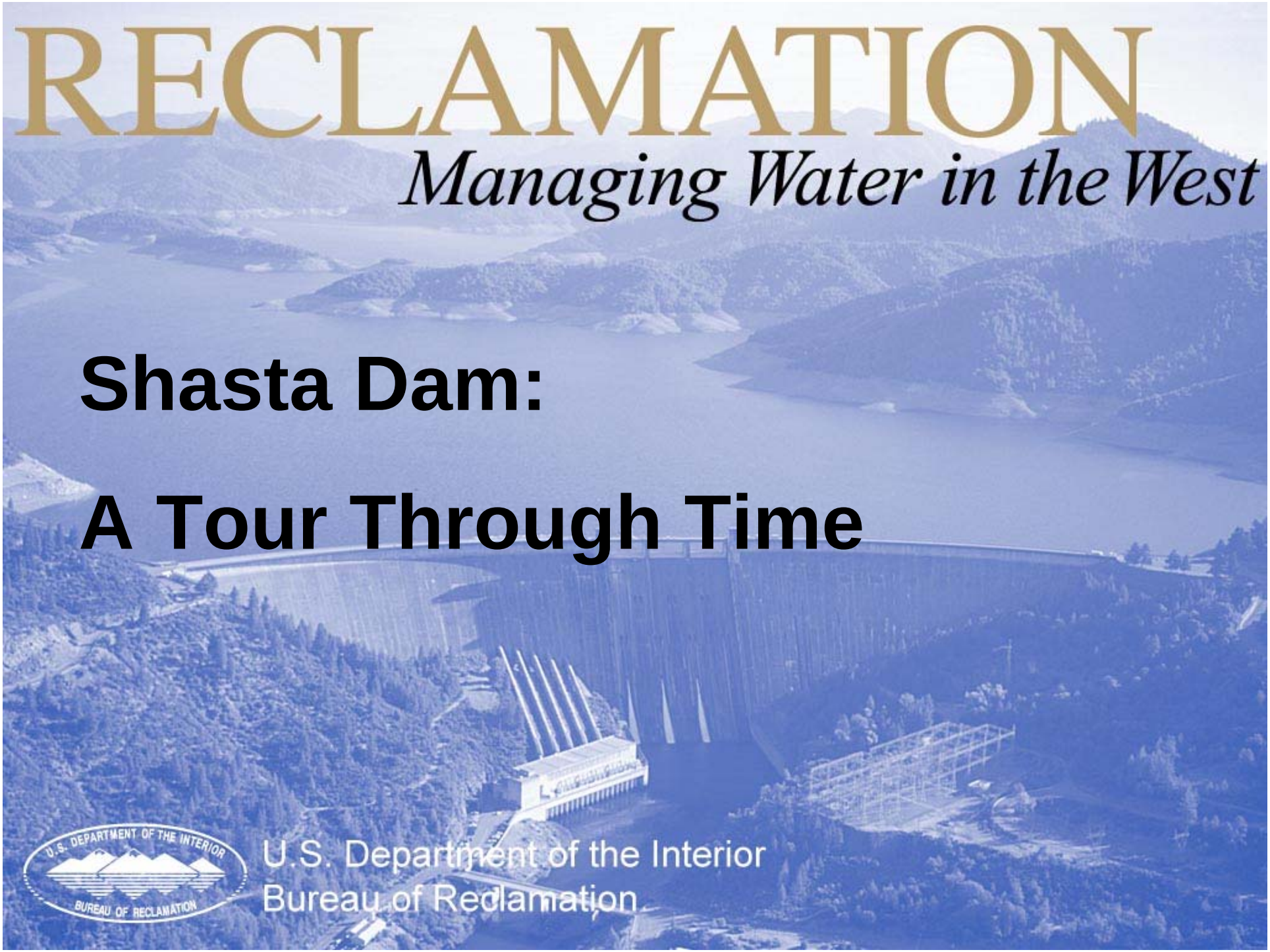
RECLAMATION
Managing Water in the West
Shasta Dam:
A Tour Through Time
U.S. Department of the Interior
Bureau of Reclamation

Welcome to Shasta Dam!

Shasta is a curved, gravity dam, containing 6.5 million cubic yards of concrete, making it the second largest concrete dam in the United States. The dam stands 602 feet tall, has a crest length of 3,460 feet, and at its base in front of the spillway it is 883 feet thick. There is enough concrete in Shasta Dam to make an average-size sidewalk long enough to wrap around the world at the equator. It is its sheer weight and mass that keeps the dam in place.

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Shasta Lake

From the top of the dam, we get a chance to see beautiful Shasta Lake and Mt. Shasta. Shasta Lake sees millions of visitors annually who enjoy swimming, fishing, skiing, boating, or just relaxing and taking in all the beautiful scenery aboard a houseboat. Shasta Lake has 365 miles of shoreline and contains 4.5 million acre-feet of water, making it the largest reservoir in the state of California. This huge lake has 30,000 surface acres, giving plenty of room for its big recreational draw. Even though snow-topped Mt. Shasta is clearly seen from the lake, we don't see much of that snowmelt here. Shasta Lake gets most of its water from rainfall - in fact, that is one of the main reasons Shasta Dam was constructed.

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Flood Control and Water Management

This region gets an annual average rainfall of around 60 inches, which would often create floods throughout the Sacramento River valley. Rainy winters were often followed by hot dry summers, causing a vicious flood/drought cycle: too much water in the winter, not enough in the summer. To even out the flows of the river, provide flood control, and create water storage, Shasta Dam was built. The water stored from the rainy season would be used for irrigation, municipal and industrial needs, and wildlife habitats.

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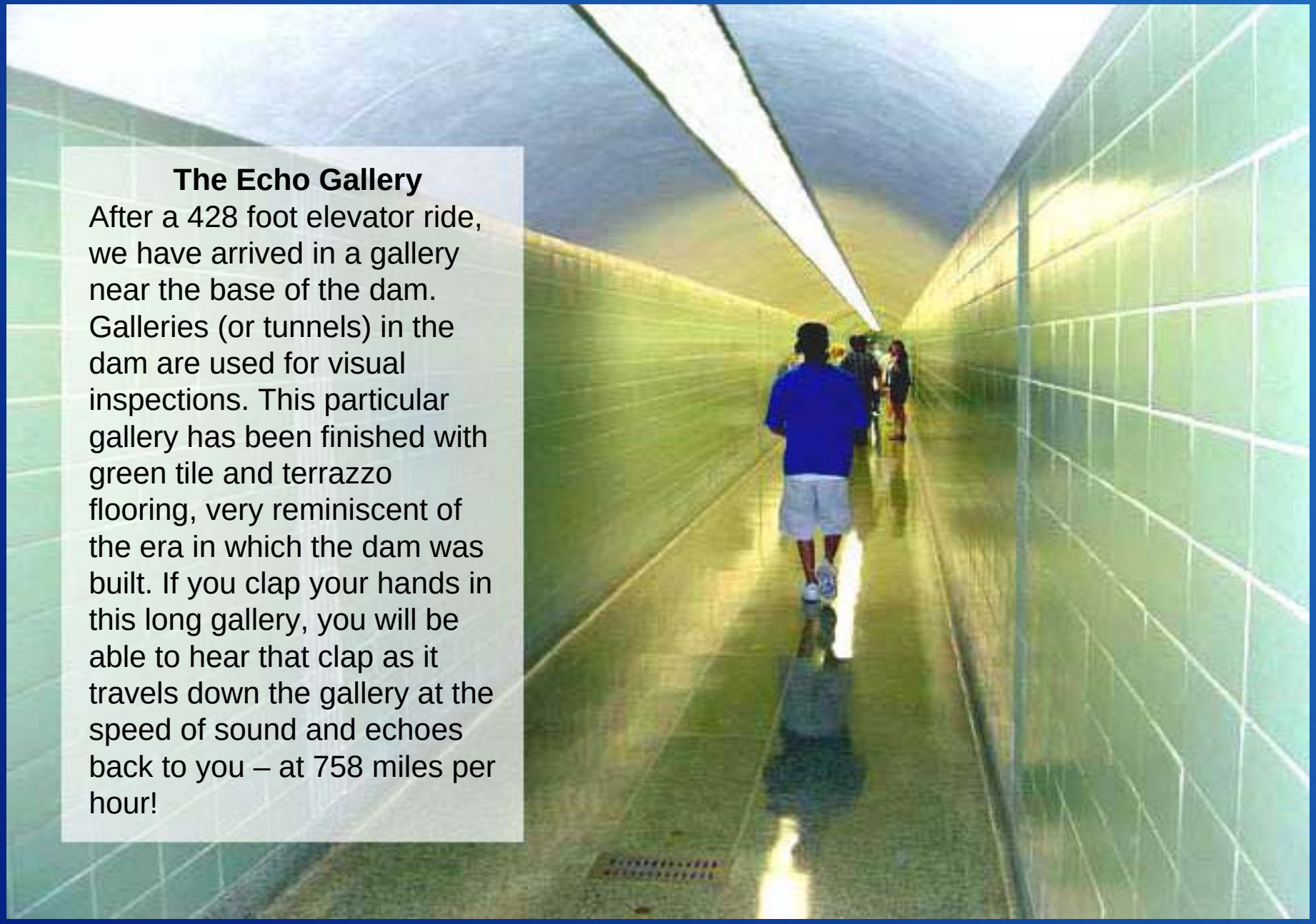
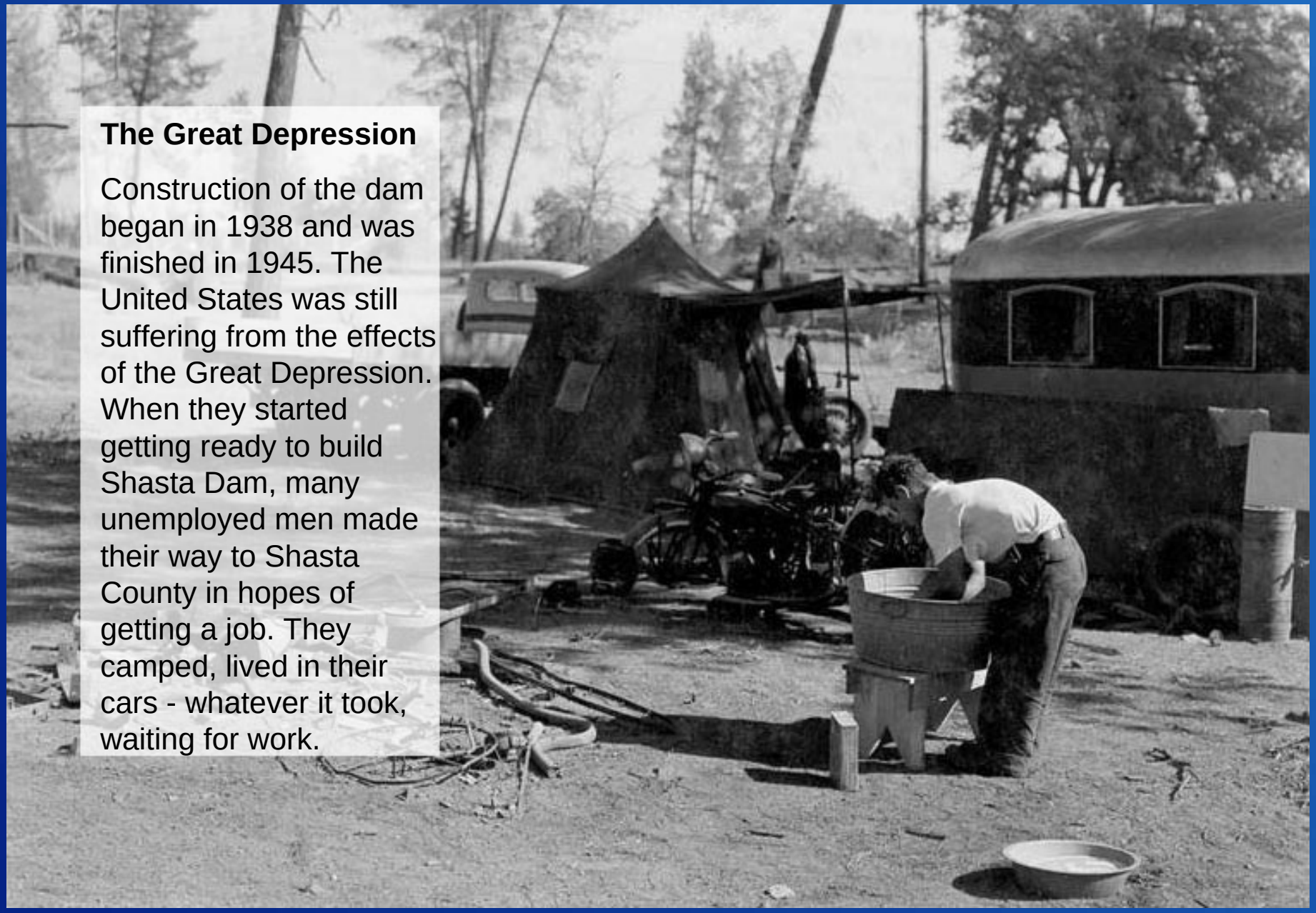


The Echo Gallery

After a 428 foot elevator ride, we have arrived in a gallery near the base of the dam. Galleries (or tunnels) in the dam are used for visual inspections. This particular gallery has been finished with green tile and terrazzo flooring, very reminiscent of the era in which the dam was built. If you clap your hands in this long gallery, you will be able to hear that clap as it travels down the gallery at the speed of sound and echoes back to you – at 758 miles per hour!



The Great Depression

Construction of the dam began in 1938 and was finished in 1945. The United States was still suffering from the effects of the Great Depression. When they started getting ready to build Shasta Dam, many unemployed men made their way to Shasta County in hopes of getting a job. They camped, lived in their cars - whatever it took, waiting for work.

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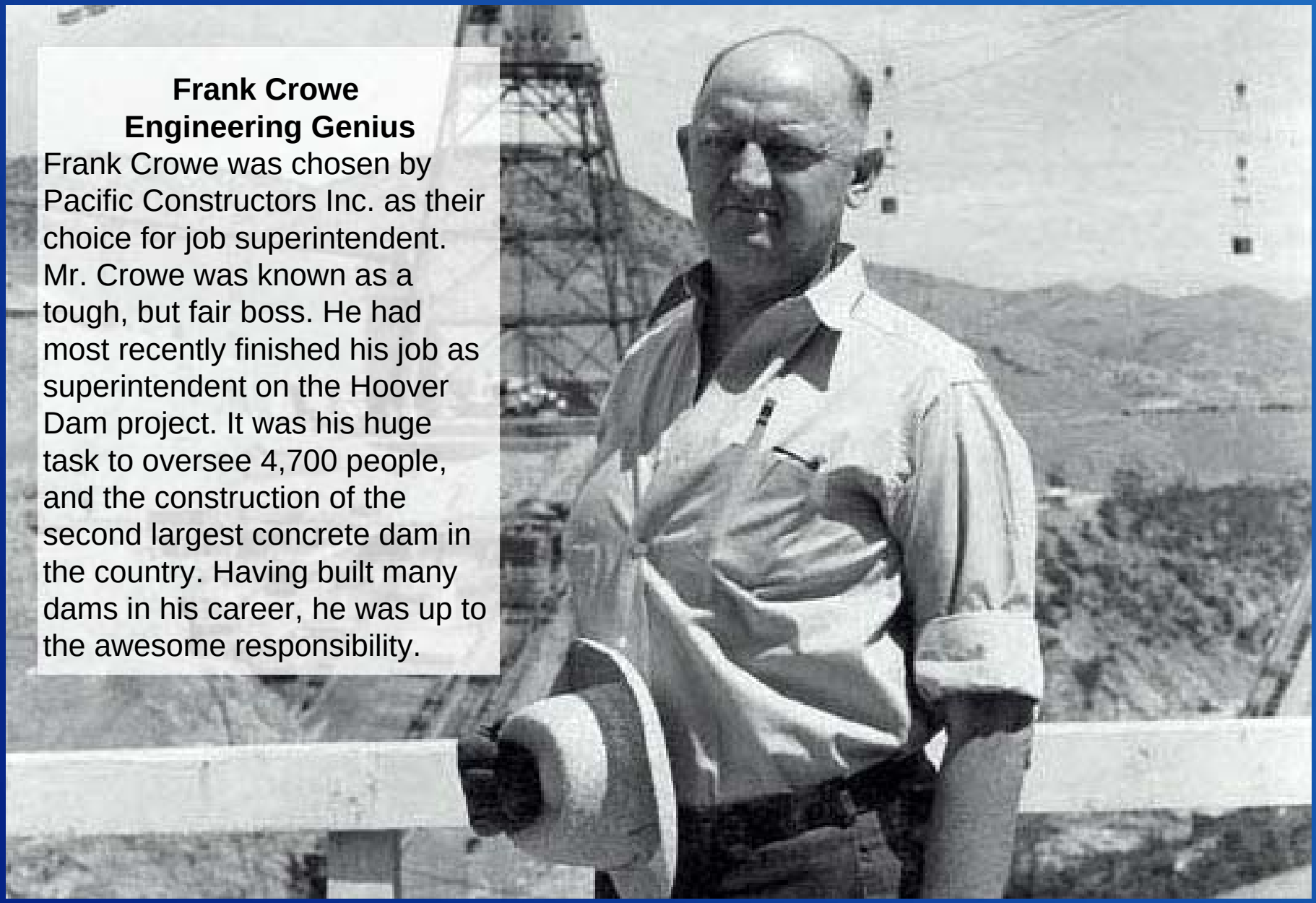

Frank Crowe
Engineering Genius

Frank Crowe was chosen by Pacific Constructors Inc. as their choice for job superintendent. Mr. Crowe was known as a tough, but fair boss. He had most recently finished his job as superintendent on the Hoover Dam project. It was his huge task to oversee 4,700 people, and the construction of the second largest concrete dam in the country. Having built many dams in his career, he was up to the awesome responsibility.

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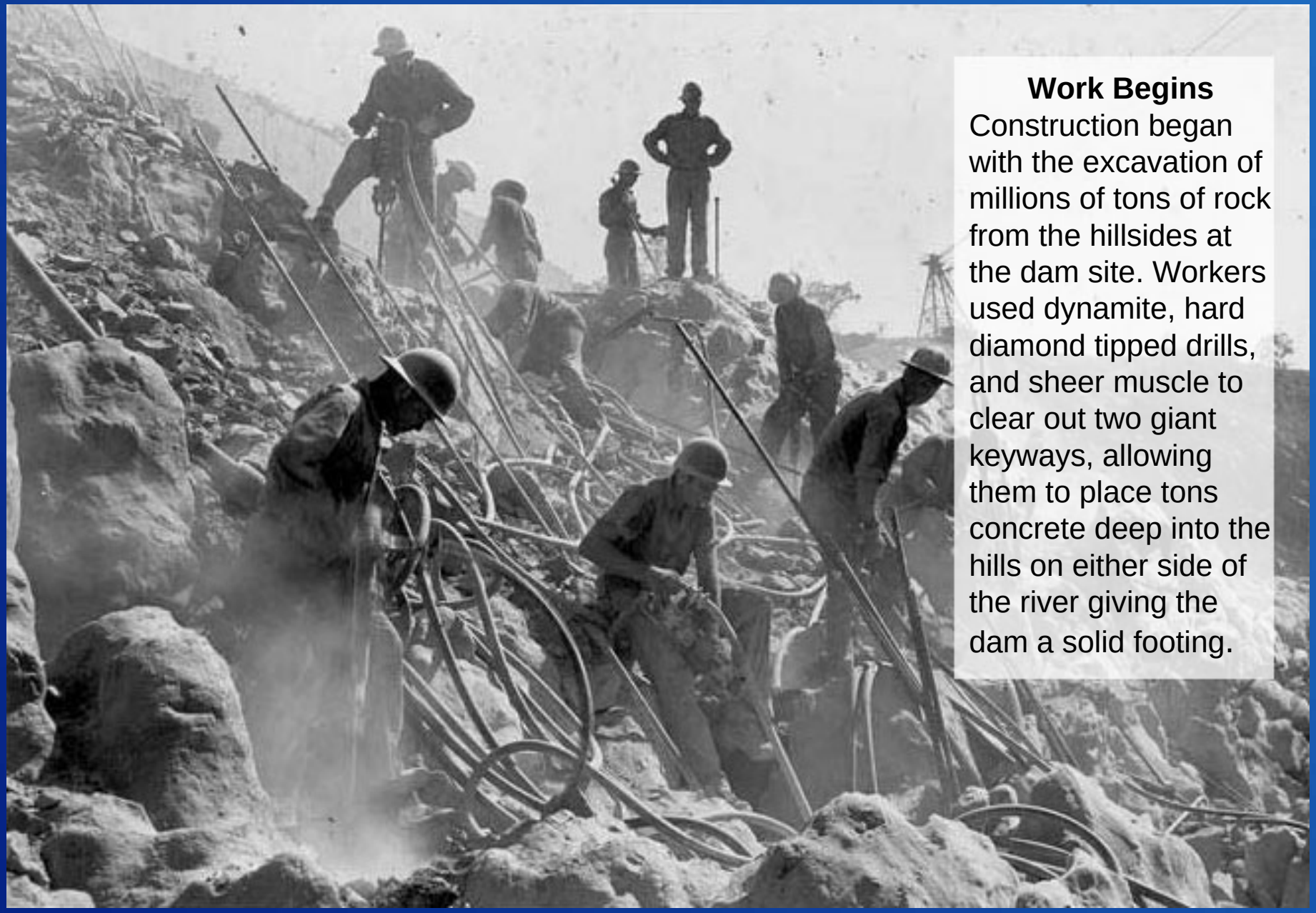

Work Begins

Construction began with the excavation of millions of tons of rock from the hillsides at the dam site. Workers used dynamite, hard diamond tipped drills, and sheer muscle to clear out two giant keyways, allowing them to place tons concrete deep into the hills on either side of the river giving the dam a solid footing.

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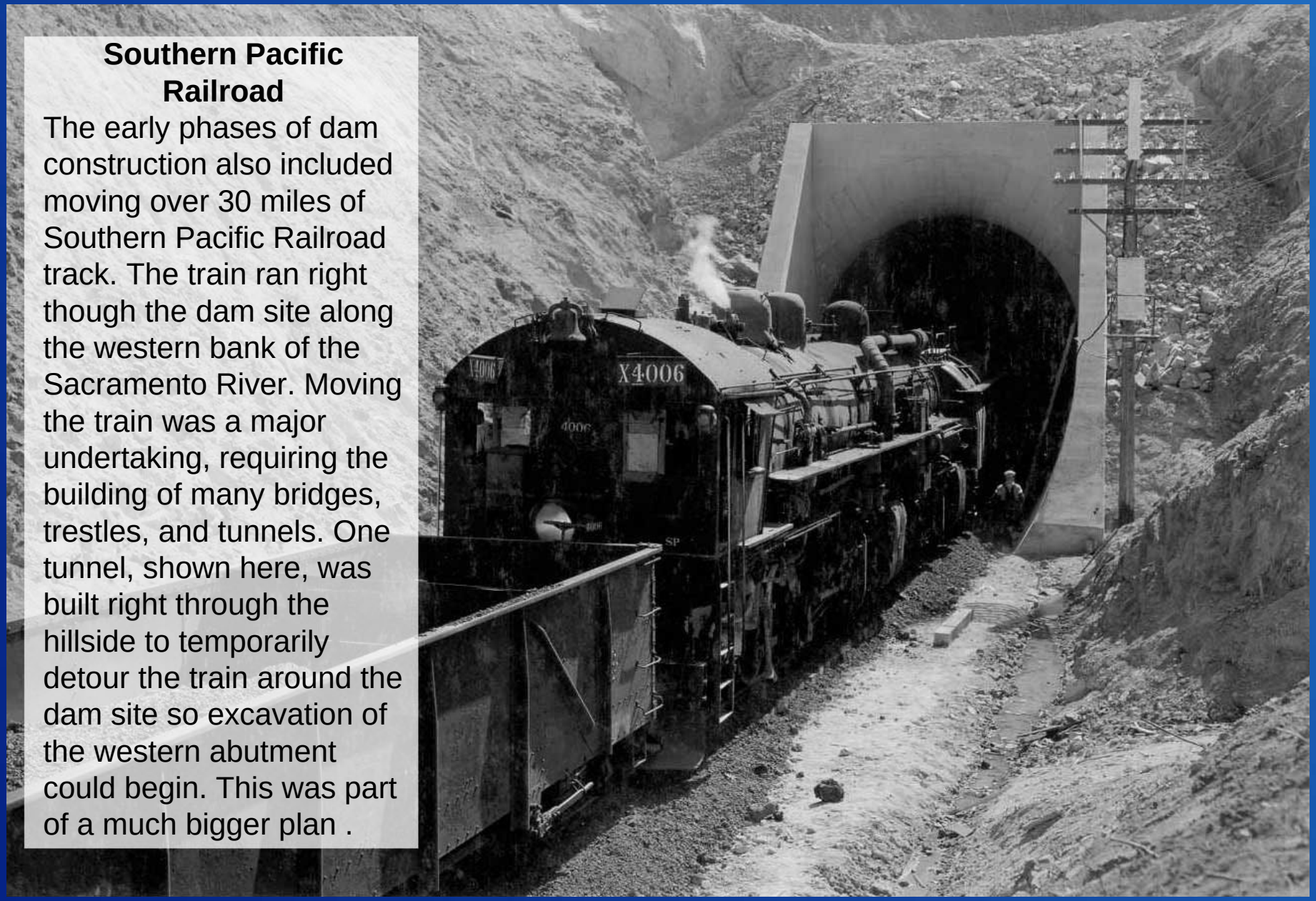
Southern Pacific Railroad

The early phases of dam construction also included moving over 30 miles of Southern Pacific Railroad track. The train ran right though the dam site along the western bank of the Sacramento River. Moving the train was a major undertaking, requiring the building of many bridges, trestles, and tunnels. One tunnel, shown here, was built right through the hillside to temporarily detour the train around the dam site so excavation of the western abutment could begin. This was part of a much bigger plan .



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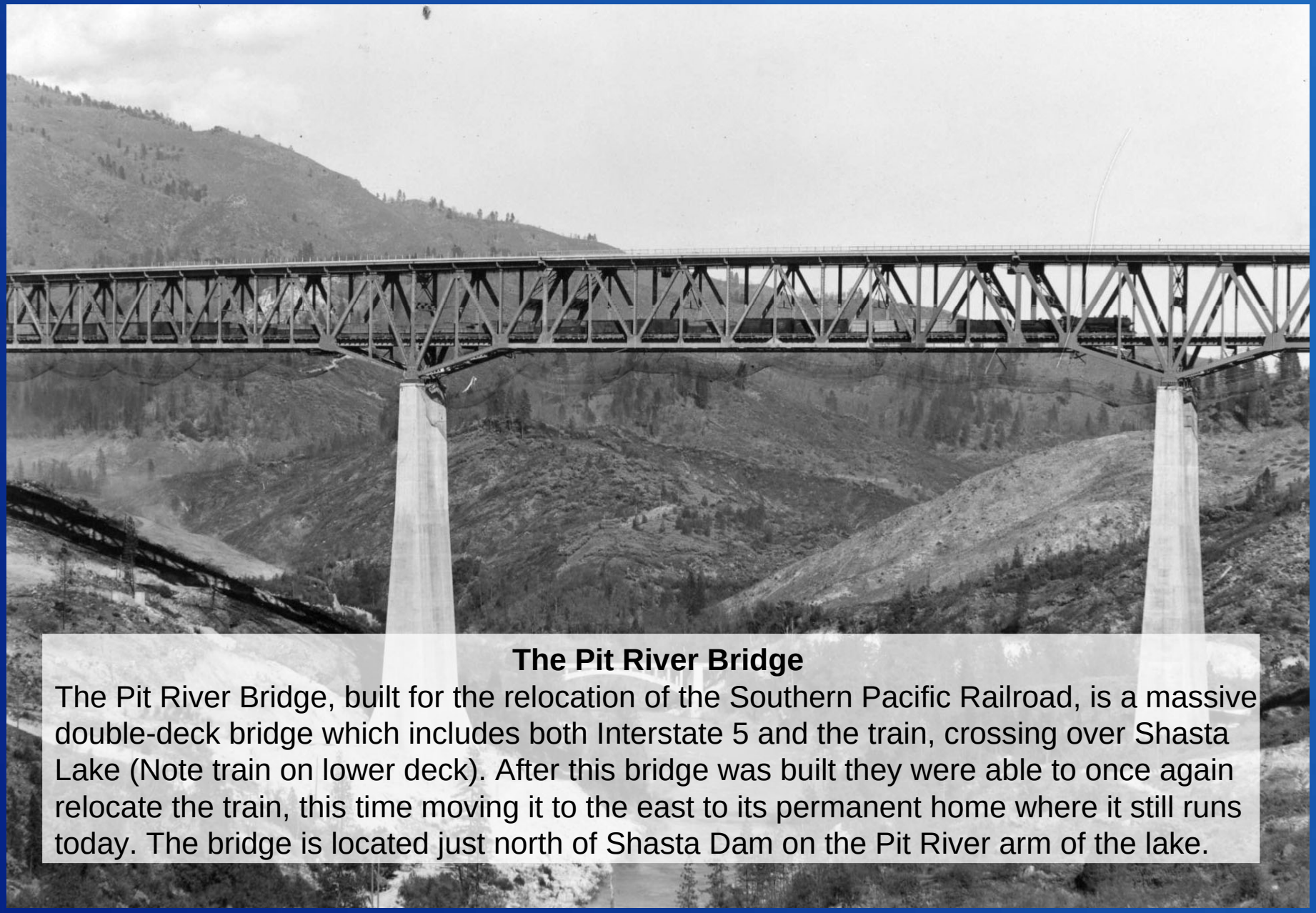

The Pit River Bridge

The Pit River Bridge, built for the relocation of the Southern Pacific Railroad, is a massive double-deck bridge which includes both Interstate 5 and the train, crossing over Shasta Lake (Note train on lower deck). After this bridge was built they were able to once again relocate the train, this time moving it to the east to its permanent home where it still runs today. The bridge is located just north of Shasta Dam on the Pit River arm of the lake.

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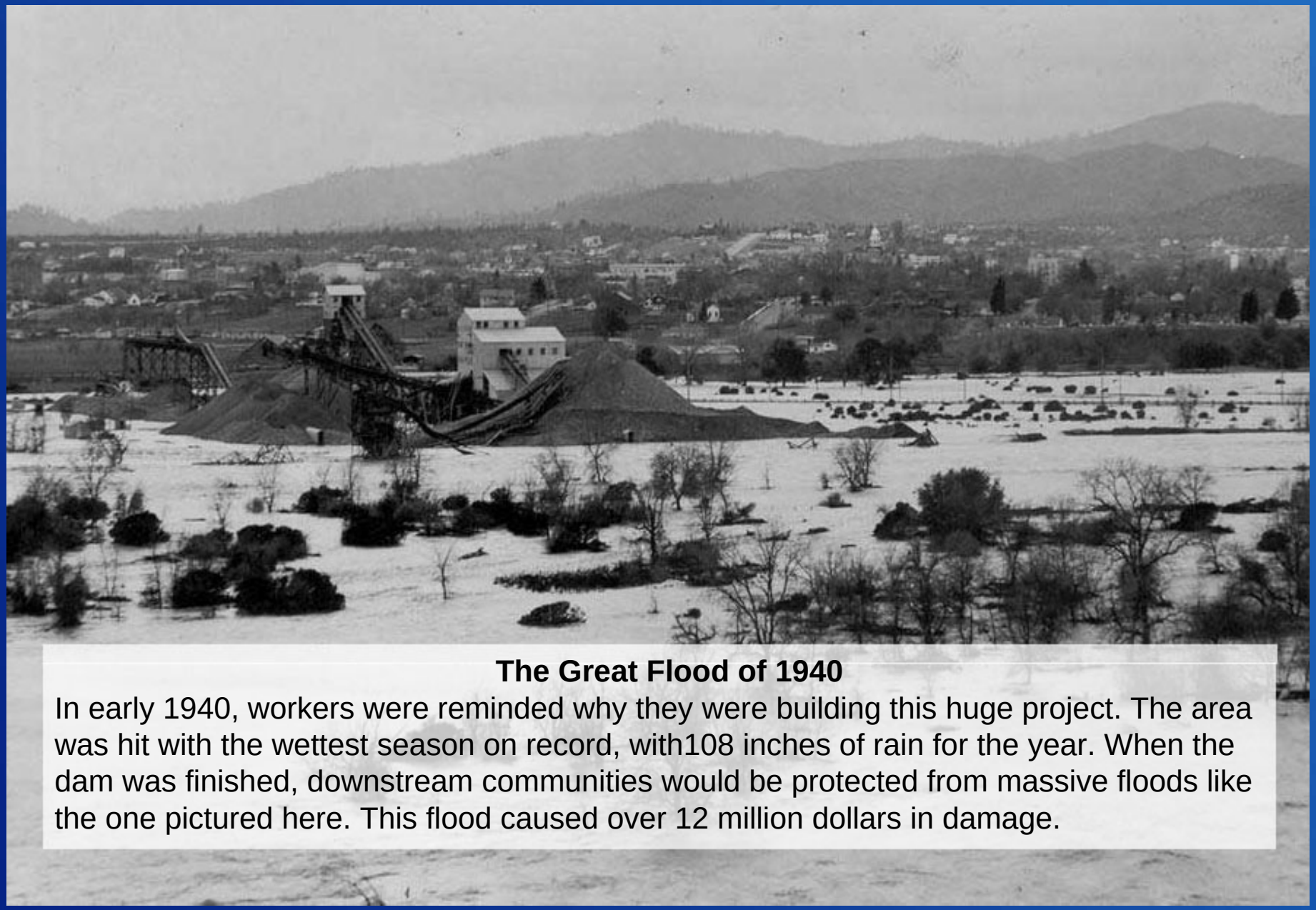

The Great Flood of 1940

In early 1940, workers were reminded why they were building this huge project. The area was hit with the wettest season on record, with108 inches of rain for the year. When the dam was finished, downstream communities would be protected from massive floods like the one pictured here. This flood caused over 12 million dollars in damage.

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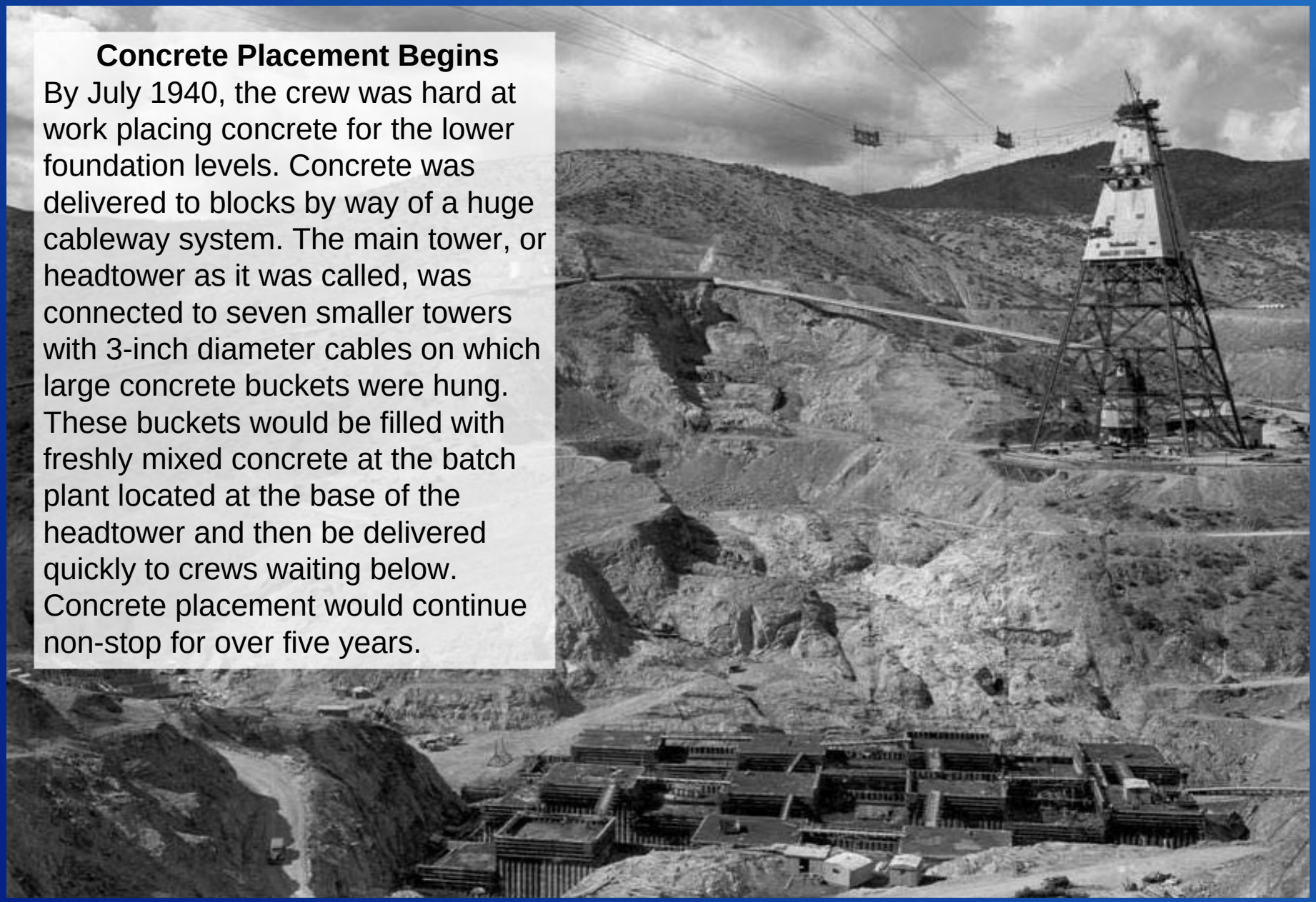

Concrete Placement Begins

By July 1940, the crew was hard at work placing concrete for the lower foundation levels. Concrete was delivered to blocks by way of a huge cableway system. The main tower, or headtower as it was called, was connected to seven smaller towers with 3-inch diameter cables on which large concrete buckets were hung. These buckets would be filled with freshly mixed concrete at the batch plant located at the base of the headtower and then be delivered quickly to crews waiting below. Concrete placement would continue non-stop for over five years.

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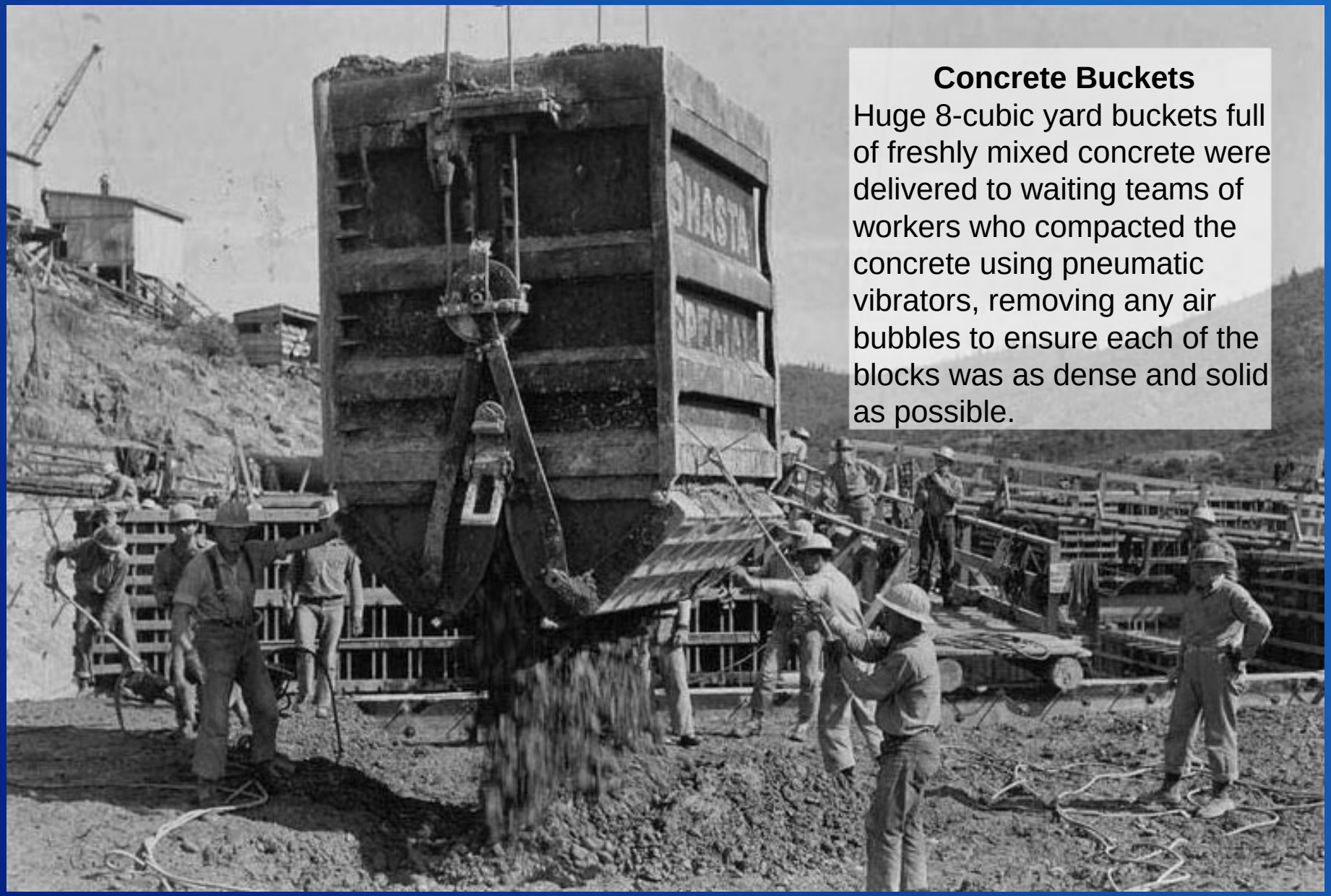

Concrete Buckets

Huge 8-cubic yard buckets full of freshly mixed concrete were delivered to waiting teams of workers who compacted the concrete using pneumatic vibrators, removing any air bubbles to ensure each of the blocks was as dense and solid as possible.

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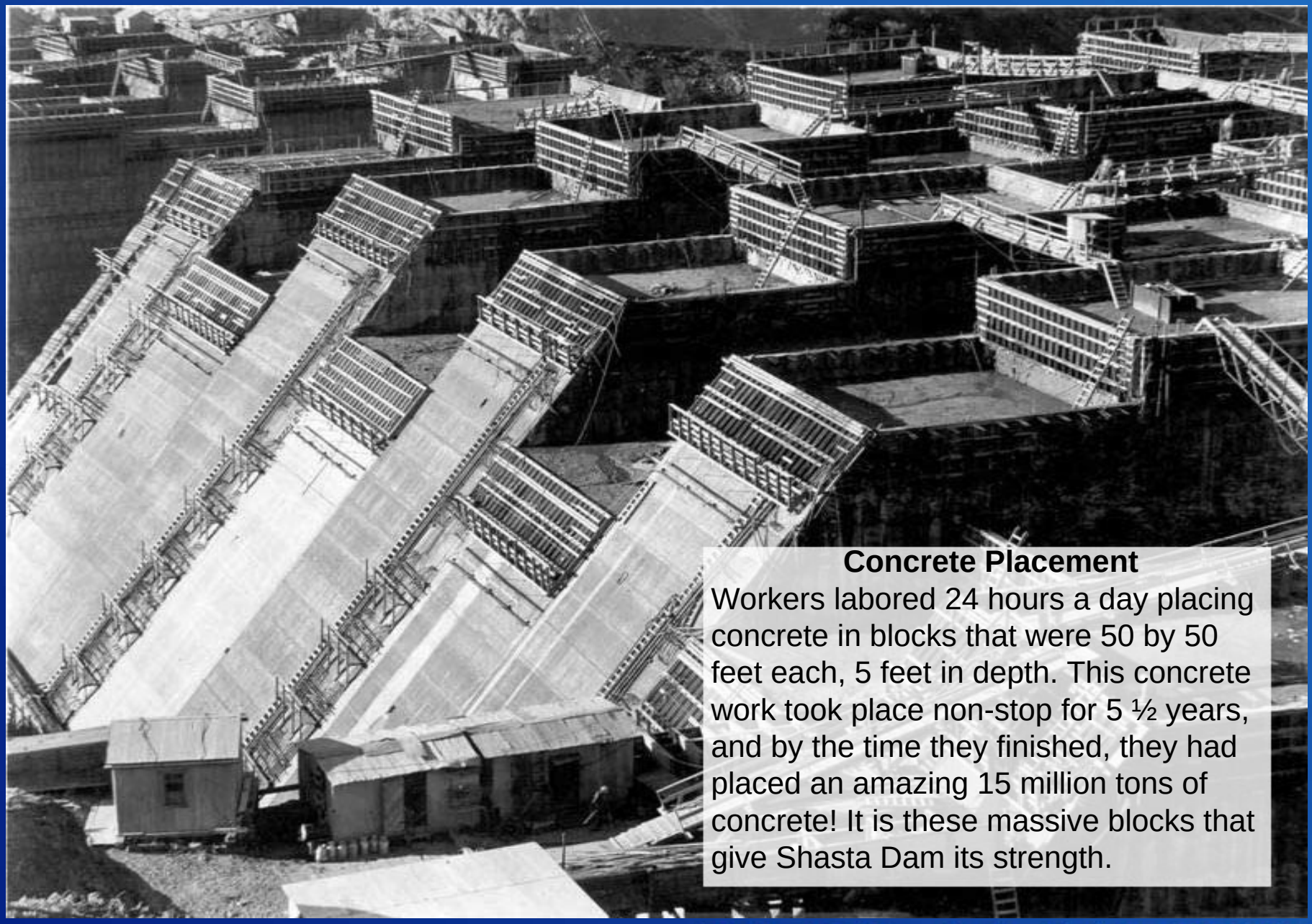

Concrete Placement

Workers labored 24 hours a day placing concrete in blocks that were 50 by 50 feet each, 5 feet in depth. This concrete work took place non-stop for 5 ½ years, and by the time they finished, they had placed an amazing 15 million tons of concrete! It is these massive blocks that give Shasta Dam its strength.

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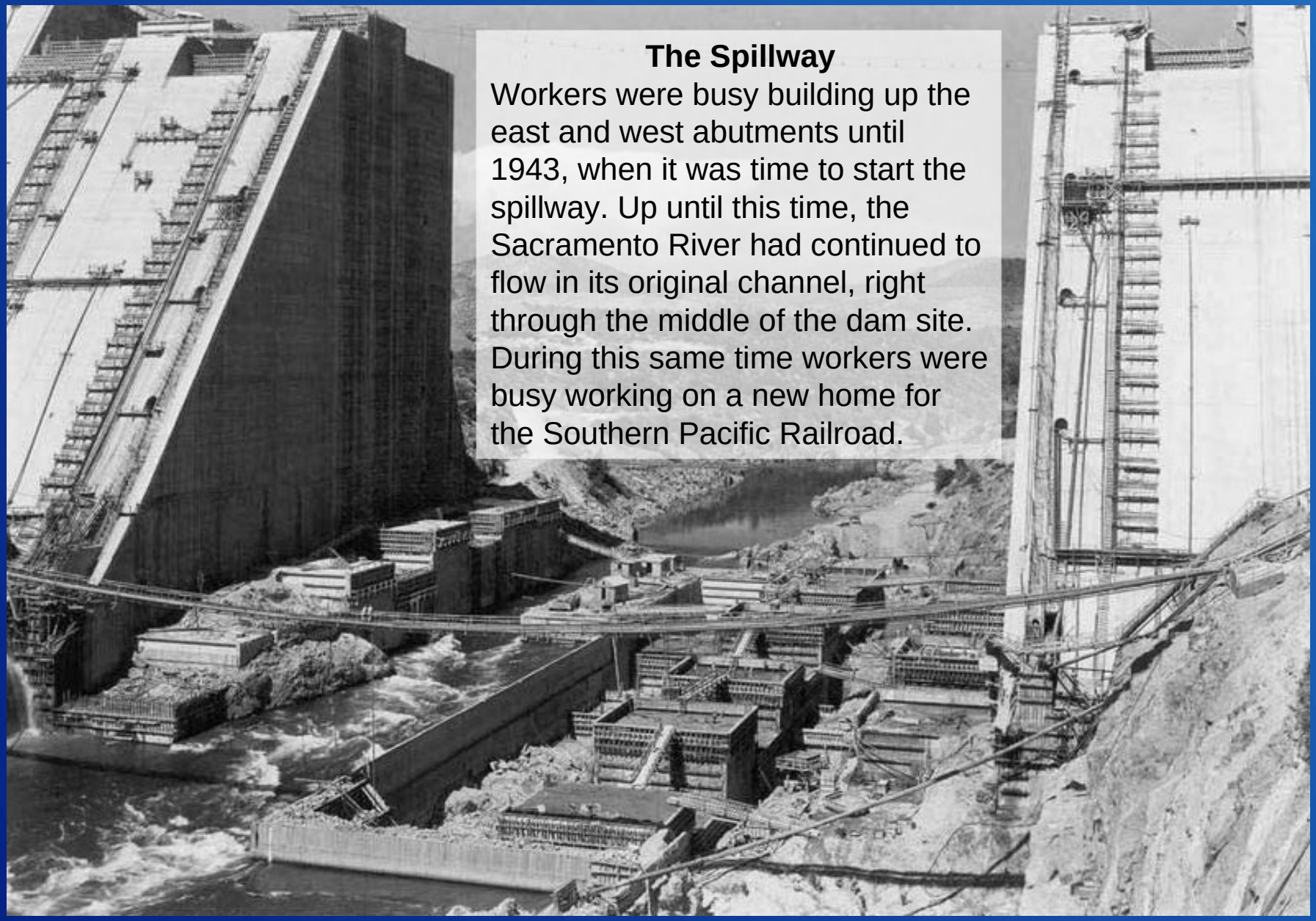

The Spillway

Workers were busy building up the east and west abutments until 1943, when it was time to start the spillway. Up until this time, the Sacramento River had continued to flow in its original channel, right through the middle of the dam site. During this same time workers were busy working on a new home for the Southern Pacific Railroad.

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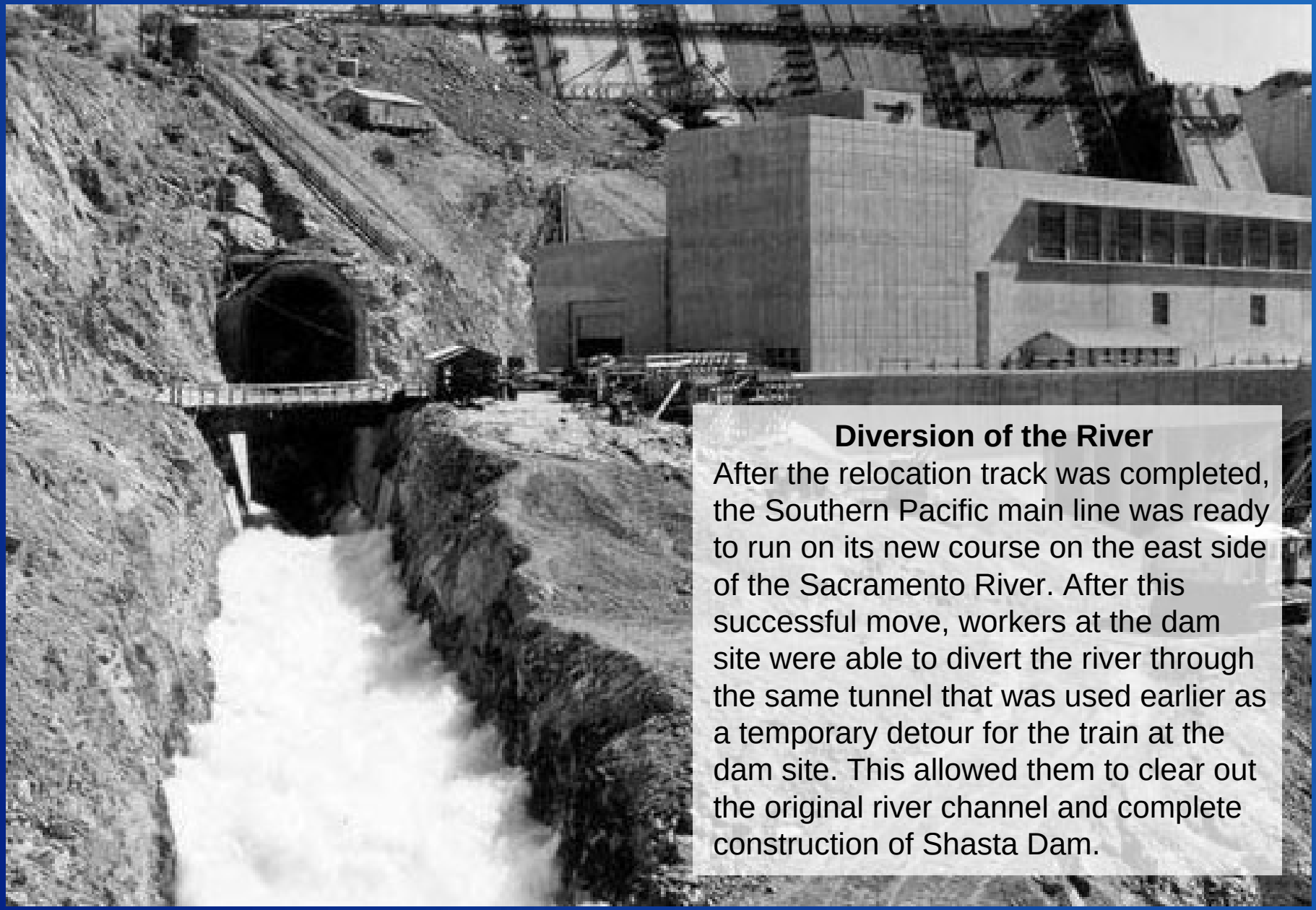

Diversion of the River

After the relocation track was completed, the Southern Pacific main line was ready to run on its new course on the east side of the Sacramento River. After this successful move, workers at the dam site were able to divert the river through the same tunnel that was used earlier as a temporary detour for the train at the dam site. This allowed them to clear out the original river channel and complete construction of Shasta Dam.

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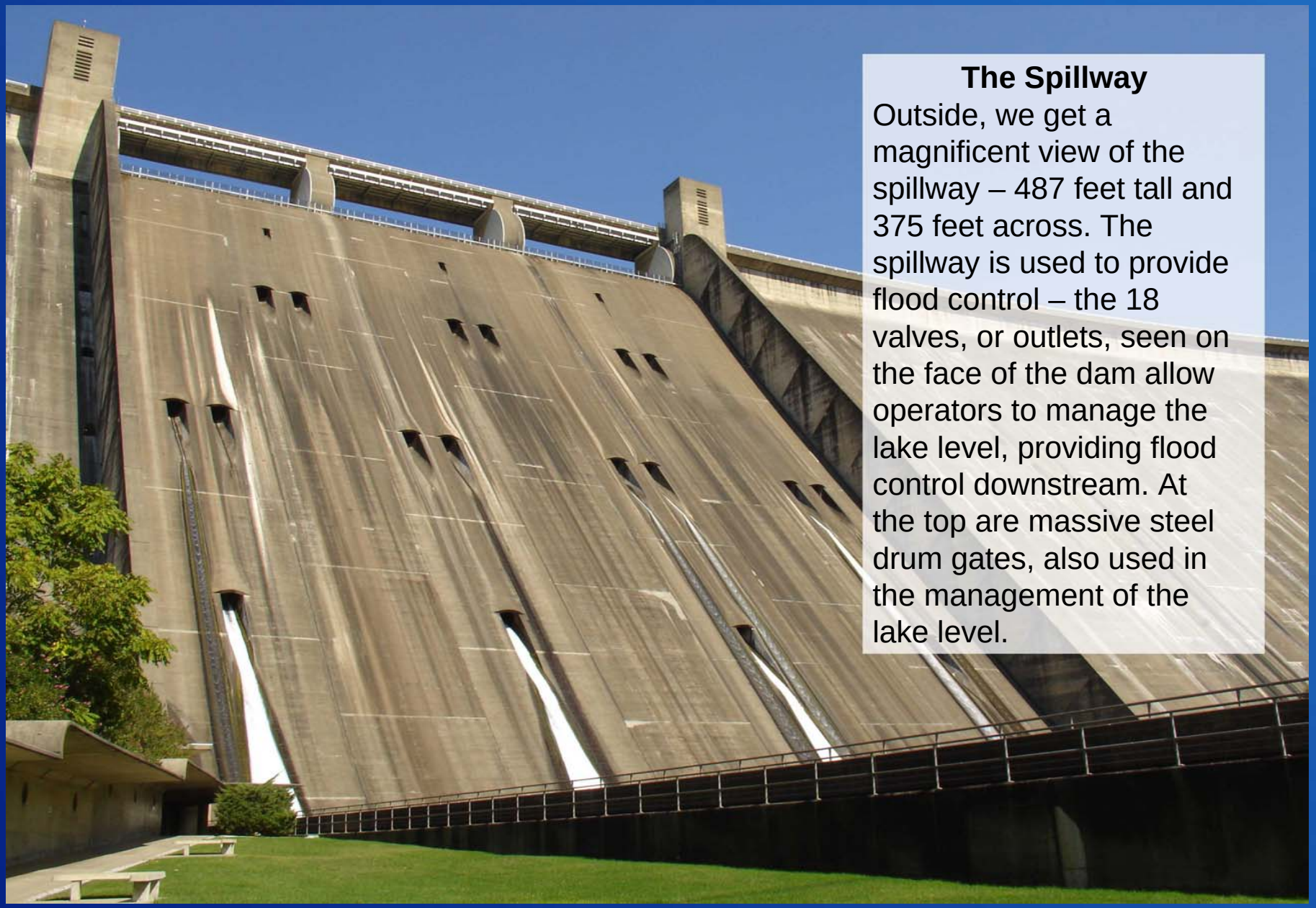

The Spillway

Outside, we get a magnificent view of the spillway – 487 feet tall and 375 feet across. The spillway is used to provide flood control – the 18 valves, or outlets, seen on the face of the dam allow operators to manage the lake level, providing flood control downstream. At the top are massive steel drum gates, also used in the management of the lake level.

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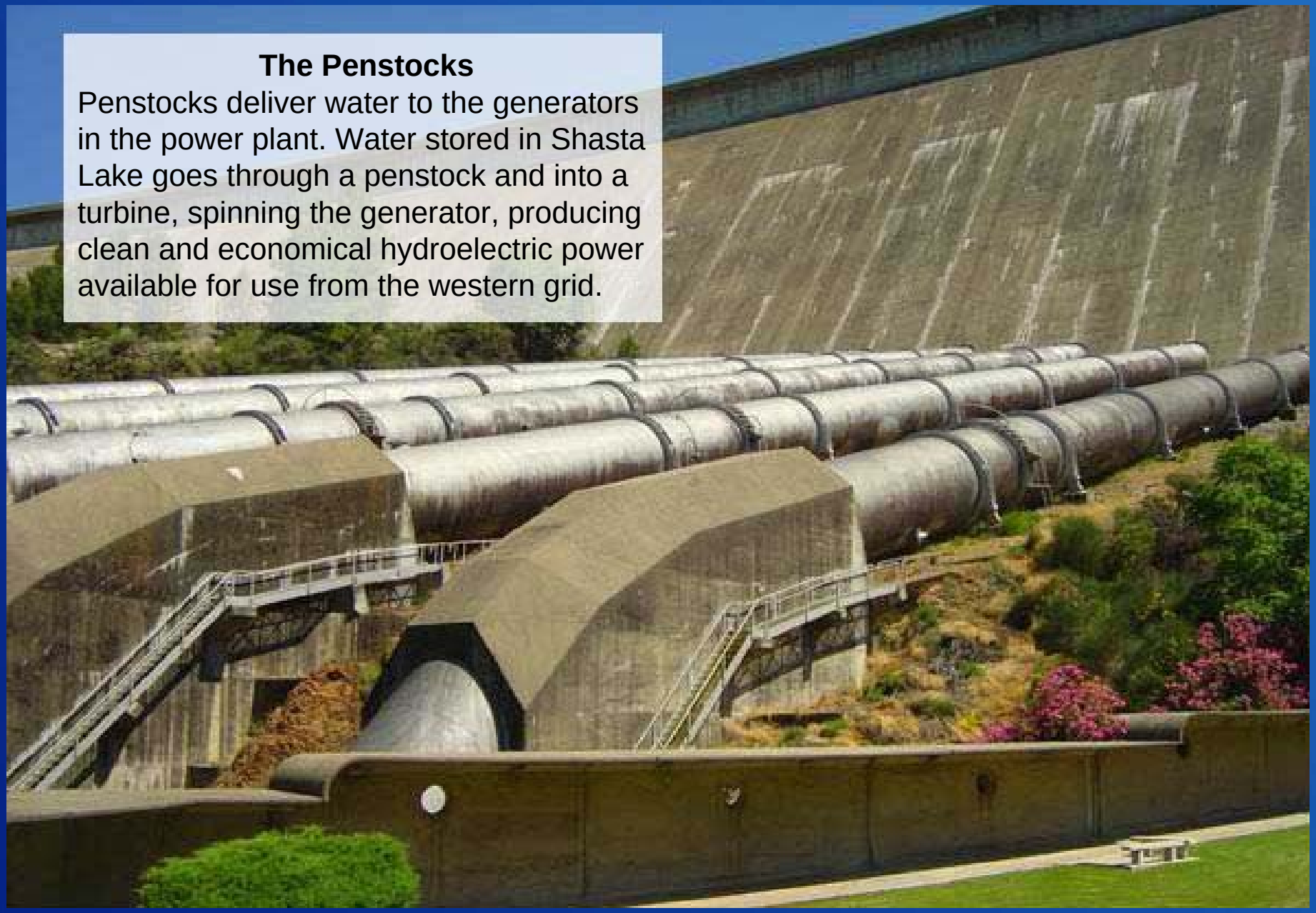

The Penstocks

Penstocks deliver water to the generators in the power plant. Water stored in Shasta Lake goes through a penstock and into a turbine, spinning the generator, producing clean and economical hydroelectric power available for use from the western grid.

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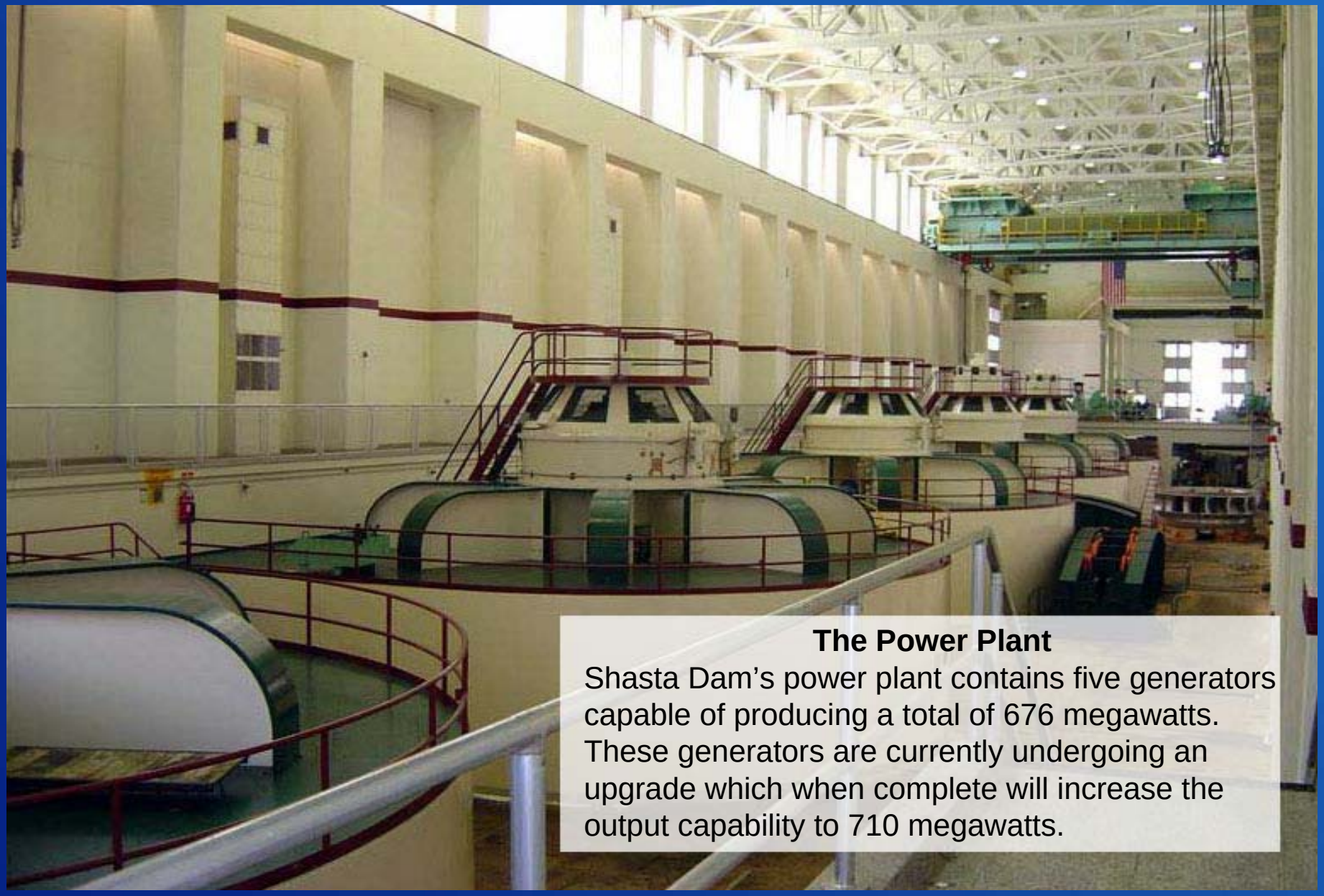

The Power Plant

Shasta Dam's power plant contains five generators capable of producing a total of 676 megawatts. These generators are currently undergoing an upgrade which when complete will increase the output capability to 710 megawatts.

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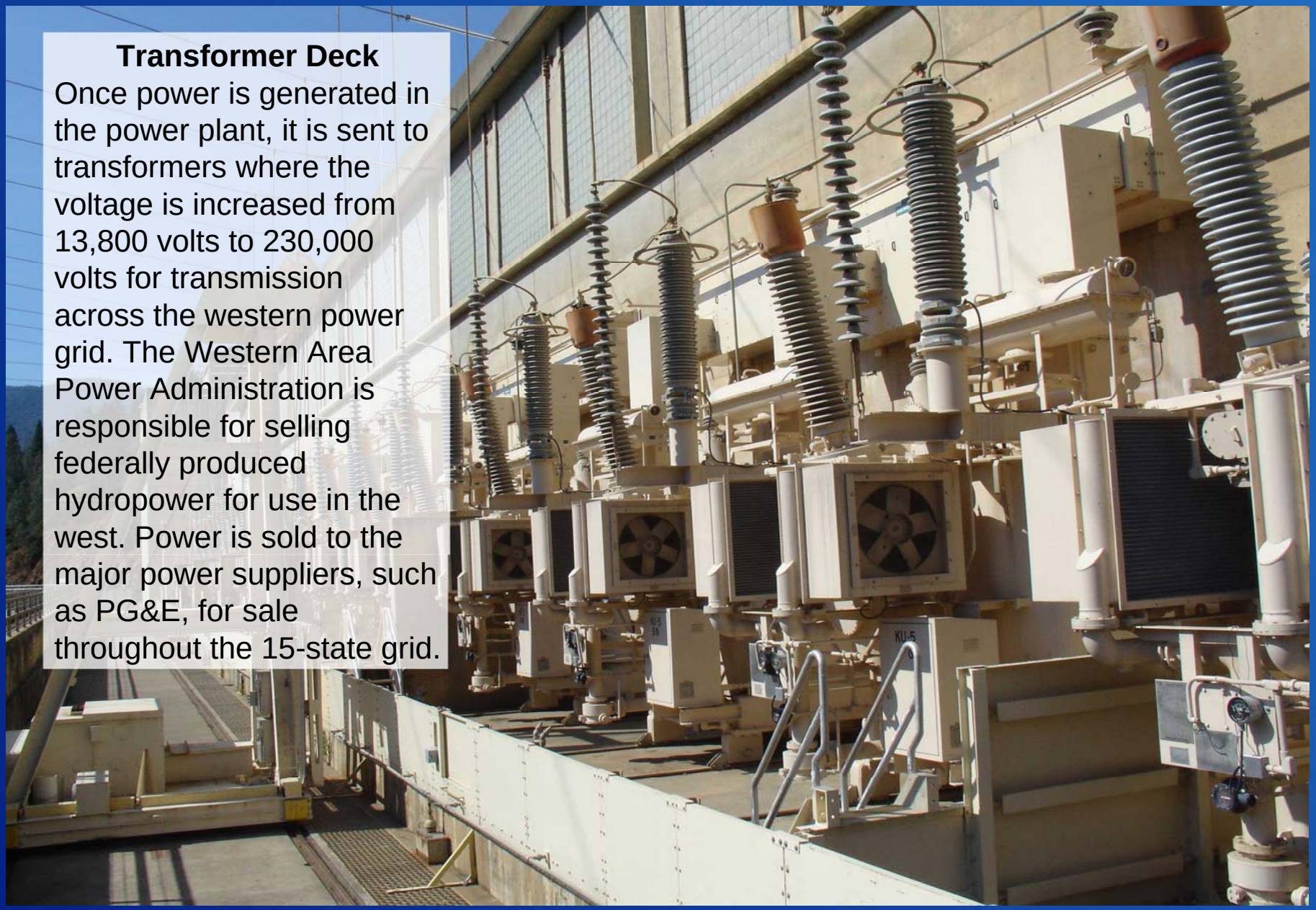

Transformer Deck

Once power is generated in the power plant, it is sent to transformers where the voltage is increased from 13,800 volts to 230,000 volts for transmission across the western power grid. The Western Area Power Administration is responsible for selling federally produced hydropower for use in the west. Power is sold to the major power suppliers, such as PG&E, for sale throughout the 15-state grid.

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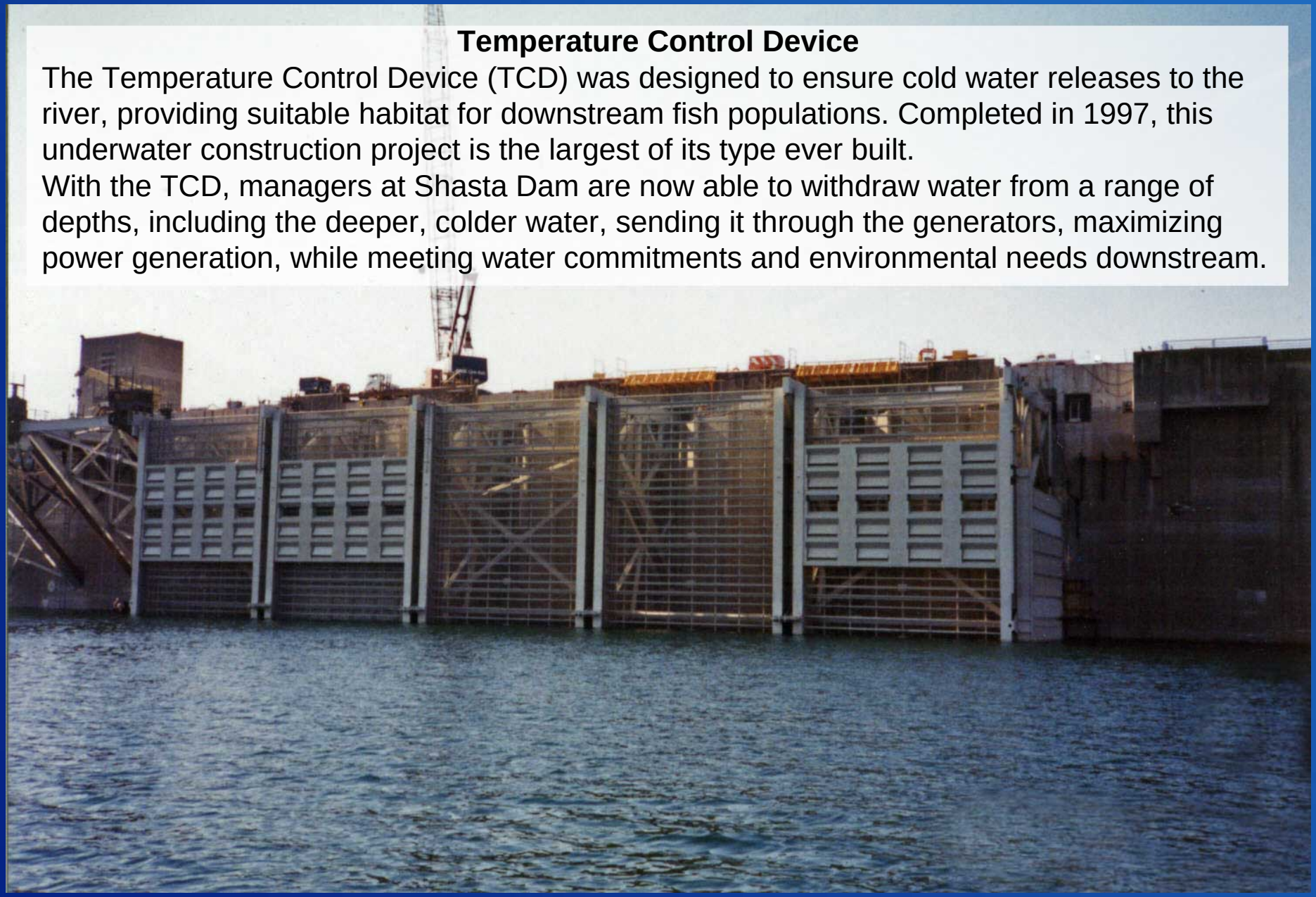
Temperature Control Device

The Temperature Control Device (TCD) was designed to ensure cold water releases to the river, providing suitable habitat for downstream fish populations. Completed in 1997, this underwater construction project is the largest of its type ever built.

With the TCD, managers at Shasta Dam are now able to withdraw water from a range of depths, including the deeper, colder water, sending it through the generators, maximizing power generation, while meeting water commitments and environmental needs downstream.



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Shasta Dam has an amazing story…

…and we want to share it with you! Free guided tours are offered daily except winter holidays.

Come join the friendly, knowledgeable guides on a visit through the Nation's second largest concrete dam. Tours include a visit to the power plant as well as the spillway area at the base of the dam. Come join us and learn more about the history and continued importance of this amazing structure!

PLEASE NOTE: The following items are restricted and not allowed on the tour:

*Cameras
*Cell phones or pagers
*Bags of ANY kind
*Electronic devices of ANY kind
*Weapons of ANY kind (including small pocketknives)

We appreciate your support of these security measures.

For tour information contact:
Bureau of Reclamation
16349 Shasta Dam Boulevard.
Shasta Lake, CA 96019
530-275-4463

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