

Milltown Superfund Site Update – June 13, 2008

In January, 1908 the Milltown Reservoir was filled for the first time. Plant Superintendent George Slack was quoted in the Daily Missoulian:

"...when the last piece of timber is added to the dam it will be in such condition that the highest waters ever known in this vicinity will not affect it in the least. No expense was spared in making the dam one of strongest of its kind..."

Large Amount of Material Used.

"In the construction of the new dam an enormous amount of material has entered," said Superintendent George Slack to The Missoulian. "Two million feet of timber were used in the dam proper, while in the concrete work constructed, and which is of vital importance, 5,000 barrels of cement found their way. Just how many thousand tons of granite are in the huge dam is a pretty hard question to answer; hundreds of tons of structural steel are also to be found in the great mass of strength that is nearing completion, and when the last piece of timber is added to the dam it will be in such condition that the highest waters ever known in this vicinity will not affect it in the least. No expense was spared in making the dam one of the strongest of its kind, and with the completion of the work enough power will be generated to furnish the entire western portion of the state with electricity for all purposes.

"When all of the turbines are in position we will be able to generate 5,000 horse-power, which will be sufficient to supply the needs of the western portion of the state for many years to come. The plant is so constructed, however, that it can be enlarged at any time with a small additional outlay of time and money.

In May 1908 it started to rain, and it kept raining for 33 days on end. By June 7, 1908, the Clark Fork River was flowing at an estimated 48,000 cubic feet per second, indeed the highest waters ever known in this vicinity. For comparison, today's flow in the Clark Fork River downstream of the former Milltown Dam is 10,600 cubic feet per second.



The photo above shows the Milltown Dam during the 1908 flood. Water inundated the former powerhouse to a depth of about 6 feet. Despite the incredible force of the floodwaters, officials were optimistic about the condition of the dam. "Firm as a Mountain is the Dam", proclaimed the Missoulian headline. Charles Marsh, Missoula City Alderman, visited the dam and said, "There is no more danger of the power dam going out than there is of the mountains washing down the river...the dam is as firm and solid as can be."

CAUGHT ON THE RUN THROUGH THE MUD WHILE PEOPLE WATCHED THE FLOOD GO

Things That Some of Them Said and Did During the Busy Hours of Yesterday While the Crisis of the High Water Was On Along the Missoula and Its Tributaries.

Watching the wreck of the Higgins avenue bridge yesterday afternoon, after all of the action between the piers had gone out, Mayor Keith said: "There is one thing that we should consider now that this piling bridge has gone. When we rebuild it, we should make it so that it cannot go out again. The city is too large now to put up with any such cheap affair. When the structure is replaced it should be with a substantial section like the spans that remain. They are well-built and they have stood this flood in splendid style. If we span the space between with a similar piece of work we will never have a repetition of the experience that we are going through now. I think it would be the height of folly to put permanent bridge that we must build." Following the suggestion of the mayor, a Missoulian man interviewed yesterday evening a number of business men and each one of them was in favor of the proposition made by Mr. Keith. The general sentiment was that there should be no money wasted on a structure that will not be permanent and substantial.

Down in the Orchard Home conditions were bad yesterday in the section along the river. Most of the pretty farms there were submerged and it will not be possible to estimate the damage that has been done until the water recedes. Fayette Harrington drove down along the north side of the river yesterday afternoon and looked across. "It looked like a big lake in the lower bottom on the south side," said Mr. Harrington when he came back. "The river was about two miles wide down there and was

The only excitement was in the democratic caucus, which was peaceable and which simply varied the monotony a bit.

Captain Parker came down Grant creek yesterday afternoon and got to town by making several wide detours. This stream has made its usual high-water spurge and has done considerable damage. "There are no bridges left on the creek," said Captain Parker. "The stream spread out in several places wider than I ever saw it before and I have seen it a good many times. Down at the England ranch, of course, it is all over the country; it always is when it gets high. The railway bridge was damaged some and the water got all over the track; but there was a big gang of men at work and when I came down they had the track in good shape."

The people on the south side had nothing to do, apparently, yesterday except to sit on the river bank and watch the stream. If there were any of them at home at 3 o'clock in the afternoon, it was not evident from the north side, as the bank looked as if every person on the other side was somewhere along the bank, watching the progress of the flood. The bank was lined with spectators all the way from the baseball grounds to the railway bridge. There was a good deal of wig-wagging across between the two crowds, but it didn't afford much information to anybody on either side.

J. W. King, city clerk, interposed himself to good advantage in the welfare of the bears in the Greenough park zoo. In the excitement of the morning along the Rattlesnake, nobody

A Bargain

Seven-room house, East Front at \$3,700.

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Another Bargain

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Six-room house, two lots, close in, South side \$1,500
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wagon bridge having been carried away by the flood, Mr. Leahy decided to ford the stream, and was thoroughly drenched, the water being so deep that it was necessary for the horses to swim about 15 yards. The buggy, in which Mr. Leahy was the only passenger, was partially under water for the greater part of the journey, and it is more than likely that the thriving city of Reed will be minus one of its most prominent and influential citizens until the water recedes.

Among the railroad passengers in the city is a sailor from the Atlantic battleship fleet. He has been on a leave of absence and was returning to the coast from a visit with relatives east of here when the floods blocked traffic.

It was just turning day when the livestock in the Greenough barn was taken out. The barn, a big brick building, was surrounded on all sides by water and the animals were led out. The water was not deep enough to force them to swim.

FIRM AS A MOUNTAIN IS THE DAM

CHARLES H. MARSH DESCRIBES CONDITIONS AT THE POWER PLANT AFTER A VISIT.

At 6 o'clock last night the water at the power dam began to lower, and at 11 o'clock, when the last word was received from there, it had fallen six inches, and the men who have been watching it felt certain that it was safe. The battle with the water had been a long and severe one, but it looks now as if the fight were won, and there is much encouragement in the situation. This was the word that came to The Missoulian office from the sub-station last night just before midnight. It was good news.

The official statement was confirmed by Charles H. Marsh, who walked in from Bonner, where he had been, called on business. He was taken up at noon on a hand car, but he walked back, after he had looked over the situation at the mouth of the Blackfoot. He came home well satisfied that the worst was over.

"There is no more danger of the power dam going out than there is of the mountains washing down the river," was his positive declaration.

"The water is running over the top of the dam for its entire length, but the dam is as firm and solid as can be; there is not a tremble in it, and it shows not the least sign of weakness. I learn that there is a report in town that the south end of the dam was successfully dynamited; this is not so. An attempt was made to shoot the top off the south end of the dam in order to divert the current, but it made no impression; four shots were fired, but they didn't loosen a hair of the dam. It is as solid as a rock."

"The water is running through the power house, but it seems to be doing no serious damage. There is a seething whirlpool below the dam, but the only harm that lies in that is in the fact that there is a lot of heavy timber burning around in it and they

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But when the floodwaters receded, William Andrews Clark's dam was in serious disrepair. The left side and entire toe of the spillway had been washed away. The reservoir had filled with toxic sediments from the mines and smelters 100 miles upstream, but that would not become a concern until 73 years later when arsenic was found in local drinking water supplies. In 1908, the immediate problem was rebuilding the dam, completed just five months earlier.



The photo above, courtesy of the National Archives, shows the Milltown dam under reconstruction in 1909. Note the construction methods of the time, using ten inch timbers crafted into cribs filled with rock. The spillway was completely reconstructed in 1909, shored up over the years and covered with concrete following flood and ice damage in 1986.



The photo above was taken on May 28, 2008 by Gary and Judy Matson of the Friends of Two Rivers, a local conservation organization instrumental in the decision to remove the Milltown

Dam. The rivers were flowing high, but nowhere near the immense flows of the 1908 flood. Water in the Blackfoot River, flowing in from the left in this photo, appears more turbid. The Clark Fork River is flowing in the engineered bypass channel from the right, well contained in within the flood berms designed to withstand the 100 year flood and isolated from the most heavily contaminated sediments in the Clark Fork arm of the reservoir.



It is hard to imagine, but until late March of this year, all of the flow of both the Blackfoot and Clark Fork Rivers was passed through this narrow, 54 foot wide structure known as the radial gate, which sits just adjacent to the 210 foot long spillway. Since the dam breach on March 28, the radial gate sits high and dry.



Today, June 13, excavators from Envirocon are hard at work removing the radial gate, now exposed in the upper left hand portion of this photo, and the large concrete divider block, located just above the radial gate. As the excavator dug down through the concrete shell of the divider block, it encountered the original ten inch timber cribs, filled with rock. This uncontaminated material is being removed and disposed of on the south side of the former reservoir. The divider block was a massive structure, about 26 feet wide, separating the powerhouse from the radial gate and spillway. In the most recent dam safety inspection, performed for the Federal Regulatory Energy Commission by Montana Power Company in 2001, the 26 foot wide divider block was the only portion of the 660 foot long dam that met all contemporary dam safety standards. All other portions of the dam had sub-par safety factors for such threats as floods, earthquakes, or ice jams. In the center of this photo an excavator with a hydraulic hammer is chipping away at the concrete in the spillway, while a worker sprays water from a hose to keep the dust down. It only took a few days to remove the massive concrete headwall from the powerhouse earlier this year. The concrete poured in the spillway in the 1980's is heavily reinforced with rebar, and the powerhouse headwall was not. The demolition of the spillway will continue for about the next five months. As the concrete is removed, the original timber cribs will be exposed. The timbers will be removed to the south bank, and some will be salvaged. Most of the rock fill will be allowed to erode into the scour hole below the dam, but some of this may also be salvaged for future use in construction of park facilities at the site.

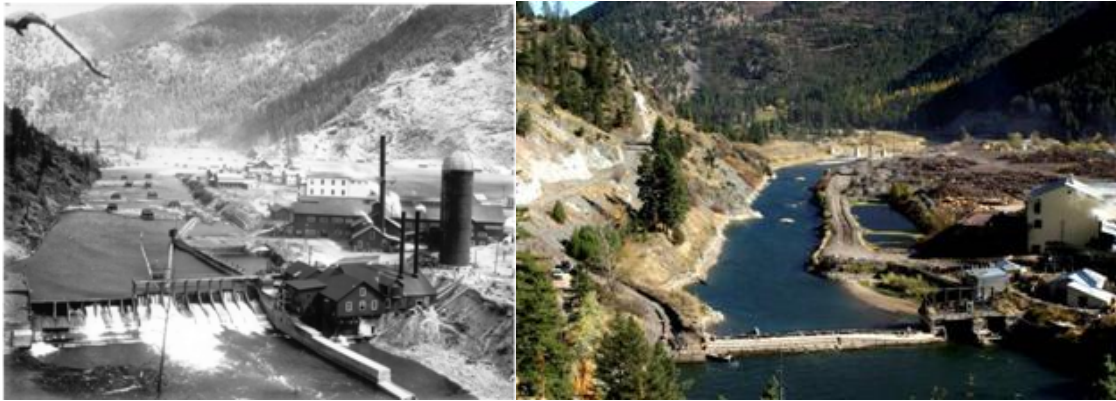


This photo shows the remediation project area on June 13, from the bluff overlook. One train, 45 cars each day, hauls contaminated sediment to the waste repository at the Anaconda Smelter Superfund Site. Hauling began last fall, and the total amount of sediment removed will surpass one million tons any day now. Sediment removal will continue for up to another year and a half.

Water quality monitoring for the project shows increased levels of sediment downstream of the dam, most of which comes from upstream on the two rivers or from the Blackfoot River arm of the reservoir. Water quality remains within the standards set for the project. Arsenic and copper levels are now comparable upstream and downstream of the dam on the Clark Fork. Dissolved Arsenic and total suspended solids levels in the river exceeded the standards for one to two days after the dam breach in March. Fisheries studies indicate no increased mortality of fish downstream of the dam, and radio tagged fish have been tracked swimming upstream for the first time in one hundred years. Water quality in local wells has not deteriorated, and initial results from monitoring wells near the reservoir indicate reduced arsenic concentrations. Water levels in the surrounding aquifer did not drop significantly as predicted following the dam breach in March. Still, EPA has replaced more than 70 wells in the area for local residents. Work continues on replacing the highway 200 and county pedestrian bridges, on schedule for completion this fall.



In late May, the Blackfoot River flowed at about 10,000 cubic feet per second, higher than at any time since 1997. With the Milltown and Bonner Dams removed, water levels behind the Stimson mill have dropped and velocities have increased. Combined with the constriction created by the Stimson cooling ponds, this erosive force has undercut and eroded the bank on the north side the river, directly adjacent to the cooling pond.



The photo at the left shows this reach of the river in the late 1800's, after the Bonner Dam was constructed. The photo at the right shows the dam just prior to its removal in 2005. The cooling pond and associated fill material had filled in about 40% of the river's available channel. This was constructed by the Anaconda Mineral Company in the mid-1900's. The bank that eroded this year is visible across from the cooling pond, just downstream of a rock spur in the river. The large ponderosa pines at the top of the bank are still there, but the bank has eroded out below them. EPA has protected the cooling pond from erosion with riprap armoring, to prevent erosion of sediments in the ponds into the river. These sediments contain a number of contaminants,

including detectable PCB's and hydrocarbons. The PCB's and other contaminants have not been found to pollute local drinking water supplies, but some are seeping into the groundwater and the river and should be cleaned up. The Montana DEQ is heading up investigations of options for cleaning up the contamination.



More changes are occurring in the Blackfoot River just upstream of the former Bonner Dam, and near the Weigh Station River Access site. The photo at the left was taken in June 2007, showing an island covered in willows. The photo at the right was taken today. As the river bed has dropped in this area following dam removal, most of the island has eroded, the vegetation is gone, and the river has found a new channel in the left hand side of the photo, or right bank of the river as it flows downstream.

As the river drops this summer, thousands of logs and other debris will be exposed in the bed and banks of the river. The State Natural Resource Damage program plans to remove logs this summer for use in construction of the restored Clark Fork River. Some logs may be salvaged for construction of park facilities at the site. Plans will be developed to clean up debris deposited in the river by the mill and local residents over the past one hundred years. Restoration of the two rivers is just beginning, and will take several years to complete. The State Natural Resource Damage Program has completed restoration plans for the Clark Fork, and initiated weed control and salvage of wetland and riparian vegetation for replanting in restored areas. The program will begin seeding disturbed areas and soil stockpiles this summer to initiate restoration, control weeds and prevent dust from blowing from the site on windy days. The Milltown Site Redevelopment Working Group has completed plans for development of the area as a State Park following cleanup and restoration. Funding is being sought through Montana Senator Max Baucus, who delivered the first \$2.5 million appropriation for the project a few years ago. A new tax exempt organization known as the Friends of Confluence State Park will be created to head up the fundraising efforts. The State of Montana is considering acquisition of the Northwestern Corporation lands in the reservoir area, and conversion of the lands into a State Park. Funds for the land acquisition have been requested through the Upper Clark Fork Restoration Program, and may be approved by Governor Schweitzer later this year. Additional lands have been donated by Plum Creek Timber and the Jacobs Family for the construction of the bluff overlook area, which is scheduled to begin later this year. The Carpenter's Union has agreed to serve as an intermediary landowner, until the State assumes public ownership of these lands in the future.

It is an exciting time for the Milltown project. Many big changes have occurred in the first six months of 2008. The project is proceeding well, on schedule and without injury. Missoula based Envirocon, contractor to Arco, is doing a good job with the cleanup, and the EPA and Montana DEQ are capably overseeing this work. The State is initiating an ambitious program to restore natural resources in the area following dam removal, and working with the County and local citizens to plan for future use of the area as park and open space, with pedestrian trails and public access to the restored rivers. The project is a testament to what people can accomplish when they set high goals and work together to achieve them.