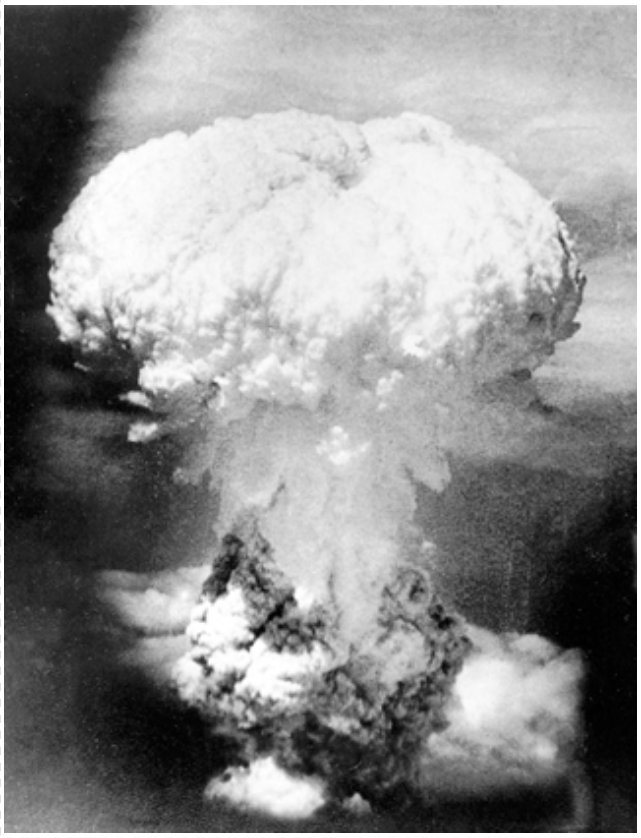
Cotter at the Crossroads
A community grapples with a uranium mill's past, present and future

Critical MASS



A massive column of smoke mushrooms over Nagasaki, Japan, after an atomic bomb was dropped Aug. 9, 1945.
AP file photo

The Cotter plant and tailings impoundments are situated next to Shadow Hills Golf Club in Cañon City.
Times-Call/Jeff Haller

Part of a deadly past

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The Daily Record News Group

CAÑON CITY - When the United States dropped the two atomic bombs on Japan in August 1945, the 20th century's most closely guarded secret was out.

With the fate of the world on the line, total secrecy surrounded the development of the bombs that would end World War II and launch the Nuclear Age.

But, 57 years after a uranium-based bomb destroyed the Japanese city of Hiroshima and a plutonium bomb leveled the port city of Nagasaki, the nuclear waste generated in making the bombs remains a source of both mystery and controversy.

That mystery came to Colorado in 1968, when open railroad cars were used to transport the Manhattan Project residue to Cotter Corporation's Cañon City mill. Cotter then extracted uranium and metals from what has been called the most radioactive material ever mined from the earth.

And, while southern Colorado residents debate Cotter's plan to store and process contaminated soil, the Manhattan Project still casts a shadow over a company that has been the center of controversy and the target of several lawsuits over the past 30 years.

Cotter, in fact, doesn't even use the word Manhattan when speaking of the materials.

"We have it on our books as the Colorado Raffinates and the Congo Raffinates," Cotter Executive Vice President Rich Ziegler said. "We purchased it as the St. Louis Airport Cakes in the late 1960s."

Regardless of what the material is called, about 11,000 tons of it remains unprocessed at the Cotter mill, some was processed and the tailings deposited in the mill's impoundments, and the rest continued to create controversy until it was finally processed at a Utah facility in the past few years.

Even the amount of the Manhattan Project waste is a matter of debate. The late Lynn Boughton, who for years was the chief chemist at the mill, claimed about 100,000 tons of the material was shipped to Cañon City. Ziegler said that figure is "way high," but added he doesn't know the exact tonnage of the material.

The material, purchased by Cotter as the St. Louis Airport Cakes, was apparently composed of two different batches. The Congo Raffinates, according to Ziegler, later became known as Cotter Concentrate after being processed to

remove uranium and several metals.

The other part of the Manhattan Project waste, the Colorado Raffinates, weighed about 12,000 tons when it arrived at Cotter. According to Ziegler, most of it is still at the mill.

"It's proven very hard to break-out," he said in reference to the milling process that breaks down the material and extracts components. "We have an idea we might get it to break down using a heating process, but I'm not planning on doing that in the near future."

A look at the history of the material explains why critics of Cotter - including some scientists - believe much of the radioactive material in the Manhattan waste was not extracted during processing - allegedly releasing some of the world's most radioactive material into the waste stream and the air.

While Adolph Hitler's conquering hordes were just beginning their march across Europe in the late 1930s, the American government became concerned Germany - with which the country would soon go to war - was developing a nuclear-fission bomb. Albert Einstein, perhaps the most famous physicist in history and an escapee from Nazi Germany, was enlisted to help the U.S. develop the bomb before Hitler's scientists had the chance.

In 1939 Einstein wrote a now-famous letter to President Franklin Roosevelt in which he said the element uranium "could be turned into a new and important source of energy" and that newly discovered nuclear chain reactions could lead to the development of "extremely powerful bombs." Germany's newly acquired access to high-grade uranium in recently conquered Czechoslovakia also concerned him.

"I understand that Germany has actually stopped the sale of uranium ore from the Czechoslovakian mines which she has taken over," he wrote, adding that the son of Germany's Undersecretary of State was working at a Berlin lab where German scientists were duplicating the atomic research going on in both France and the U.S.

Expressing a sense of urgency, Einstein told FDR, "The United States has only very poor ores of uranium in moderate quantities. There is some good ore in Canada and the former Czechoslovakia, while the most important source of uranium is in the Belgian Congo." Einstein encouraged Roosevelt to establish "permanent contact" with American physicists working on nuclear reactions.

Roosevelt took Einstein's advice about both the bomb and the uranium ore. The super-secret Manhattan District was formed to research and develop the bomb and within a year a cargo ship laden with Belgian Congo ore pulled into New York Harbor.

Much of the processing of the ore was conducted at the

Mallinckrodt Chemical Co. plant on Latty Avenue in downtown St. Louis, Mo. After the war, the waste was moved to a storage area near Lambert Field, the St. Louis Airport, and became known as the St. Louis Airport Cakes. Although the material was shipped to Cañon City in the late 1960s, pollution from the waste was left behind. Both the Mallinckrodt plant and the airport-area storage site are still listed on the Environmental Protection Agency's list of the country's most polluted sites - the so-called Superfund List.

So is the material's next home - the Cotter mill and the surrounding Lincoln Park neighborhood.

Mound Laboratories, which among other things produces nuclear fuel, has had a longtime fascination with the Manhattan waste and the "Cotter Concentrate" it produced. In the early 1960s Mound, which was anxious to find a source of the radioactive metal thorium-230 and which first approached federal officials about obtaining the material in 1960, found it at Cotter. Prior to his death in 2001, Boughton said he had no idea what the material was until a Mound representative came to Cañon City to obtain samples for testing. Boughton maintained that his bosses never ordered that the material be assayed for thorium and other isotopes, didn't have the equipment to perform such tests and never tried to remove the thorium - allowing it to end up as waste in the now-closed original tailings impoundments at Cotter.

Ziegler scoffed at the idea, saying "We assayed it for everything," adding that the milling process removed about 95 percent of the radioactive material contained in it. Boughton said the thorium was neither detected nor removed and was passed along to the old tailings impoundments. The contents of those early impoundments, which the company admitted were designed to leak, was moved to new impoundments in an environmental clean up in the 1980s.

A study conducted by Mound and published in 1966 took the same position Boughton would take years later.

"The uranium recovery processes tend to reject thorium," it said, "and thus the ionium (thorium-230) and natural thorium end up in the waste stream."

According to the federal government, the Cotter concentrate is also one of only four materials known to contain plutonium-244 -- an extremely rare form of naturally occurring plutonium. The U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry says plutonium-244 "has been detected in extremely small amounts as a naturally occurring constituent of some minerals and ores." It lists the Belgian Congo product as one of those places, but Cotter has always maintained there has never been any plutonium at the mill. Jake Jacobi, who heads the radiation division at the Colorado Department of Public Health and Environment, said Cotter has never reported having plutonium on site.

"Plutonium-244 can be manufactured," he said. "That, of course, is not licensed for possession at the mill."

Jacobi also said the health department can do nothing about possible traces of "naturally occurring" plutonium at Cotter.

"If any discrete atoms of Pu-244 ever existed in ores that Cotter ran, those discrete atoms are part of natural background, would not be regulated, would not be detected." Jacobi said state officials have little information about the Manhattan Project waste and have never tested the entire content of the old tailings ponds.

Mound Labs, however, kept close tabs on the material for years.
In the late 1970s the federal government bought what was left of the Cotter Concentrate portion of the Manhattan waste, but in partnership with Mound apparently had little success extracting radioactive ionium (thorium-230) and protactinium at a Mound lab in Miamisburg, Ohio.

A paper written in 1998 by three Department of Energy scientists said the government "discontinued extraction operations when it was determined to be infeasible." The material was transferred to the Nevada Test Site in 1994 and stored as "strategic material," the paper said. It was declared to be "waste" in 1995 and the DOE planned to dispose of it permanently at the Nevada site. But in 1996 the department allowed 400 tons of Cotter Concentrate to be taken to the White Mesa uranium mill in Blanding, Utah for processing. That move angered environmentalists and some Native American groups, who called on Utah Gov. Mike Leavitt to fire the head of the state's radiation-controls division for approving the transfer of the material from Nevada. Leavitt declined and the processing went on.

During testimony before Congress in 1998, a representative of the International Uranium Corporation - the owners of the Utah mill - said the last 400 tons of Manhattan material was processed in 1997 and 1998. Earl L. Hoellen told a Senate Committee the mill extracted 60,000 pounds of uranium from the material.

"The Cotter Concentrate has now been completely processed and tailings from that processing disposed of at the (Blanding) mill," he said.

The 57-year journey of most of the Manhattan Project waste was apparently over.

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