Poway, Cal., Jan.,3,191[illegible].

Mr. Ed. Fletcher,

7th & D Strs.,

San Diego, Cal.

My Dear Fletcher:-

As requested, I interviewed Mr. Wohlford at Escondido January, 4th and 6th and examined their maps.

The substance of the interviews is as follows:

Mr. Wohlford referred to previous conferences with you; and stad stated that as it stands the proposal is satisfactory to their board and reviewed the points in his own way.

Minimum Amount at diversion point to be 100,000 Miner's Inchdays Inch days.

In constructing Warner's Dam Escondido Mutual Water Co. shall be protected in this; (and that if necessary it be turned down to them) The rate at which they will desire to take it away will be 2000 Miner's Inches normally. (Their improvement plan now under way for two years will allow this.) Their run would be complete in 50 days.

In a contract they would agree, that accident to their ditch or their " inability to receive " would not prevent Warner's Dam from being credited with the water at the rate of 2000 Miner's Inches days per day, which it stood "ready to deliver." And vice versa " inability to deliver" would be charged when the canal was " ready to receive ".

But any surplus which Warner's Dam could not store, or any amount over 2000 Miner's Inches originating below Warner's Dam, may be diverted by Escondido Mutual Water Co. and is not to be reckoned in this 100,000Miner's Inches.

The figure of 100,000 Miner's Inches at Diversion point is arrived

from
arrived at their opinion of their records and the capacity of Bear Valley Dam which is 78,000 Miner's Inches days.

This allows for a known loss of 100 tp 300 inches per day in the ditch as at present operated, amounting to in sixty days to from 18,000 to 24,000 Miner's Inches days.

In discussing your proposition, to make up all deficiencyes from Pamo, he says this is not favorably considered,because of the elevation at which they must receive it, viz: at 940 feet to assure the north xx side ditch as well as the south side.

I Na asked why the make up water or this deficiency could not be placed on the lower lands, while the upper took the regular source,his reply is,"the valuable orchard lands are the high lands 900 to 800 and 700;and as a matter of fact the low lands, most of them now,no longer hold water rights, but have sold to the upper holders. This is explained as follows:

Original Irrigation District covered all lands more than they h had water for, 10,000 acres-. After default of interest, bond holders compromised on a basis of $[illegible],000 raised by assessment on all willing to pay. Those assessed received stock in the Escondido Mutual Water Co. in proportion to assessement, and each share of stock carrying right to a fraction of all the water brought in by the system. The shares of the low land holderes were largely sold to th the high land holders, who thereby increased the amount of water for the same amount of land. This has resulted in less acreage and more water per acre, the quantity supplied being the same. The high lands are citrus land, frostless. The low lands are not,and generally speaking, have no water rights, and are not of any concern in this agreement to Escondido Mutual Water Company.

We then discussed the supply of deficiency from Pamo.

I argued (a) that El. 880 should be plenty sufficient to cover a zone , which entirely supplied from Pamo Conduit, would release enough water to cover high lands.

(b) That the guarantee would be stronger because there would be two reservoirs above them than instead of one; that we wanted it because it was most economical ditch management but they should want it because it strengthened the guarantee.

(c) that Santa Ysabel is the best dry weather stream in San Diego County.

Mr. Wohlford took this under advisment, but again said that they would prefer to stick to San Luis Rey, supply, avoid complication and distribution difficulties,-that a condition precedent for such an agreement the elevation of 840 is necessary to take advantage of the distribution system and deal equitably with the north and south sides water users. But assuming that an agreement could be arrived at among water users, a proposition would be considered to deliver Pamo Water delivered at El.838.7, being the head of the pipe leading to the City Reservoir, reaching an area of covered by 25% of the water stock. This area is almost all on the undeveloped lands of the Escondido Land and Town Co.

However he considers it very improbable that this would be acceptable.

Various farther Points.

Escondido Mutual Water Co.own land and water rights on Libby Ditch on lower San Luis Rey, bought to protect their rights.

The lands originally to be irrigated were 10,000 acres. Actually to-day there is about 2000 acres on which water stock hold-

holding is concentrated. The low lands are with out water stock and to a considerable extent can be irrigated more cheaply by pumping. The bulk of the irrigated lands is ab ve 800 ft.altitude and more than 2/3 of the water stock.

Salient Elevations.

Bear Reservoir	1500
Head of Diversion Ditch	950 about
Head of North Side Syphon	940
City Settling Basin	905
Head of City Pipe	838.7
City Reservoir	873

Conclusions.

The quantity of 100,000 Miner's Inches at diversion is x close to the actual quantity required for the storage of 78,000 Miner's Inches, and in an agreement will have to be accepted as an ascertained fact. Legal questions aside here,it could probably be proved that water enters Bear Valley Reservoir at the same rate at certain times at the same rate at which it is taken out and used. In other words ,the capacity of Bear Valley Reservoir plus what goes on and over and is utilized could be claimed. The basis of 100,000 Miner' Inches appears reasonable.

To reduce to figures Mr.Henshaw's position that they should have what they have been using,- the first answer is 78,000 Miner's Inches year in and out, plus this used water passing through and not stored. A second answer shows that if the acreage is 2000 Acres that 1 Miner's Inch is serving 5 acres, a liberal amount but subjecting to the city domestic use, and if to valid water stock amounting to about 25% on improved lands. When these lands are

in, the figure will be ~~1~~ Inch for 7 acres. Either of these figures are higher than elsewhere in California. However they include such evaporation as there may be from Bear Lake. This amount could be used without harm ,and obviously is used.

The ownership by Escondido Mutual Water Co.of land under Libby Ditch gives them a very strong position. It is frankly held with thepurpo e of protecting their water right.

There is a bare possibility of a small reservoir site some little distance above the Escondido Ditch diversion, This might be a solution by impounding the flood rushes of the 38 sq.miles between Warner's Dam and theis ditch. ~~And~~ An agreement should foresee this possibility and if feasible it would in my opinion largely settle ~~it~~ not only this but also the Rincon Indian Matter.

Very sincerely yours,

Rampart Apartments,

Los Angeles, Cal.~~Febr~~

January 23,1913.

Mr. Wm. G. Henshaw,

Hills Building,

San Francisco, Cal.

Dear Sir:-

I give herewith certain suggestions for changes of line as heretofore accepted which seem to me worth considering.

General.

The following points have been considered. The altitude of 300' is low for a water project in a citrus belt. The so called frostless belt is higher as a rule, say 1200' down to 600'. In San Diego County The rich lands are the disintregated granite lands on the slope of the mountains. These ~~lands~~ again do not extend much below 700' in altitude. The areas around San Diego below this are, roughly speaking, all ancient beach gravels and not specially productive.

It is true that the Linda Vista Mesa is an exception and that lemons are successful on the lower coast lands, but it is a proper criticism of both the Sweetwater and the San Diego Flume, that the water is delivered too low.

The statements of the Escondido people as to their most valuable lands and therefore those best affording to pay prices for water, confirms the general fact and leads to the query,is not the Pamo outlet too low.

The ultimate use of all this water in domestic supply is

anticipated, and this one of these points are not so important except the higher the elevation of water delivered the smaller the syphons and pipes leading into San Diego.

Plan "A".

This suggestion begins the Santa Ysabel diversion at the junction of the Santa Ysabel and Black Canyon, some three miles upstream from Pamo Reservoir at an elevation of 1700'. it would propose a low dam at this point sufficient to regulate the flood rushes, a large capacity conduit, say of 5000 miner's inches, to rapidly convey the waters away to a reservoir just east and a xxtlex above the town of Ramona. Here also would be impounded such water as the upper Santa Maria Brook yields. The ~~outlet~~ overflow from this reservoir would descend the Santa Maria & Brook in its natural channel and be stored in Alvarnon's Santa Maria Reservoir, thence a conduit preferrably a large pipe-line would join the present (1911) survey at the 18th mile and so on to San Clemente. This introduces a 700' power drop between the Santa Maria Reservoir and the 18th mile or say 5000 H.P. effective constant output, but with a peak load capacity as large as desired, say of 8000 H.P.

Plan "D".

This is concerned with the Pamo reservoir, and xxxx proposes to move the dam site into Pamo Valley above the junction with the Santa Ysabel, with an outlet elevation of 930'. This I will call Pamo site "D". This is strongly recommended whether as favorable a dam site can be selected or not, for the following reasons:

(1) Pamo Dam site "D" can be made an hydraulic fill, and probably be less expensive.

(2) It is located in an area of old beach gravels suitable for hydraulic fill.

(3) It is off the main stream of the Santa Ysabel, and free from spillway dangers, but still the total flood waters may be cheaply diverted into it coupled with devices for removing silt and driftwood.

(4) In the summer after the rains, the Santa Ysabel may be allowed to flow on to San Pasqual Valley, without the slightest change in the regimen except as concerned in the Temescal Creek and Pamo Valley proper, which affords a simple solution of riparian questions.

(5) The increased altitude of the point of diversion, viz; 830' elevation, instead of 800'as now proposed, a difference of 40', is most important, although it increases the length of the Pamo conduit perhaps two miles, and adds a diversion from Santa Ysabel of perhaps two miles, this ~~=~~ 40' higher grade decreases the length of tunnels below. I estimate the value of 1 foot of grade saved at the head of the conduit to be worth $3,000 or a total of $80,000, which is more than the extra conduits would cost.

(6) The diversion would be practically from the bottom of the Dam at site "D" and therefore the conduit could begin doing business before much is expended on the dam, while the 40 ft. of dead water ponding in the site now proposed, involves 50% of the ~~=~~ cost of the dam.

(7) It would put water into Escondido at an elevation of 888 feet which is not possible without pumping on the accepted route.

Plan "G" (San Luis Rey)

The negotiations with Escondido suggest a return to the

original plans of the P.L & P. Co. with this amendment.

Build Warner's Dam as proposed, build to Lusardi as proposed abandon the long tunnel and proceed to a point above the Escondido Ditch, secure a fall of about 1000 feet, utilize a possible reservoir above the head of this ditch; run your water through this with a joint carrier arrangement. This delivers your water into the Bear Valley Reservoir at an elevation altitude of 1500 feet, ready for distribution on the lands from Escondido to Oceanside etc at a low figure.

At the Bear Valley dam we are still 35 miles from San Diego and 45 miles from Linda Vista. Such a disposal of the water could only be accomplished by a direct pipeline from Bear Valley to the 16th mile of Pamo conduit as surveyed, and shown as on Power House Site on enclosed map of Plan "A".

It is clear that it involves the abandonment entirely of t the Pamo Reservoir, and this plan would then be coupled with Plan "A".

Plan "B".

Plan "B" limited to Escondido-Oceanside region would become a very reasonable, if Warner's Ranch thoroughly irrigated and intensely farmed.

The irrigation of Warner's Ranch seems to me to be capable of a very large return. The use of the waters there would first yield revenue and the drainage or the return waters (usually amounting to one-third) would be impounded in Warner's Dam, ready for resale in the Escondido-Oceanside region.

Plan "H".

Acquire a storage site below the Bernardo post office in the Canyon of the San Ysabel River at the lower end of the San Pasqual

Valley. Its altitude is 300 feet. It is the sort of reservoir that Sweetwater is. It receives all the return water of the San Pasqual irrigation and all the drainage which would be lost by abandoning the Pamo Reservoir..

This Bernardo Reservoir is admittedly low, and requires pumping for its utilization. But it is capable of settling all riparian questions by pumping back to San Pasqual users preferably at their expense what waterthey want. It also provides insurance on dry years as it may be made very large and can be connected,by pumping,with other systems.

In concluding this outline, I hold at present the ~~As~~ following tentative opinions:

Plan "A" should be adopted in any scheme, and probably should be built first of all.

Plan "B" is better per Se that ~~than~~ the present Pamo route.

Plan "C" is less expensive and a complete solution of riparian questions on the San Luis Rey.

That Plan "A" and Plan "C" can interlock between Bear Valley and the 16th mile of the Pamo Conduit, by a pipeline some ten to fifteen miles long of small size on account of the heavy pressure and thence proceed by Pamo Conduit as ~~has~~ now surveyed to San Clemente, but that this is justified only by municipal prices of water in the Linda Vista or San Diego region.

That Plan "B" and Plan "E" are a better settlement of present San Pasqual riparian rights than the Pamo Reservoir.

That Plan "D", irrigation of Warner's Ranch is strongly to be advised.

Very sincerely yours,

not sent
revised Feb 10-

Rampart Apartments,

Los Angeles, Cal: Jan. 23, 1913.

Mr. Wm. G. Henshaw,

Mills Building,

San Francisco, Cal.

Dear Sir:-

I give herewith in outline certain suggestions for changes of line which seem to me worth considering.

Brief of Alternate Plans.

The following points have been considered. The altitude of 300 ft. is low for a water project in a citrus belt. The so called frostless belt is higher as a rule, say 1100 ft. down to 600 feet. In San Diego County the rich lands are the disintregated granite lands on the slope of the mountains. These again do not extend much below 700 feet in altitude. The areas around San Diego below this are, roughly speaking, all ancient beach gravels and not specially productive.

It is true that the Linda Vista Mesa is an exception and that lemons are successful on the lower coast lands, but it is a proper criticism of both the Sweetwater and San Diego Flume, that the water is delivered too low.

The statements of the Escondido people as to their most valuable lands and therefor those best affording to pay prices for water, confirms the general fact and leads to the query, is not the

Pamo outlet too low.

The ultimate use of all this water in domestic supply is anticipated, and in this case the higher the elevation of water delivered the smaller the syphons and pipes leading into San Diego.

Plan "A".

This suggestion begins the Santa Ysabel diversion at the junction of Santa Ysabel and Black Canyon, some three miles upstream from Pamo Reservoir at an elevation of 1700 ft. It would propose a low dam at this point sufficient to regulate the flood rushes, a large capacity conduit, say of 5000 Miner's Inches to rapidly convey the waters away to a reservoir just east and above the town of Ramona. Here would also be impounded such water as the upper Santa Maria Creek yields.

From this Ramona Reservoir the conduit would begin at about 1475 feet altitude, traverse the Ramona Valley for six miles of the cheapest construction, and arrive at the head of the Mussey Grade. The line would then require 9 miles of mountain side with some 4000 feet of tunnel to a power drop of 300 feet, whence distribution can be had in any direction. This point is on top of a long mesa divide leading to San Clemente Reservoir, 5 miles distant, or ready for a pressure line to San Diego.

Plan "B".

This would be identical with Plan "A" in diversion of the Santa Ysabel but would store the water in Alverson's Santa Maria Reservoir, thence joining the present (1911) survey at the 14th mile and so on to San Clemente. This introduces a 700 feet power drop between Santa Maria Reservoir and the 14th mile, or say 2000H.P. effective.

Plan "C", (San Luis Rey)

The negotiations with Escondido suggest a return to the original plans of the P.L. & P. Co. with this amendment.

Build Warner's Dam as proposed, build to Lusardi as proposed,abandon the long tunnel and proceed to a point above the Escondido Ditch, secure a fall of about 1000 feet, utilize a possible reservoir above the head of this ditch; Run your water through this ditch with a joint carrier arrangement. This delivers your water in the Bear Valley Reservoir at an altitude of 1500 feet-, ready for distribution on the lands from Escondido to Oceanside etc,at a low figure.

It would be 35 miles from San Diego and 32 miles from Linda Vista,and this would not aid in that direction.

Plan "D".

Plan "C" would become a very reasonable solution,if Warner's Ranch were thoroughly irrigated and intensely farmed.

The irrigation of Warner's Ranch seems to me to be capable of a very large return. The use of the waters here would first yield revenue and the drainage or the return waters (usually amounting to one-third) would be impounded in Warner's Dam, ready for resale in the Escondido-Oceanside region.

Plan "E".

Acquire a storeage site below Bernardo post office in the Canyon of the San Ysabel River at the lower end of the San Pasqual Valley. Its altitude is 300 feet. It is the sort of reservoir that Sweetwater is. It receives all the return waters of San Pasqual irrigation and all the drainage which is lost by abandoning Pamo Reservoir.

This Bernardo Reservoir is admittedly low, and requires pumping for its utilization. But it is capable of settling all riparian questions by pumping back to San Pasqual users preferably at their expense what waters they want. It also provides insurance on dry years as it may be made very large and can be connected, by pumping, with other systems.

In concluding this outline, I hold at present the following tentative opinions.

Plan "B" is better per than the present Pamo Route.

Plan "C" is less expensive and a complete solution of riparian questions,present and future, on the San Luis Rey.

That the two can interlock between Bear Valley Reservoir and the 14th mile of Pamo Conduit, by a pipeline some ten miles long of small size on account of the heavy pressure, but that this is justified only by municipal prices of water in the Linda Vista or San Diego region.

That Plan "B" and Plan "E" are a better settlement of San Pasqual riparian rights than the Pamo Reservoir.

That Plan "D", irrigation of Warner's Ranch is strongly to be advised.

Very sincerely yours,

William G. Henshaw
Mills Building
San Francisco

San Francisco, Cal. Feb. 14, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:-

I am very much interested in your letter of Jan. 23rd just received in which you discuss generally the proposed utilization of the possible development of the properties of the Volcan Land & Water Company.

There are many questions that I would like to ask you, but feel at present I haven't sufficiently digested it to be able to crystallize my questions.

Let me know your movements for the next ten days and I will try to make an appointment with you for a general discussion. In the meantime,also crystallize your recommendation as to which scheme you would recommend as the best,with its approximate cost in round figures, and then which plan would involve the least amount of money.

Very truly yours,

Wm. G. Henshaw

WGH

Mr. Henshaw personally dictated this letter but had to leave the office before it was ready for his signature.

Return to W S Post
924 - 5th St.
San Diego.

Office Copy

Rampart Apartments,

Los Angeles, Cal. Feb. 14, 1912.

Mr. Wm. G. Henshaw,

Mills Building,

San Francisco, Cal.

Dear Sir:-

Mr Fletcher tells me that you have sent me a letter on San Luis Rey riparian matters, which however has not reached me. In themeantime I forward my position regarding thisand will supplement it with such further data as your letter may require.

Riparian Rights on The San Luis Rey.

The theory of riparian rights as supported by court decisions supposes a vested right in waters flowing through the lands and in percolating waters under the land, to the extent of economical use of such waters on said lands. This right exists in law whether in use or not, but is subject to the law of appropriation and priorty among riparian owners.

The tendency of the court decisions are that a riparian owner cannot interfere with surplus waters such as are intended to be ponded in Warner' Dam.

The next question and the only one which in my opinion can make you difficulty, is with regard to ordinary flow. Let us assume that the total of riparian lands whether using water or not could ---------

a matter of factuse all the ordinary flow. My understanding is that a riparian owner could then attack in the courts the divertion at Warner's Dam-of the ordinary flow above the Dam-, that the courts would decide that the riparian owner is entitled to enjoin any change in the regimen of the river which prevent him from enjoying his vested right to use of waters on the land, at any time he may elect to ~~do so.~~ use it. In this He might have his troubles with other riparian owners who had established priorty of use, but not with a divertion out of the watershed, such as Warner's.

The phisical facts regarding a stream are important. It can be proved of the San Luis Rey that the first ten miles below Warner's ~~xxxxxxxxx~~ to the Rincon is a canyon without possibility of riparian use, and flowing in variation with rains and ~~descending~~ decreasing in flow to a minimum of flow of 75 Miner's Inches at the Rincon. Here it enters a broad gravel area (Pauma Rancho) 300 or 400 feet deep, fed as into a sponge by the encircling watershed od Palomar Mt. and the upper San Luis Rey. This is the significant general fact. From here on water flows in as into a sponge until saturation of gravels is complete from Pauma to the sea, and any flow beyond saturation appears as stream flow. It is true that outside of storm floods (which are surplus waters) that this mass of saturated gravels are and will remain the real distributing point of useful irrigation waters in the lower valley, that is as far as summer use is concerned these gravels hold back and deliver water after the rains are over, and that once saturated in winter, all other water is lost by for useful use by surface flow to the sea.

My opinion is that the Palomar anlother mountain drainage above Pauma Rancho is sufficient to maintain this

ation in the winter without the flood waters or ordinary flow above Warner's Dam. I believe this theory will work out in practice and be accepted in the courts if it came to that as applied to riparian ~~xxght~~ pumping plants. There remain the various ditch rights as at Pala and particularly in the lower valley around the Mission. These are based on surface flow and it is simply a question of fact as to what rights they have, what quantity they divert, and during what period. They are in a position to demand these ~~quantities~~ rights. The simplest solution will be to make agreement to supply such water by pumping in case operations at Warner's Dam do as a matter of fact decrease stream flow.

If such agreements can be made to cover every ditch right in every ditch, it is the solution to be advised. otherwise itis a question whether the courts would compel a ditch right owner to take pumped water in lieu of water which he formerly diverted as surface water.

To avoid any contradiction here in my opinion that the saturated gravels really establish the regimen of the river and answer the question why then will surface flow conditions be changed, I add this additional fact regarding the river,- originally suggested by Mr. Olberg of the Indian Service. The waters in these inclined gravels have a slow rate of flow toward the sea, as though a filter, and this establishes a ground water grade line illustrated in the sketch. The actual surface grade due to geology is different. Where the ground water grade is below the surface grade the stream is dry, when is is above, the stream is flowing. An Example would be the

Monsterate Narrows. That is according to this theory where the stream is flowing above ground is merely a special case of ground water plane exposed by removing gravel which in other places covers it.

Now if ditch rights could be confined to by agreement or in future court decisions to this view of the stream flow, My contention is that t e building of Warner's Dam will not interfere with this class of flow because it is based on the saturated gravels. But on the other hand, it is very possible that these old ditches have actually been picking up also flood rushes in the late spring, spread out and lengthened into several days flow over the saturated gravels. They then have rights established apparently to surplus flow.

This is inmy opinion the only difficulty, and should be avoided by agreements and defifition of ditch rights, which will remove any necessity of turning down surplus water.

I recommend-,

a) Continuing to acquire riparian rights by purchase of the rights or lands with rights,

b) To arrive at an agreement with all ditch users as to the amount which they lawfully are entitled to, and an understanding both as to time,- quantity and rate at which they have received water, and a guarantee that any substantial difference will be made good by pumping.

c) Tht steps be taken to obtain all hydrographic and legal differences evidence along the river, preferably in co-operation with or through an impartial authority like the U.S. Geological Survey or the State Board of Water Control. This is particularly desirable during this season, which will

be a dry year and the evidence will be conclusive as to the influence of Warner's diversion, as long as this year's observations are not lowered in the future.

These data would consist of-

1. Ground water and water plane gages, every few miles from the Rincon to te sea, observed say once a week.

2. Measurement of all waters entering the gravels around Pauma.

3. The proof of priorty, us e and extent of all active ditch diversions, and the acreage irrigated.

4. Proof of abandonment of any ditches at date of your filing at Warner's.

5. Statistics of the entire irrigated riparian acreage of San Luis Rey Valley, the quantity of water pumped and amount used per acre, and period of use.

6. Statistics of all irrigable riparian lands not in use.

You are then in a position to say to the 10% or less riparian owners with whom you have not settled that their rights correlated to the of other riparian owners users are thus and so, and that you cannot guarantee to them more than they would obtain by court decision between riparian owners.

Very sincerely yours,

William G. Henshaw
Mills Building
San Francisco

San Francisco, Cal. Feb. 17, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:-

Answering yours of the 14th in re riparian rights on San Luis Rey, I would suggest that you go ahead at once to have the data that you refer to prepared in such a way that we can always have the evidence, and also arrange that the data should be kept up for us in the future.

I was much interested in seeing the estimate for the hydraulic fill at Warners, but as I remember it is more than the estimates previously submitted to me as to the cost of such a dam.

Yours truly,

Wm. G. Henshaw

WGH

H. HAWGOOD
CONSULTING ENGINEER
H.W.HELLMAN BUILDING

M.AM.SOC.C.E.
M.INST.C.E.(LONDON)
M.AM.RY. ENG.& M.V. ASSOC.

LOS ANGELES, CALIFORNIA

Pamo

February 19th, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:-

Please supply at once the remainder of the contour maps required to complete the continuity of the 39 sheets of the Pamo Conduit Line previously handed me. The gap on the maps extends from west of the Santa Maria Canyon , at what is marked on the map "Head of Alverson syphon" to a point marked "A 186" which is somewhere south of Winn's pass.

If there are any breaks of continuity between A 186 and the southerly end of the San Clemente Tunnel, send covering maps also.

I am waiting for these maps, please give the matter immediate attention.

From about the 6th to the 8th mile the maps are defective, as the contours all lie below the line of the conduit and are only of indirect value.

Yours very truly,

H Hawgood

A. H. SWEET
ATTORNEY-AT-LAW
303, 304, 305 UNION BUILDING
SAN DIEGO, CALIFORNIA

San Diego, Cal. Feb. 21st, 1912

Mr. W. S. Post,

Ramona, Cal.

My dear Mr. Post:-

I herewith hand you rough draft of proposed contract between Escondido Mutual Water Company and Volcan Water Company. Will you kindly go over it and make such alterations and additions as you deem proper, then send it back to me It is of course not worded as it will be when finally prepared for submission to the other people, but the draft I think contains the substance that we expect will be incorporated in the agreement.

Truly yours,

A. H. Sweet

AHS-S

Met Feby 29th + settled

H. HAWGOOD
CONSULTING ENGINEER
H.W. HELLMAN BUILDING

M. AM. SOC. C.E.
M. INST. C.E. (LONDON)
M. AM. RY. ENG. & M.W. ASSOC.

LOS ANGELES, CALIFORNIA

March 1st, 1912.

Mr. W. S. Post,

San Deigo, Cal.

Dear Sir:-

My instructions of January the 3rd were explicit. At no time have I seen any reason to modify them, and I have not done so. As to what action you take, you must be governed by such instructions as you may have received from Mr. Henshaw.

Yours very truly

H. Hawgood

CC. W. G. H.

ans Mar 6-

[POST]

Ramona, Cal. March 5,1912.

Mr. Ed. Fletcher,

SanDiego, Cal.

My Dear Fletcher:-

Mr. Sutherland of Ramona has just told me that there are four surveys in existance between Sunderland Dam Site and Ramona, made twenty-eight years ago. Two of these surveys were made by Milton Santee and two by his son Homer Santee, both deceased.

He says that Mrs. Scoffield of Los Angeles, a sister of Santee has the maps and that A.J.Santee, Streetcar conductor of San Diego will know all about the matter.

These surveys may or may not be of value but I think it will be worth while to try to obtain a blue print copy of all of them.

Very sincerely yours,

Copy

Los Angeles, Cal. March 7, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:

Under date of March the 5th Mr. Henshaw asks me to give you instructions in the matter of completing the Pamo Conduit Survey. Mr. Henshaw further advises that he will write you to give this work preference.

I desire a continuation of your contour survey from Station 46, sheet 191-56 (0), the present end of your line in the San Pasqual Valley, so far as shown by the maps you have furnished, to Winn's Pass, and from there over proper route, or routes, where requisite to decision as between alternative routes, to a connection with your other contour surveys extending to San Clemente Reservoir site.

The maps you sent me a week ago show that you have abandoned the Alverson location from the neighborhood of Santa Maria Canyon to Winn's Pass, and beyond which Mr. Alverson writes that he has made no location other than preliminary lines, and substituted a tunnel 9,800 feet long. From such evidence as I have it appears that the line around by Winn's Pass would be but little more than twice the length of the tunnel line, and unless there are extraordinary difficulties on the longer surface line, the tunnel is unwarranted. The contour maps called for, and the engineering notes that customarily accompany such maps, will be the basis for

determination as to tunnel or open line.

The series of maps, as a whole, to cover the entire distance between the Pamo and San Clemente Reservoirs, and taking the elevation of bottom of conduit at Sta. 2, Map 191-56, Sheet 1, to be 885.00, and the gradient to be 5.28 ft. per mile, the maps are to show sufficient contours to project a conduit location thereon within the limits of the contours shown.

Your attention is directed to the great difference between your elevations and those of the U. S. Geological Survey. Your maps indicate an elevation close to 800 feet at the intersection of your tunnel route with the east line of Sec. 17, T. 13, S. R. 1 W. The Government maps give an elevation of 1075 for the same point. A difference between you of 275 feet. The indisputable facts in this case must be established.

In view of this difference of levels, together with the difference of about 100 feet previously found to exist at the Pamo Dam Site, the use of U. S. Geological Survey topography is not permissible for any portion of your survey.

Setting aside the U. S. maps as inaccurate, please advise me what other contour maps covering any substantial portion of the conduit line you have, if any; the accuracy of which you have carefully and fully verified, and are prepared to vouch for.

Yours very truly,

(signed) H. Hawgood.

TELEPHONES: { HOME, 3867 / SUNSET, 167

AGENTS
SOUTH COAST LAND CO.
F. & W. THUM CO. BLDG.
GROSSMONT PARK CO.
PINE HILLS ASSN.
JAMES A. MURRAY

ED FLETCHER CO.
REAL ESTATE INVESTMENTS
1548 D STREET

SAN DIEGO, CALIFORNIA Mar. 9, 1912.

Mr. W. S. Post,
6th & Rampart Sts.,
Los Angeles, Calif.

My dear Post:

Enclosed find copy of agreement as per your letter of the 8th from Escondido. I want to rush the Escondido settlement, because the South Coast Land Co. are going to make the Escondido Water Co. people trouble in my opinion.

Very truly yours,

EF/K
Enc

Not read after dictation.

Ed Fletcher
SWS

Rampart Apartments,
6th & Rampart Strs.,
Los Angeles, Cal. Mar. 11, 1912.

Mr. Ed. Fletcher,
7th & D Strs.,
San Diego, Cal.

Dear Sir:

My meeting with Mr. Wohlford resulted in the understanding that if the following pointswere attended to, that the substance of the agreement is satisfactory to him; and that the matter is ready for final draft by Mr. Sweet and Mr. Wright. Mr. Wohlford said he would so advise Mr. Wright.

The points are:

1st: Must return to original verbal agreement with Fletcher- viz.:
100,000 miners inches per day at point of diversion cut out the 71,000 miners inches measured at Bear Valley, and statements regarding improvements, leakage etc., become unnecessary.

2nd: Lines 4-14 the plural terms dams and reservoirs, must not include the drainage area below the proposed Warner Dam.
This should read "for all dams and reservoirs above the westerly line of Warners Ranch," and nothing in this paragraph shall impair the right of Escondido Mutual Water Co. to construct dams and store water below said westerly line, it being always understood that the water originating below said westerly line shall be credited in the accounting on basis of 100,000 miners inches, either under the present natural conditions or as modified by storage works therein by Escondido Mutual Water Co.

3rd: As to riparian rights of Escondido Mutual Water Co. proposed to be transferred to the Volcan Land & Water Co. Escondido Mutual Water Co. in return desires entire protection in all diversion of waters below Warner Dam and above their intake, in excess of the 100,000 Miners inches,(which can be made by a dam below Warners for instance) This protection is necessary because Volcan Land & Water Co. is considered the only riparian owner eventually. It is true that Volcan Land & Water Co. will own or control or settle all riparian ownership in its own interest. Then such development by dam or otherwise by Escondido Water Co. of the 38 sq. miles below Warners dam should not be subject to attack and suits for damages.

Escondido Mutual Water Co. would then assign its entire riparian rights, in exchange for such protection.

A provision for joint share in damages (as making good by pumping etc.) will be satisfactory,- based on pro-rata of diversion by each, over and above the 100,000 miners inches.

4th: The provision regarding dry years where ~~Warner~~ Volcan Land & Water Co. does not guarantee more run-off than actually occurs, is satisfactory provided that the provision for joint measurement be also arranged for at Warner's Dam. "The provision should be clearer".

On point No. 3 Mr. Wohlford's view is that the Escondido Mutual Water Co. and the Volcan Land & Water Co. are virtually dividing the non-riparian flow of the San Luis Rey, that they consider the drainage area below Warner's as their territory, and they don't want to be put in the position of standing the whole riparian attack later because they happen to divert this surplus flow, subsequent to the Warner's diversion.

Further: Mr. Wohlford states positively that the water required by the Indians shall not be included in the 100,000 inches.,- as they have never furnished them any.

As he recognizes the point, I cannot see but what we will have to concede it.

I am writing this without Mr. Sweet's copy at hand, but imagine that there will be no confusion. I enclose a copy of this letter for Mr. Sweet.

Very sincerely yours,

Rampart Apartments,
6th & Rampart Strs.,
Los Angeles, Cal. Mar. 11, 1912.

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7th & D Strs.,
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Post

WILLIAM S. POST
CIVIL ENGINEER
ASSOC. MEM. AM. SOC. C. E.
1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

Rampart Apartments,
6th & Rampart Strs.,
Los Angeles, Cal. March 12, 1912.

Mr. Ed. Fletcher,

Regarding Escondido Agreement:

My letter of the 11th gives all the points to be covered, according to Wohlford excepting this one, which please also place in Mr. Sweet's hands.

Page 5, line 25, add an exception to read about this way: "but in the above accounting it shall be expressly understood that when the total flow of the San Luis Rey River at the point of diversion is 200 Miner's inches or less, such quantities shall not be included in the accounting of 100,000 miner's inches as delivered to the party of the first part, but shall be considered the same as if no water were flowing".

The reason of this clause is that 200 M. I. is required to get any water at all through the flume. This is somewhat far reaching in its effect and I shall want to think it over more before saying what it will do to the agreement.

Mr. Wohlford has agreed to furnish a transcript of their recors for two years past, showing as a matter of fact, that Escondido has been diverting more than 100,000 miner's inches.

In my letter of the 11th, referring to page 2, line 4- etc. "dams and reservoirs" the change to "dams and reservoirs below the westerly line of Warners Ranch" should be extended by saying or " below the conduit proposed to be built from the dam

WILLIAM S. POST
CIVIL ENGINEER
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1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

to Lusardi Canyon". Otherwise we will lose some water rights.

Replying to yours of Mar. 13th regarding the sweeping character of the riparian protection desired by Wohlford, I think that he introduces that in exchange for their riparian rights in Libbey Ditch and one other ditch.

If we don't ask for release of these rights, he does'nt ask for protection, as I understand it.

I have been expecting you up here, or this would have been sent sooner. My report is nearly finished and then I can take this Escondido business up again.

Yours sincerely,

William S. Post.

Rampart Apartments,
6th & Rampart Strs.,
Los Angeles, Cal. March 13, 1912.

Mr. Ed. Fletcher,

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TELEPHONES: { HOME, 3567 / SUNSET, 167

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JAMES A. MURRAY

ED FLETCHER CO.
REAL ESTATE INVESTMENTS
1548 D STREET

SAN DIEGO, CALIFORNIA, Mar.22,1912

Mr. W. S. Post,

Los Angeles, Cal.

Dear Sir:

Mr. Henshaw has asked that you figure on the basis of 5000 horsepower for the Warners Ranch proposition, and that you figure the horsepower of the other power propositions, Pamo, and Santa Maria, the amount obtained at the switchboard or power house. I guess you will understand what he means by this.

Very truly yours,

EF/K

H. HAWGOOD
CONSULTING ENGINEER
H.W.HELLMAN BUILDING

M.AM.SOC.C.E.
M.INST.C.E.(LONDON)
M.AM.RY. ENG.& M.W. ASSOC.

LOS ANGELES, CALIFORNIA

April 27th, 1912.

Mr. W. S. Post,

Los Angeles, Cal.

Dear Sir:-

I am today in receipt of yours of April the 20th.

In the matter of the maps referredto in my letter of April the 12th, from the 19th mile to San Clemente Canyon, which portion of the route you say in your letter of April the 20th you understood from me was unnecessary to survey, please see the second page of my letter of March the 7th, to you, which, among other things, particularly requires that,

> "The series of maps, as a whole, to cover the entire distance between the Pamo and San Clemente Reservoirs"

Also, that on account of their demonstrated inaccuracy,

> "The use of the U. S. Geological Survey topography is not permissible for any portion of your survey."

Such maps as you have furnished me of your final selection of route between the Poway and San Clemente, use, and are largely based on the U. S. Geological Survey topography, and the route is therefore only one of surmise and conjecture, and valueless except for approximate estimates, which are the very things which Mr. Henshaw tells me he does not want, and the information which I have specifically asked for in my letter of March the 7th I must have to give Mr. Henshaw the report he has requested.

Yours very truly,

H. Hawgood

[from: W.S Post]
<8m

May 16, 1912.

Mr. Wm. G. Henshaw,

Mills Building,

San Francisco, California.

Dear Sir:-

I have read with interest the Byllesby report in the Warner's Water Project, and have the following comments to make:

Page 2 contains a quotation from U. S. Geological Survey Water Supply Paper No. 251. Several months ago my attention was called to this by Mr. Ebert, the present hydrographer, whose predecessor wrote the paragraph. Mr. Ebert criticised the propriety of such a statement, the point being that this is inserted in a "station description" giving the location and description of the Pala measuring station, fifteen miles below the dam. The survey has made no measurements at the dam, and no one was especially familiar with the project. It was not an engineering opinion; it is a gossippy description.

Page 4: The report evidently adopts the relation of run-off at Warner's as about 63% of the run-off at Pala, instead of 40% as first proposed by Mr. O'Shaughnessy. The six years run-off then results in a mean of 101.4 acre feet per day, or 50 second foot,

PAGE 6 discusses evaporation losses, and notes the general conclusion of five feet of evaporation per year, or for an assumed area of 2000 acres, 27 acre feet per day. It must be remembered that the draught for power is continuous and that 50% of the water

on which this assumption is made will have been transferred to lower reservoirs before the evaporation takes place. This, I believe, was recognized by Mr. Lippincott in his report to you. Further, about one-fourth of the reservoir area is swamp land, or land where the water plane is within five feet of the surface. Exhaustive experiment on similar lands in Owens Valley for the Los Angeles Aqueduct has proved that evaporation from such a surface is at least 90% of the evaporation from a lake surface, or practically the same as from a lake surface. That is to say, that over a quarter of the area of Warner's reservoir this deduction is already accomplished at the present time, and the run-off measured at the dam site has already accounted for it.

It would seem more correct then to reduce the deduction for evaporation one-half, or make this figure, say, 14 acre feet per day.

Referring now to the summary on Page 11, the three alternative estimates become

Warner's Run-off by comparison with Pala observations, as shown by Table "B", 40% assumed, and based on six year period of low flow,

Available,	44 acre feet
Or,	22 sec. feet

Warner's Run-off by comparison with Hawgood's measurements and proportioned for a six year period of low flow,

Net,	81 acre feet
Or,	41 sec. feet

Warner's Run-off by study of rainfall and comparison of actual conditions found on the Cottonwood water-shed compiled by M. M. O'Shaughnessy, for a six year period of low flow.

Daily Run-off,	54.4 acre feet
Or,	27.4 sec. feet

The accepted conclusion (adding 14 acre feet) would then become 44-1/2 second feet, and "this flow will vary" between a minimum of 17 second feet and as high as 77 second feet. 44-1/2 second feet is 2225 miners inches.

On page 12 is a discussion of the Escondido Water Company's demands out of the above amount, the conclusion being that 17-1/2 second feet must be deducted from the Warner's project. Our recent arrangement with the Escondido Company requires a total of 100,000 miners inch days or 5.5 second feet continuous flow. Of this we are required to supply only the deficit not supplied by the drainage area below Warner's and above the Escondido Ditch. That is when the area of 38 square miles does not yield an average of 5.5 second feet, we are to make up the balance out of Warner's Reservoir. But 38 square miles is nearly one-fifth of the drainage area of Warner's dam. One-fifth of 44-1/2 second feet is 8 second feet, which is more than the Escondido requirement. In normal years, therefore, it is unnecessary to consider Escondido, and certainly not in the method of averages used in this report. The figure of 44-1/2 second feet apparently should replace the 20 second feet, which was the conclusion of the report.

METHOD OF AVERAGES-

It is scarcely necessary for me to draw attention to the

fundamental difference in the study of water supply as used by Mr. O'Shaughnessy and others and my own method. There is a great difference between adding up the rainfall over a series of years and adding up the rainfall over the same period, dividing each by the number of years of the record and assuming that the average thus obtained is a correct figure on which to plan a water system.

Further, the Table "F" on Page 9, a statement of the Cottonwood Watershed is made up from January to January, while all of the data, with which it is compared, is based on seasonal rainfall and discharge. Important conclusions on the lines proposed by Mr. O'Shaughnessy can be obtained by direct comparison of the run-off on the Cottonwood and the San Luis Rey for the seasons 1905-6 and 1911-12, and in an indirect way by comparison on a seasonal basis of the discharges at Pala with the Cottonwood from 1905-1912. This comparison I will make and furnish in a supplementary letter.

PAGE 8 - TABLE "E"-

Table of Annual Run-off from Warner's Watershed. This table is undoubtedly obtained from the chart of Equal Rainfall Curves furnished with Mr. O'Shaughnessy's report. Mr. O'Shaughnessy could not have been aware of the high precipitation upon the Volcan Mountains, on which he gives between 15 and 20 inches rainfall. All recently established rain gauges on three sides and on top of this mountain tend to show that this figure should be nearer 30 or 35 inches of rainfall. This will transfer about 20,000 acres, which he credits with a rainfall of 20 to 15 inches to the zone of 40 to 30 inches.

This will increase his zone estimate in Table "E" to about 25,000 acre feet. This virtually reconciles the third alternative in the summary with the first.

PAGE 13 - DAM-

Is a description of the type of dam. It appears to me that a certain confusion of ideas exist between securing water-tight seal and making a contact with solid rock. The consensus of opinion regarding the San Diego granites, generally speaking, is that they are biotite granites and subject to remarkably deep weathering to depths of 30' or even 100'. This is admitted and is a very unfavorable condition for masonry dams, or for dams which depend for their safety to any extent upon masonry. On the other hand, if the products of the weathered or disintegrated granite are water tight, the depth of such weathering is a matter of no concern in a true earth dam. Consider the products of disintegration of this biotite granite. Feldspars weather into clays, biotite or black mica weathers largely into manganese and iron solutions, which are drained away if water circulation exists. The quarts particles remain as quarts, which is also true of hornblende where it occurs. In other words, the very materials which are used to form puddle wall already exist underneath the entire area of the dam, except where exceptionally hard masses of rock exist. In the experimental cut-off wall built last summer, we sunk an average distance below the stream bed of 10'-15' through the water-worn gravels. We then passed into the disintegrated material and penetrated it for a depth of 5'-10'. On the upper portion of this disintegrated material we encountered

the characteristic iron stains, indicating the solution of the biotite. Beyond 3' below this zone we encountered no underground water, which could be considered as being in motion or constituting an underflow. The wall from end to end was founded either on rock or water tight material. The greatest depth was 22' below the surface, and even then, in my opinion, was unnecessarily deep to secure a wall below all underflow.

The theory of the true earth dam is not very abstruse. The theory presupposes that the up-stream face will be wet; that the water enters the material slowly to a certain extent. Where it is wet it is called "surcharged". This line of surcharge lowers until it passes below the down-stream side of the dam. In this sense a true earth dam is a filter and the filter can be very thoroughly clogged. The hydraulic fill method is the most perfect to secure this condition. It has been customary to introduce through the center of an earth dam a water tight core wall or a clay puddle wall. The concrete core wall has been generally abandoned by engineers on the Pacific Coast. The puddle wall is well thought of, but there is an inclination to have it occupy the entire space between the center and the up-stream face. The remainder of the dam is frankly admitted by everyone to be simply a support to the puddle wall, and whether it is made of rock or of earth, it should be thoroughly drained. With sufficient slopes and with proper water tight material, it is then a safe dam.

On Page 15 is an estimate of the cost of a dam, which, in my opinion, neglects the principles just stated.

I consider the following item unnecessary and not good practice.

"Concrete core walls,
10,600 yds. @ 10.00- - - -$106,000.00"

I consider the third item,

"Rock fill, 40,000 yds. @ 4.00- - 160,000.00"

is entirely unnecessary. The necessary embankment is obtained in the earth formed on the next line.

Sometime ago I furnished you an estimate from an experienced contractor, who estimates that 200,000 yards could be placed in 250 days, at about 27½ per yard. This reduces the fourth item,

"Earth fill, 300,000 @ 40¢- - - - - -120,000.00"

to $81,000.00.

My conclusion is that the estimate, on the face of it, is some $300,000.00 too great, and if the ratio is maintained on the other items, you will probably find no essential difference between this and other estimates which have been furnished you.

PAGE 17 - CONDUIT CONSTRUCTION-

Without discussing the differences in the matter of conduit prices, it is perhaps enough to indicate that a cost of $4.00 per foot will be found to pay for a steel flume, as suggested originally by Mr. Mulholland as having certain advantages over other types. In other words, the price of the cement conduit has been so increased that it looks like bad engineering or economics.

On PAGE 23 the run-off of Santa Ysabel Creek is discussed. The hydraulic data in the report ends with the season 1908-9. As the

data for the intervening period to date can be obtained, it is useless to discuss the conclusions stated, but the remaining data will be supplied in a supplementary letter.

On Page 26 a paragraph draws attention to the fact that a permanent injunction was granted a few years ago to riparian owners in the San Pasqual Valley prohibiting diversion of the Santa Ysabel to another water-shed. This injunction was against a diversion for the purpose of hydraulic mining for gold, the waters tailing into the San Diego River. No attempt was made to protect the interest of the ranchers and the injunction was a proper one, involving the superior right of agricultural and domestic use of water over mining use, which has been established in this state since 1872.

O'SHAUGHNESSY REPORT

"As there is a generous supply of disintegrated granite in the surrounding hills, there will be no lack of material to make a good dam of this type, the only objection to same being the short time in which work should be finished,- the summer season, from the 1st of April to the 1st of November, seven months,- as the whole work of this type of construction should be completed without any interruption from winter storms, which only occur during the other five months. Such a program of construction would leave too short a time for the proper drainage and set of the mass, and if subjected to a severe test might work a failure, such as took place at Necaxa in Mexico - with an empty reservoir - in 1909, when 715,000 cubic yards of semi-fluid mud from a hydraulic fill dam slipped in a body into the reservoir basin."

The objection to the short season is well worthy of consideration. Mr. O'Shaughnessy concludes virtually that $200,000.00, at least, should be added to our estimates to provide for floods. Such a sum, it may be remarked in passing, would do very nicely in developing the small reservoirs required for the irrigation of Warner's Ranch proper. It may be argued also that a much less sum would provide temporary storage of flood waters in the Big Lakes and the Dry Lake, which would practically eliminate the danger of imposing a flood rise on a newly constructed hydraulic fill in excess of the capacity of the scouring sluices, which undoubtedly should be provided.

The instances of failure referred to do not seem to me to be very revellant. I attach herewith a letter from Mr. E. H. Varner, who was Assistant Chief Engineer on the Necaxa Dam, which, I think, shows that there is no real parity between the two dams.

The next failure referred to is that of the Arrowhead Reservoir. This dam contains a concrete core wall. It may be mentioned incidentally that it was of surprising thickness, about 130' thick at the bottom, 30' wide at the top and 100' high. It cracked into five pieces. It is simply another instance of the failure of a core wall, which is not proposed in the structure under consideration. The Crane Valley Dam, in Fresno County, is also a core wall type. A few feet more of water was permitted to be impounded on one side than on the other during construction, and it broke and tipped over in accordance with theory. This question has nothing to do with the case.

PAGE 5 - OTHER DAM SITES-

The suggestion to utilize a rock fill dam a mile down the canon from the present site would be important, but for the fact that the conduit can not be lowered.

PAGES 5-11

Discussion of rainfall is quoted verbatim in the Billesby report, which has already been discussed.

PAGE 12

Contains a reference to Sweetwater Dam during the seven year dry spell. The situation of the Sweetwater Dam is so different from Warner's that extreme care should be taken in making analogous. If we should assume a dam in the San Luis Rey River, a few miles above Oceanside, this then would be analogous to the Sweetwater. Engineers could then say that there was no water flowing for many months, and perhaps even failed to appear in extremely dry years, but it would be clearly understood that considerable quantities of water would be flowing at Warner's and other streams in the mountain region, just as it is true that when the Sweetwater reservoir was dry, considerable quantities of water were flowing at Descanso in its mountain watershed. The water which disappears between these respective points is amply accounted for in evaporation from the surcharged gravels at the rate of 4' or 5' per year, over areas 30 miles long and averaging one-half mile wide.

PAGE 15, giving an estimate of costs, has already been somewhat discussed. It has been shown that $400,000.00 for a dam at Warner's

does not bear analogous, and that half this sum is a conservative figure.

The next item, Hydraulic Conduit, seems also to have been raised, but as it is not itemized, cannot be analyzed, except to say that a permanent open concrete lined conduit cannot be built for less than $4.00 a foot. I have first hand information from a foreman on Mr. O'Shaughnessy's own conduit at Delsora, showing the cost of lining to have been 10¢ per square foot. Our conduit calls for 11 square feet per linear foot, or $1.10 per linear foot for lining. This leaves for excavation cost $2.90 per linear foot, a price which I think would be very attractive to contractors at $1.00 to $2.00 per linear foot.

Very sincerely yours,

WSP-B

Form 168

THE WESTERN UNION TELEGRAPH COMPANY

INCORPORATED

25,000 OFFICES IN AMERICA. CABLE SERVICE TO ALL THE WORLD

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THEO. N. VAIL, PRESIDENT — BELVIDERE BROOKS, GENERAL MANAGER

RECEIVED AT Main Office, 608-610 S. Spring Street, Los Angeles, Cal.

NOT LISTED A

A362CH. V. 30-GOVT.

WASHINGTON, DC., MAY 24-12.

926

W. S. POST, CARE P. M. JOHNSON,

749-GARLAND AVE., LOSANGELES, CAL.

HOW MUCH POWER WILL BE DEVELOPED BY HUNTINGTON PROJECT IN WARENERS VALLEY WIRE REPLY COLLECT.

MENDENHALL.

247PM.

1st draft-Killed

WILLIAM S. POST
CIVIL ENGINEER
ASSOC. MEM. AM. SOC. C. E.
1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

May 27, 1912.

Mr. Wm. G. Henshaw,
Mills Building,
San Francisco, California.

Dear Sir:-

In accordance with your instructions, I give below a preliminary report on the irrigation of the lower San Luis Rey Valley. This report is necessarily an outline and represents an opinion as to the most economical solution of the proplem. The lines suggested must be varified by survey, and it is probable that the whole plan will be greatly modified, but the probable cost should not be greatly increased.

OUTLINE-

The area considered lies between Monserate Ranch to Oceanside and thence along the coast to include Carlsbad. Roughly this area may be divided into four sections.

(a) From Monserate Narrows to Bonsall.

(b) Bonsall to the West line of Guajume Rancho.

(c) Guajume Rancho to Oceanside.

(d) Oceanside to Carlsbad.

PROPOSED METHOD OF IRRIGATION-

A plan is to utilize pumping plants placed in the river bed and pumping to a sufficient elevation to cover the riparian lands along the river, conveying the water in cement pipes or concrete conduits. It is obviously desirable that as long as water is flowing on the surface in the river that the various pipe lines should be designed for gravity flow and the pumping plants used when surface

flow ceases. Attention also will be drawn to several storage sites, which would further relieve the pumping plants.

SECTION (A), MONSERATE NARROWS TO BONSALL-

The lands to be irrigated lie principally on the south side of the river, and one conduit line is sufficient. A pumping plant with a capacity of 300 miners inches is already installed with a lift of about 10'. The conduit or cement pipe line would have an initial elevation of 280' above sea, and extend for a distance of _____ miles to Bonsall, and will irrigate _____ acres. It should be noted that this conduit need not maintain a high elevation, unless it is desired later to extend it in the direction of Carlsbad. It is assumed here that it will be run at an elevation to secure this result and a separate estimate given for its extension to Carlsbad.

In a side canon at the Monserate Narrows appears a reservoir site worth considering, where storm water from the river can be stored in winter, and to that extent relieve the amount of pumping. This reservoir site and the most of the lands considered in this section are a part of the original Monserate Ranch.

SECTION (B), BONSALL TO GUAJUME-

This is a narrow portion of the river with a number of small ownerships ending in the large Guajume Rancho. The elevation of a pumping plant would be 130' above sea. The true riparian lands could be served by a 20' lift and a pipe line on each side of the river. However, at first thought, it appears that the pumping lift should be about 50', which would secure the entire irrigation of Guajume Rancho as well.

SECTION (C), GUAJUME RANCHO TO OCEANSIDE-

There seems little doubt that this section will be best served by a development of existing ditches. On the north side the Libbey Ditch is taken out at a point of the river where the valley narrows somewhat and where the probability is that a submerged dam would bring water to the surface in the summer. Whether this is done or not, it is a probable site for pumping plants. The Libbey Ditch flows by one of its laterals into a shallow lake some three miles distant, which probably will be found very useful for impounding winter floods. This is now apparently not used for such purpose, but fills naturally from side drainage.

Similarly, on the south side, the ditch of the San Luis Rey Company is taken out at a point slightly up stream from the heading of the Libbey Ditch. These ditches, at present, take out surface flow until the river dries up. To supplement the decreasing flow, several pumping plants exist owned by individual owners, which are put into service in the summer. If it were possible to improve the ditches and couple up the pumping plants by some joint action of the present owners, this section could be installed and operated economically. The lower end of the south side pipe line would be the City of Oceanside's pumping plant, where water could be delivered in case of shortage of the city supply without changing its present pumping plant.

SECTION (D)-

This is a zone extending along the ocean between Oceanside and Carlsbad, about six miles long and extending inland for a width of about three miles. The altitude varies from about 50' above sea

to 300'. It has already been noted that the highest pumping plant at Monserate Narrows would start with an elevation of 275'. If this pipe line were maintained towards Carlsbad on as low a grade as practical, it would deliver water on Section (d) at about the 200' elevation. The first study of such a conduit line appears to indicate that it will pay to elevate the water in this conduit some 50' near the town of Bonsall. In this way, the remainder of the distance is greatly shortened, and it is probable that several storage sites, as at Vista, would then be made available. This suggests that the Bonsall pumping station may be made quite powerful and be the real source of supply for Section (d). This would be true, especially, if your control of Monserate Ranch and other lands in Section (a) make unnecessary the immediate development of a water system for that section.

ESTIMATES-

Section (a)-

Pumping Plant:- Capacity _____miners inches;

Lift _____feet; Cost $_____

Section (b)-

Pumping Plant: Capacity _____miners inches;

Lift _____feet; Cost $_____

Section (c)-

Pumping Plant: Capacity _____miners inches;

Lift _____feet; Cost $_____

Section (d)-

Pumping Plant: Capacity _____miners inches;

Lift _____feet; Cost $_____

June 1, 1912.

Hon. J. W. McKinley,

Pacific Electric Building,

Los Angeles, Cal.

Dear Sir:-

I am instructed to supply the information which is underscored in the enclosed letter.

COMMENCEMENT OF WORK-

Work was commenced on the Warner Dam on May 6, 1911, upon a cross-cut of the river and the building of a cut-off wall of concrete from the lowest point of the stream bed and the water surface,

STATEMENT OF WORK DONE-

The work performed consisted of moving approximately 5000 cubic yards of material and placing 800 cubic yards of concrete. The expenditure was approximately $15,000.00. This work was followed by a thorough prospecting by means of drills of the underlying rock strata to a depth of 100 to 150 feet. The drilling operations cost about $10,000.00; total $25,000.00.

TERRITORY TO BE SUPPLIED WITH WATER-

The purpose of Warner's Dam is to impound water to be conveyed by conduits, aggregating thirty-six miles in length, and by distributing pipes to various lands lying between the City of San Diego and the City of Oceanside, principally lying in a zone parallel to the coast and extending inland some ten miles.

As soon as I return to San Diego I will forward to you

a copy of the water filing at Warner's Dam, which states at some length the places of intended use. If you have in your files a copy of the application to the United States Government for rights of way, I presume that you will find this water filing among the exhibits.

Very sincerely yours,

WSP-B

H. HAWGOOD
CONSULTING ENGINEER
H.W.HELLMAN BUILDING

M.AM.SOC.C.E.
M.INST.C.E.(LONDON)
M.AM.RY. ENG.& M.W. ASSOC.

LOS ANGELES, CALIFORNIA

June 3rd, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:-

I received from you Saturday afternoon, topography map of the Alverson Santa Maria Dam Site, and expanded Sheet 191 - 56 - 40, topograhpy of the lower end of the Pamo Conduit.

The Dam Site map does not state its scale, please advise me what it is.

On the Conduit Map, you were requested to furnish topography to the 775 contour, from about your Sta. 98, through the heads of both the canyons shown you on the map, from which the tunnel to the San Clemente Canyon might run. The 775 contour ends at about the crossing of the Section Line between Sections 25 and 36, and the topography of the canyon near the Section Line between Sections 35 and 36 is carried to only the 750 contour, the map there running off the paper, and there being no supplemental sheet to cover this work. In all probability the field work covers the head of this canyon to the 775 contour, please have me furnished with completed map at your earliest convenience.

Yours very truly,

H. Hawgood

V. L. & W. CO.

[re: PALA GRAVELS]

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

Los Angeles, Cal.
June 7, 1917.

Mr. W.S. Post,
749 Garland Ave.,
Los Angeles, Calif.

Dear sir,

My recent visit to the San Luis Rey River and examination of the surface and underground water conditions of that stream were necessarily very incomplete on account of the limited time at my disposal. There is also much information which I lack which I could obtain by a conversation with you. However there are a some features of the problem which you are attacking upon which I may be able to offer suggestions which will be of value to you.

In travelling up the river I was greatly impressed by the zone of rank vegetation and swamp land on either bank of the stream which widens out to a distance of about 2000 feet in several localities. Judging from my past experience in the measurement of soil evaporation and transpiration I should say that the annual loss by evaporation from the river bottoms between Pala and the ocean amounts to a continuous flow of between 5 and 10 sec. ft. The diversion of all

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

WATER RESOURCES BRANCH

water from the channel at the lower end of Warner Ranch to some point without the drainage area, together with surface or ground storage of water supplied by tributary streams below and artificial distribution of this water to irrigated lands along the lower river bottom would to a great extent eliminate this needless loss. According to testimony given a few days ago by F.C. Finkle before the California State Railroad Commission, the value of a miners inch of water in the vacinity of Los Angeles is $2000. At this rate the saving of 7½ sec. ft. would mean the creating of water rights valued at $750,000. With careful study I believe that a practical scheme could be worked out for irrigating more lands than are now under cultivation along the San Luis Rey and at the same time allow your proposed diversion to be made. The verdure along the river bottoms would of course disappear to a certain extent but the practical benefit to mankind would far exceed the aesthetic value of the natural vegetation.

The gravels accumulation above Pala has great value as a storage site for flood waters. Its efficiency could be very greatly increased

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

by spreading the flood waters from Pauma Cr. and other streams near by, retarding their velocity and allowing the waters to percolate into the porous formation instead of flowing directly into the channel of the San Luis Rey. This method of storage is being used successfully on several streams of Southern California which I have visited.

The wells which Mr. Case is measuring are most of them equipped with windmills for power pumps and some of them are near irrigation ditches. This gives rise to local variations in the ground water surface which will lead to confusion and error in drawing final conclusions from the data. I would suggest that the company establish their own wells and locate them where they will be most free from disturbing local conditions. Two inch holes drilled with a spoon auger and cased with light galvanized sheet metal, perforated, are very effective. Their first cost is small and very little attention is needed to keep them in good condition.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

I do not feel that I have yet sufficiently covered the ground to be able to recommend a general plan for gathering the field data necessary to a solution of your problem, but I shall be glad at any time to make further examinations with this end in view. I am enclosing a bill for the time which I have spent on the matter as you suggest.

Yours very truly,
Charles H. Lee

619 Federal Bld.,
Los Angeles, Calif.

Los Angeles, Calif.

June 7, 1912.

Mr. W. S. Post,
749 Garland Ave.,
Los Angeles, Calif.

Dear Sir:

My recent visit to the San Luis Rey River and examination of the surface and underground water conditions of that stream were necessarily very incomplete on account of the limited time at my disposal. There is also much information which I lack which I could obtain by a conversation with you. However there are some features of the problem which you are attacking, upon which I may be able to offer suggestions which will be of value to you.

In travelling up the river I was greatly impressed by the zone of rank vegetation and swamp land on either bank of the stream which widens out to a distance of about 2000 feet in several localities Judging from my past experience in the measurement of soil evaporation and transpiration, I should say that the annual loss by evaporation from the river bottoms between Palaand the ocean amounts to a continuous flow of between 5 and 10 sec. ft. The diversion of all water from the channel at the lower end of Warner Ranch to some point without the drainage area, together with the surface or ground storage of water supplied by tributary streams below and artificial distribution of that water to irrigated lands along the lower river bottom would to a great extent eliminate this needless loss. According to testimony given a few days ago by F. C. Finkle before the California State Railroad Commission, the value of a miner's inch of water in the vicinity of Los Angeles is $2000. At this rate the saving of seven and one-half sec.ft. would mean the creating of water rights valued at $750,000. With careful study I believe that a practical scheme would be worked out for irrigating more lands than are now under cultivation along the San Luis Rey and at the same time allow your proposed diversion to be made. The verdure along the river bottoms would of course disappear to a certain extent but the practical benefit to mankind would far exceed the aesthetic value of the natural vegetation.

The gravel accumulation above Pala has great value as a storage site for flood waters. It's efficiency could be very greatly increased by spreading the flood waters from Pauma Creek and other streams near by, retarding their velocity and allowing the waters to percolate into the porous formation instead of flowing directly into the channel of the San Luis Rey. This method of storage is being used successfully on several streams of Southern California which I have visited.

The wells which Mr. Case is measuring are most of them equipped with windmills or power pumps and some of them are near irrigation ditches. This gives rise to local variations in the ground water surface which will lead to confusion and error in drawing final conclusions from the data. I would suggest that the company establish their own wells and locate them where they will be most free from disturbing local conditions. Two inch holes drilled with a spoon auger and cased with light galvanized sheet metal, perforated, are very effective. Their first cost is small and very little attention is needed to keep them in good condition.

I do not feel that I have yet sufficiently covered the ground to be able to recommend a general plan of gathering the field data necessary to a solution of your problem, but I shall be glad at a any time to make further examination with this end in view. I am enclosing a bill for the time which I have spent upon this matter as you suggest.

Yours very truly,
Charles H. Lee
(Signed)

619 Federal Bld.
Los Angeles, Calif.

WILLIAM S. POST
ASSOC. MEM. A.S.C.E.
1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

San Diego, Cal.
July 26, 1913.

Mr. Wm. G. Henshaw,

C/o Ed. Fletcher Co.

San Diego, Cal.

Dear Sir:

Replying to your inquiry for a comparison of the the drainage output of Warner's dam and Moreno Dam, the following contains all the data in my possession.

Warner Dam

Drainage Area	210 sq/ miles
Runoff-1911-12 July to July	12808 Acre-ft.
Runoff per sq.mi.	60 " "
Mean Rainfall, prelim. figure, 1911-12	14.4 inches
Normal rainfall, prelim. figure	20. "
% of 1911-12 to normal	72%

Moreno Dam

Drainage Area	135 sq.miles.
Runoff 19 11- 12, taken as total stored water in Moreno Dan, published height June 25, 55 ft/7in and stated to store 1,000,000,000 gals	3360 Acre-ft
Runoff per sq/mile	17 " "
Normal rainfall, average 5 years , all of Cotton-wood and Pine V. Creek O'Shaughnessy	21.5 inches
Rainfall, 1911-12, ditto using same %72 above	15.6

William S. Post.

San Diego, Cal. July 28, 1912.

Mr. Wm. G. Henshaw,
Mills Bldg., San Francisco, Cal.

Dear Sir:-

Replying to your inquiry as to the correctness of applying the same hydraulic constants or percentage of catchment and run-off of the Cottonwood system and comparing the same with the Warners and Santa Ysabel systems, and thereby reaching a conclusion that the power on the Warners is 2600K.W., I furnish herewith a comparison of the hydraulic information for the year 1911-1912.

Our information from the Spreckels Company of the Moreno Dam catchment for the year 1911-1912 is approximately One Billion Gallons. This is substantiated by the engineer in charge, as the water now stands at about 80 ft, while the published record of capacities shows Moreno Dam at this depth as holding 1,008,000,000 Gallons. The catchment for the year 1910-1911, while the dam was under construction was between Three and Four Hundred Million gallons, and this amount was let down into Otay dam in January 1912 before the heavy rains of 1912.

On the face of the returns, See Exhibit A, Warners dam shows during the past season three times the run-off per square mile of Moreno dam and probably of the entire Delzura water-shed. The Santa Ysabel shows six times this amount. As the rain-fall data is insufficient on all water-sheds, excepting Warners and Santa Ysabel, it is purely speculative to assign this large difference to deficiency of rain-fall on Moreno and Cottonwood.

The rainfall in San Diego County last year was about 72% of the normal and the records show that there is no difference in this percent in each of the basins. If anything the Moreno and Cottonwood systems secured a larger percentage of normal than Warner and Santa Ysabel. It is clear that the season's results require using at least double the constants as found at Moreno and Cottonwood and the conclusion reached by me as to the quantity of water and power on the basis of equality should be doubled if not trebled; that is, the available power becomes 5400 K. W. or 7800 K. W.

SUMMER FLOW.

It is agreed in general that steep, rocky unforested areas have large winter run-off and small summer flow, and that smoother, forested areas with much soil cover, hold back flood rushes and yield summer flow.

In Table 1 we have not only the characteristic of high run-off for Warner and Santa Ysabel greater than Cottonwood, but also higher summer flow as follows on dates when the streams were jointly measured.

May 28, Cottonwood & Moreno	300	miners inches
" 28, Warner & Santa Ysabel	1900	" "
July 25, Cottonwood & Moreno	10	" "
" 25, Warner & Santa Ysabel	215	" "

This means on Warners and Santa Ysabel water-sheds greater rain-fall or higher altitude, or a combination of the two types of areas, all of which is the fact.

The Cuyamaca Lake water-shed of 12 sq. miles developed this season a run-off of 1,040,000,000 Gallons or a run-off of 265 acre feet per sq. mile and this is due to its altitude of 4500 feet and over. The Moreno water-shed with an area of 135 sq. miles all of which is above the 3300 ft. elevation and approximately 20 sq. miles of which being above the 4500 ft. elevation, impounded this season approximately 1,000,000,000 Gallons or 23 acre feet per square mile.

The San Luis Rey and the Santa Ysabel systems have approximately 45 sq. miles of water-shed above the 4500 ft. elevation and similar in character to the Cuyamaca. It must be concluded that the yield elevation for elevation is greater by far according to this years record. The catchment per acre foot per sq. mile for this last season is as follows:

Warner Ranch Dam	61	acre ft. per sq. mile
Santa Ysabel	132	" " " " "

This difference can hardly be accounted for by an assumed deficiency of rainfall at Moreno, as the storms were general, and the variation from the normal approximately the same.

AUTOMATIC GAUGE AT WARNERS

This gauge has been under constant inspection and checked daily by visual readings. Follwoing the instructions of the U. S. Hydrographer the gauge has been moved from its position on the cut-off wall to the Weir, one mile below. The purpose of the change is to increase the vertical movement and therefore the accuracy of the results. There has been no break in the daily observations during the change.

MISSING DATA.

We should be furnished with the run-off figures for Morena Dam for the season 1905-06 to compare with Warners and Santa Ysabel as we have accurate records for the two seasons last mentioned.

CONCLUSION.

The final data of run-off for this year not only confirms as far as it goes, but is inexcess of my original analysis and conclusion of water supply for Warners handed Mr. Lovell in June at San Diego, viz: 31,000 acre ft. Gross run-off per annum, as shown by the accompanying diagram, Exhibit B.

Very sincerely yours,

W. S. Post

	Moreno Dam	Cottonwood flume plus River	Cuyamaca Dam	Diverting Dam San Diego River Flume plus River	Santa Ysabel	Warner Dam	Sweetwater Descanso
Sq. Miles	135	270	12	104	112	210	40
Run-off 1911-12 acre feet	3060	5560	3182	9423	14772	12808	5356
Stream flow May 28,1912 Sec. ft.	1	5	0.8	22	18	20	1
Stream flow July 25,1912 Sec. ft.	0.2	0	0.2	15	3.3	1	0.3

Run-off per sq. mile 1911-12.

Moreno Dam	23	Acre feet
Cottonwood	20	" "
Cuyamaca	265	" "
San Diego	90	" "
Santa Ysabel	132	" "
Warners Dam	61	" "

1914 Morena Evap Rain

June 1 - 84.8

July 1 - 84.7 $\frac{.7 \times 12}{9.90} = 85\%$ 0.0

Aug 1 - 84.0 $\frac{.7 \times 12}{10.76} = 78\%$ 0.0

Sept 1 - 83.3

	Run off.	Waste at Barrett.	Diverted by Delgena Conduit.	Safe Yield.
1906	19,506 000 000			
1907 16% above	11,080.000 000			
08 12% below.	4,227,000,000			
09 11% above.	9,414 000 000	5,535,173,125	3,713,822,800	
10 2% below	5,500,000,000	2,685,001,992	- 2,680,755,200	
11 3 above.	1,585,488.469	264,918.869	- 1,320,569.600	+ 683,815,000
12 2% below.	2,181,342,638	684,078.138	1,497,264,500	+ 2,572,029.000
13. 30% below.			- 2,453,103,025	loss - 545,532,000
14 12% above.				

				Storage	Supplied from. Net stream yield
Consumption 1911.	City Country (say)	1,653,815,000 200 1,853,815,000		loss of storage 1,170,000,000	683,815,000
1912	City County	2,141,120,000 230,909,000		gain of storage.	
		2372 029 000.		200,000,000	2,572,029,000
1913	City	2501.660.000 202,808.000 2,704 468,000 →		loss of storage 3,250,000,000	negative 545,532,000

Consumption

Story of the City System.

Amount in Storage on ~~Jan~~ Jan 1 ~~19~~ ~~of~~ since the completion of Morena Dam. in Mar. ~~1909~~ 1911.

Reservoirs	1911		1912		1913		1914	
	Depth	Capacity	Depth	Capacity	Depth	Capacity	Depth	Capacity
Morena	42.0x	70,000,000	67.0	550.000.000	84.2	1,350,000,000	64.9	500,000,000
Lower Otay	109.9	8,150 000,000	102.0	6,500,000,000	98.9	5,900 000 000	83.0	3,500,000 000
		8,220,000,000		7,050000,000		7,250,000,000		4,000,000 000
Storage Decrease 1911 decreased				1,170.000,000				
1912 increased						200,000,000		
1913 decreased.								3,250,000,000

(1)

The Facts of the Present Cottonwood System

~~as turned over in~~ as turned over in 1912 and ~~operated~~ its supply during the last two years.

Reservoirs	Contents July 1-1912		Contents July 1-1914		Storage of water withdrawn during two years. (a decrease.)
	~~Depth of Water~~	Gallons	~~Depth of water~~	Gallons.	Gallons
Morena	83'-3"	1,210.000.000	84.9'	1,350.000.000	
Upper Otay	70'	747.402,000	68.3'	670.000.000	
Lower Otay	107' 10"	7,675.000.000	82' 4½"	3,425,000.000	
Chollas	33'	80.776.000	33' 10½"	84.000 000	
Total "Balance on hand"		9.713.178.000		5.529.000.000	4,184,178,000

~~Records on hand July 1st 1914~~

Loss of Reserve July 1st 1912 To July 1st 1914

City Consumption during this period

Inside City Consumption July 1-1912 - July 1-1913	2,289.510.756
" " " 1913 " 1914	2.561.581.878
~~Total 2 years Inside City~~	4,851.092.634
Outside City Consumption July 1-1912 - July 1-1914	398.907.366
Total Consumption	5.250,000.000

Analysis.

	Consumption	Supply
Total City Consumption inside & outside 2 years.	5,250,000,000	
This was furnished		
(a) Total stored water withdrawn from Reservoirs during the 2 years.		4,184,178,000
(b) Remainder was the net ~~actual~~ supply actually furnished by the watersheds of the Cottonwood system. ~~From July 1st 1912 to July 1st 1914~~		1,065,822,000
		5,250,000,000

Analysis of (b)

The actual net supply of the Watershed ~~during the~~ for the 2 years July 1912 – July 1914

Net supply	2 years	1,065,822,000	Gals.
" "	1 year	532,911,000	"
Average "	per day	1,460,000	"
" consumption	" "	7,400,000	"
Daily deficit of watershed (last 2 years.)		5,940,000	"

Supplied from -

Consumption

			Reservoir Storage	Net stream flow.
1911-12	City	1,981.000,000		
	Country	200,000,000		
		2,181,000,000	Increase. 270,000,000	Gained. 2,451,000,000
1912-13	City	2,367,000,000		
	Country	200		
		2,567,000,000	Decrease. 3.365,000,000	Loss 798,000,000
1913-14	City	2.597,000,000		
	Country	200,000,000		
		2,797,000,000	1,235,000,000	1,562,000,000

Consumption

	1911-12	1912-13	1913-14
July – Dec.	1,041,580,000 ±	1,201,120,000 ±	1,236,591,790 ok
Jan – July	940,000,000 ±	1,166,371,010 ok	1,360,000,000 ±
	1.981580000	2,367491010	2,596,591,790

TELEPHONES: { HOME, 3367
SUNSET, 167

AGENTS
SOUTH COAST LAND CO.
F. & W. THUM CO. BLDG.
GROSSMONT PARK CO.
PINE HILLS ASSN.
JAMES A. MURRAY

PANAMA-CALIFORNIA-EXPOSITION 1915 THE COMPLETION OF THE PANAMA CANAL SAN DIEGO

ED FLETCHER CO.
REAL ESTATE INVESTMENTS
1548 D STREET

SAN DIEGO, CALIFORNIA. Aug. 12, 1912

Mr. W. S. Post,
649 Garland Avenue,
Los Angeles, Calif.

Dear Sir:

Enclosed find article by our friend, Capps. On the basis of Capps' statements, you many miner's inches of water, perpetual flow, will be developed from the entire system? Pick this to pieces and let me know their weakest point by comparison with the rest of our system. Our friend Clayton never opened his "yip" again.

Very truly yours,

Ed Fletcher

F/K
enc

N Not reviewed after dictation.

RECORD OF MATERIALS REMOVED PAGE ____ OF ____

COLLECTION NAME ED FLETCHER.

SERIES & FOLDER TITLE VOLCAN

Description of Material		Date Of Material	Re-Filed As:	
			Series	Folder Title
news-paper	clipping on water.	Aug 11, 1912		
	from SAN DIEGO UNION		see VOLCAN	

APPRAISEMENT OF PROPERTY.

of

Southern California Mountain Water Co.
as appears from published data, by
Wm. S. Post.

Authorities O. Shaughuessy - Transactions Am Soc. C E October, 1911, newspaper articles and information by foremen.

Morena Dam

Rubble concrete 120,000 cu yds at $5		$ 600,000
Loose rock 120,000 cu yds at $1		120,000
Rock laid in concrete say 66,000 cu yd at $5		330,000
Water tower and valves		60,000
Tunnel 387 lin ft at $20		8,000
		$1,118,000

Delzura Conduit

Flume 4,490 ft at $6	26,940	
Tunnels 9,219 ft at $20	184,380	
Conduit concreted 56,957 ft at $4	227,830	439,150

Upper Otay Dam

Say		80,000

Lower Otay Dam

Masonry say 20,000 c y at $6	120,000	
Rock fill say 540,000 Cu yd at $1	540,000	
Steel diaphram say 400,000# at $.06	24,000	684,000

Pipe Line to City

20 miles at $15,000		300,000

Filtering Plant and Reservoir: say 20,000

Lands

Lower Otay	1000	acres	
Upper "	200	"	
City	20	"	
Morena	2000	"	56,000
			2,697,150
		Add 10% omissions	269,850
		Probably total value	$2,967,000

WK
8-21-12

(1)

Appraisement of Property
of
Southern California Mt. Water Co.
as appears from published data
by William S. Post.

Authorities O'Shaughnessy - Transactions
Am. Soc. C E. Oct. 1911, newspaper
articles and information by foremen.

Morena Dam.

Rubble Concrete ~~120,000~~ 120,000 cu. yds @ $5	600,000
~~120,000~~ " Loose Rock - (say) 120,000 cu yds @ $1	120,000
Rock laid in concrete - say 66,000 cu. yd @ $5	330,000
Water tower + valves -	60,000
Tunnel 387 lin ft @ $20	8,000 $1,118,000

(2)

Delzura Conduit

Flume 4,490 ft @ $6	26,940	
Tunnels 9,219 ft @ $20	184,380	
Conduit concreted 56,957 ft @ $4	227,830	$439,150

Upper Otay Dam.

say	80,000

Lower Otay Dam.

Masonry ~~say~~ say 20,000 cy @ $6	120,000	
Rock fill say 540,000 cy @ $1	540,000	
Steel Diaphram say 400,000# @ .06	24,000	$684,000

Pipe Line to City.

20 miles @ $15,000	300,000

749 Garland Ave.,

COPY

Los Angeles, Cal.

Sept. 4th, 1912.

Ed. Fletcher

Mr. Wm. G. Henshaw,

7th & D Sts

~~762 Mills Building,~~

San Diego

~~San Francisco~~, Cal.

Dear Sir:-

Replying to your instructions to analyze the recent purchase of the City of San Diego of the Southern California Mountain Water Company, as to quantity of water and amount paid per Miners Inch, I forward herewith a table compiled from the United States Geological reports, extended by estimate to cover the last six years.

The safe diversion of the Delzura Conduit appears to be about 11 second feet. The safe yield is found by subtracting about 25% for losses in transit and evaporation from the Otay reservoirs, that is the safe yield or delivery to San Diego is about 8.2 second feet. To this we should add the safe yield of the Moreno Dam which cannot be taken at over 2 second feet. This is a total of 10.2 second feet or 510 Miners Inches net delivered at San Diego, which the City recently voted to purchase for the sum of $4,000,000. It will be under stood that by additional expenditure, further regulation and an additional safe yield is possible to the City, but it is probably such an addition as the Barrett reservoir will cost in about the same ratio.

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510 Miners Inches is equivalent to 6,600,000 gals per day. The published statements regarding the consumption of water show a maximum of about 9,000,000 gals (the limit of existing pipe lines etc.) and a minimum of about 2,000,000 Gallons.

Very sincerely yours.

Note: To avoid any misunderstanding the drainage area of the Otay has been omitted from the estimate of water supply, as my information is that this is practically sold outside of San Diego, to Coronado and elsewhere, and the City buys subject to these uses. The Otay Drainage area is stated to be 100 square miles of barren country 3000 ft. altitude down to sea level, with rainfall of 10 to 15 inches.

TABLE OF WATER SUPPLY

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from Cottonwood Creek near Jamul.

In Acre Feet.

Compiled from U. S. Geological Survey, with interpellations as noted below by W.S.Post.

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** Estimated for 1911-12.

WILLIAM S. POST
ASSOC. MEM. A.S.C.E.
1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

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Los Angeles, Cal.
Sept. 4th, 1912.

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[POST]

H1

V. L. & W. CO FILE

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COPY Los Angeles, Cal.

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Close Spaced

question #7

V. L. & W. Co. Engr Data 11

Mr. W. S. Post:-

In accord with your instructions I have made a survey of the center line of a proposed dam at Pamo and have examined the formation in so far as it is exposed.

Taking for top of dam Elev. 1010.0 I determine the length as 992 ft. with a maximum fill on Center Line of 160 ft. at the Creek Crossing. Considerable digging has been done on or near this center line and all work has exposed the same formation, viz: a disintegrated granite, seemingly in place. Not one of the holes has been sunk through the granite and I think it useless to attempt to go through by team or hand work, and advise if further explored, it be by drilling.

The granite comes to within 2 ft. or less of the surface of the ground, being covered over only by a thin layer of soil which is itself mostly disintegrated granite.

On the north side of creek an excavation has been made, breaking ground at or near Elev. 1005 and at Sta 0+30, the excavation is to Elev. 955.5, while at Sta 0+35 it is to elev. 954.2; this bottom is about 85 ft. horizontally from the surface of the ground, exposing thoroughly the character of the granite. Several features in the excavation point to formation in place: one of which is the appearance of a fault or tight fissure cutting diagonally across ~~the~~ and exposed for 50 ft. or more. The granite is quite hard but disintegrates rapidly when exposed to the elements. It cannot be dislodged in any quantity except by shooting. About 100 ft. down the hill from the bottom of the above mentioned excavation, the granite has been stripped for a length of more than 60 ft. and on the high side to a depth of about 4 ft. This depth practically shows the amount that can be excavated without powder.

About 100 ft. below where the center line crosses the stream bed the granite assumes a slope of nearly 45° and I am informed that even in the driest time with no water flowing above, the water is brought to the surface at this point.

To the south of the stream bed at an elevation of 889 a road has been cut around the mountain side, exposing a similar granitic formation. At an elevation of 908 ft. and 50 ft south of the road a long cross cut has been made and a shaft sunk 25 ft. in depth. This shaft had been filled up intending to enlarge the excavation but from what is to be seen it is the same granite formation. As the granite formation may reach quite a depth and being exposed on both sides of the creek sufficient to determine its continuity on the mountains sides, some work should be done in the creek bottom, to ascertain its condition here.

In this connection I respectfully call your attention to the gaging station for stream flow. The boulders and derbis have been removed from the channel and if a concrete control was put in below the gage staff, thoroughly reliable results could then be obtained from this station.

E. W. Case

San Diego -
Sept. 5- 1912

WILLIAM S. POST
ASSOC. MEM. A.S.C.E.
1217 HIBERNIAN BLDG.
LOS ANGELES, CALIFORNIA

October 25, 1912.

Mr. E. Newman,

1048 W 8th St.,

Los Angeles, Cal.

My dear Mr. Newman:-

I am making extensive topographic surveys of Warner's Ranch, and am very desirous of obtaining a transcript of your original field notes of survey made for Pacific Light and Power Company. I should be glad to pay for the transcript or will make a copy of your book and return, as you may prefer.

All that I have is a map, scale 2"-1 Mile; P. L.& P. Co. Dec. 8, 1909, showing a tabulation, U. S. field notes, and along with it a table marked notes by E. Newman, where there are undoubtedly mistakes in copying.

For instance between corners 6 and 7.

U. S. gives	N 39½ E	49.0 chs or	3230 feet
Newman	" N 34°53' E		3335 "
San Diego Highway	" N 38°52' E		2443.4 "
Post	" N 38°55' E		2442.1 "

I conclude that the map mentioned has been "balled up" and will greatly appreciate whatever you can do in furnishing original notes.

File 332

Very sincerely yours,

WSP-Wk

Received from Mr G. O Newman
set of notes on Warner Ranch boundary
Arthur Taylor
627 Burlington Av

A. G. WISHON, GENERAL MANAGER — TELEPHONE 113

SAN JOAQUIN LIGHT & POWER CORPORATION

TULARE AND H STREETS

~~FRESNO~~, CAL.

ans Nov. 2.

North Fork Oct 30th 1912

624 PE
60 Newman

William S. Post Esq.

513 Am. Bk. Bldg San Diego Cal. Friend Post.

I just received your letter of 25th inst and have sent it to my brother with request that he furnish you with the information you want— I do not remember just where Corners 6 and 7 are located but my recollection is that the survey checked fairly accurate with the Government field notes and that in most cases I found the witness trees and I do not think that I made mistake of 900 feet (about)— I have no evidence here so I cannot say for certain but my opinion at present is that you and the Highway surveyor did not have the right corners— At the time I made up a traverse sheet of the survey and closed as nearly accurate as usual for such light of line— I do not claim that all my courses are right to a foot as I took some long stadia shots but I do not think I made mistake of about 900 feet. I am up here now working on San Joaquin L. & P. Co Plant 2 on North Fork. It is a small plant with about 3 1/2 miles of tunnels and conduits— 1/2 mile of pressure pipe and 2 small dams about 30 feet high each and we will develop about 2500 K Ws

With kindest regards to yourself and family—

Yours very truly

E. Newman

P.S. Write to me when you have time. Letters always welcome even on business—

San Francisco, Cal. Nov. 27, 1912.

Mr. W. S. Post,

San Diego, Cal.

My dear Mr. Post:-

I am enclosing herewith a copy of a letter just received from the Secretary of the Interior. It is to the last degree important that a complete and satisfactory answer should be made to this. I enclose also a copy of a showing made by the Company upon many of the subjects touched upon in the Secretary's letter.

As I read the Secretary's letter he is impressed with the statements made, but as they are merely the statements of the corporation, he desires a further showing "detailed showings" upon the subjects therein contained. The detailed showings I take it to be the statements of my engineers, touching plans and probable cost.

Thus, you will note, that the Honorable Secretary says, "that if one of two plans results in the development of power, whereas, the other would permanently prevent the use of the water for the development of power", he believes that the method "which makes power development possible should be adopted." Therefore, in this connection it should be pointed out upon the authority of the engineers, that the running of the water down the bed of the Santa Ysabel Creek would not only be a transportation without present power possibilities, but would be a transportation "which would permanently prevent the use of the irrigation water for the

D 94 M.S. v. 1.

Oldberg

development of power." The reasons being that to carry the water down the bed of the creek, as I understand it, necessitates to prevent waste, and for its economic saving, the equivalent in cost and expense of the proposed canal. That if the Company were thus forced to construct such a canal, or pipe line, or cement conduit down the bed of the creek, it would not thereafter incur the double expense of a subsequent building of the canal for purposes of power development alone. In this connection as accurately as practicable, though roughly, of course, should be given the engineers estimate of the comparative and parallel expenses of the two methods.

Again the statements contained in the enclosed petition should be reaffirmed and amplified upon the authority of the engineers. That is to say, that the power to be developed, is not only to be primarily used for the indicated purposes of irrigation, but is essential to those purposes as it will enable the company to lift its waters and supply lands therewith, which by gravity alone could not be done. There should be a statement, approximate, of course, but as accurate as possible as to the increased acreage made tributary to the water scheme by the development of power, which without this power would still remain but a desert land.

The quotation from you given in the Secretary's letter is liable to misconstruction and should by you youself be explained in accordance with what I understand to be the facts, namely, that when you said that the other water would be allowed to flow into the Pamo Reservoir by natural channels, you did not mean that it would cost less to so convey it, but if there were no power possibilities there would be no occasion to con-

TELEPHONES: { HOME, 3567 / SUNSET, 167

AGENTS
SOUTH COAST LAND CO.
F. & W. THUM CO. BLDG.
GROSSMONT PARK CO.
PINE HILLS ASS'N
JAMES A. MURRAY

ED FLETCHER CO.
REAL ESTATE INVESTMENTS
1550 D STREET

SAN DIEGO, CALIFORNIA. Nov. 29, 1912.

Mr. W. S. Post,

San Diego, Cal.

Dear Sir:

This Murray-Fletcher application from the Government is, in my opinion, being held up by our friend Sacket. I don't know why I feel so, but I cannot helpt it. Can we not stir up Washington in some way and find out where we are at?

Very truly yours,

F:K

84

No 014883 Los Angeles-
Right of way for reservoir & Canal
on Conejos & King Cr-

FOR ACCOMPANYING CORRES. (1913 & 1914)

SEE HENDENHALL, W.C.
" OLBERG, C.R.
MERITT, E.B.
McCORMICK, T.E.

Mr. Mathews =

514 American National Bank Bldg.,

San Diego, Cal.

Mr. C. R. Olberg, December 31, 1912.

U. S. Indian Irrigation Service,

Los Angeles, Cal.

Dear Sir:-

I beg to submit herewith a statement regarding the application for rights of way on Conejos and King Creeks, for reservoir and canal line.

HISTORY

Murray & Fletcher, present owners of the San Diego Flume System, purchased the system fully aware that it was in receivers hands and with the expectation of making large expenditures for betterments. During the two years prececding June 1, 1912, the period of their ownership, they have spent in enlargements in carrying and receiving capacity the sum of $68,452.53: (Affidavit before State Railroad Commission). During this period the system was operated at a loss of $4,013.00 per year, with absolutely no return to owners. (Same)

PROBABLE REQUIREMENTS OF THE STATE OF CALIFORNIA

UNDER ITS PUBLIC UTILITIES ACT.

The general principles governing public service corporations in California will undoubtedly be applied to the system of Murray and Fletcher, as follows in the forth coming decision of the State Railroad Commission regarding the system.

1. Adequate service. The testimony before the State Railroad Commission shows that the Cuyamaca Water Co. has been giving only 75% adequate service.

viz: 2776 acre-feet out of a consumers demand of 3702 acre-feet.

The Commission will insist upon the Cuyamaca Water Co. furnishing 100% service.

The Commission will protect all those involved by its orders and secure and enforce substantial justice. The Government benefits in this additional safeguard so far as entire publicity, legal procedure and reasonable return is now enforced upon all public service corporations, and reference is made to some 13 volumes of testimony before the Commission Application No. 118, in which every phase of the system has been fully set forth.

PROPOSED BETTERMENTS.

The owners have always considered the property of potential value and benefit, and that the lack of practical success hitherto was due to financial weakness and poor engineering.

The known losses in the system at present are as follows:

A. Evaporated water from Cuyamaca Lake amounting to 56% of the volume.

B. Losses in the natural channel of Boulder Creek, amounting to 20% of water in transit.

C. Losses in the Flume line (36 miles in length) 14%.

D. In additional inadequate mountain storage, resulting in losses of flood water in winter, for which there is ample conduit capacity, if storage were had.

The owners moved promptly on these matters and took up (on their own initiative and before the creation of a State Railway Commission) these problems and have taken them up in the order of urgency as follows:

They have constructed:

A. 1 mile of syphons, increasing capacity of flume and reducing flume leakage 10%.

B. Murray Hill Dam for additional receiving capacity, safety in case of accident to flume and improving municipal supply.

They have made:

C. Surveys of additional mountain storage and conduit lines.

D. Application for right of way for Conejos and King Creeks Reservoir and canal; to the Department of the Interior.

REASONS FOR THIS CONSTRUCTION.

The Department has already been informed of this general plan.

Its purposes are as follows:

To increase the mountain storage of the system. Conejos Reservoir is one of 5 reservoirs which are in the plan of the Company.

To convey a portion of the water to its economic use at a higher elevation (700 ft. higher) than heretofore, securing thereby the irrigation of citrus lands now not irrigated. Incidentally the return waters from such irrigation will benefit lands now served and result in greater conservation.

To bye pass that portion of the Cuyamaca Lake water which can be so conveyed without impairment of contract with the Government by this route and reduce the present losses in the natural channel of Boulder Creek of 20%, to an anticipated 3%.

To afford a bye pass for this water, during the period of reconstruction of the existing flume, a matter which is extremely urgent. It must be understood that this existing flume 36 miles long is 24 years old and in need of prompt replacement, but at the same time it is the only means of conveying the stored waters of Cuyamaca Lake in the summer to 2000 inhabitants and 4000 acres of

valuable lands, and the only means in winter of conveying the floodwaters of the San Diego River to La Mesa Dam, next to Cuyamaca Lake the most important winter storage on the system. That is to say it is in continuous use. The proposed canal and reservoir will release for considerable repair periods (several months) 21 miles of the existing flume.

To answer certain doubts and reflections on the honesty of this proposal as affecting the contract with the Indians on the El Capitan Reservation in the San Diego River Valley. I beg to state that; in the proposing to bye pass the waters of Cuyamaca Lake around the lower reservation the owners do not intend to abandon the existing flume. This is clear from a consideration of water rights alone. Excluding the drainage area of Cuyamaca Lake of 12 square miles, and an area below included in the proposed diversion of 7 square miles, there still remains 85 square miles tributary to this flume. The observed yield of this area, 19 year mean, (testimony before State Railway Commission) for 92 square miles is 17.8 second feet. The proportionate amount for 85 square miles will be 16.1 second feet or 805 miner's inches. Deducting the 40 miner's inches now being served to the Indians we have 765 miner's inches.

However riparian ownership below require that Murray and Fletcher be limited to about 350 miner's inches. The value to them of this 350 miner's inches requires no further proof of the necessity of maintaining the flume, as it is worth approximately $6,000 per inch or $2,000,000. It is not intended to abandon this flume and the water rights and values involved.

It is however, intended to supply summer water from other reservoirs marked Nos. 7, 9 and 10 on the map on the immediate drainage area of the San Diego River, which cannot be bye passed through Conejos, and eventually they will replace Cuyamaca Lake in

the function of complying with the contract with the Indian Service, in the furnishing summer water to the Reservation. Until these are built, the owners understand that the obligation exists to supply enough of Cuyamaca Water to satisfy the requirements of the Reservation.

Any changes in this status must be on the initiative of the Indian Bureau. The ninth paragraph in Murray and Fletcher's application regarding the transfer of the 40 inches on the lower Reservation to the upper or Conejos Reservation was a stipulation inserted not on the initiative of Murray and Fletcher, but at the suggestion of an officer of the Indian Service, and while Murray and Fletcher recognize that the Bureau might prefer such a consolidation of the reservation because of administrative reasons and the interest of the Indians, they would regret it on account of the resulting difficulty of sanitation upon the waters entering the proposed Conejos Reservoir, which will be/partly used for domestic purpose.

CONCLUSION

I cannot believe that the Indian Bureau is aware of the gravity of the situation confronting the San Diego region, regarding water supply. This application was filed in May-1911 and a full statement made to the representative both of the Forestry Service and of the Indian Service in May 1912.

The water situation in San Diego City and vicinity is a close parallel to that of Los Angeles 5 years ago. At that time the City reached its limit of water supply and therefore of population with about 800-1100 miner's inches available.

It has wisely spent $20,000,000 in obtaining additional supply.

San Diego City proper has a supply of 500 miner's inches and at the present rate of growth will reach a shortage in two years. The vicinity of San Diego served by the San Diego Flume System is growing equally, but for 23 years has had no increase of water supply and has maintained growth only by the San Diego Flume System losing its former contract for the supply of water to the city of San Diego and the conversion of water before used in irrigation into domestic supply.

New works take time. As an engineer I can see a most serious check to the development of the region if the storage and additional water facilities are not promptly undertaken by those in responsible control of water systems, nor can I patiently see the economic use of water now wasting into the ocean, deferred from year to year.

Respectfully,

William S. Post.

749 Garland Ave.,

Los Angeles, Cal.

COPY

Sept 4th, 1912.

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7th & D Sts.,

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(Sgd) W. S. Post.

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from Cottonwood Creek near Jamul.

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Miner's inch continuous	1470	700	800	645	550	550

A Delzura conduit built and record begins in Jan. 1909;

+ Proceeding adapted from U.S. records, limiting the diversion in one month to 3000 acre feet, the capacity of the conduit.

++ Estimated for 1911-12.

Ed Fletcher Papers

1870-1955

MSS.81

Box: 21 Folder: 27

General Correspondence - Post, William -