

INTERSTATE COMMERCE COMMISSION
WASHINGTON

INVESTIGATION NO. 3240
THE ATCHISON, TOPEKA AND SANTA FE
RAILWAY COMPANY
REPORT IN RE ACCIDENT
AT SAN MARCIAL, N. MEX., ON
MARCH 17, 1949

SUMMARY

Date: March 17, 1949

Railroad: Atchison, Topeka and Santa Fe

Location: San Marcial, N. Mex.

Kind of accident: Derailment

Train involved: Maintenance-of-way service train

Train number: Work Extra 905

Engine number: 905

Consist: 13 cars, caboose

Speed: 5 m. p. h.

Operation: Timetable and train orders

Track: Single; tangent; level

Weather: Clear

Time: About 2:15 p. m.

Casualties: 1 killed; 5 injured

Cause: Sinking of a fill

INTERSTATE COMMERCE COMMISSION

INVESTIGATION NO. 3240

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION REPORTS
UNDER THE ACCIDENT REPORTS ACT OF MAY 6, 1910.

THE ATCHISON, TOPEKA AND SANTA FE RAILWAY COMPANY

May 2, 1949

Accident at San Marcial, N. Mex., on March 17, 1949,
caused by the sinking of a fill.

REPORT OF THE COMMISSION¹

PATTERSON, Commissioner:

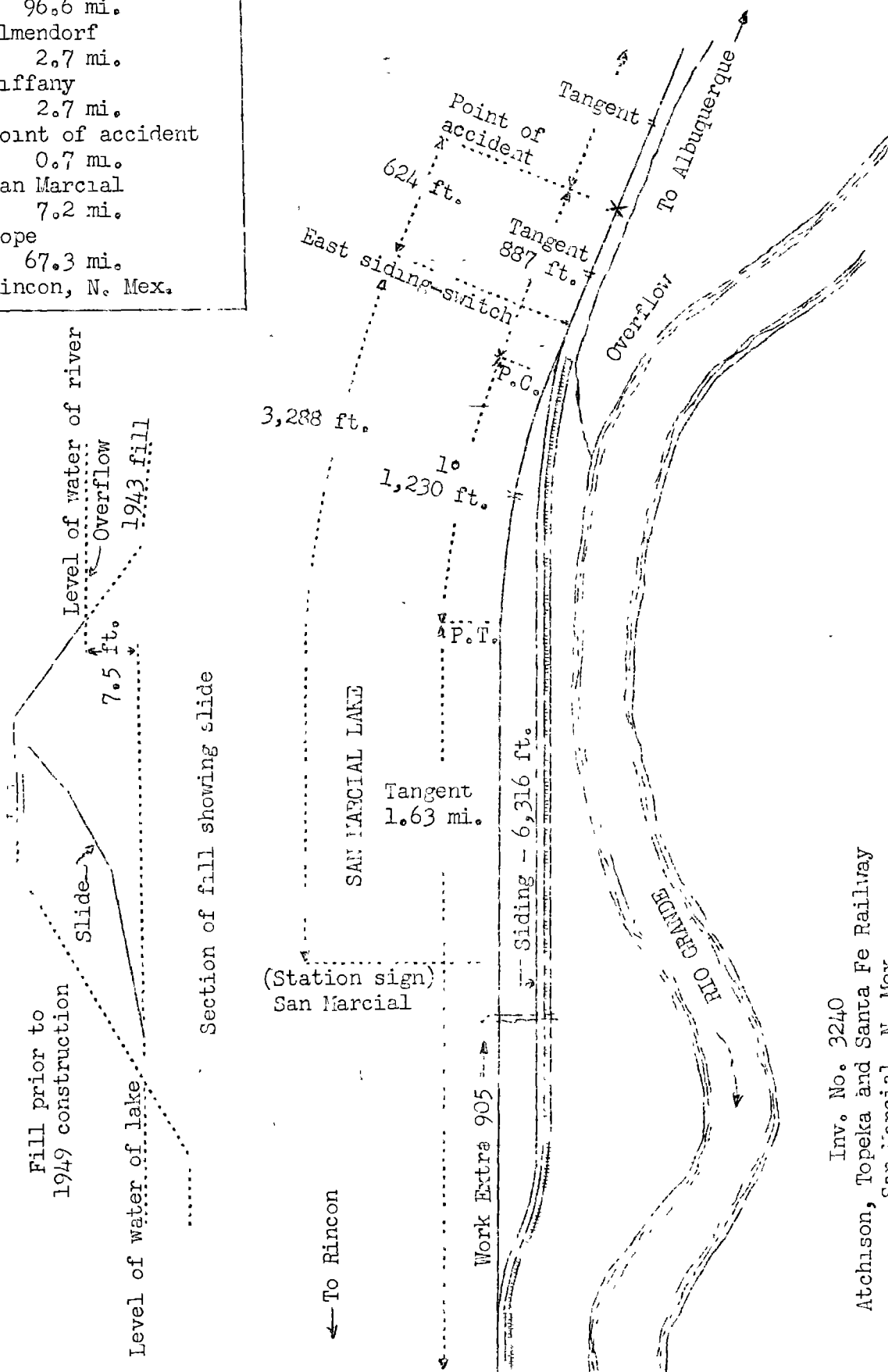
On March 17, 1949, there was a derailment of a maintenance-of-way service train on the Atchison, Topeka and Santa Fe Railway at San Marcial, N. Mex., which resulted in the death of one train-service employee, and the injury of two train-service employees and three maintenance-of-way employees.

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Under authority of section 17 (2) of the Interstate Commerce Act the above-entitled proceeding was referred by the Commission to Commissioner Patterson for consideration and disposition.

o	Albuquerque, N. Mex.
	96.6 mi.
o	Elmendorf
	2.7 mi.
o	Tiffany
	2.7 mi.
X	Point of accident
	0.7 mi.
o	San Marcial
	7.2 mi.
o	Pope
	67.3 mi.
o	Rincon, N. Mex.

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Inv. No. 3240
 Atchison, Topeka and Santa Fe Railway
 San Marcial, N. Mex.
 March 17, 1949

Location of Accident and Method of Operation

This accident occurred on that part of the New Mexico Division extending between Rincon and Albuquerque, N. Mex., 177.2 miles, a single-track line, over which trains are operated by timetable and train orders. There is no block system in use. At San Marcial, 102.7 miles west of Albuquerque, a siding 1.2 miles in length parallels the main track on the south. The east siding-switch is located 3,298 feet east of the station sign at San Marcial. The accident occurred on the main track 624 feet east of the east siding-switch. From the west there are, in succession, a tangent 1.63 miles in length, a 1° curve to the right 1,203 feet, and a tangent 887 feet to the point of accident and a considerable distance eastward. The grade is level.

In the vicinity of the point of accident the structure of the main track consists of 90-pound rail, 39 feet in length, laid new during March, 1928, on an average of 24 treated ties to the rail length. It is fully tieplated, single-spiked, and is provided with 4-hole 100-percent joint bars, and 4 rail anchors per rail length. The track is laid directly upon the top surface of a fill. The fill is about 23 feet high and, from the center-line of the track it extends horizontally 10 feet to the south and 21.5 feet to the north. It is 76 feet wide at the base. The material of the fill consisted of pit-run sand and gravel mixed with a small amount of clay. In the vicinity of the point of accident, the fill separates San Marcial Lake on the north and the Rio Grande on the south. On the day of the accident the level of the water of the river was 7.5 feet higher than the level of the water of the lake.

The maximum authorized speed for the engine in backward motion involved in the accident is 20 miles per hour.

Description of Accident

At Tiffany, 3.4 miles east of San Marcial, the crew of engine 905 received copies of train orders reading in part as follows:

Order No. 502

Speed limit 20 MPH between 17 poles west of MP 1002 and 15 poles west of MP 1004. * * *

Order No. 556

Engines 905 and 1646 work as 2 work extras seven thirty 7:30 a.m. until eight ten 8:10 p.m. between Elmendorf and Pope protecting against each other.

Elmendorf and Pope are, respectively, 6.1 miles east and 7.2 miles west of San Marcial. At the time of the accident, Work Extra 905 consisted of engine 905 headed west, one spreader-ditcher car, 17 air-operated dump cars and a caboose, in the order named. This train was engaged in hauling fill material from a borrow pit near Tiffany and in unloading and spreading it between Tiffany and San Marcial. At 2:10 p. m. this train departed eastward from San Marcial and while it was moving at a speed of about 5 miles per hour the engine, the tender and the first car became derailed on a fill at a point 3/4-mile east of San Marcial.

The engine and the tender remained coupled and stopped north of the main track, on their right sides and at the bottom of the fill. The first car, a spreader-ditcher car, became separated from the engine and the second car, and stopped north of the main track and on its side. The engine was considerably damaged, and the first car was slightly damaged.

The firman was killed, and the engineer and the front brakeman were injured.

The weather was clear at the time of the accident, which occurred about 2:15 p. m.

Discussion

As Work Extra 905, proceeding eastward, approached the point where the accident occurred the speed was about 15 miles per hour in territory where the maximum authorized speed was restricted to 20 miles per hour. The enginemen were in the cab of the engine and the front brakeman was on the tender. These employees were maintaining a lookout toward the east. The view of the track was unrestricted throughout a distance of 650 feet immediately west of the point of accident. The brakes of this train had been tested and had functioned properly when used en route. The engineer said that he observed a caved-in section of the fill about 150 feet east of his engine, and made a light service application of the brakes. As the engine was moving over this location he observed another caved-in section of the fill larger than the first and about 75 feet east of it. He immediately moved the brake valve to emergency position. The train was moving about 5 miles per hour when the unsupported track structure collapsed under the engine. The front brakeman said that he observed a deflection in the main track and the sunken portions of the fill, and immediately called a warning to the engineer. The front brakeman was in the act of entering the cab when the engine started to turn over.

Examination after the accident disclosed that two sections of the north side of the fill had sunk. The section at the point where the accident occurred was about 100 feet in length and 15 feet deep. It extended about 6 feet south of the center-line of the main track. The other section was about 75 feet west of the point of accident and about 75 feet in length. It extended under the ties to the north rail of the main track.

The main track west of the point of accident was in normal alignment.

The investigation disclosed that during the past 25 years deposits of silt had raised the bed of the Rio Grande at this point more than 20 feet. During this period it was necessary to raise the grade line of the fill on three occasions to keep the track above the flood level of the river. The fourth raise of the grade was in progress when the accident occurred. At the time of the accident the top of the fill was about 23 feet above the original subgrade. Throughout a distance of about 1.5 miles immediately east of the east switch of the siding at San Marcial the grade was to be elevated to a maximum of 6 feet, but was to be raised only 5 or 6 inches at the point where the accident occurred. From February 17, 1949, to the day of the accident about 2 000 carloads of gravel had been dumped on the north side of this fill.

At the time of the accident the level of the water in the Rio Grande was higher than normal, because the Middle Rio Grande Conservancy District was discharging 3,000-acre feet of water per day from the El Vado Reservoir, located about 145 miles north of San Marcial, to minimize anticipated flood conditions later in the season. This excess flow of water in the river inundated the lower ground on the south side of the fill in the vicinity of San Marcial. About 2 miles west of the point of accident a portion of the river flows into San Marcial Lake. At the time the accident occurred the level of the water in the river was 7.5 feet higher than the level of the water in the lake.

Work Extra 905 moved over the fill west-bound about 20 minutes before the accident occurred. The members of the crew, and a roadmaster who operated the spreader car, said they did not observe any unsafe condition at that time. Several persons who were in boats on the lake said that noise attracted their attention toward the railroad fill, and they observed trees and other vegetation at the toe of the embankment moving outward into the lake. Then a portion of the embankment slid downward, but the track remained in almost normal alignment. Immediately afterward they observed a train approaching from the west, and they gave warning signals to the train, but their signals were not acknowledged by members of the train crew.

The engineer of maintenance-of-way said he had been over the fill in question numerous times during the 30-day period preceding the day of the accident, and he observed no indication of failure of the fill at any location, such as settlement or displacement in the alignment of the track. His examination of the fill after the accident disclosed that the fill was compact and there was no indication of water having passed through the embankment. He said that he observed trees, which had been growing at the toe of the fill, and refrigerator-car racks, which had been placed at the toe of the fill to protect the fill from wave action, had moved laterally into the lake. He said that during the 26 years he had been employed by this railroad he had never

seen a failure similar to the one in question. He was of the opinion that water seeped from the river through the foundation of the fill to the lake, and that pressure exerted from the higher level toward the lower level caused the foundation to slip and the upper part of the fill to sink. This carrier is making constructional changes in this fill for the purpose of eliminating foundation failures in the future.

Cause

It is found that this accident was caused by the sinking of a fill.

Dated at Washington, D. C., this second day
of May 1949.

By the Commission, Commissioner Patterson.

(SEAL)

W. P. BARTEL,
Secretary.