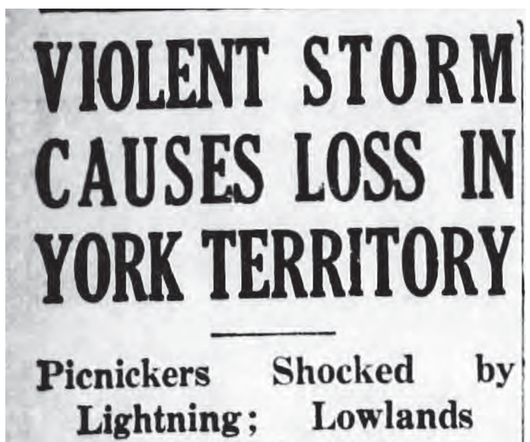
US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

From the Flood of 1933 to Indian Rock Dam

The 1920's and 1930's saw tremendous flooding throughout the United States, with York being no exception.

Though not the only major flood around that time, the flood of record for York struck in 1933 - causing an estimated millions of dollars in damages while the region was already dealing with the Great Depression. It was a primary impetus for the construction of Indian Rock Dam.



VIOLENT STORM CAUSES LOSS IN YORK TERRITORY

Picnickers Shocked by Lightning; Lowlands Flooded by Rain.

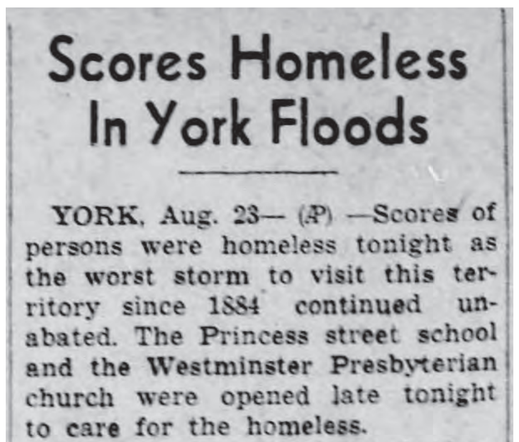
York, Pa., Aug. 21—(UP)—Residents of central and lower York county today counted their losses after a violent rainstorm that laid waste to several areas and brought injury and shock from lightning to persons at a Sunday school picnic.

The storm, which was said to be the worst in this district for many years, struck Saturday night, flooding lowlands in the southern part of the county, damaging railroad tracks and causing a concrete highway bridge to sink a foot into the ground.

Twenty persons were stunned and injured when 60 picnickers at Pittersville sought refuge in a metal-covered refreshment stand which was struck by lightning.

Beatrice Snell, 11, was thrown against a cabinet and critically injurer, and Curvin Seneltzer suffered a possible concussion of the brain. Both were treated at a York hospital. After the blinding flash the panic stricken refugees in the small building found a score of their number strewn about the floor, many of them unconscious and the others temporarily stunned. Two doctors were hurriedly summoned and after first aid treatment, the more seriously injured were rushed to a hospital here.

Shamokin Daily News - August 21, 1933



Scores Homeless In York Floods

YORK, Aug. 23— (AP) —Scores of persons were homeless tonight as the worst storm to visit this territory since 1884 continued unabated. The Princess street school and the Westminster Presbyterian church were opened late tonight to care for the homeless.

Water passed all of the bridges in the city with the exception of the College avenue bridge, the highest of which crosses the Codorus creek within the city limits.

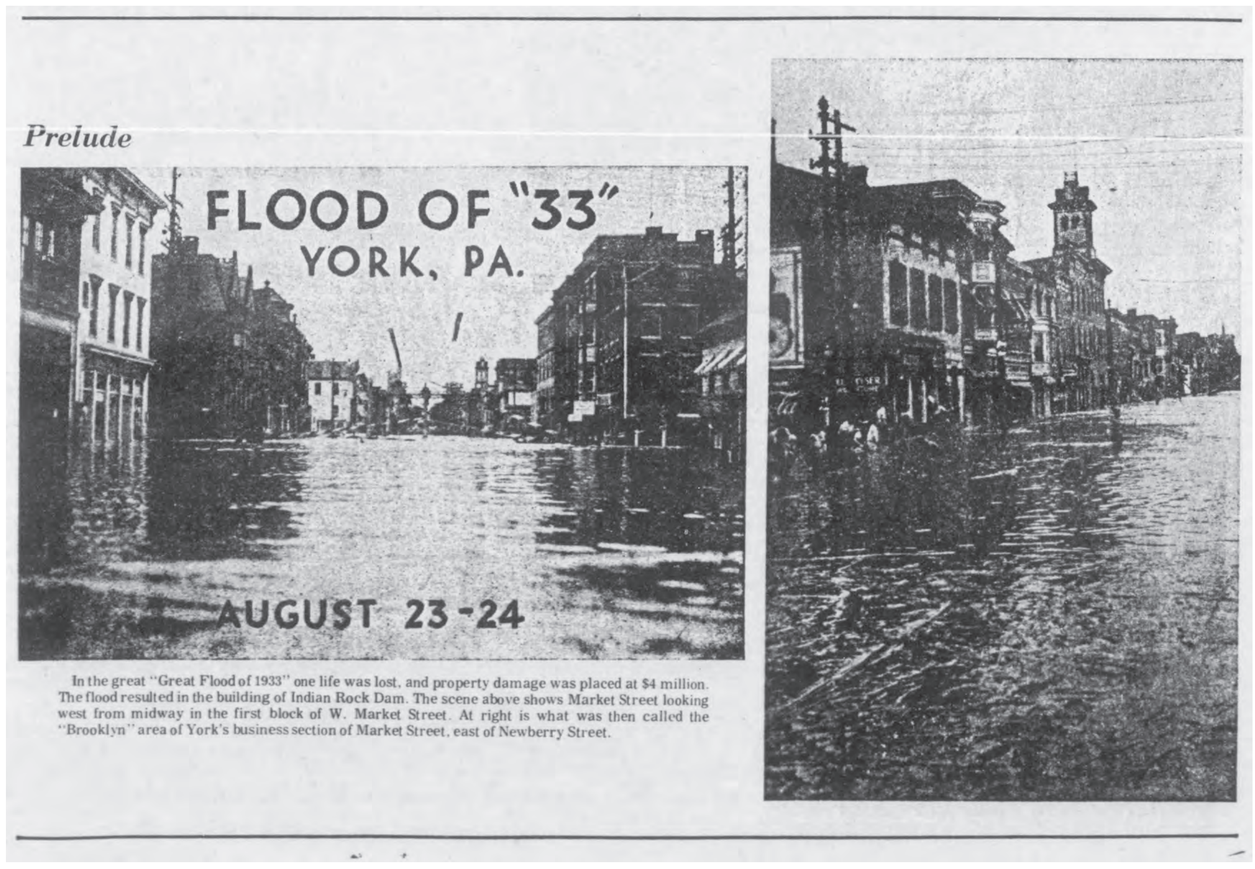
The twenty-eighth military police were called out to assist wherever possible.

The Pennsylvania Gas and Electric company called in every available man, prepared for an emergency. All of the gas mains run along the bridges and it is feared that the pressure of the water will break them.

The so-called "Brooklyn" section of York, which borders the Codorus creek in the shadow of the business center, was inundated early and Market street, the continuation of the Lincoln highway through the city, was impassable.

Streets were turned into rivers, sewers were unable to handle the volume of water which poured into them, and cellars rapidly filled. A piano firm moved a dozen pianos from private homes to its warehouse. The gas main which followed a stream at Windsor broke and that town of approximately 2,500 persons is without gas.

The Altoona Tribune - August 24, 1933



In the great "Great Flood of 1933" one life was lost, and property damage was placed at $4 million. The flood resulted in the building of Indian Rock Dam. The scene above shows Market Street looking west from midway in the first block of W. Market Street. At right is what was then called the "Brooklyn" area of York's business section of Market Street, east of Newberry Street.

York Daily Record Tropical Storm Agnes Supplemental - June 29, 1972

The Flood Control Act of 1936

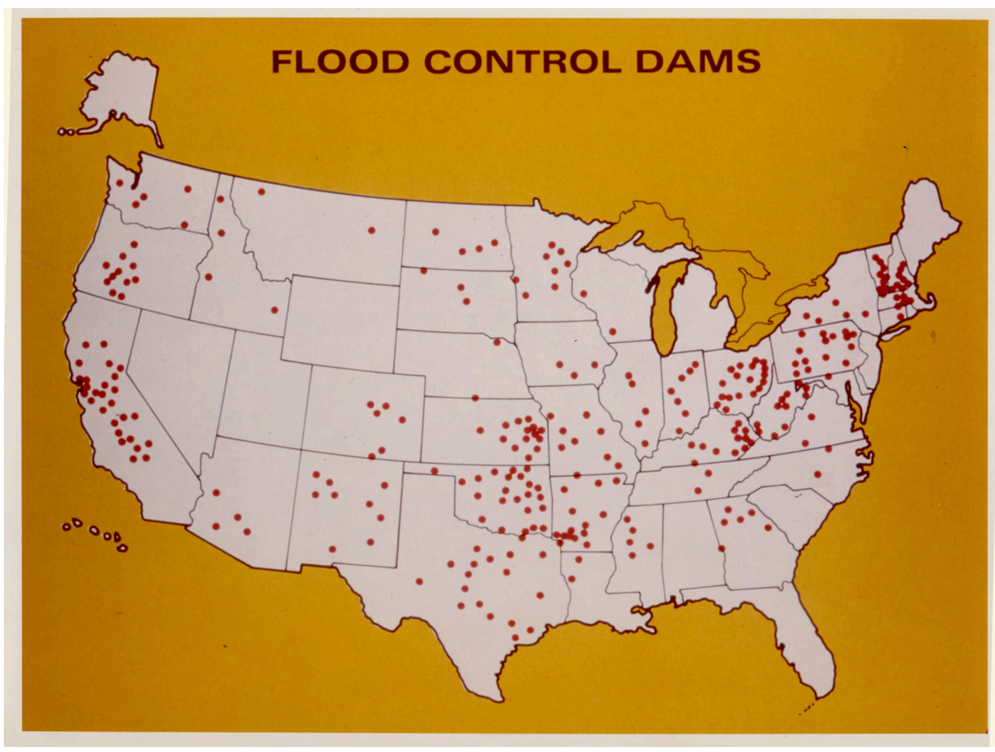
The Flood Control Act of 1936 was landmark legislation that ultimately determined that flooding was a national problem that the federal government was going to become more involved in addressing.

It created a new major mission for the U.S. Army Corps of Engineers and provided the statutory authorization for the construction of Indian Rock Dam - as well as hundreds of other flood risk management works across the country.

These remarkable engineering projects today comprise one of the largest single additions to the nation's physical plant - rivaled only by the highway system.

Over the years, they have saved billions of dollars in property damage and protected hundreds of thousands of people from anxiety, injury, and death.

"It is hereby recognized **that destructive floods upon** the rivers of the United States, upsetting orderly processes and causing loss of life and property, including the erosion of lands, and impairing and obstructing navigation, highways, railroads, and other channels of commerce between the States, constitute a menace to national welfare." - ***Flood Control Act of 1936***



U.S. Army Corps of Engineers, Office of History

Indian Rock Dam was not the only dam authorized by the Flood Control Act of 1936. Subsequent to passage of the1936 Flood Control Act, hundreds of flood control dams were built throughout the United States.

Did You Know?

The Flood Control Act of 1936 provided the authorization for 5 flood risk management dams constructed along the Susquehanna River and its tributaries that are still operated and maintained by the U.S. Army Corps of Engineers, Baltimore District. Several other dams have been authorized by later Flood Control Acts and have been constructed as well.

US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

Indian Rock Dam Construction Coverage

Construction on Indian Rock Dam began in 1940, and the U.S. Army Corps of Engineers considers construction to have been completed September 12, 1942

The Weather
Eastern Pennsylvania — Partly cloudy, colder in southeast portion Monday; Tuesday increasing cloudiness followed by rain in west portion at night.

THE GAZETTE AND DAILY

The Gazette and Daily prints All the News All the Time

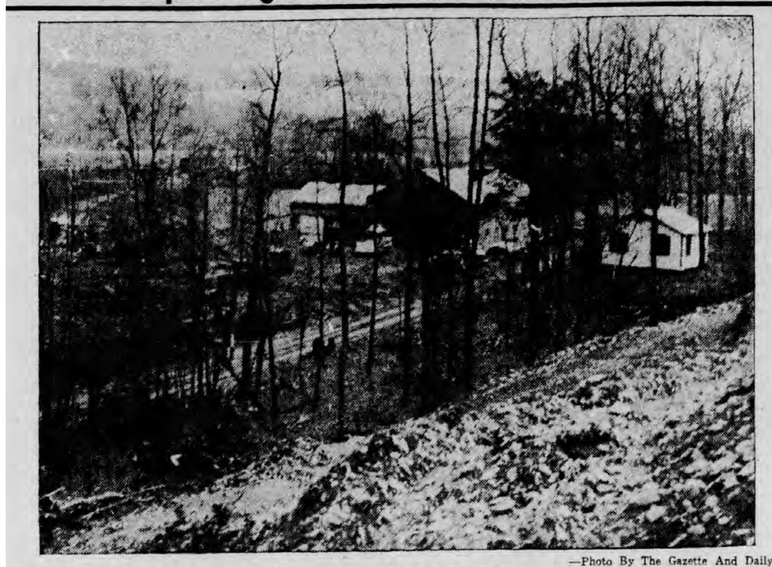
VOL. CV.—NO. 17133. YORK, PA., MONDAY MORNING, APRIL 1, 1940.—TWELVE PAGES. PRICE TWO CENTS—TEN CENTS A WEEK

Indian Rock Dam Will Make York Flood-Proof

—Photo By The Gazette And Daily

While residents of cities up-state are fearing floods from the Susquehanna river, work is going forward on the Indian Rock dam project, which is being done by the U. S. Army engineers at a cost of more than one million dollars. The dam, when completed about four miles south of York, will put the Codorus river under flood control and never will the great August flood of 1933 be repeated to cause Yorkers untold financial losses. Shown above is a picture of the work now being done. The picture was taken from Indian Rock.

Operating Base At Indian Rock Dam



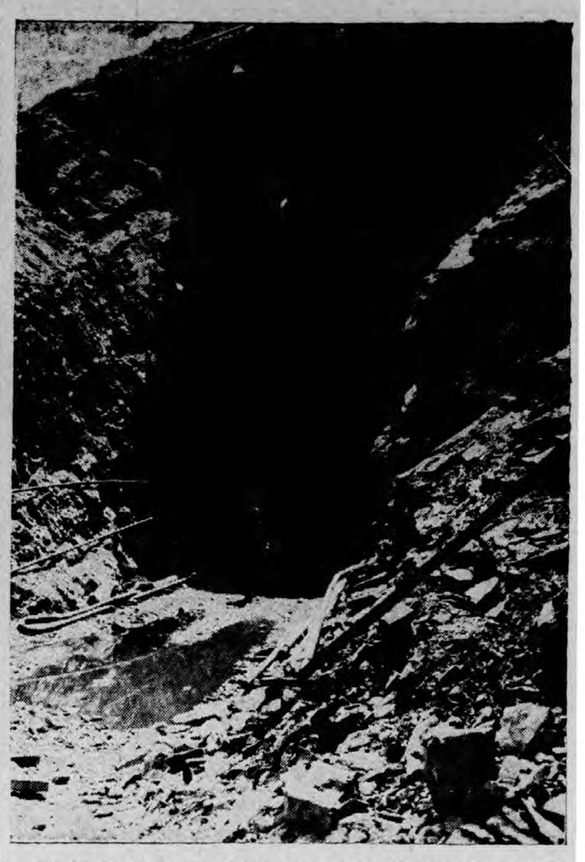
—Photo By The Gazette And Daily

Shown above is the operating base at Indian Rock dam, southwest of York. Here the machinery is stored and the records kept for the dam project now under construction at a point nearby on the Codorus river. The government is building the dam at a cost of more than one million dollars.

York Gazette and Daily News - April 8, 1940

Construction Work At Indian Rock Dam

Above is pictured a concrete cement conveyor which has been constructed for purpose of mixing and pouring cement for the tunnel. This conveyor is about 60 feet high.



This picture shows the one end of the tunnel. This is being cut through a hillside and will be about 360 feet in length. This tunnel, when finished, will be solid concrete.

Here is a foreman pictured at the bottom of the conveyor from the opposite side to the picture at top.

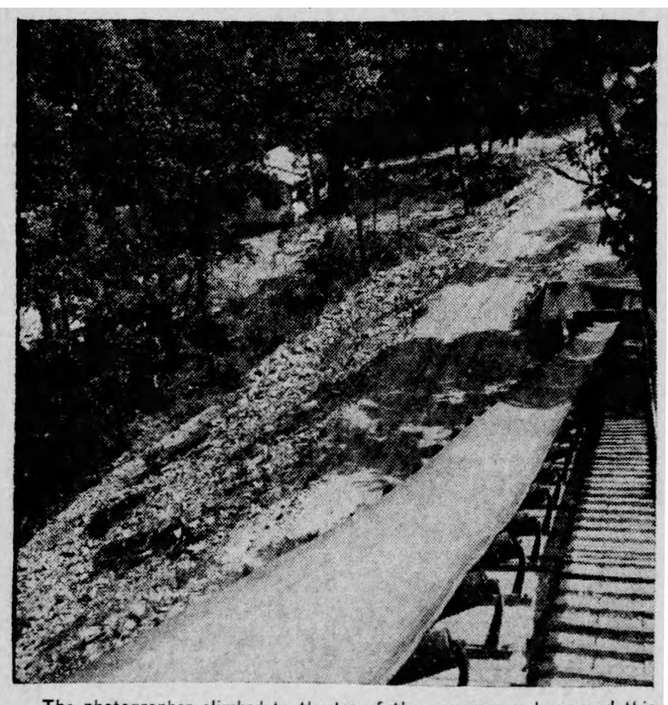
—Photos By The Gazette And Daily

This is just one of the many tractors the U. S. War department has at the construction scene.

Work Speeding Along On Indian Rock Dam

—Photo By The Gazette And Daily

Some of the excavation work being done at Indian Rock dam, south of York, on the U. S. Army flood control project being done at a cost of more than a million dollars. Additional pictures taken at the dam sight appear on Page No. 14 this morning.



The photographer climbed to the top of the conveyor and snapped this picture. The picture on the front page this morning was also taken from the top of the conveyor.

York Gazette and Daily News - June 11, 1940

Complete Work On Indian Rock Dam

When several details in connection with the construction of Indian Rock dam, the flood control measure on the Codorus creek sponsored by the U. S. War department are completed, the dam will be placed in operation, according to A. E. Steere, engineer for the War Department, who has charge of the Codorus creek work here.

The engineer said yesterday the dam is complete and he hopes the several contracting details will be worked out before the end of the month and then the control system can be placed in operation.

Other work on the Codorus, including widening, dredging and channeling of the stream, which is taken care of in another contract, may go on for some time. Present weather conditions are hampering the B. F. Foster company, the contracting firm, in the work, and there is still plenty to do on the job. But this should not interfere with placing the Indian Rock Dam Control project in operation within the near future, according to Mr. Steere.

York Gazette and Daily News - August 19, 1942

Photos and captions here from the construction of Indian Rock Dam are from editions of the York Gazette and Daily News from that time. We have shared them here courtesy of the York Daily Record.

US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

Indian Rock Dam Passes First Test

Indian Rock Dam—"Boondoggle" That Works

Controversial Issue Of 1940 Stops 1946 Flood

Dam prevented York Sunday from suffering repetition on smaller scale of 1933 flood disaster. Only automatic radio flood warning net-work in world used at Indian Rock.

The man who pressed a button and stopped a flood Sunday was busy preparing for the next rainy day yesterday.

Standing on the bridge of the control tower at Indian Rock dam, shouting instructions to an assistant working nearly 60 feet below him in the channel of the Codorus, David Young, tender of the dam, was a difficult man to interview as he supervised the work of placing the great structure in order after Sunday's flash flood.

"A lot of people think all I do is sit around here and wait for it to rain," he said to a reporter.

Actually his work is never done. In flood times things really get rough. Constant radio reports of flood stages along the turbulent Codorus, floodgates to be raised and lowered, with always the spectre of possible disaster if he does not gauge the level of the Codorus crest properly, watching for drifting trees which might jam his flood gates—all these things keep Young a very busy man.

Yorkers Show Interest

Pleased that Yorkers were beginning to show some interest in the million-dollar U. S. Engineer-built dam, Young stated that even now not enough people realize its value.

Interrupting his task of levering a large tree from the mass of driftwood piled against the dam's floodgates, he declared that but for the dam, York might have suffered a repetition on a smaller scale of 1933's disaster which cost York $4,000,000. As it was, Sunday's flash flood caused little more than longer hours and extra work for Young and his assistants.

Unique Radio Setup

"We have at this dam," he said, "the only automatic radio flood warning net-work in the world. You didn't know that, and there are very few other Yorkers who do. This Codorus is licked and unless something in the way of a miracle happens, York will never have another flood while this dam stands."

Pointing to the still incompleted spillway bridge which will permit traffic to roll on a highway over the dam breast, he said, "Once that bridge is in, perhaps more people will come out and see how this thing works."

Explains Dam's Functions

Aware that he had an interested listener, Young went on to explain how the dam functions, and how its equipment operates. Leaving the task of clearing the huge concrete trash bars which protect the floodgates, he walked into the control tower and pointed out his weather recording instruments, and other vital pieces of machinery, as polished as a fire engine for a parade.

The well-tended equipment was a testimony to the pride he feels in the dam. Pointing to the radio antenna which tops his house, he stressed again that the dam's most valuable piece of equipment was his radio net.

Young is rightfully proud of the radio warning net. An automatic transmitter on the South branch of the Codorus, another on the North, main, branch, and a third below the confluence of the two branches send in regular reports on the water stages of the Codorus. When the water level is below five feet, reports are transmitted every six hours; when the water reaches above five feet, reports come hourly, and when the water rises to ten feet and above, Young receives radio messages every 30 minutes. The transmitters can operate on their own battery power for one week, if regular power lines are knocked down, or power fails. Details of transmitters and receiver are secret, but the net-work is unique. No other flood control project in the world is so equipped. The radio apparatus was manufactured by the Raymond Rosen Corporation, Philadelphia.

Indian Rock Not Large

As dams go, Indian Rock is not considered large. Eighty-three feet high, it would require rains of terrible intensity before the reservoir would be filled to capacity. The drainage area above the dam is 93.7 square miles, or 41 per cent of the total drainage above York. The reservoir covers 1,430 acres, extends 6.6 miles upstream at spillway elevation and can store 28,000 acre feet of water, or about 2,352,000 gallons.

Speaking of the temperament and wayward disposition of the Codorus, Young pointed out how terrain has affected the North and South branches of the stream. The South branch originates in more or less gently rolling country, rarely receives too much sudden drainage, and is the quiet member of the family. The North branch flows through rugged country, usually gets entirely too much drainage entirely too quickly, and causes most of the trouble. Thus the position of the dam, which lies across the North stream above the confluence of the two branches.

Codorus Most Polluted

Young, who has served on dams throughout the nation, thinks the Codorus the most polluted stream in the U. S. Also it stinks, a condition which makes the control tower of the dam, on a hot day, fairly unpleasant.

History of Project

The dam is the culmination of numerous flood control projects started at public demand after 1933's disaster. Largely financed by Federal funds, construction of the various projects gave relief to thousands of unemployed.

Civic and business organizations collected data on flood damage, a survey was made of the creek, and the problem was eventually placed before State and Federal governments. Various Federal Relief agencies took over; the project became two-fold, to provide employment as well as flood protection. As many as 4,000 men were employed, 30 hours weekly at 50 cents an hour.

"Boondoggle" Cry Raised

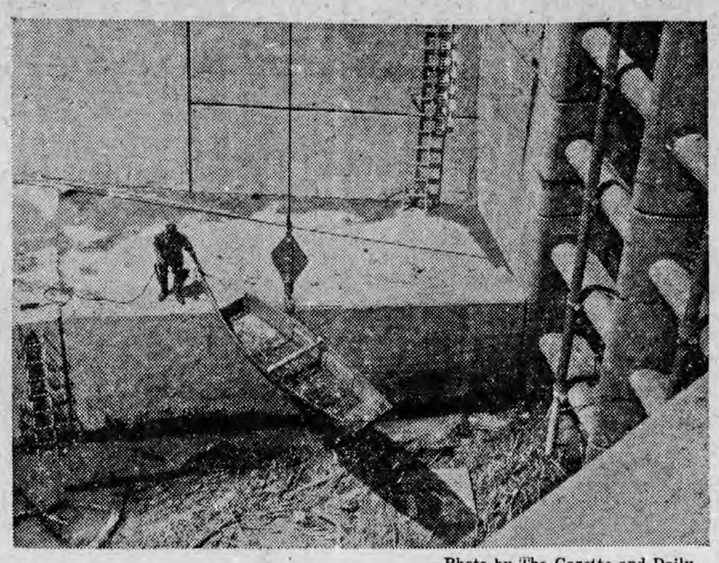
State and Federal agencies studied the creek, and finally U. S. Army Engineers took charge. Meanwhile there was the usual hue and cry that the whole business was a gigantic "boondoggle," a waste of money. But work continued. The channel of the Codorus was straightened and widened; its banks were strengthened.

Codorus Work Unfinished

Still incomplete, the Codorus project was interrupted by World War II. But for high water, work would have been resumed yesterday. The present contractor must, under the terms of his contract, have all necessary equipment in York before June 15.

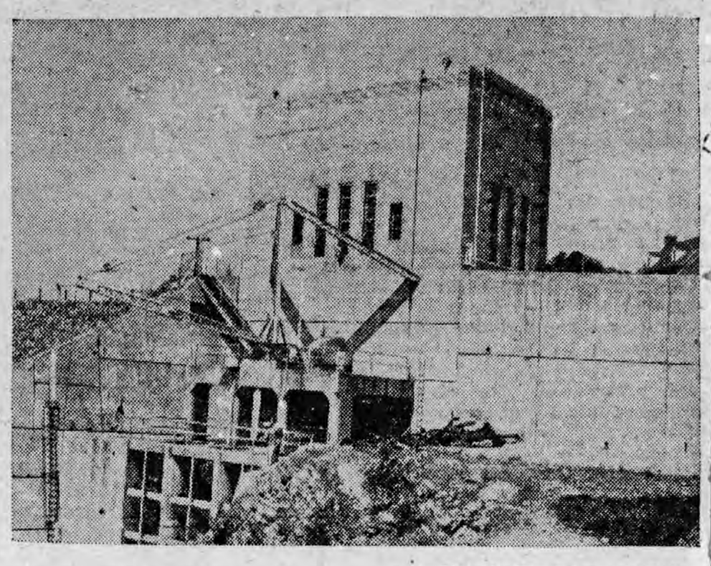
What the total cost of the several projects has been and will be has not been disclosed and probably would be difficult to assemble. But the money was not spent in vain.

York, harassed and wrecked by floods since the first Codorus flood was recorded in 1758, stands today as nearly secure as man can make it. The Codorus is impotent to harm York again. Indian Rock dam, the "boondoggle" of 1940, was York's preserver in 1946.



—Photo by The Gazette and Daily

WHY DAM TENDERS GET GRAY—Flood-borne driftwood piles up against the concrete trash bars at Indian rock dam. When the picture was taken, the water level just reached one of the lower bars, and the collection of driftwood resulted; ordinarily trash would be swept through by the force of the water. Trash bar function is to stop heavy trees and other drifting objects from damaging the flood gates. Some idea of the dam's size can be gained from the workman engaged in lowering a rowboat into the channel, and the fact that the water gauge, first figure of which is 20, soars upward for another 40 feet before spillway level is reached. Last Sunday's high waters backed 30 feet of water against the floodgates.

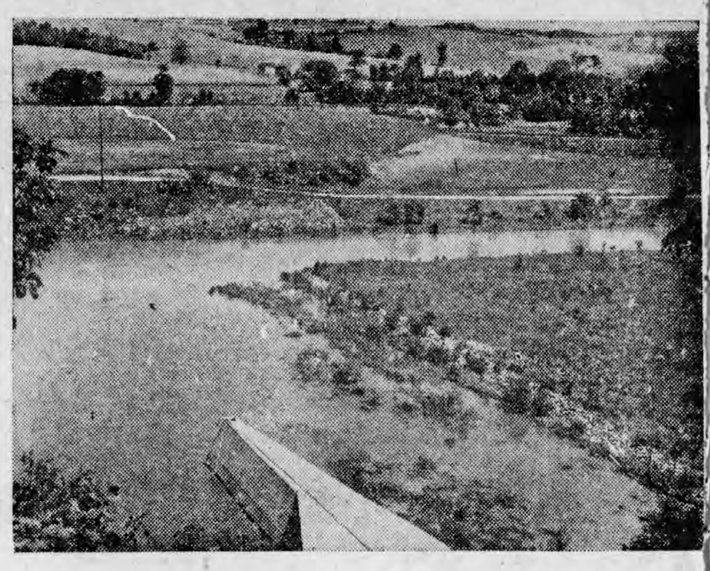


—Photo by The Gazette and Daily

CONTROL TOWER—At Indian Rock dam. The crane is used to lift heavy driftwood which frequently collects against the trash bars of the dam. Several of the large trees washed up by the Codorus after last Sunday's near-flood are shown to the left of the crane. Top of the water gauge can be seen against the wall of the tower; the Codorus would have to rise to that level before Yorkers could expect anything approaching a flood in the city. At the far right is Dam Tender David Young's residence, and the antenna of the radio receiver which gives Young constant information on water stages in the Codorus.

—Photo by The Gazette and Daily

WHERE THE CODORUS IS TAMED—Dam Tender David Young throws the switch on one of the three machines which raise and lower the 36,000-pound floodgates. One hundred machines like this were employed to raise the battleship North Dakota from the bottom of Pearl Harbor. The power which actually works the lift macinery is amazingly, a simple five-horsepower electric motor. Power is increased by intricate gearing. In the event of power failure, the dam manufactures its own electric power in an emergency generating plant. If that fails, the huge flood gates can be raised and lowered by hand. Only 26 pounds of pressure are required to turn the cranks which raise the gates. Release of automatic magnetic brakes permits the gates to be lowered by their own weight. Floodgates are knife-edged to cut through heavy driftwood, but if they fail, the giant crane is available to lever such obstructions away.



—Photo by The Gazette and Daily

CRUCIAL POINT OF YORK'S FLOOD CONTROL PROJECTS—Is the confluence of the North and South Branches of the Codorus. Here the South branch enters the main stream from the right, just beyond Indian Rock dam. Normally well-behaved, the South branch is not directly controlled by the dam. In flood times, however, flow of the stream can be affected by dam operations. When floodgates are opened, increased flow from the main stream applies pressure on the South branch, more or less cuts it off. When water rises too high in the South branch, floodgates are closed, pressure from the main stream is reduced, and the water level in the South branch is lowered. By opening and closing floodgates, dam attendants can virtually insure that no more than a maximum of 15 feet of water will ever flow under York's West Market street bridge. An automatic radio transmitter on the South branch keeps the dam operatives informed of water levels; floodgates are opened or closed accordingly.

Louise Mae Coble, York Haven, Weds

York Haven—Miss Louise Mae Coble, daughter of Mr. and Mrs. Charles H. Coble, York Haven, and Elias Updegraff, son of the late Mr. and Mrs. Norman Updegraff, Newberrytown, were united in marriage Saturday in the local United Brethren church. The ceremony was performed by the pastor, Rev. John H. Ness, Jr.

The bride, who was given in marriage by her father, wore a white gown with a net skirt and taffeta bodice, sweetheart neckline and three-quarter length sleeves. Her fingertip veil of illusion net fell from a heart-shaped crown. She carried an arm bouquet of white roses, snapdragons and sweetpeas with white satin streamers of baby breath. Her only jewelry was a string of pearls, gift of the bridegroom.

Mrs. George Coble, sister-in-law of the bride, was matron of honor. Gene Updegraff, brother of the bridegroom, was best man.

Preceding the ceremony, a 15-minute recital was given by Mrs. Percy Clemens, church organist. Mrs. John H. Ness, Jr., sang "Because" and "I Love You Truly." Mrs. Clemens also played the traditional wedding marches.

The newlyweds will reside at the home of the bride's parents.

Gatchelville S. S. Teachers Will Meet Tonight

Gatchelville—The Sunday school teachers of Prospect Methodist church will meet this evening in the Sunday school room. All teachers are urged to be present.

The men of Prospect Methodist church are requested to attend a meeting Thursday evening at 8:30 o'clock (DST) at the home of Bradley Curry to discuss the organization of a Men's brotherhood.

Rehearsal Thursday For Manchester U. B. Children's Program

Manchester—A rehearsal for the Children's Day program, to be held in St. Paul's United Brethren church Sunday, June 23, will be held in the church Thursday at 6:30 p. m. The committee is composed of Mrs. Leon Eisenhart, Mary Ann Britcher and Ruth Musser.

To Meet Thursday

The monthly meeting of the Ladies' auxiliary of Union Fire company will be held in the social room of the fire engine house Thursday evening at 7:45 o'clock.

Mr. and Mrs. C. W. Sowers and son, Claude, returned to their home at Niagara Falls, N. Y. after spending several days in the home of the former's [illegible] in-law and sister, Mrs. William K[illegible] son Sowers, Mrs. [illegible] ald [illegible] ley, [illegible] hon[illegible] of [illegible] Mrs. [illegible]

M[illegible] terta[illegible] a tur[illegible] latter's [illegible] Bruce M[illegible] who cele[illegible] anniversari[illegible]

Attending th[illegible] and Mrs. Bruce [illegible] Mrs. Elmer Strick[illegible] Mrs. Glenn Strickler [illegible] Garry and Roger and Helen[illegible] man. Other guests at the Lehma[illegible] home were Mr. and Mrs. David Fink, North York, and Norma[illegible] Strickler and son, Eugene.

While some opposed Indian Rock Dam's initial construction - whether because of concerns about cost, land use or other issues at the time - it quickly proved its value to York and others downstream by preventing potentially disastrous flooding in 1946.

Since construction was completed in 1942, the U.S. Army Corps of Engineers estimates the project has prevented roughly $55 million in damages, but the number is likely much higher since that primarily counts the most major storm events.

Did You Know?

Whether local residents realize it or not, Indian Rock Dam regularly reduces flood risks by regulating the flow of water on Codorus Creek during storm events and spring melts.

Most recently, the gates were operated in February 2016 to reduce the risk of flooding along Codorus Creek downstream of Indian Rock Dam.

US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

Tropical Storm Agnes - June 1972

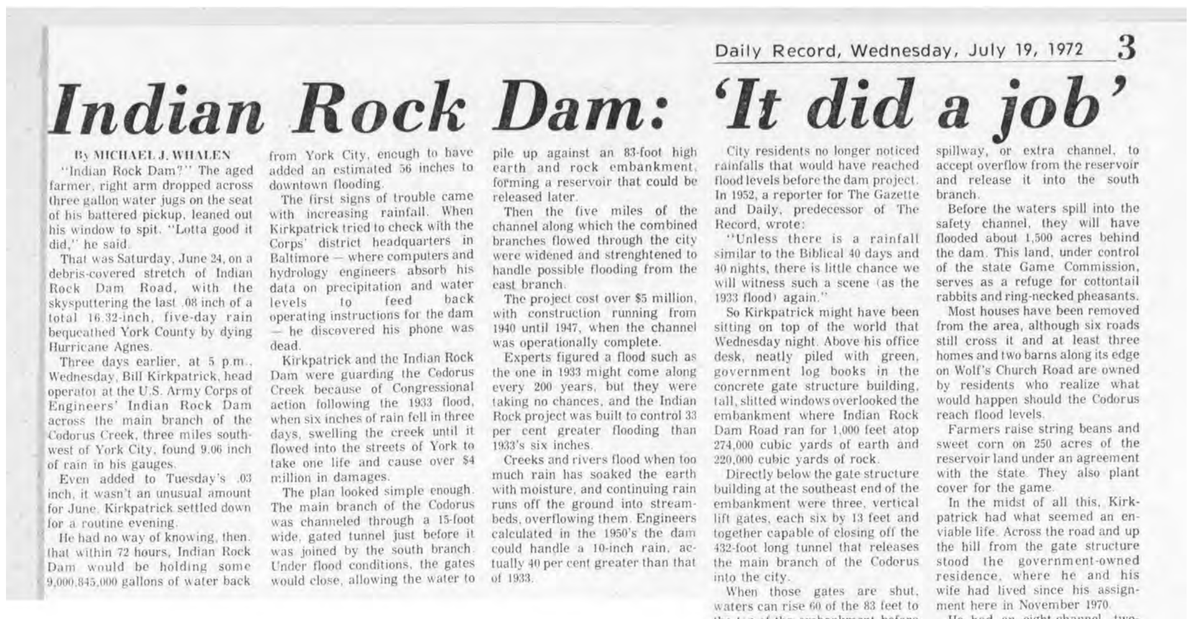
Tropical Storm Agnes impacted communities throughout the Susquehanna River Watershed in June 1972, bringing unprecedented amounts of rain and flooding to several Pennsylvania communities.

While Indian Rock Dam did not prevent all flooding in York (with rain being so heavy some flooding even originated downstream of the dam itself), it did significantly reduce what could have been much worse flooding in York.

U.S. Army Corps of Engineers File Photo

Tropical Storm Agnes was the first and only time Indian Rock Dam has seen spillway flow. What that means, is that the area behind the dam filled to its capacity - holding back 9.1 billion gallons of water from downstream communities - and excess water flowed past the dam through its concrete spillway. All elements functioned as designed.

Some have estimated that water could have been 13 feet higher than it was in York during Tropical Storm Agnes if Indian Rock Dam had not existed.



Daily Record, Wednesday, July 19, 1972 3

Indian Rock Dam: 'It did a job'

By MICHAEL J. WHALEN

"Indian Rock Dam?" The aged farmer, right arm dropped across three gallon water jugs on the seat of his battered pickup, leaned out his window to spit. "Lotta good it did," he said.

That was Saturday, June 24, on a debris-covered stretch of Indian Rock Dam Road, with the skysputtering the last .08 inch of a total 16.32-inch, five-day rain bequeathed York County by dying Hurricane Agnes.

Three days earlier, at 5 p.m., Wednesday, Bill Kirkpatrick, head operator at the U.S. Army Corps of Engineers' Indian Rock Dam across the main branch of the Codorus Creek, three miles southwest of York City, found 9.06 inch of rain in his gauges.

Even added to Tuesday's .03 inch, it wasn't an unusual amount for June. Kirkpatrick settled down for a routine evening.

He had no way of knowing, then, that within 72 hours, Indian Rock Dam would be holding some 9,000,845,000 gallons of water back from York City, enough to have added an estimated 56 inches to downtown flooding.

The first signs of trouble came with increasing rainfall. When Kirkpatrick tried to check with the Corps' district headquarters in Baltimore — where computers and hydrology engineers absorb his data on precipitation and water levels to feed back operating instructions for the dam — he discovered his phone was dead.

Kirkpatrick and the Indian Rock Dam were guarding the Codorus Creek because of Congressional action following the 1933 flood, when six inches of rain fell in three days, swelling the creek until it flowed into the streets of York to take one life and cause over $4 million in damages.

The plan looked simple enough. The main branch of the Codorus was channeled through a 15-foot wide, gated tunnel just before it was joined by the south branch. Under flood conditions, the gates would close, allowing the water to pile up against an 83-foot high earth and rock embankment, forming a reservoir that could be released later.

Then the five miles of the channel along which the combined branches flowed through the city were widened and strenghtened to handle possible flooding from the east branch.

The project cost over $5 million, with construction running from 1940 until 1947, when the channel was operationally complete.

Experts figured a flood such as the one in 1933 might come along every 200 years, but they were taking no chances, and the Indian Rock project was built to control 33 per cent greater flooding than 1933's six inches.

Creeks and rivers flood when too much rain has soaked the earth with moisture, and continuing rain runs off the ground into streambeds, overflowing them. Engineers calculated in the 1950's the dam could handle a 10-inch rain, actually 40 per cent greater than that of 1933.

City residents no longer noticed rainfalls that would have reached flood levels before the dam project. In 1952, a reporter for The Gazette and Daily, predecessor of The Record, wrote:

"Unless there is a rainfall similar to the Biblical 40 days and 40 nights, there is little chance we will witness such a scene (as the 1933 flood) again."

So Kirkpatrick might have been sitting on top of the world that Wednesday night. Above his office desk, neatly piled with green, government log books in the concrete gate structure building, tall, slitted windows overlooked the embankment where Indian Rock Dam Road ran for 1,000 feet atop 274,000 cubic yards of earth and 220,000 cubic yards of rock.

Directly below the gate structure building at the southeast end of the embankment were three, vertical lift gates, each six by 13 feet and together capable of closing off the 432-foot long tunnel that releases the main branch of the Codorus into the city.

When those gates are shut, waters can rise 60 of the 83 feet to the top of the embankment before they slop over a 461-foot concrete wall built perpendicular to the embankment.

On the other side of that wall is a spillway, or extra channel, to accept overflow from the reservoir and release it into the south branch.

Before the waters spill into the safety channel, they will have flooded about 1,500 acres behind the dam. This land, under control of the state Game Commission, serves as a refuge for cottontail rabbits and ring-necked pheasants.

Most houses have been removed from the area, although six roads still cross it and at least three homes and two barns along its edge on Wolf's Church Road are owned by residents who realize what would happen should the Codorus reach flood levels.

Farmers raise string beans and sweet corn on 250 acres of the reservoir land under an agreement with the state. They also plant cover for the game.

In the midst of all this, Kirkpatrick had what seemed an enviable life. Across the road and up the hill from the gate structure stood the government-owned residence, where he and his wife had lived since his assignment here in November 1970.

He had an eight-channel, two-way radio for emergencies, even a gasoline-powered generator to

(Continued on Page 31)

See 9.1 billion

York Daily Record - July 19, 1972

9.1 billion gallons of water held by dam

(Continued from Page 3)

operate the gates should the electrical supply fail. Firewood cut from debris he cleared from the channel improvements area rested against the side of his home.

Everything seemed ready for 40 days and nights of rain. It only took five to bring tragedy.

There was no way to tell how bad the roads to town might be that Wednesday night, but Kirkpatrick's son, Tim, 19, volunteered to try them in an effort to reach Kirkpatrick's two assistants and the telephone company.

Meanwhile, Kirkpatrick turned to his radio. Cut off from Baltimore by interference he reached the Corps station at Whitney Point, N.Y., and relayed his data through it.

By dark, he knew he would have to shut the gates. Whitney Point made a long distance call to Mechanicsburg for an H. J. Williams Co. fireman whose bridge crew had left heavy construction equipment in the reservoir area.

It was too late. By dawn the equipment — like the cellar of the elderly farmer in West Manchester Township, and like the first floor apartment of that man's granddaughter in downtown York City — was sitting in flood waters.

No wonder the farmer thought the dam had "failed." Along with many other area residents, he spent Thursday and Friday wondering if it would hold at all.

They had forgotten about the spillway. The dam would sink under water before it would let go. Meantime, in the words of Presdient County Commissioner Charles A. Stein Jr., "It did a job!"

Tim Kirkpatrick made it to York City — just. At his call, the York Telephone and Telegraph Co. dispatched Ken Rankin and Allen Walker, installation and maintenance men, to the dam in a radio-equiped panel truck.

The panel truck couldn't make it on the flooded back roads, but Tim's fellow workers at Skip's Foreign Cars loaded the panel truck onto a flatbed truck that could.

By that time, police departments throughout the county faced emergency situations, and York County Control wanted to reach Kirkpatrick for a report on the dam.

West Machester township Patrolman Bozer attempted to get through with his cruiser and was cut off on flooded roads. Bozer hitched a ride on a West York Fire Co. truck about the time Rankin and Allen reopened communications.

Also making their way to the dam were Thomas Hanlin and Robert Harris, Kirkpatrick's assistants who had taken readings on water level gauges measuring the combined flow of the two creek branches downstream from the dam — important data for Baltimore. With that information, the Corps made its decision at 10:30 p.m.: close the gates.

Bozer, with other problems to handle, left. It wasn't until he stopped by the dam several days later that Kirkpatrick knew for sure the patrolman made it back.

Rankin and Allen stayed and deserved "credit no end for their help" Kirkpatrick said later. Perhaps the hardest working member of the crew that Wednesday was Mrs. Kirkpatrick, who kept the men supplied with sandwiches and coffee through the long night.

"We had plenty of provisions and our own power system, so we were O.K.," Kirkpatrick said later. "Mostly what we did was take readings and sit on it."

There is perhaps no way for him to explain what it felt like to "sit on" 9.1 billion gallons of water. Between 5 p.m., Wednesday, and 5 p.m., Thursday, York County was hit with 13.40 inches of rain.

"Thursday was a sleepy day, mostly walking around all wet and keeping a check," Kirkpatrick remembers. Shortly after 2 p.m., a helicopter from the Baltimore office picked him up at the end of the dam for a tour of the York-Harrisburg area.

Other areas were harder hit by flooding, but York County got the most rainfall, the Corps says. The nearest to our 16.32 inches was Harrisburg with 15.11.

It was not until shortly after midnight Friday the water hit the spillway level. Somewhere out in the 1,500 acres of water behind the dam, farmer John Shearer Jr.'s snap beans, cut off from the sun, began to die.

In York City, flood waters from the south branch had crested before dark Thursday, after killing one man and, according to Donald G. Schlosser, city director of community development, creating about 80 per cent of the city's $10 million damages.

The crest reached the dam at 1 p.m., Friday: 66.44 feet, or 16.56 feet below the top of the earth and rock embankment. While it was still coming up, Baltimore instructed Kirkpatrick to begin the weeks long proccess of easing it out into the Codorus channel through the city.

Then Kirkpatrick and his men joined other countians in the long, dreary process of cleaning up.

Rumors and unofficial estimates since that week have added up to some mighty confused theories on the value of the Indian Rock Project, but even as they arrived to help with the clean up, Army Engineers were proud of their dam. County Civil Defense officials praised the way the Corps had used it.

No one is sure how much higher the flood waters would have risen in York City if it had not been for the dam. The Corps has made a rough guess at 56 inches, a considerable addition.

Damages in 1972 were $6 million higher than in 1933, but as Schlosser points out, American basements and first floors in 1933 did not contain washers and dryers, recreation rooms, television sets and stereos.

The 1972 rainfall was 10 inches — exactly the total amount the dam had been built to control — greater than that of 1933.

As Rep. George A. Goodling (R-19th) said last week, man has covered more and more earth with concrete as he crowds himself together on the Eastern Seaboard. Ground covered with concrete cannot absorb rainfall.

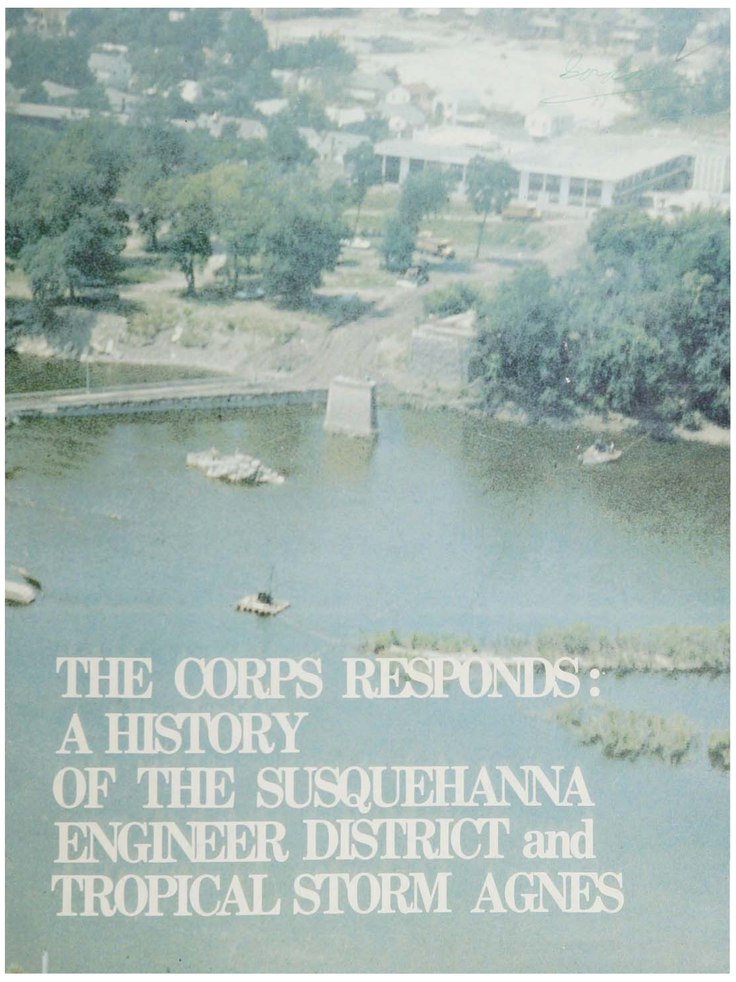
No additional plans had been made for flood protection in York County. According to estimates based on the 1933 flood, the area should have been safe.

As one Corps spokesman said, "Plans for further studies based on new information will have to come from Congress."

Congressman Goodling knew of no immediate discussions of flood control, but he said further planning for the Corps' Codorus Creek Waste Water Management Program Study, set for completion this summer, will have to include flood planning "to protect what we do."

As for what happened last month, Commissioner Stein's words come back with what is perhaps the best summary about Indian Rock Dam in the 1972 flood: "It did a job."

The Corps Responds to Tropical Storm Agnes



The Office of Emergency Preparedness (a pre-cursor to FEMA) coordinated the federal response to Agnes and the U.S. Army Corps of Engineers stood up the Susquehanna Engineer District to assist with response and recovery efforts.

The Susquehanna Engineer District supported various response and recovery missions, including:

- **Debris Removal**
- **Temporary Housing**
- **Some Minor Home Repairs**
- **Critical Bridge Replacement**
- **Water Supply and Sewage Facility Repairs**

Did You Know?

The U.S. Army Corps of Engineers still does this today, standing up what are called Recovery Field Offices after disasters that function like standalone Districts. Currently, there are RFOs in Puerto Rico, the Virgin Islands, Florida and Texas assisting with responses to the recent hurricanes - carrying out many similar missions

"The Corps Cares" was a U.S. Army Corps of Engineers slogan in the early 1970's and became the slogan of the Susquehanna Engineer District and personnel supporting recovery missions after Agnes. (U.S. Army Corps of Engineers File Photo)

US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

Indian Rock Dam - Present Day

While Indian Rock Dam has reduced flood risks to York and other downstream communities for 75 years, it continues to function as designed today. To keep a dam up and running for 75 years takes a strong commitment and the U.S. Army Corps of Engineers is committed to continuing its regular maintenance, rigorous inspections and day-to-day operations to ensure this dam continues to reduce risks for years to come.

TOP: Aerial view of Indian Rock Dam. Codorus Creek flows into the intake below the gatehouse visibile in the right of the aerial and in the photo to the right. The reservoir is normally dry as seen here, though the dam can close gates to control water flowing downstream and hold water behind the dam to reduce flood risks.

RIGHT: A closer view of Indian Rock Dam's intake. (Note: this photo was taken just after Hurricane Sandy in 2012, which is why there is debris visible. Part of the maintenance of the dam is clearing debris like pictured here to ensure the dam operates as designed). During high water events, one or more of three gates are closed, causing water to build up behind the dam in the normally dry reservoir.

Indian Rock Dam By the Numbers

- Rises *83* feet above streambed
- Can hold up to *9.1 billion* gallons of water
- Is *1,000* feet long
- Construction was completed in *1942*
- *3 20*-ton steel gates can be lowered to reduce flow of Codorus Creek downstream, reducing flood risks
- Estimated to have prevented at least *$55 million* in damages since completion
- Gates closed when downstream gage at Zinn's Quarry reaches *9.5* feet
- *75* years of reducing flood risks to York and other downstream communuties, and counting...

Recent Major High Water Events at Indian Rock Dam			
Storm Event	**Dates**	**Reservoir Crest (spillway crest is 435 feet)**	**Percent of Storage Capacity Used**
Tropical Storm Lee	September 7 - September 13, 2011	421.10'	44.1%
Hurricane Sandy	October 29 - November 1, 2012	413.66'	25.4%
High Water Event	October 7 - October 13, 2013	413.32'	24.7%

While Indian Rock Dam's gates are operated to regulate water flowing downstream along Codorus Creek to reduce flood risks more often than above, these are recent examples of significant high water events where all three of the dam's gates were closed - holding back billions of gallons of water to prevent flooding to York and other communities downstream.

Waters from Tropical Storm Lee are seen here in the normally dry reservoir behind Indian Rock Dam. To the left is the dam's concrete overflow spillway. The water in the reservoir peaked at 44.1 percent capacity during Tropical Storm Lee. Had the reservoir's capacity been exceeded, water would have flowed into the concrete spillway and made its way downstream so as to not risk putting too much pressure on the dam. Tropical Storm Lee caused devastating flooding in parts of Pennsylvania and other states, but in York its impacts were greatly reduced by Indian Rock Dam. (U.S. Army photo by Steve Young, Indian Rock Dam Head Dam Operator)

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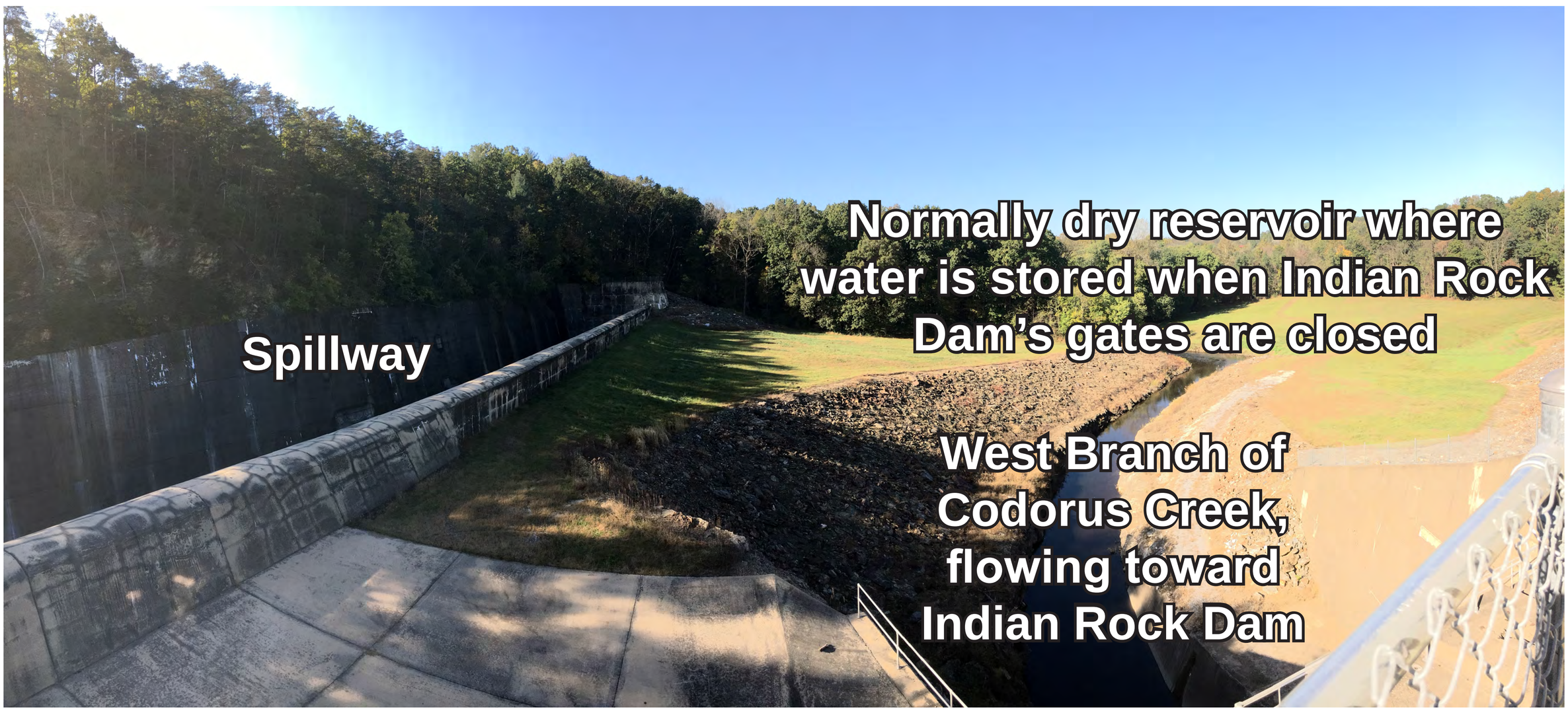
Indian Rock Dam 75th Anniversary

Indian Rock Dam - Spillway

What is a spillway at a dam? A dam's spillway is a design feature most large dams have to allow excess water in extreme situations to move past the dam without endangering the structural stability of the dam itself once the reservoir is at capacity.

How does Indian Rock Dam's spillway work? Indian Rock Dam has what is called an uncontrolled spillway. That means that the spillway sees flows of water when the water in the reservoir reaches a certain height, rather than being operated or activated by personnel.

When does Indian Rock Dam's spillway "see flow"? At Indian Rock Dam, when the gates have held back enough water that the reservoir reaches 435 feet above sea level (and is holding back roughly 9.1 billion gallons of water), water begins to flow over the concrete wall seen on the left in the image below and into the spillway. It then flows down the spillway and continues downstream past the dam. This, like other spillways, is too avoid too much pressure building behind the dam.



U.S. Army photo by Chris Gardner

U.S. Army Corps of Engineers File Photo

Left: View into Indian Rock Dam's concrete spillway.
Right: Tropical Storm Agnes was the first and only time Indian Rock Dam has seen spillway flow. All elements functioned as designed. Note in the photo, the water has filled the reservoir and excess water is flowing past Indian Rock Dam via the spillway.

US Army Corps of Engineers®

Indian Rock Dam 75th Anniversary

Indian Rock Dam - Gates

Indian Rock Dam manages the flow of water downstream by raising and lowering its three 20-ton steel gates. The gates are not visible because they are below the three hoists you see in the middle of the gatehouse.

Below are pictures of one of the gates during routine maintenance in February 2011.

Maintanence is critical to keeping a structure like Indian Rock Dam operating for 75 years. Annually, the team removes, takes apart, cleans and inspects one of the dam's three gates.