

REPORT ON
OVERFLOW LANDS AT THE
MOUTH OF SAN DIEGUITO RIVER.
by WILLIAM S. POST.
Mar. 11, 1913.

AUTHORITY.

This report is made at the request of Mr. H. W. Keller, President, South Coast Land Company, with the purpose of determining the method of reclamation of overflow land in the valley of the San Dieguito, near Del Mar and the probable cost.

GENERAL SITUATION.

These lands lie at the mouth of the San Dieguito River. The stream has a large drainage area of perhaps 300 square miles, and is capable of delivering large floods in rainy seasons. The maximum flood which may be anticipated may reach 500 to 1,000 cu. ft. per second.

In common with other costal streams, the mouth of the San Dieguito is closed in summer by tide current, wave and wind action, forming a sand bar. Behind the bar is formed a lagoon, the surface elevation of which should stand theoretically slightly above mean tide. The lagoon filters away through the costal sands, but of course this process (at the rate of 10 or 12 feet per day through the sands) is met twice daily by a high tide, and is checked to an average level.

The water way of the stream is of sluggish current for 2 miles from the mouth. It is deep and probably records the

scouring of the occasional heavy floods with a clear opening to the sea. Geologically the coast line is rising and there seems no reason to believe that these water courses are submerged by settlement, but rather they record what at one time or another has been necessary for a water way.

The elevations used in this report are based on the U. S. Coast Survey Bench at the Old Town of Del Mar. The 0 of the Coast Survey is the "mean of low tides." The range of the tide on this portion of the Coast is about 4.8 feet; so that 2.4 feet represents mean tide and 4.8 feet high tide. It should be understood that the surf heights or summit of wave crests go much higher than these planes which refer to the condition in deep water or in a harbor.

The lagoon probably stands in summer at elevation 2.5 feet or slightly above mean tide. When water is flowing down the San Dieguito this height will rise, until at about 5 to 6 feet elevation, it will force a channel through the bar, when for a brief period the lagoon may ebb and flow between nearly 0 and 4.8 ft. elevations. The bar will soon reform and the general and practical condition may be considered to be an elevation of 2.4 ft to 4.8 ft.

Borings throughout the valley for the first three miles inland establish the soil and underlying stratum to be of very fine silts and the subterranean drainage must be very slow, and cannot affect any proposed reclamation. For instance it is believed that once the water is removed by pumping from an area of these fine silts and surface waters excluded by dykes, that

the water plane can be easily kept at a level say of 0 elevation, without anticipating an upward flow from porous gravels beneath, draining extended areas outside of the dykes.

The San Dieguito main channel is on the north side of the valley and in well defined banks, 4 or 5 feet high and about 100 feet apart. On the south is a similar channel obviously an old channel, which may be called the Lagoon or "Serpentine." It may receive at times flood waters from the main stream near the Santa Fe Ranch, but this condition could be prevented by a short dyke. The lagoon seems rather to receive its water by backing up from the mouth and the local watershed to the south and east.

PHYSICAL CONDITIONS.

We have three natural or artificial dykes on the area considered, dividing it into basins.

1. The first is the ocean bar, which has already been mentioned.

2. The second is the long fill of the Santa Fe R.R. parallel to and 1,000 feet inland from the ocean front, pierced by a single waterway 300 feet long.

3. The third is the causeway of the County Road, pierced at two points by the Lagoon Bridge 100 feet long, and the main San Dieguito River 200 feet long.

Reclamation will naturally be directed to the property owned by S.C.L.Co., but it seems preferable to consider the best scheme and then arrange for pro rata of all lands benefited.

RECLAMATION PLANS.

THE RAILWAY DYKE.

The first work suggested is to utilize the Santa Fe R.R. fill. Place a line of sheet piling parallel to and 100 feet west of the railway's pile bridge and connect with dykes to the railway embankment. This line of sheet piling would be 300 feet long. The top would be at elevation of 5.0 feet and arranged for an overfall of flood waters in the San Dieguito when they occur. Tidal gates would be installed and result in maintaining a constant level to the east of the sheeting of 2.5 to 3.0 elevation, that is mean tide, except when excessive floods are in the River, generally in February and March. The maximum floods will not cause a rise over 8 feet elevation behind this sheet piling.

I am of the opinion at present that it is not wise to attempt to make an outlet through the beach for the purpose of draining down to 0 elevation or low tide. The reasons for this opinion are the unsatisfactory working of such installations as at Venice, and the consideration of the fine silts of the valley, admitting of the same results inland by pumping down to 0 behind the sheet piling. In either case the floods will overflow in the winter and the crops will be annuals whose roots will follow down the lowering water plane after floods have ceased. From 5 feet to about 3 feet elevation this will be accomplished by the tidal gates, and the unwatering completed from 3 to 0 feet or lower, by a centrifugal pump, located at the bridge.

To rid the flats of alkali it will be necessary to draw down the water plane during the high evaporation period to at least 5 feet below the ground surface, as capillary action is effective to this limit. About 80 acres of the land east of the railway is between 5 and 5 feet elevation and for this the water plane should be probably brought down to elevation 2.0. A strip of low land between the railway and the beach subdivision of Del Mar, should also be handled in this way, requiring a dyke of 350 feet in length to isolate it from the lagoon.

Undoubtedly all of the land between the Railway and County Road would be benefited by dykes along the main channel of the San Dieguito and the Lagoon brought to an elevation of 8 or 9 feet. This is done in the Northern part of the state with a dipper dredge on a pontoon. If this were done and these lands isolated from the drainage lines, the pumping plant suction could be connected by branch pipes to keep them unwatered even during the flood period and rainy season. This plan admits of this whenever the cost seems justified.

COST OF RAILWAY DYKE INSTALLATION.

300 lin.ft. of sheet piling 30,000 ft B M at \$40--	\$ 1,200
Concrete above low tide 30 yds at \$10 -----	300
Connecting dykes - 200 ft long -----	300
Del Mar Dyke - 300 ft long -----	500
Tidal valves -----	500

PUMPING PLANT.

35 H.P. electrical motor -----	450
Centrifugal pump 14,000 gals per minute -----	1,200
Installation and freight -----	370
	<hr/>
	\$ 4,800

OPERATING COST.

2 months at \$450.00 -----	\$ 900.
5 months at \$100.00 -----	500
Interest on Cost of works - 10% -----	500
	<u>500</u>
	\$1,900
	=====

The benefit affects directly 300 acres. The first cost of reclamation would be \$16 per acre and the annual operating cost \$6.30 per acre.

THE COUNTY ROAD DYKE.

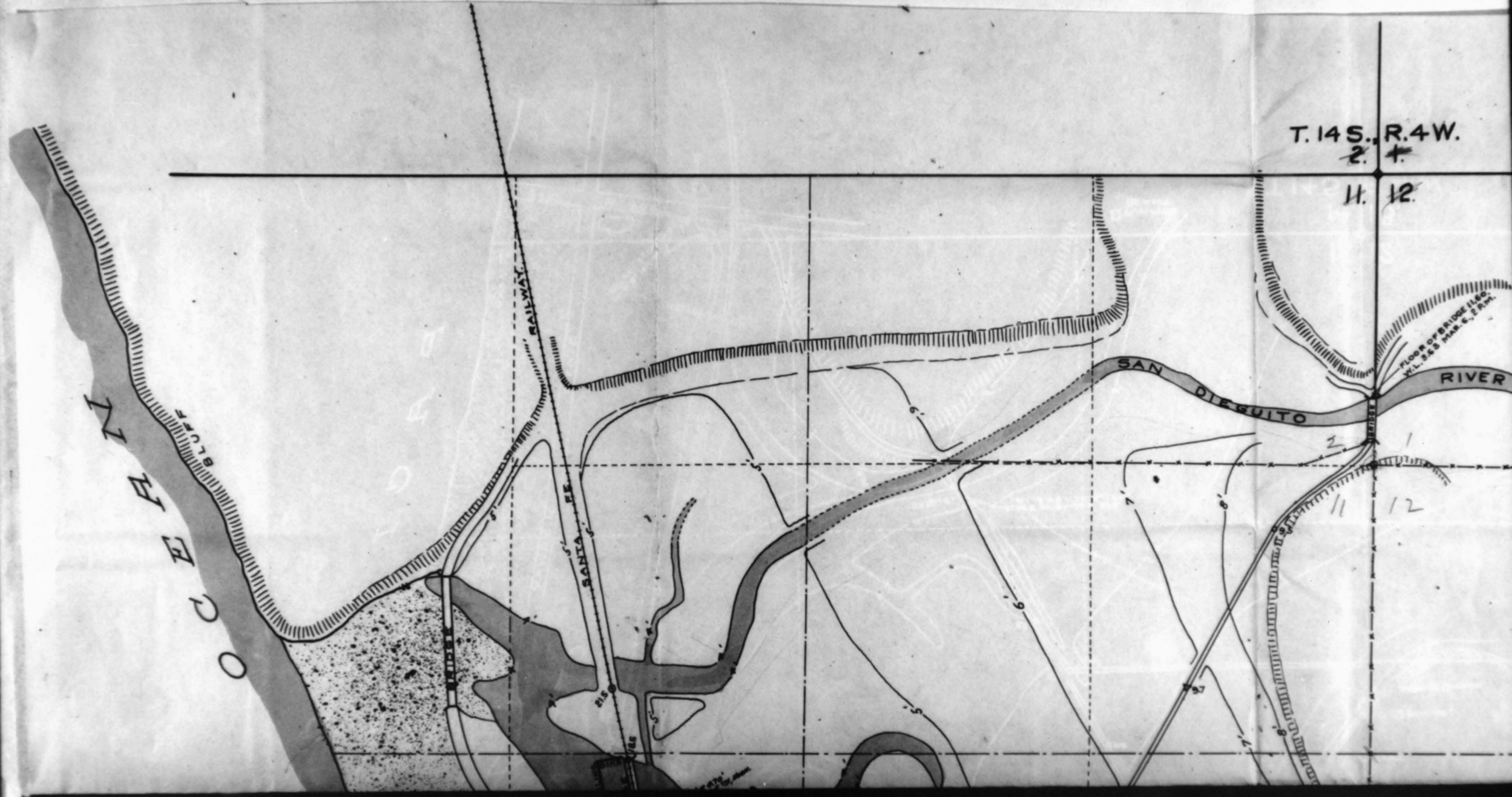
The second line of defence is obviously the Lagoon Bridge on the County Road. It is clear that the main San Dieguito River can be excluded from the south-east corner of Section 11, and south half of Section 12. The proper location of the protection line appears to be near the west line of the Santa Fe Ranch, when portions of Sections 5, 7 and 8 in the adjoining township could be benefited by this work.

The general facts remain the same. Tidal gates at the County Bridge would reduce the water plane permanently to 2.5 to 3.0 feet, but for good results a pumping plant working to 0 elevation would be required. Installed here however, it would not benefit the lands to the west and north, some 300 acres in extent. The pumping plant would not be much of an affair in this case.

As shown by the map I have not made a detailed study of this second plan of reclamation, considering that it is provided for in the other proposal. Its cost would be probably one-third of the other, both in first cost and operating expense.

San Diego, Cal.

Mar. 11, 1913.



T. 14 S., R. 4 W.
2. 4.

11. 12.

FLOOR OF BRIDGE 1160.
W.L. 363 MAR. 6, 2 P.M.

SAN DIEGO RIVER

SANTA FE RAILWAY

SANTA FE

SAN DIEGO RIVER

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216

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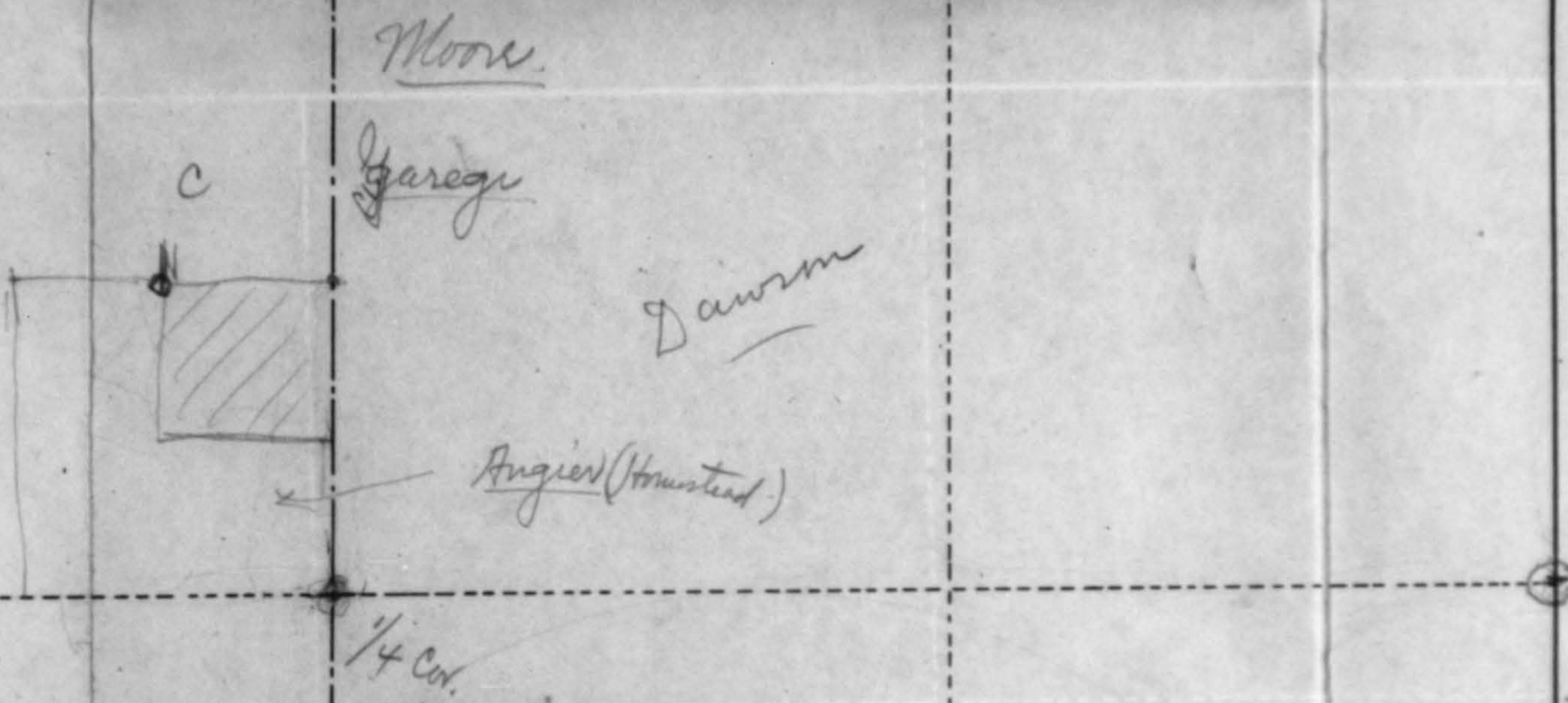
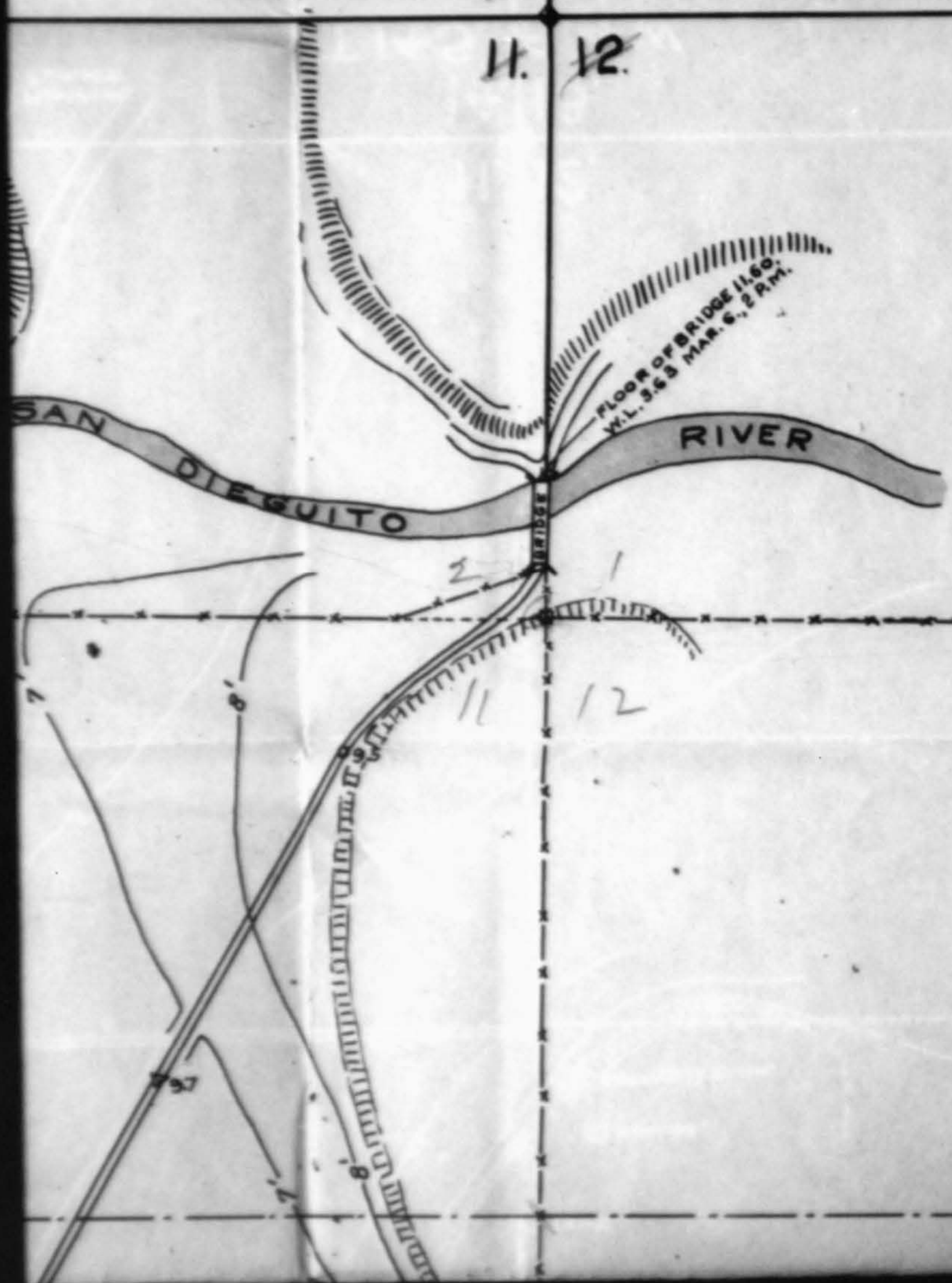
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T. 14 S., R. 4 W.
2. 4

11. 12



P A C I F I C

STATE HIGHWAY

SANTA FE RAILWAY

LAGOON

MAR. 6, 11 AM. WATER LEVEL

BRIDGE. FLOOR OF BRIDGE 978. W.L. 8.48 MAR. 6, 1 PM.

PUMPING PLANT.

TENT.

HOUSE.

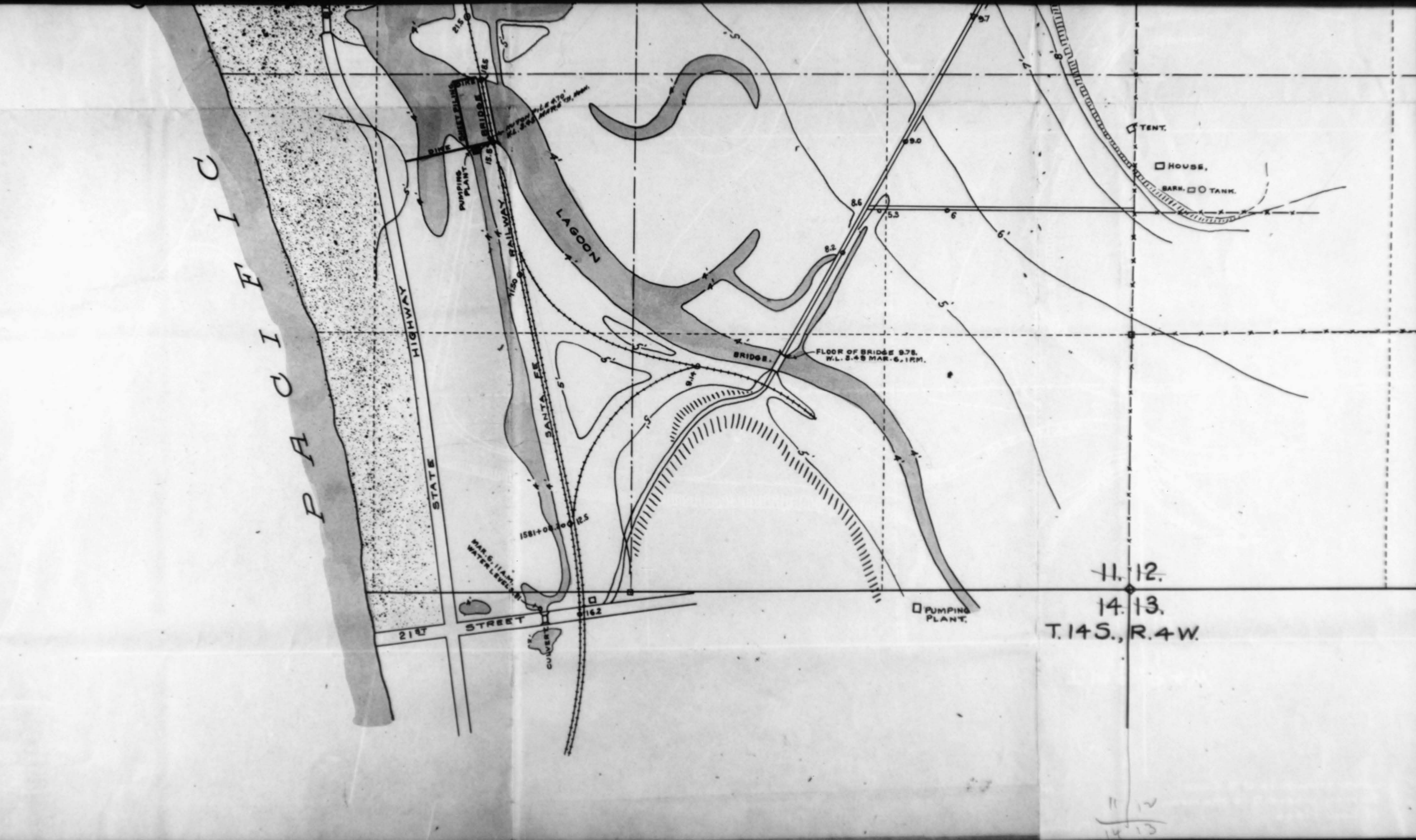
BARN. TANK.

11.12.

14.13.

T. 14 S., R. 4 W.

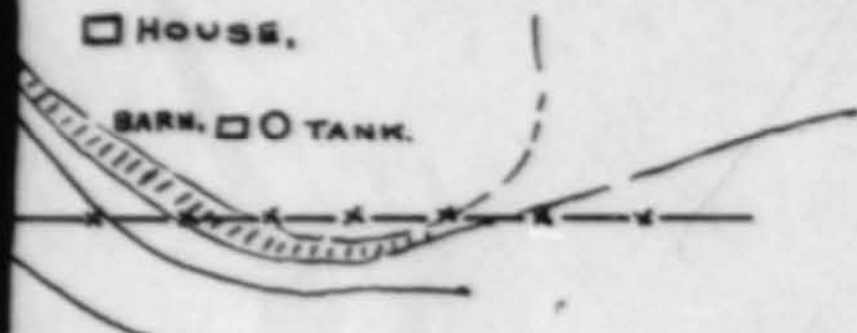
11 12
14 13



TENT.

□ HOUSE.

BAR. □ TANK.



12.

13.

R. & W.

TO ACCOMPANY REPORT OF
W. S. POST.

Level Datum is U. S. Coast
Survey, where 0 is the mean
of Low tides.

SOUTH COAST LAND CO.

MAP OF
MOUTH OF SAN DIEGUITO RIVER,
NEAR DEL MAR, CALIFORNIA.
Scale 1" = 400 feet.

February, 1918.



25-A

Report on Overflow
Lands at Mouth of
San Dieguito River
W. S. Post

Ed Fletcher Papers

1870-1955

MSS.81

Box: 40 Folder: 15

**Business Records - Reports - Post, W.S - "Report on
Overflow lands at the Mouth of San Dieguito River"**



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