

Mar. 5, 1916.

Mr. Ed. Fletcher,
Mngr. V.L. & W. Co.

Dear Sir:

As you request I review as follows the essential cost data of the Carroll-San Dieguito proposition.

Quoting from my report of Aug. 20, 1915, you can build Carroll Dam 50 feet high, with base sufficient to raise to 100 feet in height:

Concrete 58,500 cu. yds. at \$ 6.00 (including excavation)	\$ 231,000
Outlet pipes	20,000
Contingencies 15%	39,000
	<hr/>
	\$ 290,000

This will store 1.1 billion gallons or 3300 acre-ft; sufficient to carry on the San Dieguito Ranch development to the extent of 3000 to 4000 acres.

At any time or continuously you can increase to 100 feet high for the additional sum of \$110,000; securing 11.3 billion gallons or 55,000 acre-feet.

The conduit proposed is cement pipe and riveted steel pipe 36" diameter. The cost of this pipe will be \$ 127,800. Inasmuch as the intake of this pipe must be located 35 feet above the stream bed at Carroll Dam, there will be required either a pumping plant, or a temporary flume or the completion of the dam to 35 feet in height. Therefore to begin the legal and useful diversion of water would require the sum of \$140,000. The reports have discussed various other matters such as a power plant, but the above amount of \$140,000 is the least sum to secure a finished work.

V

W. S. Post

-Detail of proposed Sale and annual Charges.

Acres Irrigated	First Cost without lands and Water Rights.	Per acre	Fixed charges and oprating expense without interest on land or water rights	Per acre	Suggested sale prices and charges		
					Added to first cost an amount for lands, water rights or profit	Sale price per acre	Annual charges or gross revenue
1500	\$241,000	\$170	\$34,000	\$23	\$ 59,000	\$200	\$25
3000	437,000	136	54,000	18	163,000	200	23
10,000	570,000	57	72,000	7	430,000	100	11

The following Rights of Way are required for the Canal line - 50 ft. wide.

<u>Name</u>	<u>Description (by Forties)</u>
<u>T. 13 S., R. 2 W., S B M</u>	
U. S. (unsurveyed) - - - - -	S $\frac{1}{2}$ of NW $\frac{1}{4}$ Sec. 18.
U. S. (unsurveyed) - - - - -	NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Sec. 18.
<u>T. 13 S., R. 3 W., S B M</u>	
U. S. - - - - -	NW $\frac{1}{4}$ of SE $\frac{1}{4}$ Sec. 13.
U. S. - - - - -	N $\frac{1}{2}$ of SW $\frac{1}{4}$ Sec. 13.
U. S. - - - - -	SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Sec. 13.
U. S. - - - - -	S $\frac{1}{2}$ of NE $\frac{1}{4}$ Sec. 14.
Louis Cassou - - - - -	N $\frac{1}{2}$ of SE $\frac{1}{4}$ Sec. 14.
Louis Cassou - - - - -	SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Sec. 14.
G. F. Statt (1910 Homestead) - - - - -	SE $\frac{1}{4}$ of SW $\frac{1}{4}$ Sec. 14.
I. I. Irwin - - - - -	N $\frac{1}{2}$ of NW $\frac{1}{4}$ Sec. 23.
L. & A. K. Weller - - - - -	E $\frac{1}{2}$ of NE $\frac{1}{4}$ Sec. 22.
L. & A. K. Weller - - - - -	Lot 2 Sec. 22.

1st Stage -

Interest		
\$ 241,000 @ 8%		\$ 19,280
Depreciation 4%		9640
M+O.		5,000.
		<hr/>
		\$ 33,920

or annual requirement of about
~~\$ 23~~
~~\$ 5~~ per acre -

~~If \$ 20 is charged - addition
interest will be earned on
\$ 7500~~

9

~~which corresponds to
an allowance for water
rights of \$ 90,000~~

If \$ 25 is charged ~~if~~ interest will be earned ^{of the amount of \$ 3500}
will cover an allowance
of water rights + lands of ~~\$ 180,000~~
44,000

3000 Acres

Interest on \$437,000 @ .08 35,000
Depreciation @ 3% 13,000
operating exp- 6,000
54,000

Interest on \$163,000 13,000
23 | 57,000
23

10,000 Acres.

Interest on 570,000 45,500
Depreciation 3% 17,000
M + O. 10,000
72,500

Interest on \$430,000 34,500
107,000

$$\begin{array}{r} 241000 \\ .08 \\ \hline 19,280.00 \end{array}$$

$$2 \text{ } \$1500 \times$$

$$\begin{array}{r} 1500 \text{ Af.} \\ 150. \\ \hline 75000 \\ 1500 \\ \hline 2250.00 \end{array}$$

$$\begin{array}{r} 1500 \text{) } 24000 \text{ (15.} \\ \underline{1500} \\ 9000 \end{array}$$

$$\begin{array}{r} \$4500 \\ \hline 90,000 \end{array}$$

-Detail of proposed Sale and annual Charges.

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10,000	570,000	57	72,000	7	430,000	100	11

←
+
+
+
+
+

50 feet High
+ 10 year as needed

2nd Report on
CARROLL
SAN DIEGUITO RANCH DEVELOPMENT

By William S. Post
January 25, 1916.

---oOo---

This report extends the report of August 20, 1915, by showing results of surveys and adding the idea of a power plant.

WATER SUPPLY

The former statement regarding water supply is repeated: The O'Shaughnessy - Lippincott report finds a safe yield for the Carroll Dam (100 ft. height, storage capacity 34,800 acre feet) for a domestic supply to be 6,400 acre feet per annum. In my opinion the corresponding irrigation safe yield (providing for only 3/4 supply in certain extremely dry years) is about 50% more or 10,000 acre feet per year. The 100 foot dam therefore should contemplate the use of about 10,000 acres of irrigable land.

The 50 foot dam with a storage capacity of 3,250 acre feet may be said to be safe for the irrigation of 3,000 acres.

The maximum size of conduit to take care of 10,000 acres would call for 1,000 Miners Inch capacity or 20 second feet. This size is now adopted for the further reason that it may be used for power purposes both for construction of the dam and for sale.

POWER PLANT

A construction power plant is feasible placed on the east boundary of the San Dieguito Ranch in Section 22. 20 sec. ft. would develop

Theoretical H. P.	340 H P
Usable H P 70% efficiency	240 H P
" K W "	180 K W

To secure the volume of water supply a temporary flume is proposed above the Carroll Dam, about 3 miles long, so that whenever 20 sec. ft. are in the River, it can be diverted to the power plant.

The prime advantage of the power plant is the immediate securing of a vested right to 1,000 Miners Inches.

SURVEYS

The surveys show the distance of pipe line from Carroll Dam to the East line of the San Dieguito Ranch is ----- 4.6 miles

From east to west line of San Dieguito Ranch or the beginning of Lockwood Mesa property is ----- 6.6 "

Total ----- 11.2 "

PIPE LINE

The pipe line is now planned to carry 20 second feet or 1,000 Miners Inches, to consist of 36 inch cement pipe and 30 inch steel pipe - on a grade of 1 ft. per 1,000 ft.

ESTIMATE

Conduit

36" cement pipe,	26,093 lin. ft. at \$3.00 in place -----	\$ 78,500
30" steel pipe,	2,590 lin. ft. at \$4.00 -----	11,400
Tunnel,	2,140 ft. at \$10 -----	21,400
		<u>\$111,100</u>
15% Overhead -----		16,700
		<u>\$127,800</u>

POWER PLANT

Temporary Intake, 15,000 lin. ft. of Redwood Flume, 2'x3' at \$2.00 -----	\$30,000
Temporary Intake -----	5,000
Pressure Pipe Line, 2,000 lin. ft. at \$4.00 -----	8,000
Power House complete, 250 K W at \$42 -----	10,500
15% Overhead -----	8,000
	\$61,500
	=====

ANNUAL OPERATING EXPENSE OF POWER PLANT

The plant would operate only six months in the year until storage was provided.

The expense would be somewhat as follows:

Interest on Cost - 8% on \$61,500 -----	\$ 4,920
Depreciation - 4% -----	2,860
Operating Expense -----	4,220
	\$12,000
	=====

ANNUAL INCOME POSSIBLE IF PRODUCT IS SOLD AT 3/4 CENT

Year	PER K W HOUR	
	Annual K W hours	Income at 3/4 ct. Rate
1912	308,000	\$ 2,310
1913	175,000	1,310
1914	379,000	2,840
1915	565,000	4,230
1916	600,000 (est)	4,500
	Average -----	\$ 3,040
		=====

OBJECT OF POWER PLANT

From the above it will be seen that at first the plant will barely pay operating expense. Whenever Carroll Dam is raised 35 feet it will probably earn an income, either by sale or by supplying power for the dam construction.

Its value is in putting 1,000 Miners Inches to use and thereby vesting the water right; and second, furnishing the power plant for the dam construction.

THE PROJECT AS MODIFIED

The plan now proposed is to provide capacity for the irrigation of 10,000 acres, the system to be a gradual growth, in the following stages as outlined in my original report.

1st Stage

Building of 36" pipe line -----	\$127,800
Building of 14" line from east boundary of San Die- guito Ranch to west boundary -----	53,000
Local Pumping plant to reach Lockwood Mesa -----	5,000
Temporary Flume -----	15,000
Temporary Pumping plant in bottom of San Dieguito to provide 100 Miners inches in summer, before construction of dam -----	45,000

Reservoir at San Dieguito Ranch

This would provide for 1,500 acres. The first cost per acre then would be about \$200, and operating expense about \$20 per acre per year.

2nd Stage

This would consist of installing the power plant as the first step of the construction of the Carroll Dam.

Cost ----- \$51,500

The income at 3/4 cent per K W hour sold say to the

~~By these people would about equal operating expense.~~

3rd Stage

This would be the continuous building of Carroll Dam. As indicated in the preceding report, a dam of 50 feet will bring in 3,000 acres under irrigation, and a dam of 100 feet the full 10,000 acres.

IRRIGABLE AREA AVAILABLE

The area available from Carroll Reservoir

On the San Dieguito Ranch

Below 200' contour -----	1,850 acres
Between 200' and 300' contour, requiring local pumping -----	2,150 "

On the Syndicate Lands in the Lockwood Mesa

Below 200' contour -----	200 "
Between 200' and 300' contour, requiring local pumping -----	300 "

Remainder - Outside near Olivenheim, Cardiff, Encinitas which could be supplied

Below 200' contour -----	3,500 "
Above 200' contour -----	2,000 "
Total -----	10,000 acres

Tourist

Included in the above are various domestic areas which would yield a higher revenue than irrigation. ~~However, to supply domestic service requires that this enterprise become a public utility and not a Mutual Water Company.~~

CONCLUSIONS

No especial modifications of the conclusions of my original report are necessary, and they are quoted;

1. The total expenditures involved to secure the irrigation of 3,000 acres is from \$324,000 to \$437,000 or a first cost per acre of \$100 to \$150 per acre.

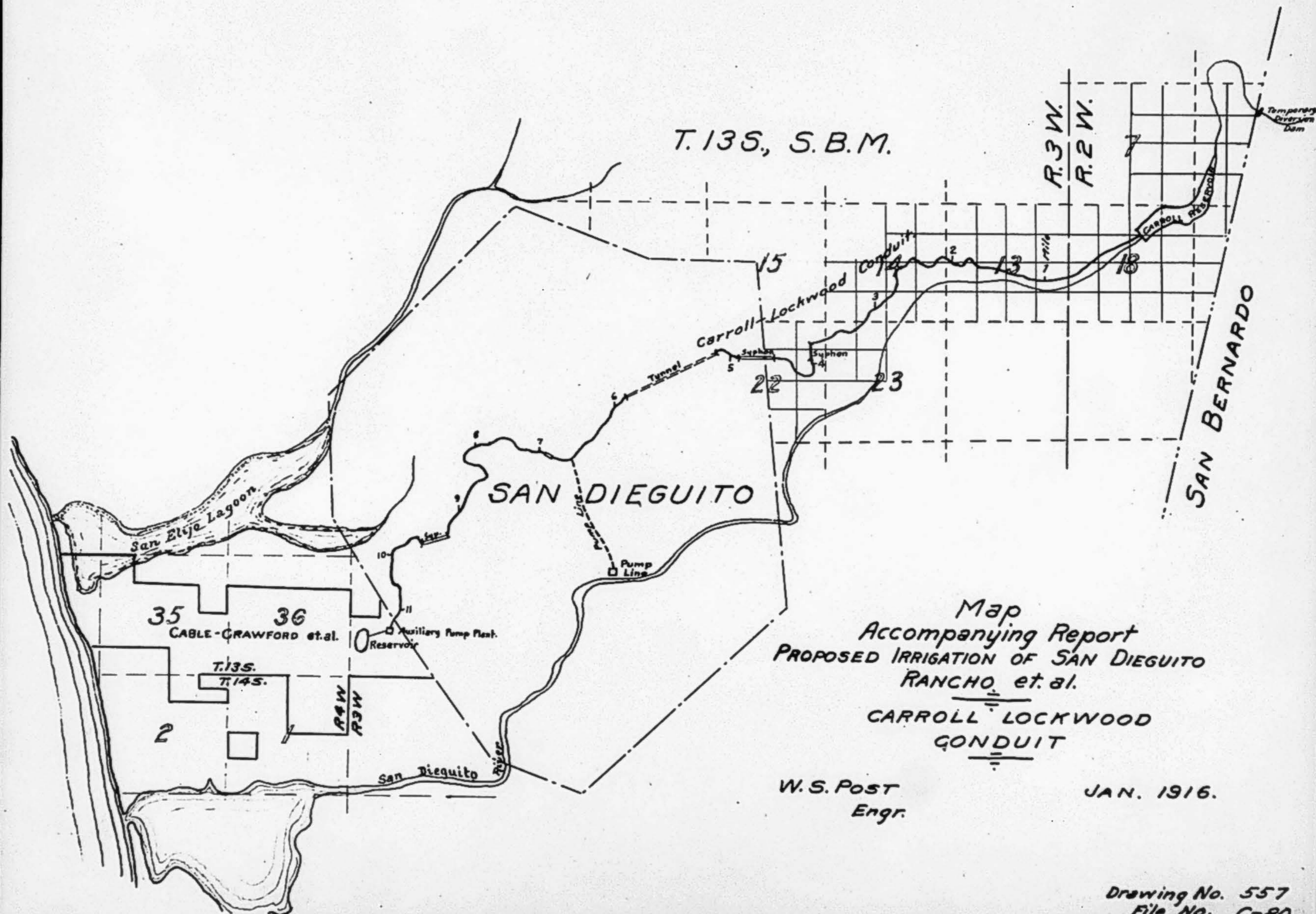
The annual operating expense including interest on above at 8% should not exceed \$20 per acre.

2. The total expenditure involved to secure the irrigation of 10,000 acres is from \$400,000 to \$570,000 or a first cost per acre of \$40 to \$60.

The annual operating expense including interest on investment should not exceed \$10 per acre.

3. The above estimates include local or auxiliary pumping to lands above the 230' elevation above sea, but do not include the value of reservoir lands in Carroll damsite, and water rights. If the project is fully developed for 10,000 acres, a charge of \$100 per acre for attached water rights or an equivalent increase of price of lands sold with water (about \$1,000 per Miners Inch) and an annual maintenance charge of \$15 per acre for service, would cover all these values and construction costs, pay interest and maintain the services.

If the development stops with 3,000 acres and some of the Santa Ysabel water is reserved for instance for sale to the City of San Diego, the charge for attached water rights should be \$200 per acre and the annual maintenance charge should be \$25 per acre, to completely cover all values.



T. 135, S. B. M.

R. 3 W.
R. 2 W.

SAN BERNARDO

SAN DIEGUITO

35 36
CABLE-CRAWFORD et. al.

T. 135.
T. 145.

R. 4 W.
R. 3 W.

San Dieguito River

Map
Accompanying Report
PROPOSED IRRIGATION OF SAN DIEGUITO
RANCHO, et. al.
CARROLL LOCKWOOD
CONDUIT

W. S. Post
Engr.

JAN. 1916.

Drawing No. 557
File No. C-80

Ed Fletcher Papers

1870-1955

MSS.81

Box: 41 Folder: 13

**Business Records - Reports - Post, W.S - "Report
on Carroll San Dieguito Ranch Development"**



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