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The Atlas Mill Radioactive Tailings Pile

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Special Section - January 6 - February 10, 2005

The Atlas Tailings Pile - where the river meets the waste

by Dr. John Dohrenwend
Adjunct Professor
of Geosciences
University of Arizona
[January 6, 2005]

For almost 25 years, Moab has been faced with a difficult problem: what to do with the tailings pile located on the Colorado River floodplain just north of town? This problem is complex and contentious. On the one hand, an impressive number of scientists and engineers have said that the pile is safe and will not be compromised by even the largest of floods that are likely to come down the river anytime during the next 1000 years.

But somehow the location of the pile just doesn't seem to be quite safe. After all, the Colorado River is notorious for the extreme variability of its flows. When standing near the Highway 191 bridge looking downstream, it doesn't take much imagination to visualize a flooding Colorado rushing out from its narrow, high-walled gorge and surging down upon the hapless pile.

Some folks might well argue that imagination has played a significant role in most of the studies, discussions and arguments concerning the safety of the pile. Of course, imagination can be a very good thing. It is probably not so useful when attempting to resolve an issue as potentially serious as the possibility, however remote, of 11.5 million tons of chemical and radioactive waste being flushed down Cataract Canyon to Lake Powell, Grand Canyon and beyond.

More useful would be careful and comprehensive evaluation and analysis of all the scientific facts relevant to the issue. The Department of Energy is charged to do just that and to present the results of such an evaluation to the public in the form of an Environmental Impact Statement (EIS).

On November 3, 2004 the Department of Energy released its draft EIS on 'Remediation of the Moab Uranium Mill Tailings.' The potential impact of an extreme flood is considered by many people to be one of the key issues relating to the safety of the mill site. Unfortunately this possibility is not adequately considered in this 'final' draft report. Instead, reference is made to previous reports that discount flooding as a serious problem.

Most notable is a letter report issued by the DOE in November 2003, which claims that "although a conclusive prediction of future river movement is not possible, evidence suggests that the river is and will continue migrating to the south and east away from the existing tailings pile."

This report presents several arguments in support of this position. These include: the current form and stability of the river channel, historical evidence of river migration, characteristics of basin-fill sediments, and the rate of salt dissolution in the Moab Valley.

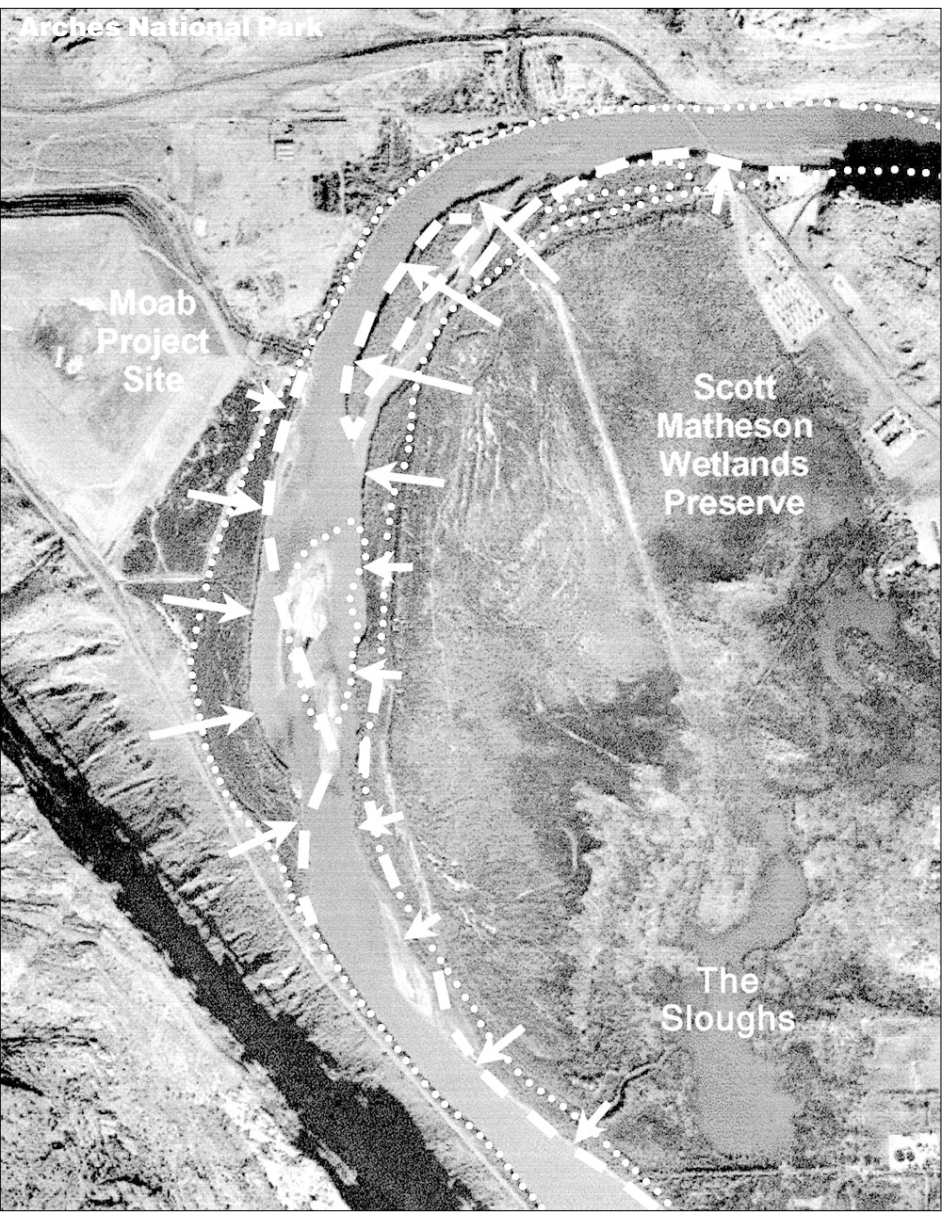
To publish a comprehensive review and analysis of all of these arguments would very likely require something the size of the Sunday supplement in the *New York Times*; and like the draft EIS, very few people would be likely to read it. However, careful review of this document reveals that it is seriously flawed by numerous errors of fact and interpretation.

To address these issues, *The Times-Independent* will publish a series of articles during January, each devoted to an evaluation of each of DOE's arguments concerning the long-term stability of the pile. The first of these articles (appearing in this issue on page A3) considers the historic evidence of river migration within the Moab Valley as shown in aerial photographs and topographic maps. We use the same photos as the DOE DEIS to examine this river migration. But our analysis shows what most of Moab knows – the river is not moving towards town.

I will also make a presentation at the Moab Information Center on January 24 at 7 p.m. about the possibility of the Colorado River moving closer to the tailings pile and other ways that the river might affect the pile.

Flooding on the Colorado River – June 1917. View upstream towards Moab and the La Sals from the old Courthouse Wash bridge. This flood, the largest of the 20th century, peaked on June 19, 1917 at 76,800 cubic feet per second.The bridge in the foreground is over Courthouse wash and was replaced in the early 1930's. The "old" Colorado River Bridge is faintly visible in the background. *Photo from Dan O'Laurie Museum collection*

The theory of river migration: is it fact or science fiction?



Changes in the position of channel banks along the Colorado River in the vicinity of the Atlas tailings pile. The aerial photo was taken in 2001. The dotted line shows the position of the river channel in 1944. The dashed line shows changes in the channel position between 1944 and 1983. The arrows indicate the direction and relative magnitude of the overall shift in the channel banks between 1944 and 2001. Note that the channel has not been migrating away from the pile and that it has narrowed significantly.

by Dr. John Dohrenwend,
Adjunct Professor
of Geosciences
University of Arizona
[January 6, 2005] Because of the potential impact of an extreme flood on the stability of the Atlas tailings pile, the Colorado River and its floodplain between the US 191 bridge and the Portal is one of the most intensively studied areas in the upper Colorado river basin. This area has been measured, modeled, drilled and sampled throughout the past two decades in an effort to predict future changes in the river's channel.

Historic maps, aerial photos and satellite images have been examined to document changes in channel form and position over the past 80 years. One of these analyses, a cornerstone of the Department of Energy's position on the long-term stability of the pile, is a 19-page letter report on the "Migration Potential of the Colorado River Channel Adjacent to the Moab Project Site."

According to this DOE analysis, the Colorado River is moving south and east towards Moab. Any river runner will tell you, however, that this is highly unlikely since Moab is on the inside of a river curve aimed away from town. In fact the historical analysis presented in this DOE report is seriously flawed. Several of the maps and photos used in this analysis were not accurately registered to each other.

These inaccuracies are most conspicuous for the DOE interpreted positions of the channel in 1944 and 1953. Downriver from the pile, the southwest bank in 1944 and 1953 is shown in the DOE analysis to be located near the present position of the northeast bank.

Also conspicuously inconsistent are the channel positions attributed to 1953 (based on aerial photos) and 1959 (based on the 1959 USGS topographic map). This is particularly surprising because the 1959 topographic map was produced from analysis of the 1953 photos!

By accurately registering all the historic maps and photographs, reliable comparisons between one time and another can be made, and the picture shown in the accompanying figure emerges clearly.

Since 1924, the right hand bank (as shown in the figure) has moved progressively north, west and southwest away from Moab. From the bridge to the pile, the right hand bank has moved north and northwest an average of 320 feet since 1944. Downstream from the pile, this bank has moved west and southwest an average of 175 feet during this same period. Interestingly, most of the left hand bank (as shown in the figure) has remained in essentially the same position since 1924.

The only significant exception is the area immediately adjacent to the pile where the channel appears relatively unstable. In this area, the left hand bank shifted rapidly eastward between 1962 and 1983, only to shift westward again sometime before 2001. The net result of all of these changes has been a conspicuous 37 percent narrowing of the channel that occurred mostly between 1962 and 1983.

These findings are directly contrary to the DOE statement that "the river is and will continue migrating to the south and east away from the existing tailings pile." They cast some doubt on the overall integrity of the DOE report. Moreover, the progressive narrowing of the channel between 1944 and the present implies that the river's past behavior may not be a reliable predictor of future channel changes.

The next article in this series will consider variations in the present gradient of the Colorado River and the significance of these variations relative to the long-term stability of the pile.

For updated information, names, addresses and resources regarding the Atlas Tailings Pile go to:
www.moabtailings.org

Want to know about the River? Just ask some Moabites

by John Dohrenwend
Adjunct Professor of Geosciences University of Arizona
[January 13, 2005]

You say you want to go on the River and have some fun? Ask almost anyone in Moab, and you'll probably get one of two answers. "If you're looking for a good time but not too much excitement, go upriver and try the Daily. For more excitement and some good whitewater, go downriver to Cataract."

So why is there no good whitewater closer to town? Because as Moab knows, the river is steeper in some places than in others. Along the Daily, the river drops an average of five feet per mile, and in Cataract Canyon the average drop is almost 12.5 feet per mile. (At least it used to be before Glen Canyon Dam was built.) And what about all that water in between, including where the river runs through the Moab Valley and past the Atlas tailings pile? Here the riverbed is much flatter, dropping a mere 15 inches per mile, only one quarter of the gradient just a few miles upstream along the Daily.

The Department of Energy doesn't seem to know as much about the river as Moab does. Their thinking is summarized in their letter report of November 2003 regarding the potential flood hazard at the Atlas tailings pile. The DOE observes that large gravels and cobbles are not found in the active river channel downstream of the Portal, except near side canyons. The DOE also believes that the surface of Moab Valley is subsiding, and that because of this subsidence, coarse river sediments are being trapped in the valley. They also believe that this subsidence will force the Colorado River channel to migrate south and east, away from the Atlas tailings pile and towards Moab.

Groundwater dissolving the massive salt layers far beneath the valley floor is in fact causing the slow subsidence of the valley's alluvial fill. But, the surface of Moab Valley is not dropping because of this subsidence.

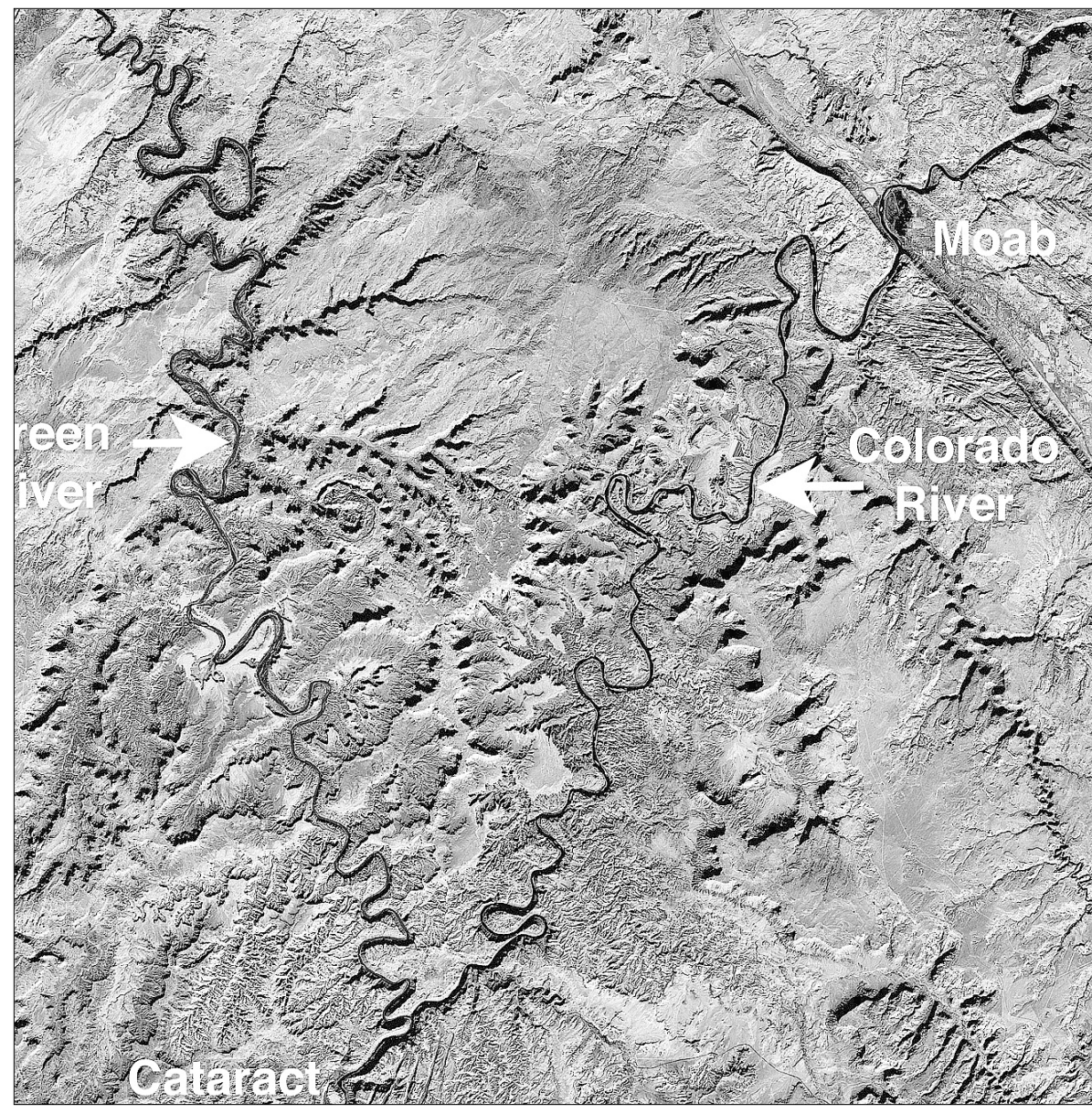
The Colorado River and its local tributaries deliver far more sediment to the valley floor than could ever be accommodated by the valley's slow subsidence. So what explains the lack of cobbles and gravels in the active channel downstream from the Portal?

Apparently the DOE hasn't looked very closely at the River either up or downstream from Moab Valley.

The steepness of a riverbed plays a central role in a river's ability to move sediment. Other things being equal, the flatter a river's slope - the smaller the size of the bedload sediment it can move. From Moab Valley all the way downstream to Cataract Canyon, the average slope of the river is very low. Therefore, channel sediments in this area are mostly fine grained. Cobbles and other coarse materials are only moved during large floods. (See map on page A5.) At all other times, only fine sediments are moved through this flat water section.

If DOE had asked Moab about the river, they might not have wasted so much time worrying about the supposed subsidence of the surface of Moab Valley, and they might not have come to the erroneous conclusion that the river is moving away from the pile.

The DOE analysis suggests that salt dissolution is the most probable reason for the lowering of the surface of Moab Valley. If this were in fact the case, the valley would be controlling the river. But has Moab Valley ever controlled the Colorado River? More next time when we consider the question, "Which came first, the valley or the river?"



Flat water near Moab. This Landsat satellite image shows the flat water section of the Colorado River between Moab and Cataract Canyon. Along this highly meandering section, the average slope of the river is only 15 inches per mile

Wanted: Photos of flooding on Colorado River in valley or Courthouse Wash

[January 13, 2005]

The Draft Environmental Impact Statement (DEIS) concerning the Moab Uranium Mill Tailings, which are located on the banks of the Colorado River three miles northwest of Moab, states that "Historically, the entire Moab site has been created and altered by natural events such as floods and, more recently, by the activities related to milling operations." [page A1-18]. It further states that a "critical flow occurs at about 70,000 cfs, which . . . produces a river elevation such that river water comes in contact with the toe of the tailings pile.[A1-19]. And "One of the highest recorded discharges of the river was in 1984, when the flow reached 70,300 cfs. This flow flooded part of Moab and rose about 4 ft above the toe of the tailings pile." [F-6] "During a 100-year flood, flow would reach 99,500 cfs" [F-6]

In the past century, the Colorado has had major flooding: June 19, 1917 (76,800 cubic feet per second or cfs); June 1, 1928 (65,000 cfs); May 15, 1941 (64,400 cfs); June 9, 1957 (64,200 cfs); June 28, 1983 (58,000 cfs); May 27, 1984 (70,300 cfs).

If anyone has photos taken during these floods and would be willing to loan them for study purposes, *The Times-Independent* has offered to be a drop off point. (photos will be copied and returned intact). Any written or oral stories or recollections would also be appreciated.

There is also an item in the Dan O'Laurie Canyon Country Museum files stating that the bridge over the courthouse wash on highway 191 washed out in the early 1930's and was replaced several years later. Anyone who remembers the washout is requested to call the museum at 259-7985 to let them know the approximate date of this wash-out. Any photos would be a bonus.

Historically, *The Times-Independent* has documented the flooding of the Colorado River with the following information.

June 15, 1917, Grand River Waters Near Danger Mark

As a result of the continuous period of warm weather that has been experienced during the last week, Grand River [later renamed to Colorado] has risen alarmingly and is now so high that considerable anxiety is being felt for the Moab bridge. The water is at the 21-foot mark, and if it continues to rise it will submerge the road between the river bridge and the span over Courthouse Wash. If this happens traffic to and from Moab will be tied up.

While there is still a clearance of about five feet between the water and the floor of the bridge, it is pointed out that an accumulation of driftwood might easily result in great damage to the bridge.

June 22, 1917 Turbulent Flood Waters Endanger Moab Bridge

Already higher than was ever before known, and still rising, the Grand River has not only stopped practically all traffic over the Moab-Thompsons road, but is now seriously threatening the Moab bridge. The river is now near the 23-foot mark and if it rises much more it is feared that Moab and all of the territory south will be completely cut off from the outside world.

The water has submerged the road just west of the bridge to a depth of several feet and for the past three days automobiles have been unable to pass. Only with the utmost difficulty are teams able to pull wagons through the flood. The stage companies have cars on each side of the river and mail and express are carried along the hills above the flooded portion of the road. Passengers are compelled to walk.

The stream is higher than was ever known by even the oldest inhabitants of the valley. The entire lower part of the valley is one vast lake, all of the meadow land and part of the lower farms being completely covered.

May 15, 1941 Record High Water Endangers Colorado River Bridge at Moab

Fed by countless streams in western Colorado and eastern Utah, as a result of the unprecedented warm weather of the past 10 days, the Colorado River is at flood stage and the prospects are that the river will continue to rise for at least two more weeks. Usually, the crest of the high water occurs between May 25 and June 10.

The river already is threatening the Moab bridge, and if the flood continues to increase strenuous measures will have to be adopted to save the bridge. The water now is within five feet of the floor of the bridge. A continued rise in the flow will place the bridge in serious danger, and if the flood should rise two or three more feet, the structure will be doomed, according to experienced rivermen. Driftwood, accumulating on the piers, throws a terrific pressure on the bridge, and guards are being placed on duty to prevent logs and debris from lodging on the structure.

The entire lower part of Moab valley is under water. A lake three miles in length and two miles wide has been created. It has been at least 15 years since the high water has been so noticeable in Moab. The Colorado river road between Moab and Castle valley has been under water in numerous places for the past several days, and is closed to traffic.

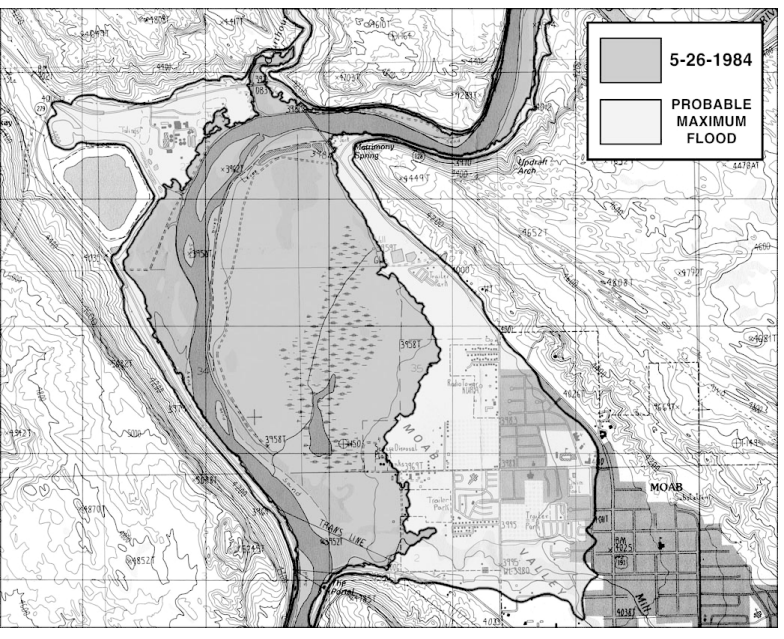
May 22, 1941 Cold Snap causes River to Recede

Danger of any immediate damage from high waters in the Colorado River was averted the last of the week, when a cold snap in the Rocky Mountains checked the rapid runoff and caused the river to drop sharply.

June 13, 1957. . . shows effects of the flooding Colorado river on the new highway bridge near Moab. Although a large log jam remained piled against the second pier for almost a week, no damage was caused to the modern structure. . . . the level of the river was over the 10 foot mark above normal flow.

May 31, 1984 As flows in the Colorado River near Moab peaked at 68,000 cfs, many sections of the road to Texasgulf's potash plant were flooded. One section of the road was covered for an estimated distance of three miles. Many drivers discovered unpleasantly that their ignition systems were not waterproof, as a large number of cars stalled in the submerged sections.

With the peak in the Colorado Sunday, the UDOT limited travel on the two roads to essential traffic only. The limitation was continued into the beginning of this week as the water level began to drop slowly. Additional sandbags had to be placed by Moab City's sewer plant over the weekend.



Large floods in Moab Valley . . .

This map shows the extent of large floods along the Colorado River. The extent of the May 1984 flood was obtained from a Landsat satellite image that was acquired on May 26, 1984 (about 24 hours before the flood peak). The river was running at about 66,500 cubic feet per second (cfs) at that time. The extent of the probable maximum flood (PMF) is based on an estimate of the probable maximum height of a 300,000 cfs flood. This estimate was made by consultants to the U.S. Department of Energy using an USA Corps of Engineers mathematical model of river flow.

DOE embarks on series of public meetings, announces comment period for tailings

by Lisa Church
contributing writer
[January 6, 2005]

The Moab Mill Tailings Stakeholders Group will meet January 14 at 10 a.m. at the Grand County Council Chambers to hear updates on the site status and remediation activities at the Atlas uranium mill tailings site north of Moab.

The group is comprised of a consortium of concerned agencies and organizations working in cooperation with the U.S. Department of Energy (DOE) to find a solution for remediation of the 11.9 million tons of radioactive material located about 750 feet from the Colorado River just outside town.

In November, the DOE released a draft environmental impact statement that examines four options for cleaning up the Cold War-era tailings. The agency is now accepting public comment on the specific options which include capping the material in place where it is, transporting the tailings to the White Mesa Mill near Blanding via a slurry pipeline, or relocating it to a secure cell at either Klondike Bluff or Crescent Junction. Comments will be accepted through February 18.

The Moab Mill Tailings Stakeholders meeting is open to the public, but only members of the stakeholders group may ask questions or participate in discussions during the meetings.

The meeting agenda includes specific discussions regarding ongoing work at the site, including groundwater cleanup, dewatering and dust control efforts. The meeting will also include discussions of controversial unresolved issues including how the stability of the mill tailings site could be affected by future shifts in the flow and channel banks of the Colorado River.

Draft EIS Public Hearings

The U.S. Department of Energy will hold four public meetings in the region to present information and accept public comments on the Draft Environmental Impact Statement for remediation of the Moab uranium mill tailings site. Meetings are scheduled as follows:

Green River, January 25, 2005, 6 p.m., City Hall Meeting Room, 240 E. Main.

Moab, January 26, 2005, 6 p.m., Aarchway Inn, 1551 N. Hwy 191.

White Mesa, January 27, 2005, 10 a.m. Education Building.

Blanding, January 27, 2005, 6 p.m., College of Eastern Utah Arts and Events Center Auditorium, 639 West 100 South.

Public Comment Process

The U.S. Department of Energy will accept public comments on the Draft Environmental Impact Statement for remediation of the Moab uranium mill tailings site through February 18, 2005.

Reference copies of the draft EIS are available at the Grand County Public Library, the Blanding Branch Library, and the White Mesa Ute Administrative Building. The document is also available on the Internet at http://gj.em.doe.gov/moab/ and in the DOE Public Reading Room in Grand Junction, Colorado. Copies may also be requested by contacting the DOE toll free at 1-800-637-4575

Comments may be submitted by e-mail to: moabcomments@gjo.doe.gov. Fax comments to: 970-248-7636, or mail them to: Moab DEIS Comments, U.S. Department of Energy, 2597 B 3/4 Road, Grand Junction, CO 81503.

Public Comment Process on Draft EIS

Reference copies of the draft EIS are available at the Grand County Public Library, the Blanding Branch Library, and the White Mesa Ute Administrative Building. The document is also available on the Internet at http://gj.em.doe.gov/moab/ and in the DOE Public Reading Room in Grand Junction, Colo., or toll free at 1-800-637-4575

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Which came first – the river or the valley?

by John Dohrenwend
Adjunct Professor of Geosciences
University of Arizona
[January 20, 2005]

As mentioned in last week's article, one of the premises behind the Department of Energy (DOE) draft EIS analysis regarding the Atlas tailings pile is an assertion that subsidence in Moab Valley is controlling the behavior of the Colorado River and causing it to shift away from the tailings pile. This is a reason they give to ignore the potential impacts on the pile of a major flood on the Colorado River. To examine this premise, a wider look at the Colorado Plateau tells a different story

Climb to the top of the La Sal Mountains on a clear day, and look to the west. You can see all the way across the Colorado Plateau , through Canyonlands, past Capitol Reef and the San Rafael Swell, to Boulder Mountain on the plateau's western rim. An awesome erosional landscape of mesas, reefs, monuments, fins, arches, valleys and canyons stretches away beneath your feet. Nearly all of this landscape has been created during the last few million years; and when compared to the billions of years of earth history, a few million years is a very short time.

It is possible to measure the ages of old land surfaces by studying the accumulation of isotopes formed by the cosmic rays that continuously shower the earth's surface. Geophysicists at the University of Utah have determined that even some of the highest mesa surfaces between Capitol Reef and Caineville Reef (just south of the San Rafael Swell) are little more than one million years old. All of the buttes, monuments, ridges, and canyons below these mesa tops have been weathered and washed, carved and sculpted by the forces of erosion during the past million years.

When this information is put into the context of the results of other geologic research, including radiometric age measurements of the volcanic caprock on Grand Mesa (about 6 million years old) and the igneous dikes in Cathedral Valley (about 4 million years old), these findings have enabled earth scientists to unravel much of the mystery surrounding the formation of the unique landscape we call the Colorado Plateau.

As it turns out, the area of the central Colorado Plateau has been subjected to more or less continuous erosion during the past five to six million years. During this time, the rocks and sediments that once covered the region to the tops of today's highest mountains have been eroding away at an average rate of approximately one foot per thousand years. Although from a human perspective this many seem to be very slow, from a geologic perspective it is very fast.

By comparison, average erosion rates in many areas of the American Southwest are only one or two inches per thousand years. The Colorado Plateau is one of the youngest, most rapidly changing landscapes in all of North America.

What has been the principal agent of all of this erosion? In Moab, we don't have far to look for the answer – it's been flowing through the Moab Valley for as long as Moab has been a valley. It is, of course, the Colorado River.

The Moab Valley is the surface expression of a collapsing salt-cored arching fold or anticline. The salt beds beneath the valley's subsiding floor are almost two miles thick. As the Colorado River and its tributaries cut down through the thousands of feet of rock that once covered this salt-cored anticline, tremendous volumes of rock were removed and the land surface gradually lowered. Eventually, probably sometime about two million years ago, circulating groundwater reached the level of the uppermost salt beds. As the salt dissolved, the crest of the anticline began to collapse forming the Moab Valley. As the river continues to cut down through the plateau, the valley continues to subside.

The rates of valley subsidence and river downcutting are closely related. Most of the groundwater beneath the valley surface is a dense salt brine. As the river continues to downcut, fresh near-surface groundwater continues to mix with the brine promoting continued dissolution of the salt. Thus the river came first. And it is the river's downcutting that controls the erosional evolution of the Colorado Plateau and all of its component parts, including Moab Valley and the site of the Atlas tailings pile.

The river and the pile. Aerial view of the Colorado River looking downstream from above Courthouse Wash towards the Atlas tailings pile. *Photograph by Kara Dohrenwend*

Governors from four states call for the removal of Atlas tailings pile

[January 13, 2005]

Before she left office, outgoing Utah Governor Olene Walker spearheaded the delivery of a powerful four-state message to remove the Atlas tailings pile from the banks of the Colorado River.

The governors of California, New Mexico, and Arizona joined Gov. Walker in urging the U.S. Department of Energy (DOE) to move, rather than cap the pile. The department released a draft Environmental Impact State on November 18 that studies four options in dealing with contamination left by the mining and production of uranium near Moab, and the waste byproduct known as the tailings pile left behind. Studies have proven that the pile, which weighs over 11 tons, is leeching contamination into the river, which serves as the water supply to 25 million downstream users.

Three of the four options are to move the pile, either by a slurry pipeline to Blanding, or relocating north of Moab – the Klondike Bluffs or near Crescent Junction. One option, the least expensive, is to cap it in place, minimize leakage and treat the water.

"We want to make it clear that any remediation other than an off-site option is unacceptable," Walker wrote in a letter to the Energy Department signed by all four governors.

The DOE was directed by Congress to solve the contamination problem after Atlas Corporation, which ran the mill and sold the uranium to the government throughout the cold war era, declared bankruptcy in 1998. The DOE will accept comments on the draft Environmental Impact Statement through Feb. 18.

DOE public hearing schedule set on draft EIS

[January 20, 2005]

The U.S. Department of Energy (DOE) Office of Environmental Management will host four public hearings regarding the Draft *Environmental Impact Statement* (EIS) for the Moab, Utah, Uranium Mill Tailings Remedial Action (UMTRA) Project Site.

Dates, times, and locations of the hearings are: Tuesday, January 25, 2005, 6:00 - 8:30 p.m., City Hall Meeting Room, 240 East Main Street, Green River, Utah; Wednesday, January 26, 2005, 6:00 - 8:30 p.m., Aarchway Inn, 1551 North Highway 191, Moab, Utah; and Thursday, January 27, 2005, 10:00 a.m. - 12:30 p.m., White Mesa Ute Recreation Center, White Mesa, Utah,

The public hearings will provide a forum to receive public comments on the Draft EIS. DOE is proposing to clean up surface contamination and implement a ground water compliance strategy to address contamination resulting from historical uranium ore processing at the site, which is located about three miles northwest of the city of Moab. DOE prepared, and released for public comment in November 2004, a Draft EIS to fulfill the National Environmental Policy Act requirement to consider the full range of reasonable alternatives and associated environmental effects of significant federal actions.

Reference copies of the Draft EIS, entitled *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah, Draft Environmental Impact Statement* (DOE/EIS-0335D), are available in DOE Public Reading Rooms located at the Grand County Public Library in Moab, Utah; Blanding Branch Library in Blanding, Utah; the White Mesa Ute Administrative Building in White Mesa, Utah; and the DOE Technical Library in Grand Junction, Colorado. The document is also accessible via the internet at http://gj.em.doe.gov/moab/eis/deis.htm .

DOE welcomes comments and suggestions on the Draft EIS through February 18, 2005. Comments, requests for further information, and requests for copies of the Draft EIS may be directed by mail to Donald R. Metzler, Moab Federal Project Director, U.S. Department of Energy, 2597 B 1/2 Road, Grand Junction, CO 81503; by email to moabcomments@gjo.doe.gov; by telephone toll free at 800-637-4575; or fax 970-248-7636.

Contact Your Legislators

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Atlas stakeholders hear results of new scientific river studies

by Lisa Church
contributing writer
[January 20, 2005]

Two new scientific studies suggest that more research is needed to determine how severe flooding of the Colorado River would impact the Atlas Uranium mill tailings north of Moab.

"It's pretty much an open question as to whether if there is change it would be more hazardous or less hazardous to leave the pile in its present location," University of Arizona geosciences professor John Dohrenwend told members of the Atlas tailings "stakeholders," a group representing federal, state and local government agencies, tribal governments, environmental organizations and Moab residents during a January 11 meeting. "You can blow a channel bank out in a heartbeat. We need to know what conditions it takes to make that occur."

Dohrenwend is completing research on river morphology along the Colorado that he says calls into question findings in the U.S. Department of Energy's recently-released draft environmental impact statement that the river is moving steadily away from the radioactive tailings perched on the banks of the Colorado.

Using satellite images and historical date, Dohrenwend compared the river channel from 1944 to its appearance in 1962 and 1983 in an effort to determine whether the Colorado is, in fact, migrating southward toward Moab as the DOE report suggests.

The study, funded by a grant from the Citizen's Monitoring and Technical Assessment Fund – monies set aside as a result of a 1998 lawsuit settlement between the DOE and 39 plaintiffs concerned with nuclear weapons issues – shows that the banks of the Colorado have fluctuated both north and south over the past 60 years, a finding Dohrenwend says points out the need for further study should the DOE decide to cap the 11.9 million tons of Cold-War era tailings in place.

In 1983, heavy flooding at more than 70,000 cubic feet per second forced the Colorado 4 feet up the banks of the tailings site. Dohrenwend's study concludes that a "probably maximum flood" rate of 300,000 cubic feet per second could cover the tailings and submerge much of Moab city.

The U.S. Geological Survey also presented preliminary results of new research the agency has conducted using funding from the state Department of Environmental Quality and other sources. That study shows that a 100-year flood event with flows reaching and estimated 97,600 cubic feet per second would cover the tailings in about 4 feet of water. If river flows reach the 300,000 cubic feet per second rate, the tailings would be buried beneath about 25 feet of water, USGS officials said.

Both studies support moving the tailings, said Loren Morton of the Utah Division of Radiation Control.

"If the pile is moved, the risk doesn't exist. It's a moot point," he said. "If the pile stays, it's an unanalyzed condition. The study shows that there are places where the bank will erode."

Calling the river migration question "a deal breaker," Morton and other Atlas stakeholders told the DOE Friday that they want the tailings relocated away from the Colorado.

Don Metzler, DOE project manager for the Atlas project, stood by the agency's draft report.

"We took other people information and studies and built on that and we came up with our own studies that are superimposed on that," he said. "Setting aside the catastrophic scenarios, where is the risk today? It's at the river. It's contamination. We are doing our absolute very best to fix that or mitigate it."

Grand County Councilman Rex Tanner said the questions surrounding the question of river migration and flooding point to the need to move the tailings.

"The more we look at it, the less we are able to predict what will happen," he said. "That tells me we need to move it off an area that is so unpredictable. It's not an issue of cost, it's an issue of not knowing what's going to happen in the future. It should be moved."

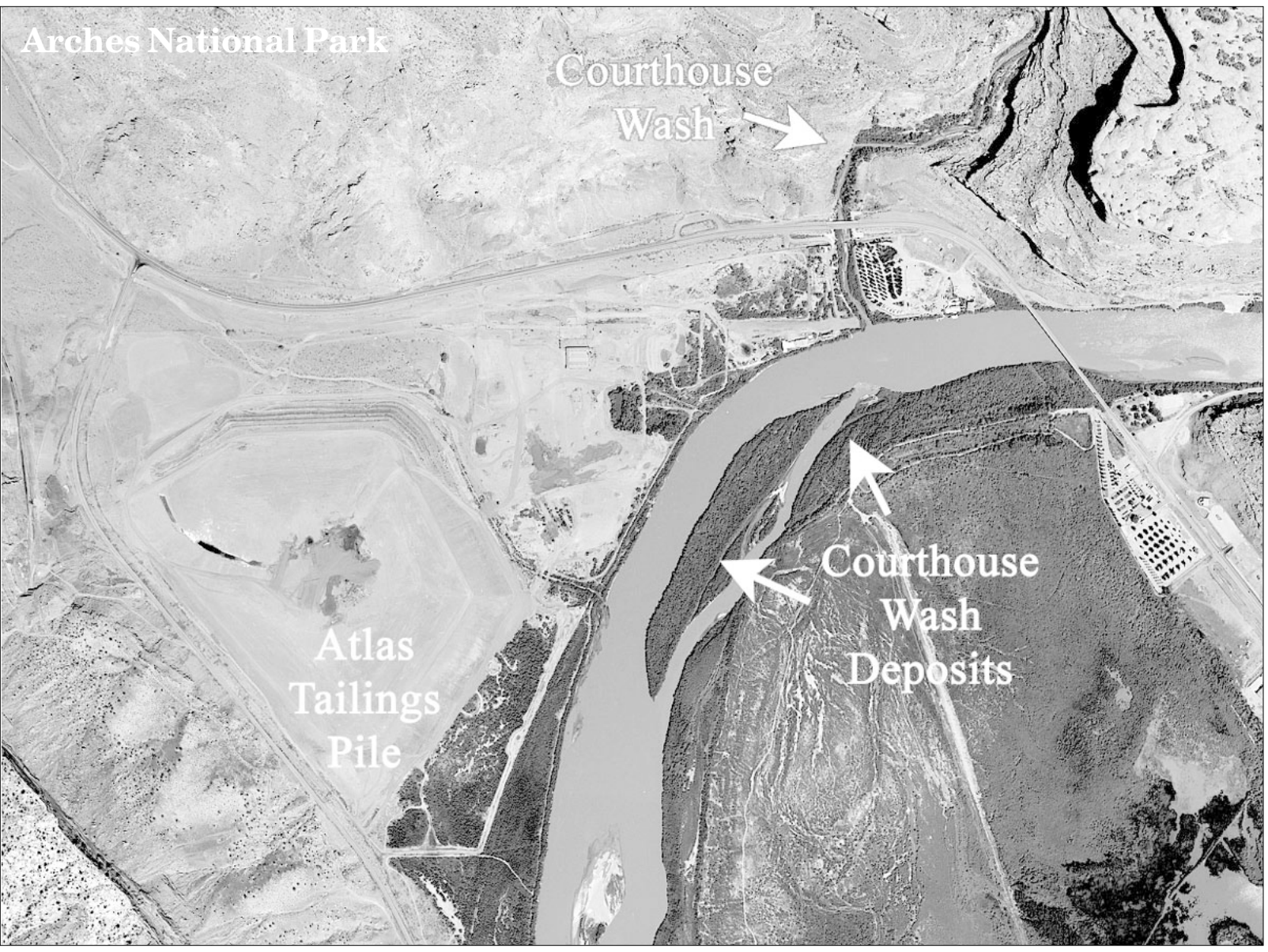
In its report released in November, the DOE outlined five possibilities for cleaning up the tailings, including capping the site in place, moving the material to one of three locations, or taking no action.

The DOE estimates that capping the tailings in place would take seven to 10 years to complete at a cost of about $166 million. The report estimates that relocating the tailings would cost between $329 million and $464 million.

The DOE will hold a public meeting in Moab on January 26 to take comments on the draft report. A 90-day public comment period on the report ends February 18.

Looking at the Atlas Tailings situation

Consider the strange case of Courthouse Wash



Where is the fan of Courthouse Wash? Courthouse Wash is a high energy stream that typically floods during the summer monsoon when the Colorado River is low. During large floods, the stream leaves its mouth with such force that it jets across the Colorado River channel. Those sediments that are not subsequently removed by the Colorado are deposited along the river's south bank.

by John Dohrenwend
Adjunct Professor of Geosciences
University of Arizona
[January 27, 2005]

In November 2003, the Department of Energy (DOE) released a report entitled "Migration Potential of the Colorado River Channel Adjacent to the Moab Project Site." This report presents a number of arguments that, according to the DOE, suggest southward and eastward migration away from the Atlas tailings pile. One of the more interesting of these arguments involves the strange case of Courthouse Wash.

According to the DOE, "The tailings pile and former mill site are sited on an alluvial fan developed from Moab Wash and Courthouse Wash. Both washes have delivered significant quantities of sediment to the area in the past, and deposition will continue unless significant changes occur in the upstream watersheds. Sediment input from Courthouse Wash and Moab Wash tends to push the river south and prevents lateral migration to the north."

However as reported in a previous article in this series (River Migration - Fact or Science Fiction?), a comparison of aerial photographs clearly shows that the Colorado River channel has, in fact, moved more than 300 feet north and northwestward between 1944 and the present time. In direct contradiction to DOE's argument, most of this movement occurred directly opposite and immediately downstream from the mouth of Courthouse Wash.

It has long been recognized that the alluvial fans of desert streams typically build outwards from their valley (or canyon) mouths. However in some important ways, Courthouse Wash is not a typical desert stream. It joins the Colorado River less than a quarter mile after leaving the mouth of its narrow, steep-walled canyon. During low flows, the much larger flow of the Colorado quickly carries away most of the sediment that might otherwise be deposited at the mouth of the wash. During high flows a very different situation may occur

Like many of the washes that drain the slickrock country around Moab, Courthouse Wash is ephemeral and its flow is highly variable. The wash seldom flows with any volume for more than a few days, even after a heavy rain. Flash flooding is common and typically occurs during the southwest monsoon in mid to late summer. During flash floods, flows down the wash may exceed several thousand cubic feet per second (cfs), and in extreme cases, may peak at flows greater than 10,000 cfs.

Most of the water flowing down the Colorado River comes from the snowfields of the southern Rocky Mountains. Consequently, the highest flows on the river almost always occur during the snowmelt floods of late spring. By mid summer, flow in the river typically drops to somewhere between 3000 and 4000 cfs. Therefore, whenever a large flash flood occurs on a tributary wash, the result is that for a short time, the flow of the tributary exceeds the flow of the main stream. When this happens, the tributary flow may jet all the way across the main stream to the opposite bank.

This unusual role reversal between tributary and main stream can be truly spectacular. For example, during a run through Westwater Canyon in the late summer of 2002, washes started running red over the black rocks of the canyon. At the end of the rapids and around the corner, a side canyon at Big Hole was spewing water, rocks and debris across the river, and effectively preventing the rafts from passing the side canyon. The flow from the side canyon had enough force to shower the rafters upstream with a rain of mud. Courthouse wash has been witnessed to behave similarly during late summer floods, shooting water and debris across the Colorado and sometimes into the sloughs.

At Courthouse Wash, this role reversal has contributed to the accumulation of large quantities of sediment along the south bank of the Colorado River directly opposite and immediately downstream from the mouth of the wash. This, in turn, has influenced a northward migration of the south bank and a significant narrowing of the river channel.

Area residents tell DOE: move the Atlas tailings pile, do it now

by Lisa Church
contributing writer
[February 3, 2005]

Area residents and government leaders made clear last week that moving almost 12 million tons of toxic waste away from the floodplain of the Colorado River is the only acceptable option for cleaning up the Atlas Uranium mill tailings site.

A January 26 public hearing in Moab – the public's last opportunity to comment in-person on the U.S. Department of Energy's draft environmental impact statement for the Moab project – drew more than 100 people. About 30 residents, many of whom have fought for 12 years to move the pile, voiced frustration, and urged the DOE to remove the tailings from the banks of the Colorado, where many fear a catastrophic flood would scour away the toxic materials, potentially contaminating portions of Moab, and polluting the river, a major source of drinking water for some 26 million people in downstream states.

Local business owner Denise Oblak summed up the position of almost everyone in the room. "Just spend the money. Do it right and do it now," said Oblak, president of the Utah Guides and Outfitters and owner of Canyon Voyages.

County officials said the DOE's only reasonable option is to move the material away from the river to a site that is safe from the potential dangers of catastrophic flooding.

"Our position is that the only acceptable thing to do here is move it," said Grand County Councilman Rex Tanner. "The level of uncertainty in itself is why it needs to be moved."

Moab resident Steve Russell called the Colorado the "beating heart of the Southwest" and said the current location of the tailings represents "a clear and present danger to the citizens of Grand County and the people of the Southwest."

Most residents favored moving the tailings to one of two possible sites in northern Grand County. Moab Mayor Dave Sakrison and others opposed any option that would carry the toxic materials through town.

Dave Cozzens offered the lone voice for possibly capping the tailings in place. Cozzens said he would like to see the tailings moved, but he worries that stirring up the pile could be more dangerous than leaving it in its current location.

"I want to see the tailings pile moved probably as much as anyone does as soon as it's safe to do so," Cozzens said. "I'm not sure at all that it can [be safe]. And I'm a lot more concerned about myself and my family and the people in this community than I am about anybody who lives downstream."

Members of the White Mesa Ute community have filed a citizen's complaint accusing the Department of Energy engaged in "environmental racism" by keeping a tailings reprocessing mill that borders the southeastern Utah town on its list of possible sites for relocating the tailings pile.

During a public hearing at White Mesa the following morning, Ute tribal leaders complained that the 85-mile slurry pipeline proposed for moving the tailings from Moab to International Uranium Corp.'s White Mesa Mill, would pass through lands containing more than 120 cultural sites, obliterating at least eight of them.

The complaint, sent Tuesday to Energy Secretary Spencer Abraham, also alleges relocating the 11.9 million tons of tailings to White Mesa threatens the community's sole water supply.

"There is nothing reasonable about dumping radioactive tailings and toxic waste on top of ancient, profoundly sacred sites including burials and ceremonial sites," says the complaint filed by a group calling themselves the White Mesa Concerned Community. "It is environmental racism and a violation of federal trust responsibility."

Bradley Angel, director of Green Action for Health and Environmental Justice, a nonprofit group working with the White Mesa Ute community to stop IUC's proposal for moving the tailings, said the DOE has a responsibility to find a "reasonable alternative" for mitigating the Cold War-era tailings.

"It is incredible and outrageous and unacceptable that the DOE thinks it is reasonable to take toxic material, slurry it with water, and dump it on the people of White Mesa," Angel said. "Nobody wants it here except IUC, and, I'm afraid, the Department of Energy."

Ute Mountain Ute Tribal Council member Terry Knight said if possible relocation sites near Green River and East Carbon were removed from consideration because of their proximity to a residential community then the 300 residents of White Mesa deserved the same consideration.

"It's just another example of what the [federal government's] mentality is for indigenous people," Knight said. "I have to wonder who keeps pushing this. There's some horse-trading. Some back room trading."

Knight suggested that a proposed relocation site in

Continued on Page 5

EIS: Science at its worst

by John Dohrenwend
Adjunct Professor of Geosciences
University of Arizona
[February 3, 2005]

Careful and consistent analyses of available scientific data concerning the Atlas tailings pile must be made within the context of accurate perceptions of how the Colorado River really interacts with the Moab Valley.

Such analyses clearly show that the flood hazard potential at the Atlas tailings site is not diminishing, as the DOE claims, because of a fantasized southward and eastward migration of the Colorado River. Rather, the river has flowed across the tailings site in the past and very possibly could return to that course in the future.

Furthermore, because the river's inner channel has, over the past 80 years, shifted closer to the pile and has become narrower and deeper, the potential for deep channel scour, sudden channel shifting, and catastrophic failure of the pile during large floods may well have increased significantly.

So after all of the studies, reports and pronouncements by the Atlas Minerals Corporation, the Nuclear Regulatory Commission, the Department of Energy and their advisors and consultants, do we really know anything useful about the suitability of the Atlas mill site for the long term storage of more than 11 million tons of hazardous waste?

For one thing, we know that there really isn't any reason to suppose that the site is suitable at all. After all, the site was not originally selected out of concerns for human health and safety or for the preservation of environmental quality.

Rather it was selected as a convenient place for the milling of uranium ore and a cheap place for dumping the enormous quantities of chemical and radioactive waste generated by that milling process.

Moreover, a comprehensive review of the Department of Energy's reports clearly shows that these reports do not present an accurate or realistic picture of the geologic and hydrologic conditions at the mill site. The DOE's reports contain numerous flaws and failings.

These include the use of inaccurate data; errors in the analysis and comparison of data; selective and inconsistent use of data; errors of logic; errors of omission; and the application of overly simplistic models and theories that are largely inappropriate to the specific geologic and hydrologic situation in Moab Valley. As a result, the DOE's perception of the potential hydrologic and geologic hazards at the Moab Mill site must be viewed as overly simplistic, highly distorted, and quite possibly, completely wrong.

Contrary to the DOE's assurances:

(1) An 80-year history documented by accurate registration of historic maps and aerial photographs clearly shows that the Colorado River is **not** migrating south and east away from the tailings pile. The high flood levees

Continued on Page 5

The River and the Pile: The Atlas tailings pile, more than 10.5 million tons of chemical and radioactive waste sprawls across the floodplain of the Colorado River at the north end of Moab Valley. Aerial view looking east across the pile and the Moab mill site towards the US 191 bridge.

Move the pile to higher and safer ground

by John Dohrenwend
Adjunct Professor of Geosciences
University of Arizona
[February 10, 2005]

Would additional scientific study of the flood hazard potential at the Atlas tailings site be useful, or would such studies only prove to be just another waste of resources and time?

To be useful, such studies would have to reduce significantly the uncertainties that surround and confound our understanding of the complex relationship between the Colorado River and the Atlas tailings site. And to be useful, such studies would also have to determine whether or not there is indeed a significant potential for catastrophic flooding that would compromise the stability and integrity of the tailings pile. However, there is no guarantee that either of these objectives can be met.

The Moab Valley is a very unusual place – essentially one of a kind on the Colorado Plateau, in North America, and perhaps anywhere in the world. The formation of the Moab Valley is in large part the result of salt tectonics. The folding, flow, and diapiric rise of massive salt deposits from far beneath the earth's surface, and the dissolution of these deposits as the earth's surface is eroded down to the level of the rising salt are the principal processes that have shaped most of the large valleys of the Paradox Basin.

And of all of these breached anticlinal valleys, the Moab Valley appears to be the only one where the Colorado River or any of its tributaries are downcutting more slowly than the valley is subsiding. This, in and of itself, makes the Moab Valley practically unique.

Moreover, the valley is located in the east central part of the Colorado Plateau, a region of very rapid erosion and landscape change. This part of the Plateau is one of the youngest landscapes in North America. And as the principal agent of this rapid erosion, the Colorado River is quite literally one of the dirtiest rivers in the world. That is to say, it carries more dirt or sediment per unit of flow than all but a few of the world's major rivers.

There is probably no other place on earth that is truly comparable to the Moab Valley. This makes the scientific study of this very unusual place all the more difficult.

Earth science works best when there are many places where similar phenomena and relationships can be used for comparison with the area being studied. Without the ability to make such comparisons, it is very difficult to test or verify the results and conclusions of the study.

Further complicating the issue is the fact that recent geologic times have been and continue to be times of changing climate. Since the waning stages of the last great ice age to the present time, climate change has been norm. Generally speaking, climatic conditions on the Colorado Plateau have become progressively warmer and drier throughout this time.

However, conditions have also fluctuated dramatically between periods of relative moisture and extended drought. These changes and fluctuations have strongly influenced extremes of river flow and rates of landscape change throughout the region. Continuous measurements of river flow on the Colorado River have only been made for the past 91 years, and this limited record does not provide a sufficient base for predicting the future frequency or magnitude of very large floods.

> ***"A great deal of time and resources have been devoted by DOE and its predecessors in their attempts to prove that the site of the Atlas tailings pile is safe from very large floods. However, it appears that very little time or resources have been dedicated to determining what has really happened at the site over the past several thousand years."***

> ***"The work of DOE and its predecessors is vague, inconsistent, incomplete, and at least in part based on errors in data analysis and biased interpretations based on inappropriate models of how things really work."***

We also lack much of the basic scientific data that is necessary to understand the complex relationship between the Colorado River and the Moab Valley. We do not have a clear picture of the rate of downcutting of the Colorado River. The many well-preserved river terraces both upstream and downstream from Moab valley have not yet been carefully studied, and the ages of these terraces have not been determined.

We also lack a clear understanding of the subsidence and filling of Moab Valley. The thickness and extent of the valley filling deposits are only approximately known, particularly on the Moab side of the river. Moreover, the depth of scour within these deposits during very large floods is not well established.

More importantly, the ages of these deposits are only very imprecisely known even though several attempts have been made to date them. Therefore, we do not have (and perhaps may never have) sufficient subsurface data to understand anything more than the general details of the dissolution, subsidence, and valley filling processes.

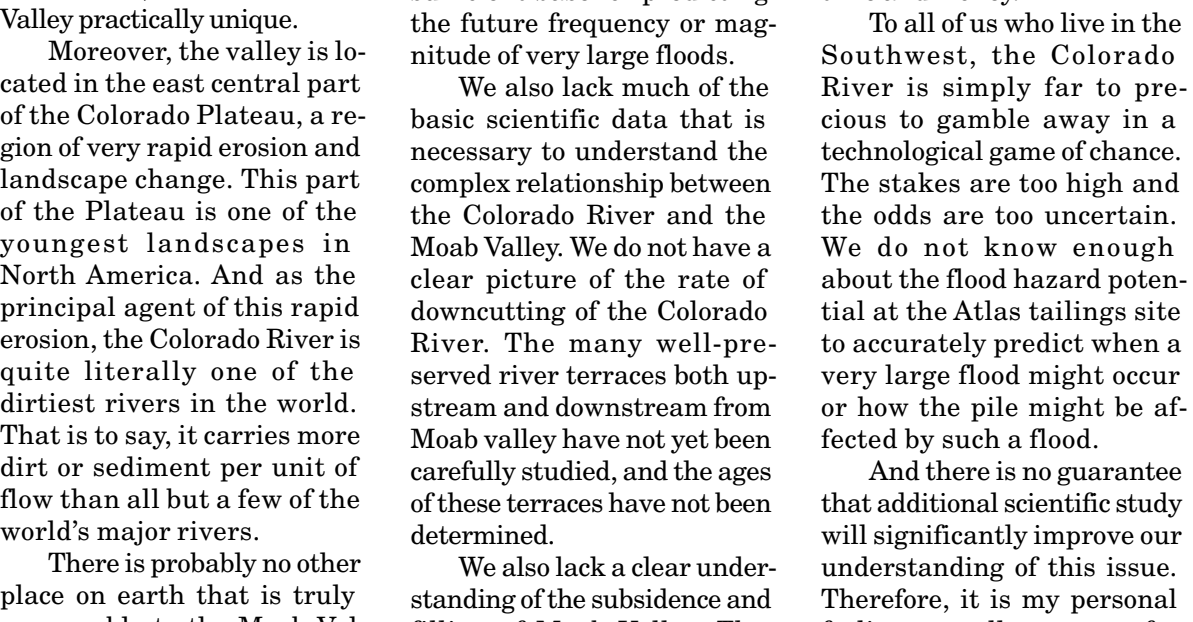
Consequently, we do not know how rapidly the river is eroding downward, how rapidly the valley filling deposits are subsiding, or whether downward erosion and valley subsidence vary in time and space. In short, we have yet to learn very much at all about the natural system that immediately surrounds, supports, and potentially threatens the site of the Atlas tailings pile.

A great deal of time and resources have been devoted by DOE and its predecessors in their attempts to prove that the site of the Atlas tailings pile is safe from very large floods. However, it appears that very little time or resources have been dedicated to determining what has really happened at the site over the past several thousand years.

In consequence, the DOE has not been successful in developing a clear understanding of the Atlas tailings site. The work of DOE and its predecessors is vague, inconsistent, incomplete, and at least in part based on errors in data analysis and biased interpretations based on inappropriate models of how things really work. Given this somewhat less than impressive track record, it can be argued that further study might very well be a waste of time and money.

To all of us who live in the Southwest, the Colorado River is simply far to precious to gamble away in a technological game of chance. The stakes are too high and the odds are too uncertain. We do not know enough about the flood hazard potential at the Atlas tailings site to accurately predict when a very large flood might occur or how the pile might be affected by such a flood.

And there is no guarantee that additional scientific study will significantly improve our understanding of this issue. Therefore, it is my personal feeling as well as my professional opinion that the most prudent course of action for remediation of the Atlas tailings site is to move the pile to higher and safer ground and to do it now.



The River and the Pile. Vertical aerial view of the Moab mill and tailings site located on the Colorado River floodplain. The site is situated on the outside of a large bend in the river channel just downstream from where the river leaves its narrow, high-walled gorge and enters the north end of Moab Valley.

On the ground: looking at the Atlas Tailings pile from the peripheral fence. *Photo by Ginny Carlson*

Draft EIS: Science at its worst . . .

Continued from page 4

bordering the main channel have not shifted measurably.

However, the south and east bank of the active channel between these levees has moved north and west and is now 150 to 300 feet closer to the mill site. And, the channel has narrowed and deepened in its new position.

(2) Available well log and bore hole data indicates that the valley fill is not thickest and deepest south of the present location of the river channel. Rather, these data show that the valley fill is thickest and deepest beneath or perhaps as much as several hundred feet north of the present river channel. Consequently, the position of The Sloughs in the Matheson Wetlands is not directly related to salt induced subsidence of the valley filling sediments. Instead, The Sloughs merely mark the lowland boundary between the Mill Creek-Pack Creek fan and the Colorado River fan. Therefore, there is no reason to suppose that continuing subsidence of the valley floor would cause the river channel to migrate away from the tailings pile.

(3) Available subsurface data also show that conditions directly beneath the tailings pile are much more complex than the highly simplistic and relatively benign picture presented by the DOE.

Indeed, these data indicate that localized subsidence of the valley floor directly beneath the tailings pile must be considered as a possible and potentially serious geologic hazard.

Moreover, comparison of surface and subsurface data along the northern margin of Moab Valley between Courthouse Wash and the mill site suggest the possibility that localized subsidence or extremely deep channel scour has occurred in this area sometime during the past 45,000 years.

(4) Courthouse Wash and Moab Wash have not caused the Colorado River channel to migrate away from the mill site. Rather, analysis and direct observation of high energy flows from Courthouse Wash demonstrate unquestionably that these floods have deposited sediments on the south side of the Colorado River channel, and therefore, have actively contributed to the northward migration of the river channel.

(5) Finally, the geometry and position of ancient Colorado River gravel buried beneath the surface of Moab Valley clearly show that the Colorado River has in fact shifted back and forth across mill and tailings site in the recent geologic past.

In summary, the DOE contends that the Moab mill site is a place suitable for the long-term storage of hazardous waste because the Colorado River is and will continue to migrate away from the site. This contention is seriously flawed.

To some it might even appear to be little more than an elaborate fabrication contrived to justify past errors and misconceptions, thus tending to allay the fears of a concerned public. If so, this would constitute a serious breach of the public trust and flagrant disregard for the public interest.

Attempts to mislead the public with scientific misinformation are an affront to science and a threat to the democratic process. They are, without question, prime examples of science at its worst.

DOE told: move pile . . .

Continued from page 4

Klondike Flats north of Moab is more sensible because it is isolated, but said it may be less desirable to some people because it is popular with off-road enthusiasts.

"They don't want to give that up," he said. "But they want to stick it down our throats."

San Juan County Commissioner Manuel Morgan, the only Native American representative on the commission, said while the county generally supports the IUC proposal because it will create much-needed employment in the region, he will speak out against it.

"The people of this community have spoken and they are against this," Morgan said. "That's where I stand. With my people."

Thursday's meeting was the second and final day of hearings in southeastern Utah over proposals for dealing with the tailings outlined in a November draft environmental impact statement. Hearings were also held in Green River and Blanding.

In an unusual move, the DOE report did not list a "preferred alternative." Instead, it proposes several possible scenarios for mitigating the tailings that are currently leaching ammonia and other toxic materials into the Colorado River.

The draft EIS proposes either covering the tailings in place with a protective cap, or moving the material to one of three proposed sites – via truck or slurry pipeline to White Mesa Mill, or by rail, truck or pipeline to Klondike Flats, near the Grand County airport, or to Crescent Junction at the intersection of U.S. 191 and I-70.

The DOE estimates that capping the tailings in place would take seven to 10 years to complete at a cost of about $166 million. The report estimates that relocating the tailings would cost between $329 million $464 million. The slurry pipeline to White Mesa carries the most expensive price tag.

The public comment period for the draft EIS ends February 18. This summer, the DOE will issue a final EIS that includes the agency's decision for cleaning up the site.

Many Trails

by Adrien F. Taylor

[Updated from February 3, 2005]

The spirit of cooperation among the city and county councils and other local organizations on the subject of facilitating the moving of the Atlas tailings pile away from the Colorado River is something we haven't seen in many years.

We seem to be a community that is exceptionally fond of controversy. The old rag suggests that if you haven't heard a new rumour by noon, you should make one. It's meant to elicit a chuckle, and it does. But it's also kind of sad.

But back to the first statement. It is truly great to see often-divergent groups sitting down at the table, working at strategies to get the national Congress to appropriate money to move the tailings. Granted, the flooding in the St. George area of Utah, in areas of California, and particular the devastating tsunami halfway around the world from us have raised fear among the people. Perhaps rightly so. Inertia has been our own worst enemy when it has come to the tailings pile.

In the first place, the issue has dragged on for years and years now, with seemingly the same arguments being put forth, and either nobody listening or nobody caring. After a while you get kind of worn down, beating your head against the wall.

Now, everyone percieves that we are finally facing our last good opportunity to get the thing moved. Paraphrasing several speakers at the Jan. 26 meeting: Just do it. Spend the money. Move it now. Do it right.

Questions have been raised from several members of the business community about raising a ruckus and scaring off that golden goose: tourists. Raising questions is legitimate, but suggesting that we stay quiet on the subject of the pile, just to cultivate the goose, is doing ourselves a disservice in the long run.

In this special section we are including a refreshed version of "Write Your Congressman," which fell by the wayside for some reason in recent years. That will help people to express their own opinions to our delegation. We also include (again) the information about writing to the Department of Energy. See pages two and three.

[February 10, 2005]

A delegation from Grand County travels this weekend to Washington D.C. to confer with our congressional delegation and others there. The Atlas Blitz Team, which I mentioned last week, has been gathering extensive lists of interested parties.

As a handout for the Washington visit, and as a compact information piece for others, I have compiled the coverage of the first six weeks of 2005 on the Atlas tailings pile into this special section. It is not going out with the newspaper mailing. I am assuming that subscribers will have read these articles as they have appeared. But the section will be available here at the office at 50¢ each until supplies run out.

Speaking of websites, the Blitz Team now also has one up on the tailings pile. Go to: www.moabtailings.org .

The team will be working to educate governors, congressional delegations, water users (both agricultural and culinary) and the public in all of the Colorado River user states.

The team has organized itself into six working subgroups: website; media; contact with elected officials; contact with concerned organizations, community effort; and talking points.

This is a powerful group of community members who are determined to see the tailings pile moved.

The valley and the river . . .

Moab Valley and the Colorado River. Aerial view looking northwest along the trend of the valley across the Matheson Wetlands and the Colorado River to the Atlas tailings pile.

Push Department of Energy to stay on course . . .

[January 20, 2005]

The TI's recent articles about the Draft Environmental Impact Statement have been excellent. It appears that the DOE has not fully considered the risks of the on-site alternative, i.e., capping the tailings in place.

Just seeing television coverage of the recent flooding of the Santa Clara and Virgin Rivers in Southwestern Utah is enough to send a shiver down your back and to raise a lot of questions about the on-site alternative.

As I see it, the worst possible thing that could happen would be for DOE to make the WRONG decisions. And the next worst possible thing would be for them to delay making the decisions. After all, just since DOE took over the problem "Moab site," we have been through scoping meetings, the National Academy of Sciences meetings, and public information meetings in June 2003 (at which time the ROI—Record of Decision was expected in September 2004). Then, the issuing of the DEIS, and last Friday the stakeholders' meeting.

Next steps are: the Final EIS with the "preferred alternative," then the ROI (now scheduled for this fall), then a proposal to Congress with funding requests, and then a Remedial Action Plan necessitating further studies. Only then can we expect some action. Since the actual decisions will be made in Washington D.C. by an assistant secretary and/or deputy secretary — positions now open, it is not clear that DOE can stay on schedule.

For those of us who want to see the tailings moved, by rail, to either Crescent Junction or Klondike Flats, it seems that the best strategy is to provide all the input we can, by the deadline of February 18, and not to ask for further studies. Let's push DOE to "stay the course" and to make the right decisions.

–Jean Binyon, Moab

Letters from the People

Grand County residents must insist tailings be moved . . .

[January 6, 2005]

I was extremely saddened to read about the tragic tsunami disaster in Asia. In a few short moments, thousands of lives were lost. Unfortunately, all of the safeguards and warnings that modern society has available were not in place because the Indian Ocean did not have a history of major tsunamis. Had governments heeded the warnings of a few concerned scientists, many lives would have been saved.

Here in Moab, we are again addressing the "moving" or "capping" of the uranium tailings pile, which sits on the floodplain of the Colorado River. The recently-released draft EIS dealing with the tailings pile does not adequately address the potential of a major flood. It is my opinion that as long as the tailings pile sits on the bank of the Colorado River, there is always a possibility that a major flood will undermine this toxic dump.

Although there is no connection between the two events, I am always uneasy when I read about the enormous power of nature. We Grand County residents must insist that the only viable permanent solution is to move the tailings pile. When that happens, I will be thankful when it rains in Moab, not concerned that it may rain too much.

–Jim Carlson
Moab

Here's another thought about Courthouse Wash . . .

[February 3, 2005]

I just finished reading the article, "Consider the strange case of Courthouse Wash." I have found with interest some of the same ideas I have felt over the years expressed in the article. However, if I may share another thought, I wonder if some ideas might be modified or altered. I am not writing this to find fault or excuse, only to present another "thought."

I can remember many years ago (my memory fails me on exact year, but I believe it was late 1960', maybe early 70s) that a massive flash flood came through Courthouse Wash. It was large enough that we at Tex's River Cruises spent most of the night moving boats and our dock upstream to prevent them from being sanded in by the backwater of the river and flood.

The next day a large deposit of sand blocked at least 75 percent of the river. The deposit diverted the water so much Atlas Minerals had no water for their operations. They were nearly shut down for days until they were able to redivert the water to their side of the river. Atlas built a dike or levee to redirect the water to their side of the river.

As I looked at the photo in your last issue, it appears to me that remnants of the levee are still evident. To me the levee also had or still has an effect on the flow of the river allowing the large downstream island to form.

As I said earlier, my intentions are not to blame anyone or distrust any findings. I am only pointing out another "factor" that may have been overlooked. I welcome any other comments or observations.

–Bernie Radcliffe
Moab

Yet more evidence to move tailings pile . . .

[January 20, 2005]

After reviewing the summary of the draft EIS on the Uranium Tailings Pile, it seems to me that moving the tailings away from the banks of the Colorado River is the best solution. Common sense dictates that once the pile is moved, it no longer poses a threat to those living on the Colorado River or using the river water.

On Friday, at the Stakeholders meeting, two new studies were presented. The USGS recently developed a computer model using actual measurements of the river. Their study raised concerns that a severe flood could generate fast currents along the edge of the tailings pile with the possibility of undermining the pile.

Dr. John Dohrenwend analyzed some of the Department of Energy (DOE) flood and river migration information and came to different conclusions than presented in the draft EIS. Dr. Dohrenwend will be giving a lecture at the MIC on Monday evening, January 24, talking in non-scientific terms about his study and answering questions.

Both studies raised additional safety questions in my mind, however none of these questions will matter, if the DOE decides to move the tailings. I urge your readers to attend Dr. Dohrenwend's lecture and to write a letter to the DOE before February 18 urging them to move the Tailings Pile to ensure the safety of those of us living along the Colorado River.

–Ginny Carlson,
Moab

PS. The Colorado River at Moab has not had a 100-year flood since the late 1800's.

Don't blame Mother Nature for river diversion . . .

[February 3, 2005]

First, let me say that I am not taking sides in the Atlas tailings debate. I get amused to see the so-called experts with Ph.Ds and whatever to tell us why the Colorado River is shifting to the north bank.

Take a good look at the aerial photo in last week's *Times-Independent* and you can see a man-made dike going from the south bank to the upper end of the island. You can also see the dike by driving across the Colorado River Bridge and looking downstream.

About 1963 or 1964, the main channel went between the south bank and the island. Atlas Mineral had pumps on the north bank and had a hard time getting enough water. Atlas hired C&W Contracting Co. to push a dike from the south bank to the island so water would be diverted to the north side of the river. The reason I know this is because I was the dozer operator that did that job. Atlas then capped the dike with rock so it became a permanent dike.

It shouldn't take a rocket scientist to figure out that if you build a dike to divert water to the north side of the river that is where the water will go.

Guess we shouldn't blame Mother Nature for something humans did.

–Neal Swisher
Moab

Supporting moving the tailings . . .

[January 20, 2005]

I support moving the Atlas Tailings Pile currently situated along the Colorado River north of Moab to a place as far away as possible. Sell it to the highest bidder. They can have it. All of it.

My wife and I recently bought property in the Moab area. We plan on retiring in Moab. I don't want to worry about radioactive waste lying in wait nearby. I have been around rivers all of my professional life and despite how much we know about them, they remain wholly unpredictable.

The tailings are located a mere 750 feet from the river. The worst flood on record was just under 80,000 cubic feet per second. One thing I know about nature is she can always top her last effort. Although it would not break my heart if it all ended up in Lake Powell, I am sure a lot of people wouldn't care for that. So short of advocating for a radioactive Lake Powell, I support complete removal to a safe location but not in anyone else's backyard please. That would not be neighborly.

I look forward to a radioactive waste free Moab upon our arrival in the future. I want to gaze across the valley from our future home and know that my letter was one of many that helped make this a reality. Thank you.

–Scott Grunder, Star, Idaho

More thoughts about Courthouse Wash . . .

[February 10, 2005]

I would like to thank Bernie Radcliffe and Neal Swisher for their thoughtful comments about Courthouse Wash. Their first-hand observations of the effects of a powerful flash flood on Courthouse Wash in the mid 60's provide insight into the effect of the wash on the river - and the river on the wash.

That the alluvial fan deposited by this flood was large enough to temporarily block and divert the flow of the Colorado River is a compelling demonstration of the possible short-term dominance of the wash during the summer monsoon season, when the river is low.

Also, it is interesting to note that a relatively small man-made dike would be substantial enough to redirect the flow of the river for significant period of time. This is probably due, at least in part, to the fact that during the two decades following the dike's construction, river flows were relatively low. Measurements recorded at the Dewey Bridge gauging station show that flows during this time only briefly exceeded 40,000 cubic feet per second (cfs) in only two of twenty years.

The success of the dike was probably also due to the fact that it was merely redirecting the river's flow back into its long-term course. Repeat aerial photographs of the river channel between Courthouse Wash and the tailings pile shows that, from 1944 to the present time, the deepest part of the river channel has almost always been located close to the river's north bank.

There is no doubt that a river can be artificially controlled over the short term, but over the long term and in the end, the river usually wins. Photos taken in September 1983 show that the dike constructed in the mid 60's had been largely destroyed by this time - probably as a result of the extended spring flood of that same year which peaked on June 27 at 60,500 cfs.

–John Dohrenwend
Moab

The Times-Independent

(UPS) 6309-2000) • ISSN 1538-1838

Entered as Second class Matter at the Post Office at Moab, Utah under the Act of March 3, 1897.
Second class postage paid at Moab, Utah 84532. Official City and County Newspaper.

Published each Thursday at: 35 East Center Street, Moab, Grand County, Utah 84532
e-mail address: editor@moabtimes.com

Postmaster: Send changes of address to: *The Times-Independent*, P.O. Box 129, Moab, UT 84532
435-259-7525 or FAX 435-259-7741

Member NNA NATIONAL NEWSPAPER ASSOCIATION
and
UTAH PRESS ASSOCIATION

Samuel J. and Adrien F. Taylor, Publishers
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