Cold and slightly damp, standing over a remote body of water collecting Thursday morning’s rainfall, local government and utility officials smiled as they held a toast to the world’s most important natural resource. In celebration of Drinking Water Week and the new Ragged Mountain Dam, The Rivanna Water and Sewer Authority held a special community event to celebrate the water Charlottesville and Albemarle County residents and visitors rely on every day to drink, cook and bathe. In a news conference that kicked off the event, local government and utility officials spoke about the history of the dam and reflected on the contentious nature of the community debate that led up to the installation of a $36 million earthen dam that’s 129 feet deep and 800 feet wide.
The water authority announced in February that the expanded reservoir had reached capacity, which is 1.5 billion gallons. The reservoir is estimated to meet the community's needs for the next 50 to 60 years. The Thursday morning ceremony included the unveiling of a plaque commemorating the reservoir. Tom Frederick, the former executive director of the Rivanna authorities, spoke at the event. “We have been able to erase the fear of drought in this community,” Frederick said. “No longer do we have to worry about our economy shutting down or eating off plastic plates. We have enough water to secure our future.”

“We recognize and prove that we as humans can live with nature. We can fulfill our needs and the needs of nature through the intelligence we have,” he said, paraphrasing the author F. Scott Fitzgerald. “We can process two competing thoughts at the same time and still function.”

Charlottesville Mayor Mike Signer, who was not an elected official at the time the dam was dedicated in fall 2014, alluded to the community-wide debate over the option to expand the Ragged Mountain Reservoir, which ultimately sacrificed some land, trees and natural habitat. “Good infrastructure projects happen when political will meets technical expertise and smart planning,” Signer said. “You see here a rebuttal to all of the cynicism that’s caused this wave in our country of people rejecting public service and stakeholders and the people who plow so many hours into projects like this … that serve the common good.”

Albemarle Board of Supervisors Chairwoman Liz Palmer spoke to the future of the site and the community. She mentioned the failed bid to attract West Coast-based Deschutes Brewery, saying that the company may have not bothered to consider an East Coast facility in Albemarle if the region did not have a reliable and ample supply of clean water.

“This reservoir is only part of the [water supply] plan,” she said. “This is not the end of our responsibility to provide raw water infrastructure. We face tremendous challenges: aging infrastructure, climate change, population growth and competing resource priorities.”

Michael Gaffney, chairman of the RWSA Board of Directors, said the next phase of the supply plan will replace aging pipelines that transfer water among three regional reservoirs: Ragged Mountain, Sugar Hollow and South Fork Rivanna. Both Gaffney and Palmer said building a new pipeline connecting Ragged Mountain and the South Fork Rivanna Reservoir is one of the priorities. “The South Fork [Rivanna Reservoir] is losing capacity,” Gaffney said. “With our biggest water treatment plant there, and the water supply being lower, we need to be able to get this water [from Ragged Mountain] there.”

Thursday’s event included a number of activities, exhibits with information about the dam and interactive demonstrations. At the end of the event, a time capsule was sunk into the reservoir. The capsule included several documents, such as an event flyer, a May 5 copy of The Daily Progress and consumer confidence reports for both the city’s Public Works department and the Albemarle County Service Authority, the region’s two water and wastewater service retailers. According to Teri Kent, RWSA communications manager, it'll be opened in 10 years.

(Keeping the flow moving.)

**Releases to increase from Fort Randall, Gavins Point dams**

By Associated Press, May 6, 2016, shorelinemedia.net.

YANKTON, S.D. (AP) — The Army Corps of Engineers plans to increase water releases from the Fort Randall and Gavins Point dams on the Missouri River. The corps has been holding back water to avoid downstream flooding. Jody Farhat with the corps says heavy late-April rains increased runoff into the reservoir system, and adjustments had to be made to avoid localized flooding downstream. The Yankton Daily Press & Dakotan reports (http://bit.ly/1NlMItD ) releases are being increased in part to protect the endangered least tern and threatened piping plover. The higher releases will prevent the birds from nesting on low sandbars that would be flooded later.

*Copy obtained from the National Performance of Dams Program: [http://npdp.stanford.edu](http://npdp.stanford.edu)*
this summer when higher releases are needed to support navigation. Farhat says despite the recent rises in river levels, the overall system is well prepared to handle any future events.

(Dam removal of the week.)

Tel-Electric Dam removal project design work expected to be completed in 2016

By Jim Therrien, 05/09/2016, berkshireeagle.com

PITTSFIELD, MA — Project design work for a long-planned removal of the Tel-Electric Dam from the West Branch of the Housatonic River in downtown Pittsfield is expected to be completed later this year, allowing the work to begin early in 2017. Alex Hackman, of the state Division of Ecological Restoration of the Department of Fish and Game, said the project is a "multi-stakeholder" effort, involving several state agencies, the city and the U.S. Fish and Wildlife Service. The dam and abandoned hydropower facility, retaining walls and a bridge that supports an unused rail line upstream from the structure — now dilapidated — are expected to be removed. That and related work will strive to restore the ecological quality of the section of the Housatonic by restoring a continuity of water flow, and include removal of built-up sediment and debris behind the dam. Other goals, Hackman said, include improving public safety and reducing the chances of flooding, as well as facilitating greenway enhancements along the riverbanks. The river in that section flows in a meandering fashion past Wahconah Park in Pittsfield before meeting up downstream with the East Branch of the river and heading toward the Lenox line. The dam structure, now owned by Nash family, is adjacent a brick mill building and behind the rear parking area for the Clock Tower building on South Church Street, which houses The Berkshire Eagle, Hackman said.

The estimated $1.5 million in funding required for the project will come from $750,000 awarded the city in 2008 as part of the GE consent decree settlement related to PCB pollution of the river from Pittsfield industrial sites, and federal grant funding allocated to the state. The Division of Ecological Restoration, which works on dam removal projects and other waterway restoration efforts in the state, also has provided in-kind support in project management since 2006, and $30,000 for a project feasibility study. James McGrath, Pittsfield parks and natural resources program manager, said the city hopes to prevent the effects of any uncontrolled breach of the 96-year-old dam to ensure public safety, and restore original river habitat and improve fish and wildlife movement through the site. He said the project also is expected to improve water quality and river temperatures and oxygen levels for fishlife, while improving public access to the Housatonic and eliminating navigation hazards. Spin-off benefits, McGrath said Thursday,

Copy obtained from the National Performance of Dams Program: http://npdp.stanford.edu
"include urban revitalization of the river corridor and — generally — restoration of a public resource."

The Tel-Electric and abandoned hydropower facility, retaining walls and a bridge that supports an unused rail line upstream from the structure — now dilapidated — are expected to be removed. That and related work will strive to restore the ecological quality of the section of the Housatonic by restoring a continuity of water flow, and include removal of built-up sediment and debris behind the dam. (Ben Garver — The Berkshire Eagle | photos.berkshireeagle.com) The dam area was proposed in 2008 as part of a Westside Riverway along the West Branch of the Housatonic between Wahconah Park and Clapp Park on West Housatonic Street. According to a report prepared in April for Hackman and the DER by project managers, Princeton Hydro, LLC, of South Glastonbury, Conn., the Massachusetts Office of Dam Safety "found the dam to be in overall poor condition with significant operational or maintenance deficiencies" in 2000. That assessment prompted discussions between the dam site owners, the city and DER, and led to proposed removal of the structure. Receipt of grant and settlement damages funding followed two years later. Princeton Hydro late last month submitted an Expanded Environmental Notification Form to request from the Executive Office of Energy and Environmental Affairs a waiver for the dam removal project from the need for a full environmental impact report. Citing work and "extensive analysis completed to date," Paul Woodworth of Princeton Hydro writes that preparation of a full EIR would not "serve to avoid or minimize damage to the environment," as described in environmental regulation. The project, instead, "rather serves to improve the environment," according to the letter to the Executive Office of Energy and Environmental Affairs. Hackman said during an interview that the DER often requests a waiver from the full EIR on such projects. In this case, he said, considerable data already has been collected about the site. He said that during the planning and design process this year, the Massachusetts Environmental Policy Act office will inform DER what permits will be required for the dam removal and related work. Hackman said a public comment period on developments in the planning process will be posted next week and a site visit will be scheduled. The notice will appear in the MEPA Environmental Monitor on Wednesday, he said, with comments due by June 10. Opinions from officials from various state agencies or departments, environmental organizations and the general public are expected, he said, adding that he intends to schedule a visit to the site or tours for interested parties. The Tel-Electric (or Mill Street) Dam is described as a privately owned, abandoned, run-of-river style hydropower facility that originally provided water power to nearby mills. It is 18 feet high and 40 feet wide with a 30-foot, curved spillway face. Retaining walls on both sides of the river are said to be in fair to poor condition. The concrete arch Mill Street bridge, about 200 feet downstream from the dam, is in a deteriorated condition, and the posted weight limit has been reduced to 8 tons. The property totals 3.11 acres around the dam structure. Located about 75 feet upstream is the abandoned steel railroad bridge, dating to about 1940, which is the one designated for removal.

(Some people take exception.)

Irrigators claim judge erred in hydropower ruling
By Mateusz Perkowski, Capital Press, May 9, 2016, capitalpress.com

Irrigators who rely on the Columbia and Snake rivers claim there’s a serious error in a recent court ruling that rebukes Northwest hydropower operations. U.S. District Judge Michael Simon recently held the federal government’s plan for operating 14 Northwest hydroelectric dams unlawfully jeopardizes threatened and endangered fish. The ruling criticized several federal
agencies for disobeying earlier orders to make “more aggressive changes” to the hydropower system and for spending billions of dollars on habitat restoration with little effect on imperiled species. Federal agencies have repeatedly been urged to consider breaching or removing four hydropower dams along the Snake River to ease fish passage, but they have “ignored these admonishments” and “done their utmost to avoid considering” this action “for decades,” the judge said. These findings were key in Simon’s conclusion that federal plans to mitigate negative fish impacts were “arbitrary and capricious” in violation of the National Environmental Policy Act. However, the Columbia-Snake River Irrigators Association argues the judge is wrong because the government has studied in detail the possibility of breaching the dams.

“It’s a major procedural error. Frankly, it shows the level of bias in the decision,” said Darryll Olsen, board representative of the CSRIA. The group has filed a motion asking Simon to correct his opinion because multiple studies have examined breaching the dams, including a seven-year analysis that rejected dam removal because it would increase water temperatures to the detriment of fish. The CSRIA hopes the motion will persuade Simon to reconsider his ruling or convince federal agencies to challenge the decision before the 9th U.S. Circuit Court of Appeals, Olsen said. “To suggest it has not been reviewed is dead wrong,” he said. “I don’t think he can just blow it off.” Removing the dams wouldn’t improve the survival of protected fish or end litigation, so that option wouldn’t help irrigators affected by the lawsuit, Olsen said. Irrigators are concerned about the hydropower litigation — which has lasted for 15 years — for multiple reasons, he said. “It makes anything we do in water management more difficult.” Requiring more water to be left in-stream for fish would reduce supplies for irrigators if state regulators refuse to issue new water rights or require irrigators to give up water when transferring or changing water rights, he said. Environmentalists want to reduce the amount of water stored in reservoirs, claiming this would improve flow rates, which would further reduce availability. The enormous cost of changing the hydropower system to aid fish recovery also drives up the cost of electricity, on which irrigators spend a lot of money for pumping water. “We are definitely worried because you never know how state and federal agencies will react,” Olsen said. The CSRIA hopes that judge’s most recent rejection of federal plans for the hydropower system — the
fourth such ruling — may spur the formation of a special “Endangered Species Act Committee,” also known as a “God Squad,” which could exempt the dams from ESA requirements as long as mitigation measures are implemented. Otherwise, it’s unlikely the litigation by environmental groups will cease, Olsen said. “They can simply challenge this thing ad nauseum.”

(Nutcase!)
http://www.msn.com/en-us/sports/more-sports/daredevil-doesnt-give-a-dam/vi-BBsQ3gK

(If there’s a dam upstream, you know who gets sued.)

**Homeowners Sue Army Base After Dam Fails in Massive Flood**
By The Associated Press, May 10, 2016, abcnews.go.com

COLUMBIA, S.C. — About a dozen homeowners in a neighborhood next to Fort Jackson are suing the federal government for at least $20 million after dams on the Army base failed during last October’s massive floods. The residents of the upscale King’s Grant neighborhood said the Army knew the first dam to fail was deficient after a 2013 inspection and made no repairs, according to the lawsuit filed Monday. The lawsuit also said the federal government did not reduce the level of the lake behind the dam even as forecasts called for at least a foot of rain in the days before the deluge started. Fort Jackson spokesman Patrick Jones said Tuesday that officials don’t comment on pending lawsuits. Four dams failed at Fort Jackson during the massive flood, and authorities have said little about the inspection histories of the dams or repairs they might have done before the flood.

The lawsuit focuses on an earthen dam built in 1940 to create Semmes Lake. Inspectors looked at the dam in 2013 and sent an email telling the federal government it was a serious hazard, which is the second worst rating for a structure. The detailed inspection report from the dam has not been released, according to court papers. The Semmes Lake dam failed about 3 a.m., on Oct. 3 not long after rainfall rates of 2 inches an hour started to fall. Meteorologists said the area received 2 feet of rain in about 12 hours. Some 200 million gallons of water rushed through a hole in the earthen dam down Wildcat Creek into the King’s Grant neighborhood. The water rushed through for about five hours before receding, according to court papers. More lawsuits are possible. A major business area and a large apartment complex are further downstream and also suffered catastrophic flooding.

(Not much of a dam.)

**Dismantling of 50-year-old dam aims to open water for fishing, boating**
$690,000 project underway near Buffalo Creek County Park
By Mitchell Schmidt, The Gazette, May 10, 2016 at 6:35 pm | thegazette.com

A Linn County and Iowa Department of Natural Resources project has shaved nearly three feet off the top of Buffalo Creek Dam near Coggon. As silt — which has backed up behind the dam over its roughly 50 years in operation — filters downstream, plans are in place to take as much as another seven feet off the Linn County dam over the next three to five years. When the nearly $700,000 project is finished, the low-head dam is to be replaced by rock arch rapids, which aim to enhance public safety and open the waterway to kayakers and fish alike. Ryan Schlader, community outreach with Linn County Conservation, said the first stage of the project, which took place over the course of two weeks in March, is one of several steps to eliminate the dam. “It’s a project that takes place over time,” he said. “We’re just waiting for the next high-water event, meaning some heavy rains or flooding in that area. Once the water passes, that will loosen
up the silt and we’re able to get the contractor back out there and do it once again.” The Buffalo Creek Dam, which cannot regulate or control water flow, was built in 1965 to create a body of water to provide a place for recreational boating and fishing at the nearby Buffalo Creek County Park. However, 50 years of impounded silt behind the dam created an area inhospitable for most aquatic wildlife and an unappealing spot for recreation, Schlader said. In 2014, Linn County Conservation began soliciting feedback from the public to find the appropriate course of action for the dam. Last fall, Reinbeck’s Peterson Contractor Inc. was awarded the roughly $690,000 contract to mitigate the dam.

The entire project, including design, engineering, wetland mitigation and about $100,000 in contingency funds, could come in at around $970,000, according to Schlader. Project funding has come from the Iowa DNR’s Dam Mitigation Program and Fish Habitat Program, U.S. Fish and Wildlife Service and local sources. Nate Hoogeveen, director of river programs with the Iowa Department of Natural Resources, said dam mitigation projects can be costly, but the DNR works with communities to find the best option available. “I think a unique thing we’re doing from an Iowa Department of Natural Resources standpoint is, helping each of these communities and our partners get these projects the right size,” Hoogeveen said. Iowa DNR has placed priority on eliminating the state’s more than 150 low-head dams, which have been deemed unsafe, as their design creates a dangerous recirculating current of water, Hoogeveen said. Hoogeveen said Iowa’s low-head dams — often called roller dams — average one and a half fatalities a year. “First and foremost it’s safety, these structures are inherently dangerous,” he said. In about the last three years, Iowa has reduced its stock of low-head dams by about 15 structures, but 162 still remain. On top of safety, transforming the Buffalo Creek Dam into a stretch of rapids also is to filter the impounded silt out of the recreation area, revitalize mussel habitats downstream and open the waterway to aquatic life and boaters. “We’ll be able to tell a story about a recovery on this stream,” Hoogeveen said. “How often do we get to say that in Iowa?”

(Repeat of amazing goats.)

Watch These Amazing Alpine Goats Scale a Near-Vertical Dam
The goats make the dangerous climb all for a lick of salt.
By Lauren Young, May 10, 2016, atlasobscura.com

Click on the URL below while holding down the CTRL key to see the video.
http://www.atlasobscura.com/articles/watch-these-amazing-alpine-goats-scale-a-nearvertical-dam

(Better be sure.)

Is Marshfield Dam ready for future flooding?
By Alexei Rubenstein, May 11, 2016, wcax.com

MARSHFIELD, Vt. - Tropical Storm Irene and heavy rains that spring caused millions of dollars in damage around Central Vermont. In both of those storms, the Marshfield Dam came precariously close to an emergency release that could have added to the price tag. With experts predictions of more frequent and severe flooding, some downstream communities are looking for assurances about the dam’s safety. Irene brought

Copy obtained from the National Performance of Dams Program: http://npdp.stanford.edu
well-documented devastation across Vermont. In addition to trying to get the lights back on for much of the state, Green Mountain Power was also dealing with potentially dangerous water levels at its 32 hydro facilities, including the Marshfield Dam. "It was a scary evening and I was concerned with the safety of our field guys, as well as we were at a point where we potentially have to release some more water out of here to maintain the stability of the dam," said Jason Lisai, Green Mountain Power. Bram Towbin, who chairs the Plainfield Selectboard, says Irene and another close call in May of that year had him worried about the dam's safety. He recently organized a site visit with GMP and other local officials to better understand how the dam and its nearby hydroelectric station operate.

"We live in new times where there might be more adverse flood events," said Towbin. Plainfield is updating their hazard mitigation plans and Towbin says the dam is a big part of that. "We live right on the Great Brook, that's one threat. The dam here, should there be a breach, would cause significant problems, so we're very interested in looking at the infrastructure and making sure everything is up to snuff," said Towbin. Despite crumbling concrete on the surface, Lisai says the nearly century-old earthen dam has passed all of its state inspections and is solid, and that backup communications like a cell tower installed in 2011 have helped. "Absolutely, this site is a safely operated and maintained site, but as there's better technology, 10 years ago what our field staff had to communicate safely and effectively is completely different than what our folks have now," said Lisai. Except for a bypass pipe that was under construction, the dam operated as it was supposed to in 2011. Water levels that night rose 8 feet from the top and triggered a sequence of spillway releases. Crews had already raised the flash boards. The last resort would have been to release the spillway's stop logs underneath which would have added to downstream flooding, but that was not needed. Emergency officials had already started to evacuate up to 350 downstream homes in Marshfield, Plainfield and East Montpelier when the rains started to let up. "It was about one o'clock in the morning, rainfall had receded and flows had leveled off," said Lisai.

Over the last seven years, GMP has invested millions in upgrades to the hydro plant and the piping along Route 2 that leads to it. Lisai says further scheduled upgrades to the dam itself, like automatic spillway controls and concrete resurfacing, will make it even more reliable. "This is a beautiful facility but it is a potentially hazardous facility and we want to make sure everyone's comfortable with that," said Lisai. For his part, Towbin says the visit left him with a better technical understanding of the dam and emergency plans. "We want to learn as much as possible before adverse events," said Towbin. It's an education in managing the state's dams during extreme weather events.

(Oops.)

Control tower floods at dam
By Reggie Ellis, May 11, 2016, thesungazette.com

Terminus Dam at Lake Kaweah isn't having any trouble holding on to water in this wet year, but it is having trouble letting go of it. That's because the main gate that releases water downstream for flood control and irrigation uses can't be opened, at least not for now. Phil Deffenbaugh, manager of Kaweah Lake/Terminus Dam for the Army Corps of Engineers (ACE), said a two-inch pipe busted inside the control tower on April 24. Deffenbaugh said an emergency flood pump was activated and working the day the pipe broke but stopped working sometime overnight. "We aren't sure what caused the pump to stop working," Deffenbaugh said. "The motor could have overheated or water could have sprayed on the pump and shorted it out."

When work crews went returned to inspect the damage on May 1,
they found that the computerized control room was under 10 feet of water and all of the equipment was “completely ruined.” The tower controls three large gates deep in the lake that release water to farmers downstream. But water is still being released through a secondary system at the power plant. Deffenbaugh said the power plant, which operates independently of the dam, can release about 1,700 cubic feet per second (cps), which is more than enough to keep up with the demand in May. But Deffenbaugh said that won’t be enough during peak irrigation months this summer, which is normally supplied from the dam’s outlet gates. Deffenbaugh said those gates can release as much as 6,000 cubic feet per second collectively. “We expect to be operational within a few weeks,” Deffenbaugh said.

Calvin Foster, Manager for ACE’s Southern Operations Area, said he is not sure what it will cost to fix the control room but estimated it to be in the millions. Divers arrived on Monday to help assess the damage of the control room and tower. Foster did say the money to fix the problem would not come from ACE’s operating budget, but rather an emergency fund. “We have the means with emergency funding,” Foster said. “We are not expecting any delay in funds. Dam safety is a big issue and we deal with it immediately.” Neither Deffenbaugh nor Foster could answer why the computerized control room was located near the bottom of the tower. Deffenbaugh did say the control room was built in 1989 to coordinate releases with the power plant at the lake. Deffenbaugh said the size of the gate and the immense water pressure placed on it by the voluminous lake make it impossible to open the gate without machines. “The gate is 5 feet wide and 9 feet tall, you aren’t going to manually open it,” Deffenbaugh said. The power plant through which water is currently being released is operated by the Kaweah River Power Authority, a joint powers agreement between the Kaweah Delta Water Conservation District and the Tulare Irrigation District. The conservation district owns 75% of the power plant and provides the staff to operate it. Mark Larson, general manager of the conservation district, said the plant works in concert with the dam to release water downstream into the lower Kaweah River. Normally when ACE receives a water release request from the dam’s various water rights holders, a portion of that is sent to the power plant to run through the turbines to generate hydroelectric power during times of peak demand for electricity. Larson said water can be released through the power plant without generating electricity which can only be produced when Southern California Edison has enough demand to place extra electricity onto its power grid.

“The power plant has the ability to make releases but can’t meet all of the demand in peak months,” Larson said.

Larson said the power plant has been able to accommodate all of the water release requests so far but would not be able to keep up demand in the summer. “If the tower is not up and functioning fairly soon, farmers will have to do more pumping out of the underground this summer,” Larson said. However, Larson said the additional pumping should not have a net effect on groundwater levels because farmers would cease pumping when the tower and gates became operational later in the summer, when surface supplies often run out. “Whether they pump now or later in the summer, we still have a decent water supply this year,” Larson said. “There won’t be any impact to the groundwater table due to this issue.” Flood control, the dam’s primary function, should not be a problem. Lake Kaweah is currently at 60% capacity, or 113,000 acre feet of a possible 185,000 acre feet. Based on the forecast for May and the snowpack level in the mountains, Larson said there is no expectation that the lake will reach capacity this year. “Originally it looked like we might reach capacity this summer but the storms kind of trickled out,” Larson said. “But even if it did reach capacity, it seems like they will have a fix in place by then. They are working hard locally and I am pleased with how they are taking this on.”
Proposed Cannonsville hydroelectric facility receives extension
midhudsonnews.com, 5/5/16

DEPOSIT, NY – The Federal Energy Regulatory Commission granted a two-year extension of its license to build a hydroelectric facility on the release works at Cannonsville Reservoir, operated by the New York City Department of Environmental Protection. The license originally required DEP to begin construction next month. The city will use the additional time to reassess the design assumptions that yielded cost and revenue estimates for the power plant and to reevaluate whether, based on additional technical information, the project can be constructed in a manner that is compatible with the highest standards of dam safety. New York City has been working with members of Congress to pass federal legislation that would postpone the project by eight years because officials believe it will likely take longer than two years to hire expert engineers and perform the new analysis.

(Hydropower, the dependable renewable.)

Half of Ohio city's energy to come from water as plant opens
By The Associated Press, whio.com, 5/7/16

HAMILTON, Ohio — A southwest Ohio city expects to produce nearly half its energy this year using hydroelectricity, now that a $685 million hydroelectric plant about 30 miles southeast of Cincinnati has become fully operational. The Meldahl Hydroelectric Facility at the Capt. Anthony Meldahl Locks and Dam on the Ohio river has been operating for more than two weeks, the Hamilton-Middletown Journal-News reported. Construction began six years ago. The city of Hamilton expects 49.2 percent of its energy portfolio to come from either buying or creating hydroelectric power this year, the newspaper said.

The city produced about 35 percent of its power through hydroelectricity in 2003, and less than 30 percent in 2015. Hamilton estimates that nearly 17 percent of its power will come from natural gas this year, and more than 30 percent from coal. The hydroelectric plant is the largest of its kind on the Ohio River, The Akron Beacon Journal reported. It can power more than 100,000 homes. Forty-seven other American Municipal Power Inc. member communities in four states will also receive electricity from the plant, including five in northeastern Ohio. Hamilton also buys electricity from the New York Power Authority's hydroelectric plants through the Columbus-based energy wholesaler. AMP has also planned to build three other hydroelectric plants on the Ohio River and is launching solar-energy-production, spokesman Kent Carson said.

(Hydro, the most efficient renewable.)

Press Release
Hydro-Québec's 14th Sustainability Report: An Enviable Performance
montrealgazette.com

MONTREAL, May 9, 2016 /CNW Telbec/ - Hydro-Québec is proud to announce the publication of its Sustainability Report 2015, which highlights the utility’s performance with regard to its main environmental, social, economic and governance issues. With 99.8% of its output generated from

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water, Hydro-Québec posted enviable results. "One of the things that puts us in such a great position, as a global shift to renewable energy takes place with a view to reducing greenhouse gas emissions, is the societal choice we made some fifty years ago to focus on clean, renewable hydropower. Today, more than 99% of the electricity generated by Hydro-Québec is clean, renewable energy, which contributes to the quality of life of Quebecers. The benefits extend to our export markets, as well, and we're very proud of that," said Éric Martel, Hydro-Québec's President and Chief Executive Officer.

**Contribution to climate stability and environmental protection**

Hydro-Québec is a known leader in hydropower, which causes very little pollution. The utility is also a major contributor to air quality in Québec and plays a key role in the Québec economy. The province's GHG emissions per capita are among the lowest in North America. The company has reduced its GHG emissions by 88% compared to 1990, the baseline year chosen by the Québec government for its reduction target. This is a significant contribution to the government's target of 37.5% by 2030. In addition, thanks to its net exports of electricity, Hydro-Québec extends the benefits of using clean energy to the entire continent. Exports in 2015 avoided GHG emissions equivalent to those produced by 1.85 million cars in a year. Since its introduction in 2003, the Energy Efficiency Plan (EEP) has saved 8.8 TWh, the consumption equivalent of 500,000 households.

**Responsibility to our customers**

Hydro-Québec endeavors to provide reliable, fast, attentive and competitively priced service. For example, this involves reducing the service restoration time after a planned or unscheduled outage. The system therefore needs to be properly maintained, updated and reinforced. The company completed the installation of 3.7 million next-generation meters throughout Québec, three years ahead of schedule. Improvements are already noticeable in terms of productivity, new services offered and distribution system management. Hydro-Québec's residential rates are among the lowest in North America. They are half the rates charged in Toronto and one quarter of New York City's rates.

**Social acceptability of projects and operations**

Our projects and operations give us a presence throughout Québec. In 2015, we had over 1,000 active electricity generation and transmission projects. More than 30 years ago, we developed mechanisms for communicating with stakeholders. We endeavor to choose project variants with the least social, environmental, technical and economic impacts. In the past year, more than 100 projects have involved a public participation process.

**Commitment to technological innovation and transportation electrification**

In 2015, Hydro-Québec invested $130 million in R&D at its research institute. IREQ is a world leader in innovation in the fields of electricity generation, transmission, distribution and storage. Its scientists, technicians, engineers and specialists develop technological solutions to support the company's operations and open up new avenues for growth. IREQ has 1,035 patents. In 2015, Hydro-Québec contributed $7.9 million in funding to universities and research. With 577 charging stations, including 29 fast-charge stations (400 V), installed in 16 of Québec's 17 administrative regions at the end of 2015, the Electric Circuit is Canada's first public charging network. It consists of 130 participating companies, institutions and municipalities that have purchased and installed charging stations.

**Socioeconomic contribution**

In Québec, the value added by the electricity industry was estimated to be about $12 billion in 2015. Since Hydro-Québec accounts for over 90% of that industry, its share of the Québec economy is about 4% of the GDP. For generation and transmission projects, partnerships are created with communities and the company provides development funding. Hydro-Québec also helps to improve the environment and preserve and enhance Québec's natural heritage. The company's donations and sponsorships support organizations in all parts of Québec.
Hydro-Québec's contribution to the Québec economy was $6.2 billion in 2015. In addition to the $2,360 million dividend paid to the Québec government, the company contributed $2,827 million in goods and services procured from Québec-based companies, water royalties of $654 million, $37 million in municipal and school taxes and $27 million in community investments. For more information, please consult the Sustainability Report 2015 and Hydro-Québec's specialized Web site on sustainable development.

Environment:
(They won't be satisfied until the dams are removed. Is Bonneville dam next?)

Judge: Salmon recovery requires big dam changes
By GENE JOHNSON, Associated Press, May 5, 2016, chinookobserver.com

SEATTLE, WA — A massive habitat restoration effort by the U.S. government doesn’t do nearly enough to improve Northwest salmon runs, a federal judge ruled Thursday, handing a major victory to conservationists, anglers and others who hope to someday see four dams on the Snake River breached to make way for the fish. In a long-running lawsuit, U.S. District Judge Michael H. Simon in Portland, Oregon, rejected the federal government’s latest plan for offsetting the damage that dams in the Columbia River Basin pose to salmon, saying it violates the Endangered Species Act and the National Environmental Policy Act. It was the fifth time since 2001 that the court has invalidated the government’s plans, and rulings in the case show increasing impatience with federal agencies, including NOAA Fisheries, the Army Corps of Engineers and the Bureau of Reclamation. In his 149-page opinion, Simon found that for the past 20 years, the agencies have focused on trying to revive the basin’s 13 endangered and threatened salmon and steelhead runs by restoring habitat without compromising the generation of electricity.

"These efforts have already cost billions of dollars, yet they are failing," he wrote. Meanwhile, he said, federal agencies have “done their utmost” to avoid even considering breaching the Snake River dams — despite strong suggestions to do so by Judge James Redden, who oversaw the case from 2001 to 2011.

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Among those who sued the government are the Nez Perce Tribe and the state of Oregon; conservation groups including the Sierra Club, National Wildlife Federation, American Rivers and Columbia Riverkeeper; and fishing organizations including the Pacific Coast Federation of Fishermen’s Associations. The judge ordered the government to come up with a new plan by March 2018, but he said the invalid 2014 plan could nevertheless remain in effect until then because it does provide some level of protection for the salmon. He said he would not dictate what options the government must consider in the new plan, but he noted that a proper analysis under federal law “may well require consideration of the reasonable alternative of breaching, bypassing, or removing one or more of the four Lower Snake River Dams.” Many biologists say breaching the dams is a crucial step for bringing back populations of salmon and steelhead that were decimated when the dams blocked upriver passage to their breeding grounds. Allowing the water to flow freely would also reduce its temperature, especially important in the face of global warming. Last summer, hundreds of thousands of adult salmon died because of warm temperatures in the reservoirs behind the Columbia and Snake River dams, said Todd True, a lawyer with the environmental law firm Earthjustice who represents some of the plaintiffs. “We need to seriously consider a plan that retires and removes the four lower Snake River dams,” he said in a written statement. “Only action on this scale has the potential to allow wild salmon to survive and recover in light of the vivid threat they face from a warming climate.” Oregon officials have suggested another approach: spilling more water over the dams to improve salmon survival rates.

The federal agencies were disappointed in the ruling, NOAA spokesman Michael Milstein said in an emailed statement. “The decision will require time and effort to analyze and fully understand,” the statement said. “We sincerely appreciate the region’s unprecedented collaboration and commitment on behalf of salmon, and the important progress that it has produced. We’ll continue our efforts with our partners to protect salmon and steelhead in the Basin and work toward their recovery.” The Bonneville Power Administration, which operates the dams and has touted the habitat restoration efforts, declined to comment Wednesday except to say it was reviewing the decision. Northwest RiverPartners, an alliance of farmers, utilities, ports and businesses, intervened in the lawsuit on the side of the government. In a written statement, spokesman Terry Flores said the government’s plan was “the most science-based, comprehensive and expensive effort to restore an endangered species in the nation.” “The decision potentially unwinds years of collaboration between federal agencies, Northwest states and tribes, and other stakeholders,” Flores said. “The ruling does not provide a path forward for the region, other than re-doing the plan’s analysis and conducting an evaluation of alternatives, including dam removal, under the National Environmental Policy Act.” In addition to suggesting the agencies consider breaching the dams, the judge found several aspects of the government’s plan inadequate. It failed to properly consider the potentially catastrophic impact of climate change on the fish and was based on a dubious legal framework that allowed the agencies to conclude the species were “trending toward recovery” even with very little actual improvement in salmon numbers, he said.

(I’d find another place to have dinner.)

47 sea lions killed by wildlife workers this year at dam

By Cox Media Group National Content Desk, 5/7/16, whio.com

PORTLAND, Ore. — Each year in early spring, opportunistic sea lions feast on thousands of migrating fish along the Columbia River at the Bonneville Dam. The federal government gave permission to wildlife agencies in Washington and Oregon to kill and remove California sea lions seen preying on salmon, sturgeon and steelhead populations in 2008. Officials have killed 47 sea lions under the
management plan so far this year, according to the Oregon Department of Fish and Wildlife. However, the government’s approval for the plan runs out in June and animal rights groups are working to stop its renewal. “This is, if you will, a kind of treadmill of death. You put the animals on it and you’re never gonna get off because it isn’t getting you anywhere. What you are doing is not making any progress at all. Which means you are killing them for nothing,” Sharon Young with the Humane Society told KGW.

The plan was put into place to save thinning fish populations. Sea lions captured about 5,800 salmonids, 34 sturgeon and 500 steelhead, according to a 2015 four-month monitoring report by the Oregon Department of Fish and Wildlife. “These are the fish that a lot of people are working really hard to save by improving habitat and making improvements at the dam and we don’t want to lose ground by having them be eaten by sea lions on their way back to spawn,” Michael Milstein, a NOAA spokesman, told KGW. Officials permanently removed 32 of sea lions in 2015. They are authorized to use lethal measures on up to 93 sea lions a year, according to the Oregon Department of Fish and Wildlife. “I don’t think we need to kill every sea lion we see. That’s not the point here,” Bill Monroe Jr., a sport fishing guide who supports the program, told KGW. “The point here is to cull the population to a point where it won’t have such a huge impact.”

Other Stuff:
(A whole lot of shakin’ going on.)
Swarm of earthquakes strikes Mount St. Helens
By Madison Park, CNN, Sat May 7, 2016, cnn.com

Although there are no signs of an imminent eruption, the volcano is recharging, scientists say. Mount St. Helens is in Washington state, 95 miles south of Seattle and about 55 miles northeast of Portland, OR. The earthquakes have been measured at a magnitude of 0.5 or less and the largest was at 1.3. They’ve been measured about 1.2 to four miles underneath the surface. With such small magnitudes and such depths, you wouldn't be able to feel the earthquakes on the surface. But it’s not the magnitude that has gotten scientists attention -- it's the frequency. They've become increasingly common since March 14, "reaching nearly 40 located earthquakes per week," according to the USGS.

The eruption of Mount St. Helens: Mount St. Helens erupted in Washington state on May 18, 1980, triggered by an earthquake. The USGS says the volcano’s collection of magma is re-pressurizing. The process can continue for years without an eruption. Scientists have seen similar patterns of small earthquake swarms in 2013, 2014 and in the 1990s, according to the USGS. Mount St. Helens erupted on May 18, 1980, blowing off more than 1,000 feet from the top of the mountain, leaving a huge crater and spewing hot ash across the Northwest. It killed 57 people, ignited forest fires from the scattering of hot ash and caused floods as the snow melted from mountain tops. Since then, Mount
St. Helens is one of the closely monitored volcanoes on the planet. CNN's Dave Alsup contributed to this report.

(The Mt. St. Helens eruption story. If it had blown down the other side of the volcano it could have failed two major dams whose reservoirs were drawn down as a precaution.)

Reliving The Mount St Helens Eruption Of 1980
8 May 2016, by James Maynard Tech Times, techtimes.com

Mount St. Helens is experiencing earthquakes as vast amounts of magma move underneath its rocky exterior. Although there are no definite signs of an impending eruption, the rumblings are bringing back memories of the massive explosion that took place there decades ago. On May 18, 1980, Mount St. Helens unleashed massive quantities of rock, ash and debris into the air as a powerful eruption shook the once-quiet mountainside. The accompanying explosion ripped out the entire northern flank of the volcano and generated massive bolts of lightning that raced through the sky for half a mile.

The initial blast from the volcano, ripping through the northern face of the mountain, flattened nearly 150,000 acres of Douglas fir trees in a fan-shaped pattern. This explosion triggered one of the largest landslides ever witnessed in recorded history. Tumbling down the mountainside, sweeping everything in its path, were lahars events - volcanic mud flows. These were accompanied by one of the most dangerous of all effects of volcanoes - pyroclastic flows. These deadly emulsions of semi-solid fragments of molten rock and toxic gases are able to tear through a region, or a populace, at more than 60 miles per hour.

In the skies above the geological melee, geologists Keith and Dorothy Stoffel were flying in an aircraft just 1,300 feet above the summit of the volcano as it came to life. Amid the chaos of random bolts of lightning, a massive cloud quickly grew in size, threatening their small plane. Only by racing south were the geologists able to safely escape the bedlam. "Over the course of the day, prevailing winds blew 520 million tons of ash eastward across the United States and caused complete darkness in Spokane, Washington, 400 kilometers (250 miles) volcano. Major ash falls occurred as far away as central Montana, and ash fell visibly as far eastward as the Great Plains of the Central United States, more than 1,500 kilometers (930 miles) away," the U.S. Geological Survey (USGS) reports.

Months before the massive event, the USGS placed a monitoring station in Vancouver, Washington, in order to monitor the build-up. One of their observers, David Johnston, was camping just a few miles north of the mountain when he became a victim of the volcanic fury. The eruption took the lives of the 57 people, including Johnston. Coldwater Ridge, near the site of his death, was renamed in his honor. Before the eruption of Mount St. Helens, most Americans were unaware that such powerful volcanoes within the continental United States could still roar to life with little warning. The stratovolcano was previously known for its picturesque views and rugged

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Mt. St. Helens is less than about 37,000 years old, but it has been especially active over the last 4000 years. Since about 1400 A.D., eruptions have occurred at a rate of about one per 100 years. Before the 1980 eruption, it had been 130 years since Mt. St. Helens last erupted, San Diego State University reports on its website. Following this main eruption, Mount St. Helens also released magma on at least six other days over the next seven months. This volcanic event became the most-studied eruption of the 20th century. In 1982, Congress declared the mountain a National Volcanic Monument. Now, as earthquakes begin to dominate the region once more, the possibility that Mount St. Helens will once again release its fury rises.

Facing the Realities of Renewable Energy
May 9, 2016, by Jay Lehr, Ph.D., science director at The Heartland Institute, heartland.org, 5/9/16

The thirst for renewable energy is nearly unquenchable, but inefficiencies inherent in renewable power production and high costs relative to traditional forms of energy have long prevented widespread utilization. Government subsidies are the only reason most renewable energy production is utilized outside of niche uses. More than 90 percent of U.S. energy comes from petroleum, natural gas, coal, and uranium, as shown in Figure 1. Of the 9 percent contributed from renewable energy sources, the venerable ones, hydropower and biomass (wood and liquid ethanol), provide over 80 percent of all renewable energy produced. Contrary to the impression promoted by renewable energy enthusiasts, the great majority of renewable energy is not wind and solar.

Forty percent of the United States’ primary energy is electricity, with renewables accounting for 13 percent, the largest portion of which is provided by firewood and hydropower. Owing to mandates, such as Renewable Portfolio Standards and subsidies, wind power’s share of renewably produced electricity has grown to 23 percent, although it is still just 3 percent of our total electricity. Hydropower turbines and wind turbines have one thing in common: They convert mechanical energy into electricity by spinning a generator, with no need for an engine to convert heat to mechanical energy. Hydropower is created when water stored behind a dam flows through a turbine that spins a generator. Currently accounting for 8 percent of electricity production, growth in hydropower production is limited by the fact the best dam sites are already in use.

Understanding Wind Power

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Wind power is generated when moving air turns the blades of a turbine. There is wind everywhere, but wind power requires fairly constant strong winds, which are found only in specific regions. In order to maintain enough energy in the wind to turn the blades and create electricity, the turbines must be separated by a set amount of space, which is determined by their size. If you double the length of the wind turbine blades, you produce four times as much power, but you must space the turbines twice as far apart in both directions, spreading out over four times the land area. As a result, the amount of power per unit of land is independent of the size of the turbines, meaning there is a fixed amount of energy you can derive from each acre of land. At the best of sites, this is about 5 kilowatts per acre. The average coal-fired power plant is located on about 200 acres of ground, produces one million kilowatts of electricity, 1,000 times the amount of electricity wind turbines can produce on 200 acres.

Understanding Solar Power
One way to produce electricity from sunlight is to concentrate sunlight from mirrors onto a container of liquid to create steam and use it to turn a conventional turbine. One such installation is at Ivanpah in California, where on 3,500 acres there are 170,000 computer-controlled mirrors. The whole system has cost $2.2 billion and is intended to produce over 392 megawatts in peak sunlight, although the year-round average is only 122 MW. So far, the plant is producing only 45 percent of its expected energy output, and environmentalists have complained about the thousands of birds who have died in recent years while flying into the intense, concentrated sunlight. Photovoltaic (PV) cells convert light directly into electricity. Sunlight causes electrons in a semiconductor junction to make a quantum leap from one energy state to a higher one. Most systems convert about 15 percent of the solar energy into electrical energy, with higher efficiency rates coming at much higher costs. Given the varying sun angles, clouds, and the darkness of night, PV arrays produce less than 20 percent of their full-sunlight capacity. PV arrays can be valuable in sunny locales where grid power is not available, such as isolated African villages, highway warning signs, and remote cell towers. At present, the cost of electricity from PV is far in excess of the wholesale cost of electricity from conventional sources, and the grid-PV industry cannot survive without massive subsidies. Jay Lehr, Ph.D. (jlehr@heartland.org) is science director of The Heartland Institute. Howard Hayden, Ph.D. (corkhayden@comcast.net) is professor of physics emeritus in the Physics Department of the University of Connecticut and editor of The Energy Advocate. This article excerpts and summarizes material from the introduction of The Encyclopedia of Renewable Energy and Shale Gas. Reprinted with permission.