	District of Fort St. James
Henry Klassen	Public participant
Donna Klingspohn	Public participant
Ray Klingspohn	Public participant
Phillip Krauskopf	FLNRORD
Gina Layte-Listen	Public participant
Jason Llewellyn	Regional District of Bulkley Nechako
Kim Menounos	Fraser Basin Council
Mark Parker	Regional District of Bulkley Nechako
Jerry Petersen	Regional District of Bulkley-Nechako
Tim Plesko	Public participant/Southside representative
Mike Robertson	Southside representative / Cheslatta Carrier Nation
Wayne Salewski	Public participant / NEWSS
Ian Sinclair	City of Prince George
Carrie Smith	MLA John Rustad's office
Dan Sneep	Department of Fisheries and Oceans

The following provides a summary of the topics discussed during the videoconference.

- RR opened the meeting by welcoming participants and reviewing the draft agenda. RR requested three additions to the agenda and the participants agreed to add these items. RR asked if the order of the agenda items could be switched around to accommodate AC and Mike Robertson (MR), who cannot stay for the full meeting. The participants agreed to this change.

- MR shared updates from summer field work, and other ongoing work being completed by Cheslatta.

    - There was a substantial fire at Chief Louis Lake, and other fires threatening private lands in the Decker Lake area. MR went in with a Cheslatta crew for 10 days to fight the fire. The Chelaslie bridge was saved by their work and a sprinkler system. Overall, about 25 ha of valuable timber resources was lost to the fires.

    - Work has begun on the Umam project. They are hoping to start work soon. Spawning generally occurs late September through to early October. Andy will speak to this as well. MR noted that Umam are an important food source. They were close to extinction in the Cheslatta system. Umam are also known as pygmy whitefish. They are resident in a few lakes in the interior. They were once a stable food source for Cheslatta, and their spawning used to correspond with the Char spawning. They are hoping to net some Umam for the eDNA project. A fish survey with Garry Blackwell may happen at the same time.

    - The erosion boat tour will happen soon.

    - Last week, MR helped with the recovery of human remains at Cheslatta and will be returning on Wednesday to complete the recovery.

    - They are keeping an eye on the reservoir elevation and have noted that there are some substantial moisture events coming.

- AL added that he was excited when MR approached Rio Tinto about the Umam study. His team has some experience with eDNA studies based on a similar study with oolichan on the coast. Hopefully they will be able to find some fish to be used as an eDNA primer. Once they have a primer, it will help to easily determine presence/absence in other areas. They will also be looking for Kokanee. AL also thanked MR for sharing the information on the human remains and noted that there was some very valuable history in that find.

- Wayne Salewski (WS) asked if more than one or two streams will be looked at for Kokanee presences/absence. AL responded that the main focus will be on Umam, but they will make observations where they can on the spawning and presence/absence of Kokanee. This will just be a first look. This data gap was identified by the Technical Working Group.

- WS asked if this survey will also be an opportunity to look at the health of the riparian zone after the fire. AL responded it was a great idea to see if the fires reached the riparian zone. WS added that he has been trying to encourage the province to look at this, and the process needs to start somewhere, so perhaps this would be a good starting point. AL said he will talk about it with the Technical Working Group.

- **ACTION ITEM: AL will discuss reviewing the extent of the fire into the riparian zones with the Technical Working Group**

- MR asked if once the water samples are extracted for the eDNA study, if other fish species can be detected. AL responded that it would depend on what other species have primers and are already in the database. If not, the primers would have to be developed first. AL will ask the lab at the University of Victoria if they have Kokanee in their database already.

- **ACTION ITEM: AL will ask the UVIC lab if they have an eDNA primer for Kokanee.**

- MR noted that there was anecdotal evidence of resident sturgeon in the reservoir, both pre and post flooding. AL responded that they might be able to make a primer from the hatchery, and it would be interesting to see if eDNA detected sturgeon.

- WS noted that there may be an opportunity to share information as primers are created and samples are collected. He also noted that it may be hard to detect sturgeon in the reservoir since the flows are large and diluted, so their presence may be hard to detect with eDNA. Some work is being done near the spawning areas, and this should be communicated between groups. AL asked for clarification on which groups are doing the work. WS responded that the main group doing the work was led by Dr. Brent Murray from UNBC who is working with FLNRO and other organizations. The work is focused on presence/absence in side streams. They are starting at Mile 1 and are working through the whole system.

- AC provided a Rio Tinto update. As was explained through the media and his letter to the Main Table, there was a labour dispute starting on July 24.

    - The work force associated with the Union went on strike. Close to 900 workers left the smelter, and partial operations have been undertaken by other Rio Tinto staff. It has been an incredibly challenging time from the perspective of the town and community, and the workers and their families.

    - From an operations perspective, there were plans in place to reduce the smelter operations during the strike, so the remaining staff could support the operation. Due to the nature of the smelter processes, it is not possible to just stop and then later on get everything fired back up again quickly. The aluminum process operates at 900-1000°C, and once it cools, it cannot just be turned back into aluminum. There has to be a safe and controlled stoppage process. There were a number of shutdowns required to continue to reduce the smelter capacity.

- Over one week, they were down to 25% capacity, which used 91 pots of the 383 that are normally in use. It went well from a safety perspective. The remaining 280 staff are doing new tasks or tasks they have not done in many years. They came through without any significant injuries. The aluminum process requires supervision and work 24 hours a day, 7 days a week. The process was stabilized at the reduced capacity and has been normalized over the last four to five weeks.

- Kemano has reduced production accordingly. Exports to BC Hydro were increased, and this has helped compensate for some of the other losses.

- Rio Tinto sought an essential service order from the province labour board, so that some positions were deemed essential services under the labour act. Under the act, essential workers are described as essential for the health and safety of British Columbians. This was achieved and had nothing to do with the business or impacts on the union.

- AC and Rio Tinto wanted to ensure four elements during the labour dispute:

    - Provide reliable operations and manage the Nechako Reservoir. They did not want to increase the downstream flood risk by not having water movement through Kemano.
    - Continue to provide energy to BC Hydro.
    - Provide critical network stability. Wildfires impacted the network over the summer, and there were 16,000 lightning strikes recorded in August. BC Hydro requested network reliability for the north.
    - Be prepared for the rapid dewatering of the Kemano River. They wanted to ensure they had highest quality operators and equipment to be prepared for any scenarios that could lead to the dewatering.

- AC was pleased to announce that an in-principal agreement was signed between the Union and Rio Tinto at 4 pm on Saturday. This will lead to a ratification vote later this week. So far all is going well, and hopefully there will soon be a return to work. Once that happens, they can start thinking about the process to restart the smelter, which will be a six-to-nine-month process. AC concluded that the last couple of months were an unprecedented time in his career.

- Henry Klassen (HK) stated that he could only imagine the complexities AC had to experience to keep operating. He noted it all revolves around flows and how flows are affected. HK asked how this will affect the flows for the next six to nine months. AC responded that he has some slides to show in response to this question, and they will be presented shortly.

- Gerd Erasmus (GE) noted that this was a good explanation, from the Rio Tinto perspective. He asked if they would also get a version from the Union perspective. He does not like being used as a captive audience for only one side of the story. AC responded that all the communications that have been released are joint communications between Rio Tinto and the Union. If there is a desire for more information, he can make that happen. RR suggested pulling together the joint communications, confirming they are joint communications, and sending them out with the meeting summary for participants to review. This was agreed to by the participants.

- **ACTION ITEM: RR will compile the joint Rio Tinto/Union communications, confirm they are joint communications, and send them out with the next meeting summary.**

- AC continued with the Rio Tinto update:

    - AC stated that he has been thinking about our path forward, and what needs to be done to get this figured out over the next few months. He has reflected on the incorporation of meaningful discussion, and to consider the interests and have access to the technical data of the non-participating First Nations. He noted that work has started on this issue, and they are starting to see a pathway forward. It is important to get data to the Technical Working Group and to the SDM process to make sure we have rigorous and robust foundation that future work can be based on.

    - AC stated that they are working hard to make sure there is good technical collaboration, and to get the most recent and best data. And to make sure that each of the working groups that exist in the Nechako are aware of and have access to the data each group is collecting. For example, Northwest hydraulics is collecting ice jam data. There is also bathymetry and LiDAR data being collected. This data has intrinsic value other groups. AC is keen to see them come together. He is not sure how that will work yet, but hopes that a solution can figured out.

    - AC stated that he has been working through these two elements. He wants to make sure the WEI has the best science and data with move forward with so that the best outcome can be found.

- RR noted that Rio Tinto is engaging with a number of Nechako First Nations. There are other First Nations that are not engaging with Rio Tinto. The WEI will work on engaging with them to make sure their interests are included in the process. RR noted that the WEI meeting agendas and invites are sent to all First Nations> The WEI process team will continue to reach out. More attempts at engagement will happen over the next few months and the hope is to include as many of the First Nations as possible.

- HK asked if the information coming from the non-participating First Nations will be made available to the table members, as our information has been made available to them, and if this information will be included in the WEI trade off discussion. RR responded that, yes, all the information will be shared.

- MH noted that there are two types of information. There is technical information that is used for assessing impacts and is incorporated into technical work. There is also value based information. These are interests that are unique to First Nations that have not been incorporated yet. They need to stay mindful of how is that information being shared and interpreted. It is important that the First Nations remain the curators of that information, and when and how that information is shared.

- MH noted that the First Nation do not have to give away site specific information. For this process, we need to understand if changes in the flow will affect those interests. There are ways to determine that without the First Nations giving away some of their information. It is important to consider how can we better collaborate moving forward.

- HK noted that there are some groups that are more powerful, and not all groups involved in this issue are equal. The First Nations have legal rights, and some of the WEI issues will be trumped by these legal rights with regards to flow. Any legal decisions made by the First Nations will supersede the decision of the WEI. MH thanked HK for making a good point. He noted that it will be up to the government to make sure these rights are maintained and enhanced. In his experience with other projects, he found that there is often a strong alignment between those constitutionally protected rights and flows that were good for the system. For example, protecting flows for salmon and to mitigate climate change aligned well with First Nations rights. HK thanked MK, and noted he just wanted to draw attention to this point and remind everyone it will be a factor.

- AC stated that there was a lot of field work happening over the summer. This included full scale bathymetry and LiDAR, from Finmoore to Cheslatta falls. This will help understand the interests around ice jams, the Vanderhoof bridge and sediment deposits, and how sturgeon spawning grounds have changed, including wintering holes. The capture of photographic and LiDAR data across different flows throughout the summer was also completed. It was a good opportunity to capture some baseline data, including the information on wetted areas, steams, and habitat interface. Good robust datasets over time were captured. This data will also help support Dr. Stephen Dery with his work. Nechako residents have reflected that they haven't seen so many boats and drones as they have this summer!

- AL added that Dr. Stephen Dery's team is collecting atmospheric data and they are already getting good information from that. LiDAR will probably be flown this week or next week. The last time this was done was in the 90s. This will help with the modeling and some other questions regarding habitat and flow regimes that have been discussed by the Technical Work Group. The bathymetry work took about a month to complete, with a crew out on the river every day. The data will be wrapped up in a report, which should be available by the end of the year. AC added that this dataset will be very useful for many interests including search and rescue, ice jam analysis, and fisheries. They are keen to get it into as many hands as possible.

- AL noted that they now have significant information on the extent of the reed canary grass on the river. The Technical Working Group is looking at the implications of it's spread, and if it is beneficial or detrimental to fish.

- AC noted that he had received some good comments about the flows over the summer, from a recreational perspective. From an environmental perspective, it has been noted that the flows have followed a more natural curve. He summarized that it has been a busy summer and there has been a lot of thought going into the decision making over the last six months.

- AC presented WEI – Rio Tinto Operations and Reflection: 2021 Illustration. He began with a review of 2021 Reservoir Operations https://www.getinvolvednechako.ca/7037/widgets/27362/documents/66771 :

    - AC showed a figure comparing the observed inflows versus the historical flows, and the forecast for the remainder of the year. AC noted that the diagram ends in November since Rio Tinto operations planning year runs from November to November. The solid blue line shows the average from 67 years of data. The dotted lines show the historical maximums and minimums. The solid blue shading was the actual data from 2021. He provided some explanation regarding the 2021 flows:
        - He noted that they were high flows in early winter when freeze up was supposed to be occurring. They were aware that there were ice jams.
        - The 2021 flows were in line with long term average over winter.
        - Freshets have been getting earlier and earlier over the last few years.
        - The second spike in late July was to keep the heat down and there were increased flows associated with that.
        - The flows moved to more typical flows for rest of summer.

    - AC showed a figure comparing historical reservoir elevations.

        - The reservoir elevation going into winter was one of the highest on record, and February 2021 was a record high.
        - Despite the record high elevation in February, the high snowpacks and high start to the freshet, the freshet ended up finishing within the range of the top 30 of years and was lower than other high years.

    - AC showed a figure of the reservoir level projection. The inflow projections are used to estimate reservoir levels over time considering current hydrology and historically observed additional snow and rain.

    - Donna Klingspohn (DK) asked how confident are we with the projections, when we consider the changes in weather and weather events due to climate change. AC responded that they are working with Dr. Stephen Dery and UNBC to get more data. They will determine if the

last 65 years of data is representative, or if a change is needed. He noted that even Environment Canada has a disclaimer for seasonal forecasts, stating " forecasts are shown to be little better than chance". With that in mind, they will not be correcting using seasonal forecasts. They will be using a stochastic dynamic model that uses data from last 65 years and the five-day forecast. He is excited to work Dr. Dery on this.

- HK noted that we have definitely witnessed changes in weather events in the last number years, expressed in extreme weather patterns, to the extent that it causes extreme events on the ground, such as flooding and fire. Based on that, going forward, maybe we should be anticipating these events so that we are more prepared, and be ready for unlikely events becoming more frequent and extreme.

- RR noted that climate change will be discussed more later in the meeting.

- AC reviewed a figure that shows water temperatures at various locations in the system, including at Vanderhoof, Cheslatta Falls, Finmore, Nautley, below the Spillway, and at Fort Fraser.

- WS noted that when the eDNA worked was being conducted, they collected air and water temperature. One set of measurements collected during the heat dome were particularly interesting. In Clear Creek, the water temperature was measured at 9°C near the headwaters. The water temperature was measured in the same creek, 3 km downstream, after it flowed throw open fields with no riparian zone, and it was 21°C. There was a huge increase in water temperature for the same creek. AC said he had been reflecting on the value of riparian areas during the heat dome. It will be interesting to learn of the effects of the heat dome and figure out what things might need to be done and how we get there. We need to turn our mind to the future. Thinking of things like this will be important.

- DK noted that some of the coverage during the heat dome showed that there were fish kills in some parts of the province. She asked if that happened in the Nechako, or if they were ok because the heat dome did not last as long here. AC and Dan Sneep (DSn) stated that they had not heard of any fish kills due to the heat dome. James Jacklin (JJ) stated that he had not head of any either, but that it does not mean they did not receive any reports. He will check with his staff and get an update. AC stated that he had chatted with a biologist in the region that said it was very fortunate that the heat dome occurred as early in the season as it did because there were not many migrating fish in the system yet.

- **ACTION ITEM: James Jacklin will determine if any reports of fish kills during the heat dome were received.**

- MR noted, that during the heat wave, they witnessed a rise in water temperatures into the lethal range. Chief Corinna gave authorization to Rio Tinto and water control to exceed

water flows, that would inundate the cemeteries, in order to keep water temperatures down further downstream. That did not happen luckily. The priority was the survival of the fish. AC added that this was a very impactful discussion. The fish need to be protected. It was also a wake-up call as to what the future could look like. He suggested that the water release point may need to be shifted to avoid the situation. HK stated he was aligned with these points.

- AC reviewed the considerations for the September spill:

  - Reduced Smelter Production given labour dispute.
  - NFCP technical committee provided guidance with 2 criteria: September > min spawning flow (31.1cms) up to max (125cms) for Chinook spawning; and, at the end of September need to consider maintaining a minimum of 50% flows as determined in September through winter for incubation.
  - The current Rio Tinto reservoir management model suggests spilling on average 120 cms for the month of October.
  - Historic spill would be 14.2 cms at the end of the STMP period in August and then 32 cms for the month of September and throughout the winter aligned with the NFCP requirements.
  - Critical Dam Safety Spillway maintenance.
  - Feedback and interests from First Nations, communities, and WEI factored into the decision making.

- AC reviewed the upcoming radial gate inspection:

  - The inspection is scheduled for week of September 27th and typically would require low flow through the gates.
  - This will include Trunnions inspection analysis, which is non-destructive testing. When this occurs, they normally lower flows so that it is safer on and around the infrastructure.
  - AC challenged the team to com up with alternatives so that down spike in flows would not be needed.
  - The team came up with 3 Options to lessen or eliminate the impact: 1. Maintain 80cms through one gate, and switch sides as needed – confirm with contactors any increased risk and controls required. 2. Day & Night approach – 40cms 12hours throughout the day then 120 12 hours overnight seeing the same average across a 24-hour period. To be reviewed with Cheslatta and Eco Fish. 3. Pre-Load approach – increase spill for days / week prior to works and keep spill low throughout. Least preferable given downstream interests

- Option 1 has been confirmed and work will start as planned on the 28th. Additional controls will also be put in place to maintain the safety of the people doing the work.

- HK noted that this spike down has always been a pain. He was glad to see there has been some effort to make some changes and to consider the downstream effects. It is a good step in moderating the changes to the flow. He thanked AC. AC thanked HK for his comments. He noted that they do not want to wait until the end of the process to start making some changes. They can start work on changing some of the low hanging fruit.

- AC reviewed spillway management – looking to winter, including a figure that showed the Skins Lake Spillway Discharge Forecast:

  - SLS discharge expected to be held at 80 m^3/s for the month of September, likely ±120 m^3/s in October.
  - Fall inflows will be a significant driver of late fall / early winter releases.
  - Detailed review of the 2020 / 2021 Freeze up Observations Report to be considered with NHC.
  - Review of fisheries data and technical team feedback
  - Spring Freshet flood risk – Murray Cheslatta System and Vanderhoof

- AC reviewed a figure showing the forecast for the Vanderhoof flows. The solid blue lines shows the actual flows at Vanderhoof. They are not expecting to see a fall freshet. He noted the lumpiness of the STMP this year.

- AC reviewed the Current Conditions report, from September 9, 2021. He noted that weekly updates are going out via Facebook and email. He asked the members to let the team know if there are other ways that they can get this information out.

- AC moved onto 2021 Incorporating Feedback. He reviewed a figure showing Nechako Reservoir Operation Observed Inflow and Discharge 2020-2021. The blue line shows the measured daily inflow (3-day average). AC discussed how it compares to the other data in the figure. He noted that it shows what is leaving the reservoir, and how the water balance is shaped over the years.

- GE asked for clarification regarding the range of the historical data, and if it was only since the dam had been built. AC replied that, yes, it only included the data after the dam was built, since 1953. GE asked if it was possible to see a line that showed flows pre-dam. AC responded that it was possible, but there is only data from 3 years prior to the dam. He suggested that the technical team could come up with a graphic that shows pre-dam flows. He noted that it was important to recognize that pre-dam flows, with various stream and

lake inputs, will be different than flows into a reservoir. GE thanked AC and said he would appreciate being able to see that.

- **ACTION ITEM: The Technical Working Group will create a graphic that shows pre-dam flows into the reservoir**.

    - HK added that weather data might be available from 1920 to 1947. He asked if it would be possible to look at precipitation records in areas near to the Nechako and put that data into a model. AC noted that it could be done. It would be a task for the Technical Working Group, and they could discuss with Dr. Stephen Dery, who has the weather data. They could also talk to others about hydraulic data models and combine them to see what it looks like. It would be interesting to compare to unregulated systems such as the Skeena and Bulkley rivers. They could be compared to see how things have changed with regards to climate change. JK noted that the Technical Working Group has done some of this. He can show some of this data to the group later in the meeting. The data is not final yet, but he can show what they have so far.

    - AC reviewed a figure showing how they would incorporate feedback into the flows at different parts of the season.

        - They looked at early freshet releases, done in the interest of decreasing downstream flood risk during freshet. However, there is no ecological value in this. An early freshet release could actually potentially have negative ecological impacts. There are certain species that have biological processes that are triggered by the freshet, so an early release may trigger these biological processes early. So it may be better to hold off on these releases as long as possible, without impacting flood risk.
        - They will try to slow down the ramping. Ramping will be staged over a period of days or weeks, instead of one hit. There is still more work to do on this.
        - Looking into avoiding the dips in flow. During both of the dips the reservoir modeling called for a return to NFCP minimums. We can actually hold the flows and avoid the dips, and will be working with First Nations, the WEI, and Mike and Cheslatta to make this happen. There was a lot of work done to analysis the dips, and in the end, we chose not to return to minimums.
        - When heat dome hit, the modelling called for an increase in the spill. We ramped gradually in order to get through heat dome. When it came time for the STMP flows, the modelling called for a dip two to three weeks prior. We worked to challenge some of these ideas to find another solution. We still have the STMP heading into the winter. We will use the feedback gained this year to look at alternatives for the future.

- GE asked how much of the adjustment room available in the flows this year was due to the strike, and so may not be available in other years. AC responded that the strike occurred July 24th, in the middle of the STMP. So, all the flow adjustments before that was unaffected by the change in availability due to the strike. That is a good question though. AC has asked the hydrologist to think how this might look for other years. This year they could be opportunistic and capitalize on this opportunity to see what these flows look at, and to challenge their thoughts. More hydrological modelling will be needed. They do not have the answer yet but will be working with the technical group to find more answers. RR noted that water availability also depends on how wet or dry each year may be. AC agreed that yes, there will be some difference between some years. But also, they may still be able to change some of these practices and it is important to challenge how we think about them.

- WS asked how these ideas will be ground truthed, as it must need to happen over a period of time. AC responded that the changes he spoke about are relatively low risk and are within the regulatory framework. The next questions are how do we turn this into an adaptive management approach, how do we monitor and collect data? River systems are dynamic, so how do we make this an adaptive process for the future and how does the adaptive management framework work in the future? WS asked AC if he has floated the adaptive management concept to the other First Nations in the other conservations. WS noted that strong partners will be needed, and the First Nations and the province will need to agree to this. AC responded that yes, they have floated the idea and it is an active part of the conversation.

- AC reviewed the 2021 Freeze Up Observations for the Nechako River at Vanderhoof. There are 4 data gaps identified some of which have made some head way on. The four gaps are:

    - Acquire LiDAR data upstream would help modelers look at different flow regimes and better understand risk of ice jam formation. (This is scheduled for this fall).
    - Develop a long-term plan for maintaining the Bubilitz pump house This would help with real time data for residence for flood warnings.
    - Develop a forecast system for river.
    - What does ice jam formation and movement mean for sturgeon, salmon and chinook, is it beneficial or harmful?

- AC stated that the 2021 Freeze up report will be made available soon.

- MH presented on the Strategic Process Considerations. This will explain the meetings that will be planned over the next few months, and what can be anticipated for the winter and spring.

    - MH stated that after the last meeting, the process team developed a schedule for the next six months using feedback provided during the last meeting. The team reviewed all the

pieces that will be needed to help the Main Table move through the process. It was apparent that members wanted more information on how climate change was going to be incorporated, and that there was a need to reassess the involvement of First Nations. This was the rationale to re-focus for the fall. MH noted that Eco Fish has been building on Dr. Stephen Dery's models around temperature, flows and climate. Other work is being done to update climate modeling to better incorporate other rivers and include climate change. However, this work will not be complete for 6 months.

- WS noted that there was a big focus on temperature, but there were also more complex issues, such as continuity with side streams. He asked if this conversation has been had. JK responded that temperature is easy, and they are also looking at timing and magnitude. He said it was all being considered, and that he will speak to it more during the Technical Working Group update.

- MH stated that the process team will conduct a round of engagement with the First Nations in the Nechako region to understand their interests and understand if they had technical information that they would like to share.

- MH noted that the process team also discussed how to incorporate the sturgeon recovery team into the WEI process, given the uncertainty of the data. The data will not be available in the short term or further near term. There may be a way to better align the two initiatives including helping to give them more certainty and fill in some data gaps. There could be opportunities to build in test flows to help them do their research.

- MH stated that the WEI could focus on these issues over the next 6 months, and then go from there. MH reviewed a figure of the updated Nechako WEI Work Planning schedule, comparing the old and new WEI workplans. The new workplan will focus on work on climate studies/modeling, aligning sturgeon recovery work with the water use plan, Nechako First Nations information sharing and engagement, STMP work and other ongoing WEI work (SSWG, performance measure and alternatives development, etc.). The discussions of the performance measures and alternatives and the trade-off analysis will be moved to spring/early summer 2022. MH also proposes that the WEI meets every other month during this phase, instead of every month.

- RR asked if anyone had thoughts about discussing the other issues first, instead of steaming ahead with the alternatives. HK noted that what we have discovered in the last year is that there are a lot of moving parts. We have learned that we need to have a good understanding of the basics. On top of the that, there are the complexities of changes, and changes in the environment. We still have some stuff to do to understand about how the decision-making process works. If we are at the table, we need to have some continuum so that the technical people can keep us updated. He stated that what was being

recommended is a good alternative. DK stated that from the beginning we have stressed how important evidence-based decisions are. She would hate to see us put in months of work only to find that key pieces of information are missing. She does not think we should be working in isolation, so working with the SRC, and hopefully First Nations, is extremely important.

- JJ stated that he thought what had been laid out here makes a lot of sense. He noted that existing litigation may be resolved this fall. There has already been a lot of commitment to this process and ensuring forward movement will be critical. He suggested that between WEI meetings, updates/bullet points could be sent out to ensure continuous communication for all those involved in the process. RR stated that if the WEI meets every two months, then a progress update will be provided in between the meetings. Gina Layte-Listen (GLL) stated she appreciated JJ's comment. She also suggested that during the times between the meeting, if there is availability from the technical staff, perhaps they could provide presentations/professional development so that the table members could continue learning. RR stated that there were other initiatives outside the SDM that can also continue to move forward, such as the Southside initiatives.

- MH reviewed the Revised Conceptual Schedule. He noted that the dates are currently just place holders. Completion is still anticipated to be by the end of 2022.

    - Proposed meeting schedule for fall/winter: Meeting 24: Mid-November, Meeting 25: January 2022, Meeting 26: March 2022
    - Proposed workplan topics/objectives: Other short term operational options 2022, Scoping longer term water flow operational boundaries, Updates: Southside Action Plan updates, ongoing draft Performance Measures/issues scoping updates, Technical Team progress updates, Sturgeon Recovery alignment, and Broader First Nation engagement / info sharing
    - Proposed meeting schedule for spring/summer: Meeting 27: May 2022, Meetings 28-31: June to December 2022.Proposed workplan topics/objectives: Re-start Water Use Planning: Long-term flow alternatives (Climate modelling updates , Issues scoping, Objectives and draft PMs, Bookend alternatives, 3 rounds of alternatives and assessment), and monitoring and implementation considerations.

- WS stated that he understood the need for a monitoring assessment but noted it will need to be judged against standards or expectations. He asked how that would be developed. MH responded that there are many different aspects to monitoring. There will be compliance monitoring, to make sure that Rio Tinto is complying. Then there is effectiveness monitoring, where we ask if we are achieving our objectives. The objective of this type of monitoring is to learn and is a part of the adaptive management piece. We need to ask at what point do we trigger a re-evaluation of our choices. There are many different facets to monitoring and we will need to talk through what we need. WS responded that that is a

difficult question as we will not all agree. We need to decide what we are monitoring against, and what are we judging the health of the river against. MH responded that in terms of evaluation, it is a key point in the development of the performance measures. It will not be just health of the river versus power production. Everyone will need to look at the information available, and there will be a need to find a balance for the species that warrants a change in flows. A lot of effort will be put into the tools to help make these decisions and answer these questions. WS asked something like the C.A.B.I.N. standards to help evaluate the health of the river. JK stated that C.A.B.I.N. is a standardized way to measure invertebrates and the health of the river. There are also other ways to determine the health of the river. This will be a key piece when we evaluate how we move forward, but something like the C.A.B.I.N. standards may be included.

- WS ask if the Technical Working Group will continue meeting on a regular basis and reporting to the Main Table. JK responded that the Technical Working Group will keep working to advance several topics and will likely continue with a schedule similar to the one that is being used now.

- DSn asked if there were only three rounds of alternatives scheduled because there was a cap on this part of the process, or if there was another reason. He noted that this is a very dynamic part of the process. MH responded that it does not have to be limited to three rounds, that is just the current guess as to what will be needed. Three rounds is likely the minimum, but more rounds could be included.

- HK noted that if our goal is to achieve sustainable spawning for the sturgeon, that will require looking at the recommended flows for achieving these results and putting in place the monitoring and adaptive process necessary. He imagines that measuring for the desirable number sturgeon for a self-sustaining population may take a long time since this is a long-term goal. And there will likely be many changes in the flows and adaptability in flows over this long-term monitoring period. He stated that he thought the WEI is up against a difficult discussion if we are incorporating sustainable flows for power while also maintaining the sturgeon goals. The government will have to make a hard choice, and he is not expecting an easy ride on this one.

- RR noted that this will be challenging, but we need to start somewhere. We will consider all the pieces. We need to get somewhere fairly quickly so we can get some flows to start the testing. He asked MH what he has experienced in other systems. MH noted that these were good points. There might be some key residual uncertainties that will remain unknown, and these will get tested over the next 10 or 20 years. We may get results that say that sturgeon cannot survive in a regulated system, but maybe there are flows that lead to viable sturgeon populations. We do not want to go into this with rose-coloured glasses. We need to be able to move

forward and make sure we are using good science. MH noted that he encountered a similar situation in the Cowichan system. They worked with the lamprey (listed species) recovery team and gave them different flow options. There was a lot of uncertainty, but what was being proposed was better than what was currently happening. From a regulatory process, they could not say if lamprey were better off or not for sure, but the changes that were being suggested would lead to a benefit to the lamprey.

- DSn noted that there are also parallels to the Columbia River water use plan. The Columbia River is also a large river with sturgeon population and a recovery team in place. It had similar issues and there was a lot of uncertainty around recovery. The issues were not just flow and flow regimes related, there were also other impacts on the ecosystem. The recovery team works in parallel, and they have their own mandates, and are looking at other issues other than flows. The solutions that the WEI are looking at are not short-term fixes, which is very similar to the situation on the Columbia River.

- RR asked if there were any objections to the new schedule. There were no objections. The WEI will move forward with the new schedule.

- RR reviewed the Main Table 22 Meeting Summary. There were no suggested revisions to the meeting summary from WEI participants. All meeting summaries are available on the Get Involved Nechako website: https://www.getinvolvednechako.ca/7037/widgets/27362/documents/62673

- RR reviewed action items from Meeting 22:

  - **Action Item:** Kevin Moutray to take additional photos of the Vanderhoof trails if they become flooded again during the STMP period. **Update:** Kevin reports no flooding during STMP.

  - **Action Item:** JK will continue to attempt to talk to the City of Prince George to find out if there are concerns of ice jams and flooding, possibly near Cottonwood Park, and its relation to operations. **Update:** JK responded that during his last discussion, the City of Prince George stated they were satisfied with their current operations. He will follow up again later in the year.

  - **Action Item:** Andy Lecuyer to provide an update on the Boat Tour. **Update:** AL stated that the boat tour is scheduled for the fall. There will be a follow up tour in the spring, that will be focused on fish. The fall tour will focus on erosion and locating erosion sites. Tim Plesko (TP) stated that he was looking forward to getting out on the water and getting some data.

- **Action Item:** Andy Lecuyer will provide an update on the Ootsa Lake Forestry Camp campsites. **Update:** AL stated that work on the campsites has been postponed for now, and work will resume in 2022. The rock for the campsites has been staged and is ready for use.

- **Action Item:** Andy Lecuyer to provide an update on the Fire Smarting of the Rio Tinto properties. **Update:** AL stated he touched base with province. There is a Provincial program and funding available for FireSmarting. The Rio Tinto properties have been reviewed, and they are mostly forested. FireSmarting could potential be disruptive. Rio Tinto will need to discuss the potential for fire guards with neighbouring properties. RR noted that there may need to be a discussion with the neighbours around the visual issues around the reservoir. AL suggested bringing it up with the Southside working group

- **Action Item:** Andy to organize reservoir boat tour to see the effects of high water. **Update:** AL noted that this update was already provided.

- RR introduced the World Rivers Update, and asked DK to provide a summary.

  - DK reminded the table members that World Rivers Day is an initiative that happens every year and involves over 100 countries. The event started with BC Rivers Day in the 80s, which organized clean ups and other initiatives. As word spread, it continued in other countries.

  - DK stated that a group of volunteers was formed, which included Devrie, Gina, Rahul and herself. Due to the covid situation, a face-to-face event was not appropriate. The group organized a brief announcement for the radio to draw attention to World Rivers Day website and the WEI website, and to inform people about the work that is being done. The wording for the announcement was based on the letter released by RR. DK has not heard of any feedback from press announcement, or if it drove people to website.

  - DS stated that she reached out to radio station to see if they had any information. They informed her that they can give her some information on click through data. Last week, the website had 19 visitors. This shows a little bit of heightened traffic earlier in the week when the campaign started. The radio station also mentioned that up to 65,000 listeners were potentially reached.

  - DK stated that she also added the information to the Vanderhoof Community Message Board on Facebook. She stated that she thought they had done the best they could do despite the challenges with COVID. Hopefully next year there will be a live event.

- RR gave an update on the Southside:
    - MR has already given an update on the Umam netting project.
    - The Southside Working Group will continue work where we left off. The intent is to ger the group going again in October. The
    - Reservoir Key Actions include:
        - Boat tour (Rio Tinto, Southsiders)
        - Navigation coordinator
        - Ootsa Lake Forestry Camp campsites
        - Rio Tinto making their properties fire smart
        - Continuous improvement: proposed reservoir advisory group

- RR introduced the updates to the Get Involved Nechako website. He asked DS to provide the update. DS noted that the WEI had four communication initiatives, one of which was to launch the website. The intent is to streamline the communications channels. The Rio Tinto team is working on building an integrated platform so that it will be easier to find information. All the information found on the website will remain, but it will be itemized, categorized and indexed. There will be changes to the look of interactive map, and the dashboard icons will mirror those in the flow facts. The current launch date is the middle of November. She asked the table members if they had any additional improvements that need to be considered.

- RR asked if anyone had ideas on how to make the website more user friendly and attractive to more people. DK responded that it was hard to say off the top of her head, and she would need to go through the website to have a look. She added that she thinks there should be a greater presence on social media, perhaps putting out something on a monthly, or bi-monthly process, that drives users to the website.

- GLL noted that she thought for most of them on the committee, they receive a lot of information via email, so there is less need to go to the website. She noted that she did visit the website for World Rivers Day. Kim Menounos (KM) stated she was thinking the same thing as GLL. She also noted that if she was not directly involved in meetings, she might go to the website more often. KM added that there is not much of a personal touch on the website, it is mostly just information. There is no sense of who is working on this at Rio Tinto and EDI. RR suggested that the main table members review the website to provide some feedback. He reminded the members that there is funding available for activities like this.

- **ACTION ITEM: Main table members will do a critical review of the website and provide comments to DS by October 8, 2021 (**Devrie.Sanghera@riotinto.com)**.**

- JK noted that when he uses the library, he observed that it was organized by meeting date. He asked if it was possible to also organized by topic. DS responded that it might be hard to do. The communications team will need to decide on how to categorize the information, by meeting date or by topic. DSn confirmed that he understood what DS was saying, and understands there may be difficulties in doing

that, but wanted to second what JK said. DS thanked them for the comments and said they will do their best to make it work.

- JK provided an update from the Technical Working Group. https://www.getinvolvednechako.ca/7037/widgets/27362/documents/66750

- As outlined in the presentation, JK reviewed climate change:
    - modeling
    - uncertainty
    - local collaboration
    - local research
    - and the WEI
        - The Technical Working Group is working with researchers (Stephen Dery, Richard Arsenault) and modelers (Alec Mercier, Ecofish) to understand how to incorporate climate change models into WEI. Suggested timeframe is 1950's-2099. Minimum 3-5 simulations.
        - Working on a short-term solution by piecing together various research and modeling. Significant 2022 milestones: Improved hydrodynamic and flow optimization models for the Nechako Reservoir (CEQUEAU); Improved HEC-RAS discharge and temperature models for Nechako River.

- He noted that the Technical Working Group is using the models that are the current world standards. They are doing what they can to use the most recent and accurate information. These are similar to what is being used by Rio Tinto but updated with the most recent information.

- JK stated that there will be two models used to evaluate the different flow scenarios. These two models should be complete by 2022. This ensures that they will be using the best available information. The researchers are confident that the models will be useful for the process planning that will be done by the WEI for the next 20 to 30 years. They will also run a sensitivity analysis.

- RR summarized that there is some good climate modelling being done, and it will be available to the WEI in about six months. JK added that the researchers are giving their best predictions on when the models will be available. There is another method that can be used if the models are not available. The Technical Working Group is piecing together the data for the other method so that it can be used if necessary.
    - JK reviewed the WEI Issues and process for scoping the issues. He summarized the results of the scoping of the WEI issues. There were 57 issues total. Nineteen issues

are complete and ready for the SDM process, five issues have an alternative pathway, two issues have been deemed not an issue, 10 issues still have data gaps. The assessment has not been completed for the remaining 21 issues. RR asked if all of this information will still be sent back to the Main Table. JK confirmed that the Technical Working Group will be providing all the recommendations and information to the Main Table.

- JK reviewed the issues that are ready for the SDM process, grouped by interest https://www.getinvolvednechako.ca/7037/widgets/27362/documents/66750

- JK introduced information on ongoing work around determining naturalized rivers temperatures and a naturalized hydrograph. https://www.getinvolvednechako.ca/7037/widgets/27362/documents/66749

    - JK showed a table comparing river temperatures to other watersheds to understand how climate change may have affected temperature (from Dr. Stephen Dery). There has been an average increase of 0.7°C. He reminded the table members that they do not have a very large data set from before the construction of the reservoir.

    - JK presented two hydrographs, one showing the actual flows and the other showing naturalized flows. The graphs show data from the 1950s to 2018. He noted that without regulation, flows would be higher in the spring and summer.

    - JK stated that these graphs are available as an interactive tool, and that he would be happy to share that with the Main Table at some point. He pointed out that it is possible to see what the naturalized flows would look like for a particular year.

- CS introduced his presentation on HydroViz https://www.getinvolvednechako.ca/7037/widgets/27362/documents/66766 :

    - HydroViz is A web-based tool for exploring outputs from hydrological modelling for the Nechako Reservoir and downstream.

    - How it helps:

        - Visualizing data is helpful, but it misses personal values
        - What's more helpful, is when we can add additional information that matters to you
        - The tool allows you to see for yourself the implications of alternatives
        - Facilitates conversation about the areas and times that truly matter
        - It's fast
        - It's always available
        - It's universal
        - Easy to use

- Current features:
  - Contains 60 years of daily conditions under each of the alternatives (1957-2017)
  - Map with key locations
  - Four chart types that allow comparisons of any combination of alternatives
  - Ability to add personal thresholds, calculate performance automatically
  - Provides stats and enables year-by-year analyses
  - Easily updated and configured for new alternatives
  - Focused date ranges
- MH stated that he wanted to remind the table why they will be using this tool. When the pre-read package goes out with a bunch of performance measures and a consequence table, the facilitation team will ask which performance you would prefer. A tool like this will be primed with the performance measures, so you can compare and contrast and figure out what works for you. DSn stated that he thinks that this tool is great. He asked if this would replace the other tools that used to be used or is this tool just used for visualizations. MH responded that this tool is not meant to replace the performance measures, and that they can be included in the tool.
- CS demonstrated the tool by showing different scenarios, thresholds and years. He noted that the tool allows the users to do this in real time during meetings, and the data can be pulled out quickly. It is easy to set new thresholds, draw on the chard, and is easy to add to and evaluate. The used can see how the scenarios do under the new thresholds.
- He noted that this will be a tool for the working group, and that he will be asking for feedback for what other features will be needed by the Main Table.
- DK stated that she really liked this tool. As a visual learner it is very helpful and valuable.
- MH asked CS to show the various locations in the watershed that can be shown with the tool. The locations include flow through generating station, Skins Lake Spillway, Cheslatta Lake, Vanderhoof, inflow to reservoir and inflow between Skins Lake and Vanderhoof.

- RR reviewed the next meeting date: Wednesday, November 24, 2021. AL asked if the meeting could be moved to November 17. WS noted that November 17 is the date of the next Nechako Roundtable meeting. AL responded that he may not be able to attend on November 24, but that AC and DS should be able to attend. There were no other objections, and the meeting date was set.

- RR encouraged the Main Table members to submit a claim for attending these meetings. RR thanked everyone for attending.

- Meeting adjourned at 2:00 pm.

ACTION ITEMS

- **ACTION ITEM: AL will discuss the extent of the fire into the riparian zones with the Technical Working Group**

- **ACTION ITEM: AL will ask the UVIC lab if they have an eDNA primer for Kokanee.**

- **ACTION ITEM: RR will compile the joint Rio Tinto/Union communications, confirm they are joint communications, and send them out with the next meeting summary.**

- **ACTION ITEM: James Jacklin will determine if any reports of fish kills during the heat dome were received.**

- **ACTION ITEM: The Technical Working Group will create a graphic that shows pre-dam flows into the reservoir**.

- **ACTION ITEM: Main table members will do a critical review of the website and provide comments to DS by October 8, 2021 (**Devrie.Sanghera@riotinto.com)**.**

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