World-first public database of mine tailings dams launched
Jan 24, 2020, miningreview.com

Environmental organisation GRID-Arendal with support from the UN Environment Program has launched the world’s first publicly-accessible global database of mine tailings storage facilities. The database, the Global Tailings Portal, was built by Norway-based GRID-Arendal as part of the Investor Mining and Tailings Safety Initiative, which is led by the Church of England Pensions Board and the Swedish National Pension Funds’ Council on Ethics, with support from the UN Environment Program. The initiative is backed by funds with more than US$13 trillion under management. Professor Elaine Baker from the University of Sydney School of Geosciences is director of the GRID-Arendal office at the university and has been a driving force in the foundation of the database, which was launched at Westminster Abbey, London.

Copy obtained from the National Performance of Dams Program: http://npdp.stanford.edu
“This portal could save lives,” said Professor Baker, who is senior expert at GRID-Arendal globally. “Tailing dams are getting bigger and bigger. Mining companies have found most of the highest-grade ores and are now mining lower-grade ones, which create more waste. With this information, the entire industry can work towards reducing dam failures in the future.” The release of the Global Tailings Portal coincides with the one-year anniversary of the tailings dam collapse in Brumadinho, Brazil, which killed 270 people. After that disaster, a group of institutional investors led by the Church of England Pensions Board asked 726 of the world’s largest mining companies to disclose details about their tailings dams. Many of the companies complied, and the information they released has been incorporated into the database.

Until now, there has been no central database detailing the location and quantity of the mining industry’s liquid and solid waste, known as tailings. The waste is typically stored in embankments called tailings dams, which have periodically failed with devastating consequences for communities, wildlife and ecosystems. The database will allow users to view detailed information on more than 1,900 tailings dams, categorised by location, company, dam type, height, volume and risk, among other factors. “Most of this information has never before been publicly available,” said Kristina Thygesen, GRID-Arendal’s programme leader for geological resources and a member of the team that worked on the portal. When GRID-Arendal began in-depth research on mine tailings dams in 2016, very little data was accessible. In a 2017 report on tailings dams, co-published by GRID and the UN Environment Program, one of the key recommendations was to establish an accessible public-interest database of tailings storage facilities.

“This database brings a new level of transparency to the mining industry, which will benefit regulators, institutional investors, scientific researchers, local communities, the media and the industry itself,” Thygesen said. Mining Review Africa will be hosting a live panel discussion on Tuesday 4 February at 7:30am at Investing in African Mining Indaba where Fraser Alexander, Knight Piesold and Webber Wentzel will discuss the importance of integrated Tailings Storage Facility management, ensuring that we continue to attract investment into our industry while containing risk.

(Removal rules! My hometown is named Jeannette.)

Removal considered for ‘iconic’ South Natick Dam
By Jeannette Hinkle, milforddailynews.com, Jan 4, 2020

The $1.8 million renovation project proposed for the 86-year-old dam is now on hold as the town investigates removal, which advocates say is the more fiscally and environmentally responsible option in the era of climate change.

NATICK, MA — The town has put a proposed renovation of the South Natick Dam on hold in order to more seriously consider removing the beautiful but aging structure altogether. Town Engineer William McDowell recently pulled the notice of intent for the rehabilitation project that he’d submitted to the Conservation Commission, pressing pause on a major public works project in town. Dam removal was first raised as a possible alternative to repair by a man who attended one of the public meetings about the rehab project, which town officials say is needed to gird the 86-year-old dam against failure. The last several inspections of the dam found it to be in “fair” condition.

In a November letter to the Natick Conservation Commission, Charles River Watershed Association Deputy Director Julie Wood also urged the town to consider removing the dam – located on Pleasant Street South – writing that rehabbing the dam without weighing the benefits of removing it would be “shortsighted.” Dam removal would eliminate the threat of dam failure, end the continuous costs associated with inspecting and maintaining the dam, and re-establish
natural wetland habitats and flood plains while improving fish passage, Wood said. A removal project at the site could also mean the towering trees that have grown up on the earthen embankment that constitutes the dam get to stay. The trees – and their root systems – are one of the main stressors on the dam as it exists today, and rehabbing the structure would include pulling them out.

Natick residents have grown accustomed to the woodsy character of the dam, which now looks more like a park than a piece of infrastructure. Several people who toured the area during a town-led site visit this fall were disappointed to learn repairing the dam requires getting rid of the trees. In the words of one man on the tour, the rehab project would make the area “naked as the day it was born.” McDowell, the town engineer, said that in order to preserve the trees in a dam removal, the dam’s spillway – which looks like a waterfall – would have to be removed. That would essentially turn the true dam - the earthen embankment now dotted with trees - into a riverbank around which the Charles River would flow. McDowell said residents are upset about removing the trees but he expects they would also be upset about removing the spillway, which is arguably the centerpiece of a picturesque and popular park. “I think most people’s knee-jerk reaction is, ‘We can’t get rid of this, it’s pretty,’” he said.

Climate change a factor
Charles River Watershed Association Executive Director Emily Norton said she understands the reticence residents might feel about removing a local landmark like the South Natick Dam. “I know people who have taken their wedding photos there,” she said. But in an era when climate change is predicted to cause more frequent and serious flood-related damage to cities and towns, sacrifices must be made, she said. Dam removal is one of the Charles River Watershed Association’s key organizational objectives, Norton said, partly because dams make rivers less climate-resilient. In addition to hardening the natural riverbank, which would be better able to absorb flood waters, dams slow down the already slow-moving Charles River, making it warmer and therefore more vulnerable to algae blooms that are harmful to people and animals, she said. “The dam is already going to need to be rehabilitated, so there is change coming anyway,” Norton said. “If we’re going to make the change, let’s make a change that is aesthetically better, ecologically better, better for public health and safety.”

Removal vs. repair
In her letter to the Conservation Commission, Wood said the community and ecological benefits of removing the South Natick Dam, built in 1934, would likely make a removal project there eligible for state and federal grant assistance. The two-phase dam renovation project, now on hold, is estimated to cost $1.8 million. In a December Board of Selectmen meeting, McDowell said a removal project would likely cost less than a repair project, while also absolving the town of future maintenance and liability costs, making it the more fiscally responsible project. The town doesn’t typically perform high-cost maintenance on the South Natick Dam year-to-year, but it is required to pay for an inspection of the dam by a registered engineer every two years. The costs of inspections vary widely from dam to dam, but a 2016 inspection of a dam in Milford cost $15,000.

The Baker administration recently doled out more than $4 million in grant money for dam projects. About 30% of those funds went to dam removal projects, with the rest going to repairs. The Charles River Watershed Association has been working with the state Division of Ecological Resources to convince dam owners like the town of Natick to remove, rather than repair dams. The DER has assisted with the removal of more than 40 dams since 2005, according to that agency. Currently, Wood said, the Charles River Watershed Association and DER are investigating the removal of dams in Watertown and Wrentham. Norton, a city councilor in Newton, said the Charles River Watershed Association seeks to be a resource to Natick town officials by providing guidance on climate resilience and assistance in seeking grant funding for a removal project at the South Natick Dam. “We will definitely support cities and towns to the extent we’re able on these projects,” she said.
**A long road ahead**
Matthew Gardner, chairman of the Natick Conservation Commission, said the town’s consideration of removal would center around public input. “We are at the very early stages of exploring the dam removal concept,” Gardner said, acknowledging that proposals for repair and removal projects at the high-profile site will likely each elicit strong opinions. “The bottom line is that that part of Natick, that very iconic corner of the community, it’s going to be different,” Gardner said. “It’s going to change. And that’s not without its own controversy.” The town recently ordered sediment tests, which will show what chemicals or compounds might be in the riverbed soil currently held back by the dam. If natural river flow were restored by removal, that soil would likely move downstream, so any contaminated soil that might exist would have to be excavated before the dam is removed. Alternatively, the results could show the soil is too contaminated to move, too costly to move, or both, outcomes that could take dam removal off the table.

The soil tests could be returned as soon as mid-January, McDowell said. He’ll then brief the Board of Selectmen, which will likely help determine the next steps for exploring dam removal, including scheduling public meetings to discuss the merits of a dam removal vs. repair project. Gardner said the Conservation Commission, which was the only relevant permitting body in Natick for the now-paused renovation project, will also be heavily involved in vetting any removal project, along with other town boards and state and federal agencies if necessary. Gardner said learning the impacts of removal on people upstream and downstream would be an important part of any feasibility study. “We’re going to need to do studies to really understand, are the communities and the neighborhoods downstream going to be at greater risk for flooding? Might there be impacts on property values? The questions are numerous,” he said. If removal is feasible and supported by residents, the project would likely take years to complete, Gardner said.

(Unusual dam removal proposed with strings attached. This sure sounds like a dig on the dam removal advocates on the Lower Snake River.)

**Senator proposes bill to breach locks, remove Seattle City Light Dams**
By Thomas Yazwinski, January 17th 2020, keprtvl.com

OLYMPIA, WA – Sen. Doug Ericksen, R-Ferndale, has introduced legislation that suggests the breaching of Seattle locks and the removal of Seattle City Light Dams before the removal of dams along the Snake River. Senate Bill 6380 would launch a study of breaching the Ballard Locks, removing the Seattle City Light dams that provide most of Seattle’s power, and restoring Seattle waterways to a pristine natural state. The measure aims to restore the natural paradise that existed in Seattle before settlers arrived 169 years ago. “When we started talking about this idea last summer, we heard applause from across the state,” Ericksen said. “It was loudest from areas where Seattle environmental groups have proposed radical measures that would create local economic disaster, like breaching the Snake River dams. Funny thing, we didn’t hear any cheers from Seattle.”

According to a news release from Ericksen’s office, this bold vision would ‘enable Seattle to “go first” and lead by example.’ The Skagit River would run free. The Montlake Cut would be filled so that Lake Washington could be raised to historic levels. Ravenna Creek, now routed through a sewer pipe, would return to daylight, providing spawning habitat for fish. The local economy could be reoriented to tourism. “I’m sure we could design an impartial study to reach the conclusions we want,” Ericksen said. “Lake Washington property owners might be inconvenienced when the water starts rising. Others might not like it when electricity bills skyrocket. But as they say in Seattle, no sacrifice is too great for somebody else to make.”

(Are people really, finally giving attention to dam safety?)

Copy obtained from the National Performance of Dams Program: [http://npdp.stanford.edu](http://npdp.stanford.edu)
Could Your Community Be Seriously Impacted by a Faulty Dam?
boldplanning.com, Jan 24, 2020

If the answer is yes, you need to read this important blog post from BOLDplanning, a leading developer of online software and provider of consultative services for Emergency Operations Planning (EOP), Continuity of Operations Planning (COOP), Business Continuity Planning (BCP) and Hazard Mitigation Planning (HMP).

The Federal Emergency Management Agency (FEMA) and its National Dam Safety Program (NDSP) recently released a new publication entitled Emergency Operations Planning: Dam Incident Planning Guide. The Guide, which builds upon the Comprehensive Preparedness Guide (CPG) 101: Developing and Maintaining Emergency Operations Plans, is intended to help community planners create a plan to respond to dam incidents that take place in, or affect, their communities. It also provides recommendations for dam owners and operators on how to engage with emergency managers prior to an incident in order to ensure a well-coordinated response.

There are now 90,000 dams nationwide, and a high number of them have received less than favorable Dam Safety Action Classification (DSAC) ratings from the U.S. Army Corps of Engineers (USACE). In fact, as of 2016, the federal government said there were approximately 15,000 U.S. dams classified as having high-hazard potential (HHP), meaning that their failure could result in loss of life.

According to FEMA, state and local emergency managers should understand the risk and implications of dam failures, and incorporate dam risk into their HMPs, EOPs, or similar documents. That’s the case even if a dam is located outside their respective communities but would impact them in one way or another during a failure. Such impacts may be minimal, i.e., localized flooding, or major, as in the case of widespread loss of life and property. To help you along with your own planning endeavors, ask for a copy of the dam owner’s Emergency Action Plan (EAP)—they’re required to have one. EAPs identify potential emergency conditions; include vital inundation maps; and specify pre-planned actions for the dam owner(s) to follow to reduce property damage and loss of life. Also, learn more about the National Dam Safety Program by visiting https://www.fema.gov/national-dam-safety-program. Such information (and such programs) may prove invaluable to your jurisdiction, as well as others, in the years ahead.

(Hate tailings dams.)

MiningWatch Canada pushes for global review of safety of tailings dams
Third party would review engineering and ground conditions, says MiningWatch spokesperson
Jan 23, 2020, cbc.ca

State prosecutors in Brazil have charged Fabio Schvartsman, the former chief executive of the mining company Vale, and 15 other people with homicide in connection with a tailings dam disaster last January that killed more than 250 people. Jamie Kneen is communications and outreach coordinator with MiningWatch Canada. Kneen said his organization is pushing for a global review of the safety of tailing dams.

“We really need an independent third party with a lot of clout and credibility to have the authority to go in and investigate and look at the engineering but also the ground

Copy obtained from the National Performance of Dams Program: http://npdp.stanford.edu
conditions," he said. Vale and the company responsible for inspecting the dam have also been charged with environmental crimes.

Kneen stated there have been layers of negligence attached to the operation, which he says the company has tried to deflect. Kneen said the dam collapse should have been preventable. "The liability is there in the sense that those structures are fairly technically designed and executed," he said. "And in this case, there were signs of instability and it was allowed to continue," he added. Kneen explained that the charges are specific to the Brazilian operation. "But I hope that it has a larger effect in making the company much more attentive to its own engineers and its own internal reporting, but also to the demands of the community," he added.

As for the tailings dams in Sudbury, Kneen said "they've been determined to be fairly safe and stable but at the same time if anything did go wrong the consequences would be very, very serious." Kneen said that while the engineers and the people on the front line have a great deal of responsibility, it needs to be clear that due diligence and accountability go all the way to the top. "I think it's important to see how that plays out legally in Brazil, and what we can take from that for Canada or anywhere else in the world," he said. A spokesperson for Vale shared a statement from the Vale press office in Brazil, which reads in part:

*It is important to note that other authorities are investigating the case and, at this point, it is premature to claim there was conscious assumption of risk to cause a deliberate breach of the dam. Vale trusts in the complete clarification of the causes of the breach and reaffirms its commitment to continue to fully co-operate with the authorities.*

A former executive with Vale has been charged with homicide after a deadly dam disaster in Brazil last year. On Jan. 25, 2019, a Vale tailings pond collapsed, killing more than 250 people.

(Lotta dams in CA with restrictions.)
https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Division-of-Safety-of-Dams/Files/Publications/Dams-Within-Jurisdiction-of-the-State-of-California-with-Reservoir-Restrictions.pdf

(There's always a dam removal story. This one looks like it deserves its destiny.)

**Undamming Beaverdam Creek**
By Luke Weir, themountaineer.com, Jan 26, 2020

CANTON, NC — Days could be numbered for an old dam on Beaverdam Creek. The Town of Canton has partnered with two nonprofits — Haywood Waterways Association and American Rivers — to seek grant funding for the demolition of a dam that has already been decommissioned, and now serves more as a manmade waterfall close to where Beaverdam Creek meets the Pigeon River. "It’s a safety hazard," said HWA Executive Director Eric Romaniszyn. “It’s causing a lot of erosion upstream, and it’s a barrier to fish passage.”

HWA and American Rivers are doing the legwork for the dam removal project, which is presently in the design phase, Romaniszyn said to the Canton Board of Aldermen. Canton’s board unanimously agreed to make the town a grant applicant of record, allowing the nonprofits to apply for an N.C. Division of Water Resources grant that will finish funding the project’s design stage. Unlike years past, when dynamite was used to blow up a dam along Canton’s stretch of the Pigeon River, the dam on Beaverdam Creek will be destroyed using heavy machinery — most likely a hydraulic hammer on a track hoe, said Erin McCombs, Conservation Director for Southern Appalachia with American Rivers.
“Like so many outdated, relic dams that at one time powered grist mills, textile mills and sawmills across the state, the Beaverdam Creek dam was related to a mill,” McCombs said in an email. “This dam is no longer serving any useful purpose and harms the health of the stream and is a public safety hazard.” A specialized Alabama unit from the U.S. Fish and Wildlife Service is lined up to perform the deconstruction, pending the N.C. Division of Water Resources grant. The dam project has been a three to four year work-in-progress, with deconstruction ideally occurring in spring 2021, Romaniszyn said. "The water quality in Beaverdam Creek has been slowly declining over the years," Romaniszyn said. “We created a Watershed Action Plan for the entire watershed, and we are considering this dam removal project as kind of the kick-off for a watershed-wide effort.”

Beaverdam Creek is not on the state list of impaired waterways, but it could be soon, primarily due to high sediment loads — a product of erosion, Romaniszyn said. Elsewhere in Haywood County, there is at least one other manmade structure creating flooding and erosion problems for a local waterway. “There are the bridge footers on Richland Creek just before it enters Lake Junaluska,” Romaniszyn said. “They are another safety hazard and catch all the debris floating down Richland.” HWA intends to remove the Richland Creek bridge footers as well, but Beaverdam Creek is the local nonprofit’s first foray into structure removal.

(This must be a dam removal week.)

Removing Jordan’s Point Dam

virginiaplaces.org, Jan 26, 2020

Ever since 2006, when a teenager drowned at Jordan’s Point Dam, the City of Lexington, VA wanted to remove the 10-high dam across the Maury River. Safety was more important to the city than fish passage, and economics played a role. The city had paid $100,000 to the estate of the 16-year-old who had been trapped in the hydraulic churn below the dam, and estimated repair costs were substantially higher than removal costs. The Virginia Department of Environmental Quality determined the dam had structural deficiencies (including a crack along the entire length) and was unsafe without repair. The $2.5-$3 million cost to grout voids, encase the downstream face of the dam in concrete, pour a new reinforced concrete cap, and install anchors into the riverbed was equivalent to a year’s worth of funding in the capital budget for the City of Lexington, but the US Fish and Wildlife Service and others were willing to provide the $190,000 needed. The city’s costs would be just $20,000 for in-kind services, plus $8,000 for plants to restore the vegetation along the shoreline. Traditionally the city had budgeted $25,000 annually for maintaining the dam and Jordan’s Point Park.

The Jordan’s Point Dam was historic and created a flatwater pool that could be used for recreational use, but the City Manager thought removal vs. preservation was an easy choice: We don't have that kind of money to fix up a dam that doesn't really have a purpose other than increasing some recreational opportunities... If you have somebody that's giving you a solution to a problem you can't afford, why not consider it? The Virginia Department of Game and Inland Fisheries completed an Environmental Assessment that considered six alternatives. The decision to remove the dam included a commitment to preserve some of the historical character of the dam, which was built before 1900. The final alternative selected in 2018 was to breach the dam in the middle, but retain portions on either side of the river and the defunct fish ladder to interpret the past. The project included taking out eight piers of an abandoned railroad bridge downstream of the dam that were located in the active river channel (leaving five other piers.

A non-profit group formed by "dam fans, pro-dam owners and operators of dams" made a last-minute proposal in 2018 to retain the Jordan's Point Dam. It was the first orphan dam that
American Dams, Inc. offered to purchase, and the Rockbridge County Board of Supervisors agreed to assume ownership of the dam as part of the proposal. One possibility was to reduce the water level behind the dam low enough so it was no longer required to meet the state's dam safety regulations, but it was not clear if major repair costs could be avoided by that proposal. The Virginia Military Institute (VMI) also urged preservation rather than removal of the dam. Keeping the dam in place would retain the flatwater pool next to VMI's campus, and eliminate the instream and riparian disturbances from dam removal. Placing stone in the riverbed below dam was proposed as a way to reduce the drowning hazard.

One advocate for dam removal stated:

...no dam is always safer, no dam is better for the river, no dam is better for the environment. The dam needs to be removed; it was not that long ago historically that there was no dam, thus the historically accurate position on the river is to not dam it. The city was obligated to make a decision by August 1, 2018, and to repay the Virginia Department of Game and Inland Fisheries $60,000 in planning costs if it withdrew from the removal agreement. However, Lexington officials decided that the proposal was not sufficiently complete to justify breaking the deal negotiated with state and Federal officials. On July 28, 2018, City Council voted for a second time to remove the dam. The two members on City Council worked at VMI had to recuse themselves from the vote, since their employee had taken a public position on the issue.

The Jordan's Point Dam was removed in May, 2019. That beat the deadline; the state's operation and maintenance certificate for the dam expired on November 3. Workers cut into the concrete dam, then discovered an older wooden dam next to it that was buried in sediment on the upstream side. The Maury River ran free after two dams, plus eight of the thirteen piers from the former railroad bridge, were removed. In the process, two historic millstones were extracted from the river for use in interpretive exhibits. The Maury River water level dropped five feet at Jordan's Point after the dam was removed. City officials planned to retain the "natural feel" of the park, while increasing public access to the river for recreational use.

(Landslides are dangerous and hard to predict. This an ad, Nevertheless it’s interesting.)

Best in state: Gold award, Unique or Innovative Applications
Shannon & Wilson, Jan 27, 2020, djc.com

Shannon & Wilson created a detailed assessment of landslide and debris flow risks to the Baker River Hydroelectric Project.

Project: Baker dams landslide inventory and susceptibility mapping
Client: Puget Sound Energy
The Baker River Hydroelectric Project was constructed within the steep-walled canyon that carries meltwater and runoff from the flanks of Mount Baker and North Cascades to the Skagit River. The nature of the surrounding topography means there is significant potential for landslides that impose multiple hazards on the dams, reservoirs, facilities, on-site Puget Sound Energy personnel, and the inhabitants of Concrete who live below the dams. Shannon & Wilson was hired by Puget Sound Energy to develop an inventory of landslides and debris flow fans. It then used this inventory to assess which slopes are potentially the most vulnerable to failure.

Since the dams were constructed, slope failures have damaged or destroyed facilities, including the Lower Baker Dam powerhouse that was demolished by a landslide in 1965. In addition to direct impacts, landslides that fall into the reservoirs can trigger impulse waves that overtop the dams and cause dam damage or failure. Consequently, understanding the potential for reservoir
slopes to fail is an important aspect of dam safety. Shannon & Wilson’s study examined areas where slopes have failed in the past — an indicator of areas where slopes may fail again. To effectively examine more than 300 miles of largely uninhabited, heavily forested terrain, the team used remote sensing data — high-resolution LIDAR — to map landslide and debris flows. From the LIDAR, digital terrain models were created to examine certain features of these past flows.

The team was able to differentiate between different types of past flows — some more damaging than others. The team then divided the landslide susceptibility into high, moderate and low zones, and translated that information into a color-coded susceptibility map of the entire watershed area. For the first time, Puget Sound Energy has a comprehensive inventory of the landslides and debris flow fans that potentially impact its facilities and operations. Additionally, Shannon & Wilson provided maps of most of the watershed areas where slopes are potentially susceptible to slope failure. From these datasets and derivative products, Puget Sound Energy can target areas of concern, plan slope monitoring projects and incorporate landslide parameters in future remedial construction projects.

(If only life was simple.)

Op-ed: Solving the Snake River Dams Debate; It’s Harder Than You Think
By KURT MILLER, JANUARY 27, 2020, washingtonstatewire.com

Kurt is the executive director of Northwest RiverPartners (NWRP)—a not-for-profit organization that advocates hydropower for a better Northwest. Kurt wrote the following commentary about the Snake River Dams and salmon declines.

Before taking the helm at Northwest RiverPartners last March, I knew the region had been deeply divided over the lower Snake River dams for decades. When I accepted my role, I truly felt that with a respectful tone and an open mind, I could perhaps build bridges that others had not. I’ve since logged countless hours and thousands of miles to meet tribal members, environmental conservation groups, salmon advocacy groups, and utility leaders across the greater Northwest. I recognize now that the challenge is bigger than I estimated, even with so many dedicated, smart, and caring people on both sides of the argument.

Here’s why...
Complex Science
Resolving salmon declines is a complicated and challenging task. Salmon cross many dynamic ecosystems, oceans and rivers are constantly in flux, and salmon are continuously forced to adapt and evolve. For scientists, it’s impossible to control for all real-world variations, so we’re often left with assumption-laden models and anecdotes instead of evidence. Consequently, hydroelectric supporters and dam breaching advocates both point to science to support their claims, but the picture is often incomplete.

High Stakes
We know the stakes are high, which makes compromise so difficult.
The dam advocate perspective:
Climate Crisis – Governor Jay Inslee described climate change as the “existential threat of our time.” It’s just as serious for salmon. NOAA Fisheries researcher Lisa Crozier has noted, “an almost synchronous decline” in worldwide salmon populations due to climate change. Given this context, removing carbon-free hydropower dams is a mistake.
Clean Energy Future – Hydroelectric dams provide roughly 80% of the region’s carbon-free electricity. They also help us safely add new intermittent renewables—like wind and solar—to the grid by filling in the gaps left by wind and sunshine. We need the lower Snake River dams to achieve our clean energy goals.
Regional Blackouts – With thousands of megawatts of coal generation being shuttered, regional utility leaders have warned that the Northwest already faces a serious risk of blackouts. Without the dams, the threat would be amplified. Energy Equity – Vulnerable communities rely on the lower Snake River dams for affordable, clean energy. Without these dams, many people who can least afford it will face rising power bills, increased pollution, the specter of blackouts, and the loss of an important economic base. If the dams remain, others fear for Snake River salmon and Southern Resident orcas.

The dam-breaching advocate perspective:
Salmon Extinction – No one knows how long endangered salmon populations can survive before extinction. Given this lack of certainty, we have to act boldly now. Orca Extinction – Native salmon populations struggle in the Salish Sea, where Southern Resident orcas mostly reside. If the Snake River salmon populations rebound, they could supplement the deficit in the Salish Sea and help the Southern Residents recover. Nothing Else Has Worked – Northwest utility customers have invested billions in fish and wildlife programs to offset potential harm from dams. While in-river salmon survival has notably improved, too few adult salmon are returning from the ocean. Dam breaching is one of the only things we haven’t tried. Cultural Significance – Tribal leaders fear the permanent loss of their cultural heritage and identities, should salmon not return in healthy numbers. Salmon are crucial to tribal health, economies, and religions, and the loss of salmon violates treaty rights.

What’s Next?
While I haven’t yet seen a clear solution to these challenges, I have no regrets about the miles traveled or the new approach my organization has taken. My work has given me the opportunity to meet some amazing people who’ve helped me better understand their perspectives. Knowing that a problem is complex is far better than oversimplifying it. If we can elevate the entire Northwest’s understanding of the issues, then I’ll feel like I’ve done my job.

(Give ‘em what they want or you’ll be sooorry!)

New Hampshire wants more authority over private dams
By MICHAEL CASEY, Associated Press | Jan 28, 2020, wcax.com

CONCORD, N.H. (AP) Lawmakers in New Hampshire are considering a bill that would give the state more authority to take action when a privately owned dam poses a safety hazard. The bill, which got a public hearing in the Senate Tuesday, would apply to hundreds of dams in the state. It would allow state officials to access the dam as well as take action when the dam poses a threat to residents or property downstream. The dam owner would be responsible for any cost incurred if the state has to take action to avert an emergency.

Hydro:
(Increased efficiency and better for fish.)

NW dam’s new-design turbine more efficient, saves more young fish
By KTVZ news sources, January 24, 2020, ktvz.com

BURBANK, Wash. (KTVZ) -- The U.S. Army Corps of Engineers Walla Walla District’s says its new fixed blade hydroelectric turbine increases energy efficiency, while recently concluded fish survival testing shows improved young salmon passage survival. The Corps’ newly designed
turbine at Ice Harbor Lock and Dam, in southeast Washington on the Snake River, is the first of its kind specifically designed for safer fish passage. It also increases turbine efficiency by 4%, which will benefit electricity distributors and consumers, the agency said. Survival tests were conducted on the new hydroelectric turbine resulting in high direct survival of juvenile salmonids migrating downstream through Unit 2. Corps Biologist Brad Trumbo said "the survival of balloon-tagged juvenile Chinook salmon across the turbine unit operating range was 98.25%.”

In addition to biological testing, the independent lab Pacific Northwest National Laboratory developed “sensor fish,” packed with miniature data collection and released through the turbine to measure pressure and acceleration data, which indicated significant improvement in flow conditions through the turbine passage route, meeting the key design criteria for improved fish passage survival. The Walla Walla District, in collaboration with the Hydroelectric Design Center and the Engineering Research and Design Center, developed a revolutionary new turbine design process. This design process combined the Corps’ fish passage design and modeling expertise with Voith Hydro Inc.’s prowess in hydroelectric turbine manufacturing. This collaboration resulted in significant design innovations that streamlined flow conditions through the turbines improving the environment for fish passage.

“Significant reductions in strike, exposure to shear, turbulence and low pressure zones, coupled with the high direct survival numbers put the turbine passage route at the same level or better than spillway passage” said Corps Hydraulic Engineer, Martin Ahmann, the project Technical Lead. “The direct survival results and efficiency improvements of this unit exceed expectations and open the door for further testing and potential rebalancing of operations at the project, improving total project survival and maximizing the stewardship of this precious resource in the Pacific Northwest,” said Corps Hydraulics and Hydrology Branch Chief Shawn Nelson.

The Unit 3 turbine installation is currently underway and scheduled to be completed in 2021, followed by Unit 1 turbine installation, scheduled to be completed in late 2023. Last year, the Corps awarded a contract and efforts are underway for a similar turbine design and replacement process for all 14 turbines at McNary Lock and Dam on the Columbia River.

(Is there another power source that lasts this long?)

**Gibraltar Reservoir in Santa Barbara Turns 100**

Jan 27, 2020, by: Ashton McIntyre, ksbym.com

The City of Santa Barbara's Gibraltar Reservoir turns 100 years old. Construction of Gibraltar was completed on January 26, 1920. The reservoir is located nine miles north of the City, along the Santa Ynez River. City officials say Gibraltar has served an important role in providing the City with affordable drinking water for the past ten decades. According to a press release, in 1903, the City employed J.B. Lippincott of the U.S. Geological Survey to examine Santa Barbara's growing water supply problem. A dam in the drainage basin of the Santa Ynez River was one of Lippincott's recommendations, and a potential site was named. A month after submitting his report, Lippincott came upon the Gibraltar site, which became his ultimate recommendation. The construction bid for Gibraltar was $342,981, which was funded by bonds. Bent Construction began the project in May 1918 and was completed on January 26, 1920.

Gibraltar Dam impounds Santa Ynez River water in Gibraltar Reservoir which conveys water through 3.7-mile-long Mission Tunnel to the City. Mission Tunnel was completed in 1912, eight years prior to the construction of Gibraltar Dam. "If they couldn't build a tunnel through the Santa Ynez Mountains, the dam would not have done us any good," said Joshua Haggmark, City Water Resources Manager. At the time it was built, Mission Tunnel was the longest irrigation tunnel in the world, passing under La Cumbre Peak, city officials say the tunnel is nearly 3,000 feet.
underground. Water from Gibraltar flows through Mission Tunnel to Lauro Reservoir, and on to Cater Water Treatment Plant (Cater) entirely under gravity. In fact, the water dropping down from Gibraltar is capable of powering a small hydroelectric plant located at Lauro Reservoir, and in a good year it nearly covers all the electrical demand at Cater. According to a press release, the engineers for the Gibraltar - Mission Tunnel system designed a green energy project with a minimal carbon footprint. When full, Gibraltar has the capability to release water during torrential rain a rate of 40 million gallons per minute flowing downstream into Cachuma Reservoir.

Prior to constructing Gibraltar, Santa Barbara relied entirely upon groundwater sources. Gibraltar, along with Mission Tunnel, introduced a much needed water supply that enabled Santa Barbara to grow and develop into a City. "To be able to tap into this pristine watershed was huge," said Joshua Haggmark. "Gibraltar was the first step in diversifying the City's water supply portfolio, and has continued to provide benefits for the past hundred years." Gibraltar is an important component of the City's water portfolio, which includes Lake Cachuma, recycled water, imported state water, desalinated water, and groundwater. For more information on Gibraltar visit this website:

(Isn't going to fix what it doesn't use.)

Loup Power District's 2019 hydroelectric generation fourth worst on record
By Sam Pimper | The Columbus Telegram, 1/29/2020, columbustelegram.com

Loup Power District, NE last year produced its fourth-worst hydroelectric generation on record, something Loup President/CEO Neal Suess attributes to the massive March flooding that decimated Platte County and its surrounding areas. During Tuesday’s Loup Public Power Board of Directors meeting, Suess noted that 1938, 1939 and 1940 – the first three years of hydroelectric generation – were the only years that had less energy generated from the hydroelectric facilities owned by the power company. The March flooding and the damage that followed was a significant contributing factor to the decrease in production. During 2018, 186,974 megawatt-hours (MWh) were generated; that number subsequently plummeted to 95,246 MWh last year. "2019 was a pretty bad year for generation," Suess said. "... We had our lowest ever April generation and, unfortunately, it was a great water year, I mean, if you think about it, we had a tremendous amount of water in the Loup River, and we just couldn’t take advantage of it.
“As a matter of fact, Central Nebraska Irrigation Public Power had their fourth-best year ever this year.” Suess added that another contributing factor was that Loup was operating under the flow restrictions contained in the license granted by the Federal Energy Regulatory Commission (FERC). Provided figures show that the best year for hydroelectric generation came in 2010 when Loup produced 194,260 megawatt-hours.

Loup officials also spent some time discussing the Horseshoe Dike in Nance County and the ongoing discussions happening with FERC as a result of the district electing to not repair the area in the wake of the March natural disaster. Nance County Emergency Management, Suess said, has been in Contact with FERC; however, he noted that he and other Loup officials expect FERC to review the purpose of the dike and side with the district regarding its decision. "A couple of the landowners there believe that that dike protects them during floods," he said. "The only part of the dike that was damaged, as we have talked about before, is that very, very southern portion of it, and that actually comes back down to ground level. "Another part of it is that the county has
decided that they don’t want to build the road back up if we are not going to build the dike. We’ve said that that is the county or the township’s decision – Loup doesn’t have a care about the road, we can get back in there with a four-wheel-drive vehicle.” Suess noted the district doesn’t believe the structure actually plays a crucial role in protecting those residents from flooding. He noted that the only time Loup officials are aware of flooding affecting that area was in 1966 and 2019.

“In ’93 there weren’t any issues down in that area,” Suess said. “It might have been wet at times, but there weren’t any real issues. Based upon our discussions with FERC, and basically, FERC has supported what we’ve said we are going to do … It’s a cost for something that we don’t have to do, and we’d have to go back and recover through the ratepayers of Loup Power District. And that just doesn’t make a whole lot of sense.” Dan Hellbusch, vice president of operations, said that the roads in the specified area were already minimum-maintenance before the flood washing segments out. “They don’t really do anything with it anyway,” Hellbusch said. “So the county doesn’t really want to spend the money to repair something like that.”

Water:
(Drought in Alaska is weird.)

After 18 Months, America’s Weirdest Drought Finally Ends
By Brian Donegan, Jan 26, 2029, weather.com

At a Glance
• Southeastern Alaska averages 100-plus inches of annual precipitation.
• This region just exited an 18-month drought that began in July 2018.
• Precipitation in Ketchikan, Alaska, was nearly 3 feet below average in 2018.
• Wetter-than-average conditions finally returned in late 2019 and early 2020.

The drought that griped one of the nation’s wettest climates for 18 months has finally been eliminated after three consecutive wetter-than-average months. This prolonged drought in Ketchikan, Alaska, began in the summer of 2018, a year that tallied 106.59 inches of precipitation (rain and melted snow). In most parts of the United States, that would be an extreme amount, but in Ketchikan, that’s 34.66 inches below the annual average. 2018 was Ketchikan’s seventh-driest year in more than a century of record-keeping, according to the Southeast Regional Climate Center.

For comparison, Wilmington, North Carolina, measured 102.4 inches of rain in 2018. That was 45.13 inches above the annual average, resulting in the city’s wettest year on record. The enormous surplus was largely caused by the deluge Hurricane Florence unleashed for days in September 2018. Ketchikan is in the southeastern Alaska Panhandle, home to one of the wettest climates in the country. Pacific storms pummel this temperate rainforest region, contributing to an average annual precipitation total of 141.25 inches. Even June and July, Ketchikan’s driest months, average more than 6 inches of rain. From September through March, average precipitation is more than 10 inches per month, led by October with 19.22 inches.
Moderate drought first developed in far southeastern Alaska during July 2018, then intensified into a severe drought by late September 2018, according to the U.S. Drought Monitor report. The severe drought continued for more than a year until it was reduced back to a moderate drought in early November 2019. During that stretch, the drought peaked in the summer of 2019 when it reached "extreme," the second-highest category of drought. Now, 18 months since moderate drought was first reported in the region, the latest U.S. Drought Monitor update valid Jan. 21 shows that it has finally been eliminated, though abnormally dry conditions remain.

Environment
(Another benefit of hydro. It’s that bald eagle time of the year.)

National symbol on display: Dozens of bald eagles flock to Lake Ogallala
By TODD VON KAMPEN, nptelegraph.com, 1/29/2020

KINGSLEY DAM — Winter ice isn’t absolutely required for the national bird to preside over his surprising aviary kingdom below Lake McConaughy. A recent morning featured frosty mid-January cold but hardly any frozen cap over the lake’s spillway outlet, home to Central Nebraska Public Power and Irrigation District’s seasonal eagle viewing shelter since 1996. The American bald eagles didn’t care. They swooped over and alighted on the open water at the watery entrance to Lake Ogallala, retreating after feasting on alewife “bait fish” to their thrones atop bare trees on a nearby bluff. That’s where water coming through the dam churns to the surface. It remains open water even when McConaughy and the “little lake” are frozen stiff, said Nate Nielsen, who helped build Central’s comfortable human perch for birders 23 winters ago. Eagles and other birds, he said, are more readily drawn there when the lakes freeze over. That hasn’t happened so far this winter — but it also hasn’t mattered.

"The bait fish are coming through more regularly this year, so the (bird) numbers are up," said Nielsen, Central’s Kingsley Dam foreman. Birders can try their eagle-viewing luck for free from 8 a.m. to 2 p.m. MT Saturdays and Sundays through March 1. The shelter is open weekdays by appointment, Nielsen said. Unless driving conditions are hazardous, Nielsen encourages visitors not to be dissuaded by snow and cold. “Usually the bad weather brings the birds even closer to the hydro,” he said. Two human interventions — mighty Kingsley, finished in 1941, and the Nebraska Public Power District hydroelectric plant added in 1984 — have unwittingly made this spot one of the nation’s best for viewing eagles and many other bird species.

Bald eagle populations shrank drastically in America through most of the 20th century but then recovered strongly. They were removed from the endangered species list in 1995 and the threatened list in 2007. Nielsen said the heated shelter, which replaced a trailer previously on the site, helps Central fulfill a public-education requirement in the federal government’s 1998 renewal of its Kingsley license. Winter operating hours are limited to mornings and early afternoons, he said, because “later in the day the birds tend to wander away and don’t provide as much viewing.” Central pays two part-time birding guides to staff the shelter on winter weekends. Visitors who show up at the right hours will soon learn why early winter mornings below the dam are a birder’s delight. “We think of birds going south for the winter," especially Sandhill Cranes and whooping cranes, Nielsen said. But “we are the south for some of the birds." Bald eagles most commonly migrate to McConaughy and the Platte River basin from northern Nebraska, South Dakota and the eastern Rockies, Nielsen said.
Seagulls are the bald eagles’ most common winter companions, but trumpeter swans occasionally stop by. “They live in the Sandhills and come down to the open water in the wintertime,” Nielsen said. Ducks and geese are plentiful, along with several different types of hawks. A bird feeder outside the enclosure attracts finches, juncos and several types of woodpeckers. Mountain bluebirds have been seen, too. Nielsen said up to 100 human visitors will visit the shelter on a winter weekend day, with 35 to 40 states represented some days. “It’s interesting how diverse the group is that shows up,” he said. But “if you’re a birder, those birder communities are pretty active about that sort of thing.”

**Other Stuff:**

(If’s about time. Don’t you think?)

**Proposed bill would include large hydro, nuclear in California's renewable portfolio standard**

By Kavya Balaraman, Jan. 23, 2020, utilitydive.com

**Dive Brief:**

- California Republicans on Tuesday introduced legislation to temporarily halt the requirements of the state’s Renewables Portfolio Standard (RPS) program and redirect funds to ensure utilities improve their infrastructure and vegetation management programs.
- The proposed bill would also, if and when the program is reinstated, include nuclear generation and all hydroelectric facilities operating as of January 1, 2021 in the program's definition of an "eligible renewable energy resource."
- The bill, along with a second piece of legislation introduced by state Assemblyman James Gallagher, R, and Sen. Jim Nielsen, R, "will help prevent future wildfires and utility power shutoff events," according to a press release. But environmental advocates say that the move to extend RPS eligibility to hydro and nuclear facilities might not go far in California's current political landscape.

**Dive Insight:**

California established its RPS program in 2002, requiring at the time that renewable resources made up 20% of electricity retail sales by 2017. However, the program's targets have changed over the years; the state passed Senate Bill 100 in 2018, accelerating RPS requirements to 60% by 2030, as well as requiring that carbon-free resources supply all of the state's electricity by 2045. Large hydropower and nuclear generation don't currently count toward the RPS standard requirements, but the state is still defining the zero-carbon requirement passed in SB 100, Alex Jackson, senior attorney at the Natural Resources Defense Council, told Utility Dive. In the last three years, California utilities have also been wrestling with the increased threat of wildfires posed by their infrastructure. Devastating fires in 2017, 2018 and 2019 have caused billions of dollars in damage across the state, pushing Pacific Gas & Electric to declare bankruptcy in early 2019.

To reduce this risk, the utility adopted a public safety power shut-off (PSPS) program, proactively de-energizing areas that are particularly prone to fires during windy or dry weather conditions. The shut-offs have drawn widespread criticism from regulators, lawmakers and customers in Northern California. Assembly Bill 1941 would tackle the issue by suspending the state's RPS requirements, and tasking the California Public Utilities Commission with estimating how much utilities would save in costs associated with the program, redirecting those funds toward
upgrading infrastructure to reduce fire risks. During this time period, utility executives will not be allowed any salary increases or bonuses. If the program is reinstated, eligibility would be extended to all nuclear generating facilities and any hydroelectric facility in operation as of January 1, 2021.

The lawmakers introduced another bill — AB 1942 — which would appropriate $330 million from the state’s greenhouse gas reduction fund and channel it to fire prevention programs. "California must get smarter about its climate goals. Century-old infrastructure, tinderbox forests and PSPS events are unacceptable. Renewable energy mandates that take away from addressing these issues while fires continue to burn are intolerable. With our plan, we can do better on carbon reduction and combating catastrophic fire," Gallagher said in a press release. However, Jackson said the bill's premise that suspending the RPS program will free up money to invest in wildfire mitigation is flawed. While early renewables contracts signed by investor-owned utilities were expensive, renewables today are cheaper than fossil fuel generation, he said. "The problem is not one of RPS compliance — it's one of legacy contracts and ripping up existing contracts is not something that suspending the RPS requirements is going to enable," he said. On a more fundamental level, he said, the bill presents a false choice between California's clean energy future, and wildfire safety and mitigation. Utilities need to focus on dramatically improving their infrastructure to prevent wildfires in the near term, but a long-term solution to fire risk involves decarbonizing the power system, he said.

"We can't throw out the baby with the bathwater in trying to solve for short-term fire mitigation while letting climate change continue to run amok," Jackson added. But nuclear advocates say the second part of the bill is "really encouraging," and nuclear power could play an important role in California's decarbonization goals. "It creates virtually unlimited clean energy in a very small space — it occupies a fraction of the space that solar or wind farms do," Carl Wurtz, president of Californians for Green Nuclear Power, told Utility Dive. The group was frustrated when SB 100 excluded nuclear energy in the 2030 goal. The state's last operational nuclear facility, the PG&E-owned Diablo Canyon Power Plant, is currently slated to retire by 2025. The plant's closure will eliminate 9% of California's electricity, which raises questions over what will fill the gap, Wurtz said. However, it's early in the bill's progress and Wurtz intends to keep an eye on potential changes to the final version before taking a definite stand on it.

Environmental advocates pushed back against the proposal to include both large hydropower and nuclear generation as eligible resources under the RPS program. The RPS is part of a deliberate state move away from fossil fuels, and utilities already get a lot of their power from hydro, so counting it in the RPS requirements would discourage investments in wind, solar, and other renewables, Kathryn Phillips, director of Sierra Club California, told Utility Dive. And because California has and is likely to face more extended droughts in the future, hydropower could become less reliable, leading to more gas-fired back-up plants firing up, according to Phillips. On the nuclear energy front, "there's no way you can call nuclear renewable," she said. "It doesn't emit carbon, but it has lots of other very intense environmental impacts." "Nuclear is being phased out not because of its ineligibility for RPS requirements, but because these large inflexible baseload plants are increasing incompatible with a system that's predominantly run on intermittent clean energy resources," according to Jackson. Flexibility is key going forward and the high operating costs of nuclear plants is what led PG&E to propose the retirement of the Diablo Canyon plant in the first place, he added. The National Hydropower Association did not respond to a request for comment.

(Renewables are on the move. Hydro is considered a renewable everywhere, except in some U.S. states.)

**Renewable will generate half of world's electricity by 2050**

January 24, 2020 by Dave Kovaleski, dailyenergyinsider.com

*Copy obtained from the National Performance of Dams Program: [http://npdp.stanford.edu](http://npdp.stanford.edu)*
Global electric power generation from renewable sources will increase more than 20 percent by 2050, according to the U.S. Energy Information Administration’s (EIA) International Energy Outlook 2019. In the report, EIA projects that renewables will generate almost half of the world’s electricity in 2050. Meanwhile, global coal-fired generation will decrease 13 percent, representing just 22 percent of the generation mix in 2050.

**Worldwide electricity generation will grow by 1.8 percent per year through 2050, EIA says.** World electricity generation will reach nearly 45 trillion kilowatt hours (kWh) by 2050, almost 20 trillion kWh more than it was in 2018. Most of the growth is expected to come from non-OECD regions. India has the highest demand growth, increasing 4.6 percent per year. In India, wind and solar generation will increase from less than 10 percent in 2018 to more than 50 percent in 2050.

In Europe, the share of wind and solar generation will increase from 20 percent now to almost 50 percent by 2050. At the same time, fossil-fired generation will decrease from about 37 percent to 18 percent in Europe by 2050. **In the Eurasia region, wind and solar generation will account for less than 10 percent of the generation mix in 2050, leaving hydroelectric power as the main source of renewables generation in this region.**

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