Contract for Outfall Sewer Gains Approva

The Brea Progress

SERVING A CITY OF SUNSHINE, OIL, AND INDUSTRY

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Council Orders Immediate Action to Set Bond Election

A contract between Brea and Fullerton whereby Brea will be allowed to connect a sewer line to the Fullerton system, which is part of the Joint Outfall Sewer network, has been approved by all the J.O.S. districts and cities concerned, it was announced at the Monday night meeting of the Brea city council.

After months of negotiation and waiting, the city of Fullerton agreed to sell to Brea a portion of its capacity rights in the Joint Outfall Sewer. This contract then had to be approved by all the J.O.S. members.

According to City Attorney Harold McCabe, the cities of Fullerton, Anaheim, Orange and Brea (as of Monday night), and have signed the contract, and the sanitary districts of Garden Grove, Placentia, Buena Park and La Habra.

Immediate Action

Upon hearing the report of the signing, City Administrator A. W. Studebaker suggested that the council instruct the city attorney to take immediate action to draw up the necessary documents for a bond election to finance construction of the sewer line. The bond issue must be set before July 1 if the city is to be eligible for state funds to aid in financing the new sewer connection.

Under the original agreement, Brea will pay 53.7 per cent of the cost of constructing the line and Fullerton will pay the balance. Total cost of the 31,000 foot trunk line from Brea's disposal plant to Fullerton is being computed, but estimates indicate it will be about $295,000.

The cost to Brea for the dumping of a maximum of 1.61 cubic feet per second into the Euclid avenue line of the J.O.S. will be $92,045, which will be paid in 20 yearly installments of $4,602.

Statements by city officials indicated that the new line when completed will take care of Brea's sewage disposal problem for several years to come. At various times in recent months the city has been severely criticized when the outdated and overloaded sewage disposal plant did not operate correctly, causing bad odors to fill the air.

Park Grading

Three pieces of grading equipment will move into the new 15 acre city park site this morning, according to Park Commissioner and Councilman Frank Schweitzer Jr. Work on the park, which is located along the channel of the Brea creek on the west side of Brea, has been held up prior to now to avoid the rainy season. It is felt that the work can proceed safely now without being hampered by wet weather.

About five to seven days of leveling work will be done on the east side of the flood channel at present, the park commissioner stated. If sufficient funds remain from the $1000 alloted for the work by the city council, some grading may be accomplished on the west side of the channel.

Sid Lowry, city engineer, reported that the equipment being used will cost the city $14 per day.

Lions Club Funds

Schweitzer reported that he believes the Lions club, which raised $1000 last year for the park fund with a benefit rodeo, will probably invest this money in barbecue pits and picnic tables to be located on the eastern side of the park. He predicts that the park will be used this summer by many people if water and sanitary facilities are made available.

In answer to questions concerning the rain waters which periodically overflow the Brea creek channel, flooding portions of the park site area, Councilman Schweitzer said that petitions are going to be circulated among Brea residents which will request that the county take measures necessary to prevent flooding of the new park in the future.

If sufficient interest is shown in the improvement of the channel by Brea residents, it is felt that this may influence the County Flood Control board to take action, Schweitzer related.

A detailed map of the eastern portion of the park where work will be beginning today was prepared by Don Allyn, park designer, who has been retained on a consulting basis by the city. The council authorized payment for the map.

Building Regulations

Building Inspector J. C. Power brought two problems before the council for its study. First he asked council to make it mandatory that all contractors use waterproof stucco on the exterior of houses to be built within Brea. Complaints of dampness in stucco houses would be avoided and the added cost would be only minor, he reported.

Building Contractor Henry Rudd, who was in the audience, backed up Power in his request. He said it would be a good idea to have such a law in the building codes.

After considerable discussion, the council instructed the building inspector to draw up specifications on how he desired to have houses stuccoed and present it at the next meeting.

Council also granted the building inspector the authority to determine the valuation of new buildings when he feels that construction costs are being underestimated. This valuation determines the amount of the building fee required by the city.

Lee Auer Resigns

The resignation of Leland Auer as vice commander of the local Civil Defense organization was accepted with regret by the council. Auer told the city officials by letter that his recent appointment to the grand jury would make additional inroads on his time and prevent him from carrying on his duties in the Civil Defense.

The councilmen will attempt to find an acceptable replacement for Auer before the next meeting. If they agree upon a person, the appointment will then be made.

Water Line Payment

Another payment was made to the Mutual Pipeline and Construction company for the cost of installing new water mains in Brea. The amount paid was $24,801.97. The city is still retaining $11,059.15 of the full payment to guarantee the completion of street repairs by Mutual, the city engineer told the council.

The total value of the work completed is $110,591.50. Mutual's low bid submitted last October was $106,952.

Councilmen To Decide Revival Of Sewer Pact

FULLERTON — The question of revising the JOS sewer purchase agreement with the City of Brea is a "policy matter" which will have to be decided by Fullerton councilmen.

Brea City Administrator A. W. Studebaker asked Fullerton councilmen Tuesday night if any action was contemplated on a request to revise an agreement whereby Brea would purchase from Fullerton a capacity share of the Euclid Avenue outfall sewer line and obtain an outlet for the proposed trunk which would continue north to Brea's old treatment plant.

Under terms of an old agreement, Brea would pay Fullerton the sum of $92,000 for rights in the Euclid Avenue line. The payments would be made in 20 equal annual installments and Fullerton would hold title to the share until full payment had been made.

QUESTION AGREEMENT

However, the legal firm of O'Melvany and Meyer, entrusted with handling the proposed bond issue to cover Brea's cost share of the connecting trunk line, questioned an agreement which would commit city funds to another city on a contract basis.

The legal firm has suggested a revision of the purchase agreement to give Brea title to a 20th of the capacity share each year as the payments are made.

Chaffee said Fullerton would be at a disadvantage under such an agreement should Brea be unable to continue payments, because Fullerton would not be able to regain title to the amount of capacity purchased.

Fullerton councilmen asked City Administrator Herman Hiltscher to arrange a meeting between the two city councils for further consideration of the matter.

The proposed connecting trunk line from Brea to the Euclid Avenue line will be 31,000 feet in length, under terms of the bi-city agreement, Brea would pay a 53.7 per cent share of the cost. Brea officials plan to hold a bond election to raise the money.

The bond issue proposal which Brea voters would face, estimated to amount to about $260,000, would pay the city's share of the Fullerton-Brea trunk as well as another proposed trunk line running from the Magnolia JOS line at Commonwealth Ave. in Fullerton north to Imperial Hwy. and east on Imperial Hwy. to Brea.

Tentative plans on this second project call for joint financing by the Cities of Brea and Fullerton and the La Habra Sanitary District.

Brea Moves To Call Bond Election To Raise Money For Outfall Sewer

BREA—Upon notification that seven Joint Outball Sewer member cities and sanitary districts have ratified the pact, Brea City Council last night set into motion machinery to call a bond issue efection to finance Brea's share of constructing an ocean outfall trunk as specified in a bi-city agreement between Brea and Fullerton.

The line, to be paid for jointly by Brea and Fullerton, will provide Brea with the long sought for ocean outfall sewerage facilities and will allow that city to eliminate the inadequate sewage treatment plant which has been the object of so much concern over a period of years.

PLANS

Brea City Atty. Harold McCabe was authorized to start proceedure for the election. Amount of the bond proposition and election date will probably be set at the next meeting April 20.

As a formality, Brea council last night also ratified the bi-city agreement.

JOS members who have ratified the sewer agreement are the Cities of Fullerton, Anaheim and Orange and the sanitary districts of La Habra, Buena Park, Garden Grove and Placentia.

Terms of the agreement, which were amended before the JOS board of directors approved it and referred it to individual member boards, contain these provisions:

The City of Brea will purchase capacity rights in the existing Euclid Ave. trunk line from Fullerton for $82,000 to be repaid over a 20-year period at 1½ per cent. This money will not be covered in the Brea bond issue but amounts to a loan from Fullerton.

To connect the City of Brea to the Euclid Ave. trunk line in Fullerton, the two cities propose to construct a new line running north to the old sewage treatment plant.

Plans and specifications have already been prepared for a 31,000-foot trunk line at a cost which has been estimated at $295,000. The bi-city agreement states that Brea's share of the cost will be 53.7 per cent. This amount will be covered in the bond issue if voters approve. Fullerton will pay the remaining share, and both cities will own certain capacities in the new line.

Amendments to the agreement worked out before ratification are that Brea has full right to connect to the Euclid Ave. line but cannot discharge sewage flow through the line until completion of the land and marine section in Southern Orange County which has been contracted by the seven Orange County Sanitation Districts, with balance of funds from the $8 million bond issue approved in an election in 1949.

Brea must further agree to pay its proportionate share of any future expansions in the system as they become necessary.

In other business, councilmen granted permission to the Regional Water Pollution Control Board to meet in the Brea City Hall on April 17 at 1:30 p.m

Mrs. Joanne West was appointed to replace Mrs. Grace Westerhout, who has resigned her position as secretary of the city Planning Commission.

Request by Martin Buck to keep 24 chickens at his home at 236 S. Pomona Ave. was referred to Police Chief Bill Atkins for investigation.

9-24-53

Brea Voters To Decide on Sewer Bonds

Brea City Council agreed to place before community voters the issue of whether to accpet the $92,000 indebtedness to Fullerton for buying rights in the Joint Outfall Sewer line on Euclid Avenue.

Announcement of the agreement was made today by Herman Hiltscher Fullerton City Administrator.

An agreement made between the two cities last October stated that Fullerton and Brea would share costs of constructing a 31,000 foot trunk line from Brea south to the Euclid Avenue JOS line at Orangethorpe Avenue in Fullerton. Brea was to pay Fullerton $92,000 as their share of the joint payment. That sum was to be paid over a 20-year period.

O'Melveny and Myers, Los Angeles bonding attorneys, contended that under that agreement if Brea defaults on any payment, Fullerton may elect to forfeit Brea's right and retain all sums collected.

At a Fullerton City Council meeting earlier this month two alternates were given Brea for making payments: One, Brea was to use its bonding capacity and pay Fullerton cash, and two, if the bonding capacity would not allow such a payment, it would be placed on the ballot for voters approval of the indebtedness.

Brea accepted the second alternative today, Hiltscher stated.

Brea voters will be asked to approve bonds in the amount of $260,000, if the legal aspects of the sewer agreement are straightened out.

REPORT

UPON THE

SEWAGE TREATMENT PLANT

OF THE

CITY OF BREA, CALIFORNIA

NOVEMBER 28, 1950

FRANK E. ALDERMAN
CONSULTING ENGINEER
ROOM 203 RIALTO THEATRE BLDG.
OXLEY AT FAIR OAKS
SOUTH PASADENA, CALIF.
TELEPHONE PY. 1-2425

Photo by "Dick" Whittington


RLD AIRLINES
STAR OF FONTAINEBLEAU
ETOILE DE FONTAINEBLEAU
TWA


LOS ANGELES CO
ORANGE CO
LA HABRA
SANTA GERTRUDES
La Habra
BREA - LA HABRA TRUNK
Brea
Brea-Olinda Union High Sch
BREA - OLINDA
FULLERTON
CITY
Mine Siding
SAN JUAN CAJON
LOS COYOTES
DE SANTA ANA
Mexican Sch
Bastanchury Ranch
BREA - FULLERTON TRUNK
Junior College
FULLERTON LANDING FIELD
ATCHISON
COMMONWEALTH
TOPEKA
SANTA FE
UNION PACIFIC
Fuller Park
Santa Ysabel
Almond
ORANGETHORPE
Orangethorpe Sch
MAGNOLIA TRUNK
EUCLID TRUNK
Canyon
Creek

January 21, 1952

The Honorable City Council
Brea, California

Gentlemen:

In accordance with a request made by your honorable body, I submit herewith a report covering three alternate methods for the disposal of sewerage from the City of Brea.

Alternate No. 1, contemplates the construction of a trunk sewer main, as shown on the attached map, westerly from Brea, along Imperial highway to a junction with the LaHabra Sanitary District Outfall Trunk Sewer at Imperial Highway and La Mirada Ave., thence Southerly through an expanded trunk sewer constructed jointly with the LaHabra Sanitary District and the Standard Oil Company, to a connection with the Magnolia-Cannery Trunk Sewer at Magnolia and Orangethorpe.

From this point it would be necessary to purchase from the City of Fullerton a portion of her capacity rights in the Magnolia-Cannery Trunk Sewer.

The estimated total cost to the City of Brea under this alternate is approximately $392,000.00

Alternate No. 2, provides for the joint construction with the City of Fullerton of a trunk sewer main Southerly thru Brea and Fullerton along a route shown on the attached map to a connection with the Euclid Ave. Trunk Sewer at Orangethorpe.

From this point it would be necessary to purchase from the City of Fullerton a portion of her capacity rights in the Euclid Ave. Trunk Sewer.

The estimated total cost to the City of Brea under this alternate is approximately $315,000.00

Alternate No. 3, provides for the expansion of the City's present sewerage treatment plant in accordance with a report made by Frank C. Alderman, Consulting Engineer, in 1951.

Reference is made to Mr. Alderman's report for a review of the probable costs to the City of Brea, for treatment and disposal of sewerage under this alternate.

Conclusions:

Alternate No. 1 would provide a trunk sewer down the floor of the valley lying Northerly of the City of Fullerton and extending from Brea Westerly to LaHabra. If constructed, it would, without question, hasten the residential and industrial development of this entire valley. However, there is no justification for the City of Brea to expend some $77,000 dollars to develop a sewer outlet for areas beyond her probable boundaries.

Alternate No. 2 would provide a trunk sewer in a location most suitable for serving the greater portion of the area within the existing City boundaries. Its construction would make possible the elimination of at least one sewerage pump station now in operation, and it would provide sewerage service for portions of the areas Easterly of the present City boundary. A trunk sewer under this alternate could be constructed and placed in operation in less time than that required for alternate No. 1.

Alternate No. 3 would, for a limited period of time, solve the City's sewerage problem at the least cost. If it is felt that the maximum amount that can be made available for expenditure at this time is on the order of $130,000.00 then alternate No. 3 should be selected.

It should be pointed out that an expenditure of this magnitude will only provide for a population growth double that of the present population and that the disposal of the treated effluent from the plant will become increasingly difficult as the flow increases. Also, the selection of this alternate will tend to restrict the City's industrial growth.

Recommendation:

In view of the above conclusions, it is my recommendation that Alternate No. 2 be selected as offering the best solution to the City's sewerage problem.

I further recommend that the City of Brea enter into negotiations with the City of Fullerton in order that the following items relative to the joint construction and operation of the proposed trunk sewer line might be agreed upon.

1. General agreement as to percentage of ownership and participation in the cost of construction of the joint trunk sewer line.

2. Agreement as to value and cost of Brea's required capacity rights in the Euclid Avenue Trunk Sewer and agreement as to method of payment therefor.

3. Authorization for and agreement as to distribution of cost of surveys and engineering necessary to determine the amount of a bond issue required to finance Brea's share of the cost of the trunk sewer construction and the acquisition of capacity rights in the Euclid Avenue Trunk Sewer.

4. Agreement as to construction and operation of proposed joint trunk sewer.

Respectfully submitted,

Sidney L. Lowry

Sidney L. Lowry, City Engineer

SLL:m

PROPOSED BREA-FULLERTON OUTFALL

Estimated Construction Costs

Location	Length	Aver. Depth	Pipe Diam.	Del. Price	Cost to Install	Total Cost Per Lin.Ft.	R/W Cost	Total Cost	%	Brea Cost	Fullerton Cost
Brea M.H. to 0+00	2200'	22'	18"	$3.34	$9.50	$12.84	$ 500	$ 28,748	100	$ 28,748	$ --
0+00 to 24+00	2400'	22'	18"	3.34	9.50	12.84	600	31,416	85	26,704	4,712
24+00 to 48+00	2400'	10'	12"	1.17	3.25	4.42	600	11,208	75	8,406	2,802
48+00 to 89+00	4100'	10'	15"	2.37	4.50	6.87	1000	28,161	60	16,897	11,264
89+00 to 145+00	5600'	10'	18"	3.34	6.00	9.34		52,304	50	26,152	26,152
145+00 to 152+00	700'	10'	18"	3.34	8.00	11.34		7,938	50	3,969	3,969
152+00 to 190+50	3850'	10'	21"	4.42	9.00	13.42		51,667	35	18,083	33,584
190+50 to 206+90	1640'	10'	21"	4.42	8.00	12.42		20,369	35	7,129	13,240
206+90 to 233+30	2640'	10'	21"	4.42	8.00	12.42		32,789	30	9,837	22,952
								$264,600		$145,925	$118,675
Engineering & Contingency @ 20%								52,920		29,185	23,735
								$317,520		$175,110	$142,410

PLANS
REPORTS
SPECIFICATIONS

CIVIL
SANITARY
HYDRAULIC

FRANK E. ALDERMAN
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ROOM 203 RIALTO THEATRE BLDG.
OXLEY AT FAIR OAKS
SOUTH PASADENA, CALIF.
TELEPHONE PY. 1-2425

November 30, 1950

The Honorable Mayor and
City Council
City of Brea
City Hall
Brea, Calif.

Gentlemen:

Transmitted herewith are 7 copies of my "Report upon the Sewage Treatment Plant of the City of Brea, California", dated November 28, 1950.

The City is to be commended for its foresight in obtaining the data necessary to anticipate the need for expansion of the treatment plant instead of, as too often happens, waiting until badly overloaded conditions and their resultant nuisance actually exist. I trust that the information presented in the report will enable the City to pursue the most economical course in the solution of its sewage disposal problem.

I appreciate the opportunity of working with the City officials in the preparation of this report and wish to express my gratitude for the fine cooperation received from all concerned.

Very truly yours,

Frank E. Alderman

FEA:ab

REPORT

UPON THE

SEWAGE TREATMENT PLANT

OF THE

CITY OF BREA, CALIFORNIA

NOVEMBER 28, 1950.

CITY COUNCIL:

CHARLES O. MC CART, MAYOR
H. H. JONES
R.W. MONROE
TORRANCE E. WEAVER
FRANK J. SCHWEITZER, JR.

RALPH S. MC LEAN, CITY ENGINEER

A.W. STUDEBAKER, STREET & WATER SUPT.

MRS. CONSTANCE YOUNG, CITY CLERK

HAROLD A. MC CABE, CITY ATTORNEY

PREPARED BY

FRANK E. ALDERMAN, CONSULTING ENGINEER

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RECOMMENDATIONS

The following is a brief summary of the recommendations which are set forth in the report. Section IV includes an estimate of the cost of constructing additions to the plant to provide for a population of approximately 7,000, and also an estimate of the cost of adding a first step to improve plant operation.

1. That the existing vitrified clay pipe across the trestle be replaced with a suitably protected corrugated metal pipe.

2. That the vegetation now growing in the creek be cleared out in the vicinity of the plant and that suitable vegetation be planted along the bank as protective measures against flood damage.

3. That periodic testing be carried on to insure a good plant effluent and to detect any significant changes.

4. That plans be prepared for plant expansion to provide for a population of 7,000 or its equivalent in domestic plus industrial load, and that the design of the plant be as outlined in Section III.

5. That, when the domestic and industrial waste requirements reach a point where additional plant capacity is required, Unit 1 be constructed. The estimated cost of Unit 1 is $130,085. including engineering and contingencies.

6. If necessary, due to financial reasons, to construct Unit 1 in two stages, that Step 1 as outlined in Section IV be constructed first, to be followed by the balance of Unit 1 when possible.

INTRODUCTION

PURPOSE OF THE REPORT

The purpose of this report is to present data regarding the existing sewage treatment plant of the City of Brea and to present recommendations for the future improvement and expansion of the plant. Plant expansion should be carried out in such a way that the further enlargement of the plant beyond the initial expansion will be possible without unnecessary expense, and it is the purpose of this report to recommend the means whereby this can be accomplished. It is also the purpose of this report to present preliminary estimates of cost of the work proposed.

SCOPE OF THE REPORT

It is within the scope of this report to present information regarding the treatment of sewage by the municipal sewage treatment plant.

It is not within the scope of this report to compare the relative merits of individual plant disposal vs. county-wide collection and ocean disposal, but rather to present the necessary information regarding the treatment plant upon which such a decision can be based.

SECTION I

THE EXISTING PLANT

LOCATION

The Brea Sewage Treatment Plant is located in the extreme westerly portion of the City of Brea on the northwesterly bank of the creek which drains La Brea Canyon and is approximately 2000 feet south of Imperial Highway, at "1" on Plate 1.

SURROUNDING AREA

On the north and west the plant is bounded by orange groves, on the south by the drainage channel of La Brea Canyon and on the east by the City dump. Beyond the creek on the east and south the bank rises abruptly approximately 40 feet.

EFFLUENT DISPOSAL

The effluent from the plant is discharged into La Brea Canyon, a normally dry creek. At a point approximately 1500 feet downstream (designated "2" on Plate 1) the flow has been dammed with an earth and timber dam to create a pond about 5 feet deep. The plant effluent is being pumped from this pond during the irrigating season and is used for the irrigation of an orange grove on the south bank of the stream. It appears that very little if any of the dry weather flow passes on the surface beyond this point. Approximately 2.5 miles below the plant is the Fullerton Dam, a flood control structure designated "4" on Plate 1. According to the records of the State Division of Water Resources, the nearest well below the plant is located at a point designated as "3" on Plate 1. It is approximately 1.5 miles below the plant and 750 feet from the stream bed.

TYPE OF PLANT

The existing plant consists of an Imhoff tank, dosing siphon, trickling filter, secondary tank, chlorinator, and sludge drying beds. (Plate 2)

The Imhoff tank is circular, having a diameter of 36 feet. The flow-through chamber has a volume of 30,800 gallons to a depth of 8 feet. Based upon an average flow during a maximum 4-hour period of 100 gallons per day per capita, the flow-through chamber has a population capacity of 3,700 persons.

The digestion chamber of the Imhoff tank has a volume of 10,540 cubic feet, disregarding that portion less than 18" below the slots. If all the solids leaving the filter were being returned to the

digester, it should have a capacity of approximately 4.5 cubic feet per capita. Since it is doubtful that all the solids are being returned (see "final settling" hereinafter discussed), we can assume it has a capacity of approximately 3.5 cubic feet per capita, or a population capacity of 3,000 persons. This is, however, subject to the influence of several factors including temperature, and of most importance is the fact that no difficulty is being experienced with digestion at present.

The filter is 64 feet wide, 110 feet long, and 5.8 feet deep. Assuming 0.15 lbs. of B.O.D. per capita per day, 35% B.O.D. removal in the Imhoff tank, and a dosing rate of 0.27 lbs. per cubic yard of rock per day, the filter has a population capacity of 4,200 persons. The effluent channel of the filter is at such an elevation that the lower ends of the underdrains are submerged, thus reducing the air circulation to the filter. Otherwise, its operation is satisfactory.

The final settling tank is a rectangular chamber with the bottom sloping toward the central portion. It has a volume of 14,850 cubic feet below the water line and a retention period at present flow conditions of approximately 1 hour during a maximum 4-hour period. Sludge is removed once each day when water is pumped from the lower part of the tank to wash down in the Imhoff tank. While the retention period of the secondary tank is relatively short, and the provisions for sludge removal is inadequate the suspended solids in the effluent were only 28 parts per million, a reduction of 4 p.p.m. in the final tank, although no sludge had been pumped for over 24 hours. It is likely, however, that during certain periods when the filter is sloughing solids, the secondary tank and its sludge removal are inadequate.

The chlorinator is the type which feeds gas directly into the plant effluent. Mr. Ted Finster of the Orange County Health Department has expressed the opinion that at times much of the gas has escaped, leaving the effluent under-chlorinated. While this was not observed during our tests, the chlorinator is quite old and might at times give trouble. Since there is no fresh water supply at the plant, a solution feed chlorinator would need to be equipped with a pump to supply plant effluent under pressure to the chlorinator.

The three sludge drying beds have a total area of approximately 5,200 square feet, which should be more than adequate for the present population.

Trestle crossing creek. The trunk sewer to the plant is 18" vitrified clay pipe, and the portion which is supported on a trestle over

the creek is leaking at the cement joints. This portion of the sewer should be replaced to avoid contamination of the creek.

Flood protection. The creek which borders the plant is badly congested with vegetation. In order to avoid the possibility of flood water being backed up over the plant site it is recommended that this growth be cleared periodically. The planting of trees along the bank would be advisable to help stabilize the soil and avoid erosion of the site.

SUMMARY OF CAPACITY

The plant is now operating at approximately its capacity and is turning out a very good effluent, as is shown in Section II. Secondary settling and digester capacity are the weakest units, but they are still operating satisfactorily. Odors are quite evident in the immediate vicinity of the Imhoff tank, a characteristic of that type of treatment.

There are now approximately 128 houses under construction in Brea, and within the next year at least 50 more are scheduled for construction. This will add a population of about 625 persons. The population will therefore almost certainly exceed 3,840 within the next year, and such growth can be expected to overload the treatment plant.

In addition to the population increases known to be imminent, there have been in the past, and undoubtedly will be in the future, requests from industries to dispose of their wastes through the plant. If suitable financial arrangements can be made it may be advantageous, both to the City and to industries located therein to provide for their wastes.

SECTION II

VOLUME AND CHARACTER OF SEWAGE AND EFFLUENT

PRESENT VOLUME

Plates 3, 4, and 5 show the rates of sewage flow on Friday, Saturday and Monday, August 4, 5, and 7, 1950, from data furnished by Ralph S. McLean, City Engineer. Plate 3 also shows flows for brief periods on later dates from observations by the writer.

The peak flow of 400 g.p.m. occurring on August 4, 5, and 7 was not observed on August 24. Investigation of this revealed that the Hart's Fruit Products Company had, on the earlier dates, been operating with two shifts, the clean-up crew starting at 3 A.M. to get ready for the first shift at 8 A.M. Washing operations carried on by the clean-up crews accounted for the peak flows reaching the plant at 4:30 A.M. and 8:30 A.M. Prior to August 24 this procedure had been changed and the clean-up crew started at 6 P.M., with only one shift working.

From the area under the flow curves, the total volume of sewage passing through the plant on each of the three days was:

August 4, 1950,	212,000 gallons
August 5, 1950,	211,000 gallons
August 7, 1950,	212,000 gallons.

The following data is calculated from the flow rate curves, using the 1950 Census population of 3,215:

Total flow during maximum 4-hour period,	57,400 gal.
Average flow " " " "	239 g.p.m.
Average daily flow per capita,	66 gal.
Average daily flow,	147 g.p.m.
Ratio of Peak flow to average flow	2.7
Ratio of maximum 4-hr. average flow to 24-hr. average	1.6

CHARACTER OF SEWAGE AND EFFLUENT

Table I shows the results of tests of raw sewage and at various stages of treatment. The grab samples taken at various times indicate that the plant is operating satisfactorily and is not overloaded in any important way. Grab samples were taken to coincide with and follow the peak flows to determine what effect industrial loadings might have on the plant. Sewage strength during those periods was quite normal, and it is believed that no sig-

nificant industrial load, other than volume of flow was being placed on the plant.

Using the composited value for B.O.D. of 258 reported in the Orange County Sewerage Survey, the per capita B.O.D. load would be:

$$0.212 \times 8.3 \times 258/3215 = 0.14 \text{ lbs. B.O.D./cap./day.}$$

This agrees very closely with the value of 0.15 recommended by the State Health Department for use in plant design.

The test results verify the fact that the plant is not overloaded and is performing satisfactorily at the present loadings. Testing should be continued periodically to insure a satisfactory effluent in the future.

CHEMICAL ANALYSIS OF EFFLUENT

Table II shows the chemical analysis of the filter effluent, taken at 8:30 A.M. August 24, 1950. For the purpose of evaluating this as an irrigation water the Sodium ratio and electrical conductivity have been plotted upon a diagram taken from Circular 784 of the United States Department of Agriculture. (Plate 6).

The sodium ratio (percent) is calculated as follows:

Ca 36/20 =	1.8	HCO_3 244/61 =	4.0
Mg. 2.4/12.2 =	0.2	SO_4 231.3/48 =	4.8
Na 248.4/23 =	10.8	Cl 141/35.5 =	4.0
	12.8		12.8

$$100 \times \frac{10.8}{12.8} = 84.4\%$$

Plate 6 shows the plant effluent values of 84.4% Sodium and 1,400 total concentration as electrical conductivity plotted on the Department of Agriculture chart.

Also plotted thereon are similar values for treated Colorado River water as reported by the Metropolitan Water District of Southern California in its report of 1950.

Ca. 31/20 =	1.6	CO_3 11/30 =	0.4
Mg. 12/12.2 =	1.0	HCO_3 111/61 =	1.8
Na. 187/23 =	8.1	SO_4 296/48 =	6.2
K. 3/39.1 =	0.1	Cl 84/35.5 =	2.4
	10.8	NO_3 .1/62 =	0
			10.8

$$100 \times \frac{8.1}{10.8} = 75.0\% \qquad EC \times 10^6 = 1100$$

While the results of this test indicate that the effluent is not an ideal water for the irrigation of citrus, the long record of its successful use on an orange grove is evidence that under the existing conditions it is evidently not harmful. The amount of other water, including rain, applied to the grove, the type of soil and the drainage of the soil are other important factors influencing its suitability for irrigation use.

The amount of Boron appearing in the sample tested was 0.9 p.p.m. which places it in "Good" irrigation water classification for semi-tolerant crops and "Permissible" for sensitive crops, according to the aforementioned U.S.D.A. Circular 784. Boron is the characteristic element in borax, boric acid and similar compounds, the use of which is no doubt responsible for the Boron content of the sewage. Their use in Brea should be held to a minimum.

The fact that the effluent from the plant has been used successfully for many years to irrigate an orange grove seems evidence enough that it is not a serious threat of ground water pollution, as long as no major change occurs in its chemical content. Normal treatment processes do not remove dissolved chemicals, and only by controlling their entry into the sewers can they be kept within permissible limits. Cities having treatment plants which discharge their effluent to streams must assume the responsibility of regulating industries and barring the discharge of harmful substances to the sewers. This can best be accomplished by a two-fold program of regulation of industrial wastes and periodic testing of sewage and plant effluent.

SECTION III

PLANT IMPROVEMENT AND EXPANSION

DESIGN CONSIDERATIONS

In designing improvements to the present plant consideration must be given to the possibility of enlarging to meet the needs of several times the present population. If doubling the plant capacity were sufficient, the problem would be simple. On the contrary, provision must be made for doubling the present capacity, using the existing plant to the fullest possible extent, and the design must be such that further expansion to four or more times the present capacity is possible with a minimum of reconstruction.

THE PROPOSED PLANT

Plate 7 shows the proposed plant (Unit 1) to serve a population of approximately 7,000, and Plate 8 shows the proposed method of expanding the plant to serve 17,000 persons. Computations for the sizes of components required in Unit 1 are shown on Plates 9 and 9 A.

Digester. It is recommended that the digester be unheated until a population of approximately 5,000 is reached, and that heating be added at that time. Use of a floating cover with gas storage is anticipated.

Clarifiers. As shown in the computations on Plate 9 the clarifiers should each be 35' diameter by 8.5' deep.

Filter. The filter computations shown on Plate 9 show the need of a standard rate filter 75' diameter by 6' deep.

Chlorinator. In order to provide ready access to the chlorinator room with 1-ton cylinders, it is proposed that the chlorinator be located in the control house. The economy of using 1-ton cylinders instead of 150-pound cylinders is computed as follows:

Chlorine cost in 150-lb. cyls. $ 0.125 per lb.

Chlorine cost in 1-ton cyls.

1-ton Cl.	$ 103.00
Delivery	21.20
Return empty	4.50
Cyl. rent 3rd month	5.00
	133.70/2000 = 0.067

Saving per lb. in ton cyls. = $ 0.058/lb.

Present rate of use is 16 lb./day
Assume an average rate of 20 lb./day over a period of 15 years.
20 x .058 = $ 1.16 per day saving, or
1.16 x 365 = 423.00 per year.
At an interest rate of 2% the expenditure which would be justified at this time to save this annual cost is
12.849 x 423 = $5,440.

The estimated cost of providing for handling 1-ton Chlorine cylinders is as follows:

Handling equipment and scales	$ 1000.
300 ft. hose in 4" duct @ 2.50	750.
300 ft. water supply line @ 1.00	300.
Additional building 80 sq. ft. @ 12.	960.
	$ 3010.

Since the saving is nearly twice the estimated cost of providing for the handling of 1-ton cylinders, the provision for them is recommended.

A new solution feed chlorinator with a water pump should be provided, having a capacity of 50 lbs. of chlorine per day.

Sludge Beds. The computations shown on Plate 9 A indicate that when the plant loading reaches a capacity of 7,000 population, sludge bed area should be approximately twice the present area. Plate 7 indicates the proposed location for these beds.

Pump Pit No. 1. Pump Pit No. 1 is required to raise the Primary Clarifier effluent approximately 3 feet and proportion it between the existing and new dosing siphons.

Pumps should be alternated automatically, and when the flow increases to over 500 g.p.m. both pumps will work at the same time. An overflow by-pass to both of the filters should be provided in case of a power failure.

Pump Pit No. 2. Pump Pit No. 2 is needed to raise the filter effluent to the Secondary Clarifier. If this were not done, the underdrains of the existing filter would continue to be submerged, the water surface in the secondary filter would be approximately 8 feet below the ground surface, and the new filter would need to be shallower than 6 feet. The additional cost of the secondary clarifier and filter construction is approximately equal to the cost of the pump pit with pumps and the capitalized operating cost of pumping. Other advantages of having the secondary clarifier at the higher elevation include lower pump lift for sludge return, and

a positive head to discharge effluent during floods.

The size of pit and pumps should be the same as for Pump Pit No. 1, but provision should be made for dividing the two halves of the pit when the plant is enlarged, since it is contemplated that the pit will be used for recirculating pumps at that time. An over-flow by-pass should be provided so that in case of a power failure the effluent will flow to the chlorination chamber.

Chlorine Contact Tank. It is proposed that new inlet and outlet pipes be installed and baffles be constructed in the existing final settling tank and that it be used for a chlorine contact tank.

FUTURE EXPANSION

It is proposed that after the capacity of the first unit has been exceeded, (at about 7,000 population or equivalent domestic plus industrial load), the plant be converted to a bio-filtration type treatment with high rate filters, as shown on Plate 8. At that time the existing fixed nozzle filter would be abandoned, the circular filter would be converted to a high rate filter by removing three feet of rock, Pump Pit No. 1 and both dosing siphons would be abandoned, Pump Pit No. 2 would be converted to a recirculation pump pit, new primary and secondary clarifiers, a new digester and a new high rate filter would be built, and the sludge beds would be relocated and additional beds built.

The computations on Plate 10 are for a plant having a capacity equivalent to 17,000 population. A recirculation rate of 1 to 1 is used.

If, when it becomes necessary to increase the capacity of Unit 1, it is desirable to increase the capacity to approximately 11,000 population, it could be accomplished without a new filter, by removing only two feet of rock from Unit 1 filter and converting to a single stage bio-filtration plant. This would save the cost of a new filter until the population exceeds 11,000.

SECTION IV

ESTIMATE OF COST -- UNIT 1

The following is the total preliminary estimate of cost of constructing Unit 1 for a loading equivalent to 7,000 population.

SCREENING UNIT

Concrete	$ 250.	
1 Bar Screen	50.	
1 Comminutor	4165.	
Installation	200.	$ 4665.

PARSHALL FLUME & RECORDER

Concrete	125.	
Recorder	800.	
Installation	50.	975.

PRIMARY CLARIFIER 35' ø x 8.5' S.W.D.

90 cu. yds. concrete @ 70.	6300.	
425 cu. yds. excavation @ 2.50	1065.	
Clarifier mechanism, installed	5730.	
Misc. pipe and equipment	300.	13395.

SECONDARY CLARIFIER

90 cu. yds. concrete @ 70.	6300.	
400 cu. yds. excavation @ 2.50	1000.	
Clarifier mechanism, installed	5600.	
Misc. pipe and equipment	300.	13200.

CONVERT IMHOFF TANK TO DIGESTER

69 cu. yds. removal of misc. concrete @ $15.	1035.	
1 L.S. remove misc. piping	100.	
1 L.S. close openings through walls	150.	
12 ea. build concrete corbels @ 10.	120.	
1 L.S. wall openings for new piping	150.	
2 cu. yds. conc. feed box & overflow @ 150.	300.	
1 L.S. Floating cover	10000.	
1 L.S. Gas equipment	850.	
Install equipment	600.	
Misc. piping	500.	13805.

FILTER 75' ϕ x 6' Deep

1675 cu. yds. excavation @ 2.	$ 3350.	
175 cu. yds. concrete @ 70.	12250.	
985 cu. yds. filter rock @ 6.	5910.	
4500 sq. ft. underdrains @ 1.10	4950.	
1 L.S. misc. piping	200.	
1 L.S. Distributor, installed	2260.	$ 28920.

CONTROL HOUSE

400 sq. ft. building @ 12.	4800.	
1 L.S. Chlorinator with scales & pump	2800.	
Chlorine cylinder handling equipment	500.	
300' Chlorine hose in 4" duct @ 2.50	750.	
2 Sludge pumps	2200.	
Misc. piping	1000.	
Install equipment	300.	
Electric work, incl. outside wiring & lighting	5000.	17350.

PUMP PIT NO. 1 and DOSING TANK

34 cu. yds. concrete @ 70.	2380.	
1 8" siphon	120.	
2 500 g.p.m. pumps	2150.	
Misc. piping	600.	5250.

PUMP PIT NO. 2

10 cu. yds. concrete @ 70.	700.	
2 500 g.p.m. pumps	2150.	
Misc. piping	400.	3250.

ALTER EXISTING FILTER OUTLET TRENCH

7 cu. yds. remove concrete @ 30.	210.	
10 cu. yds. replace concrete @ 30.	300.	
1 L.S. reconstruct outlet pipe	100.	610.
		3800.
YARD PIPING		1000.
SLUDGE BEDS		2000.
FENCE		2500.
GRADING & LANDSCAPING		

REPLACE SEWER ACROSS TRESTLE

294' 12 ga. 18" asbestos bonded, paved invert, corrugated, galvanized pipe @ 4.76	$ 1400.	
12 couplings @ 8.65	105.	
Sales Tax	45.	
Cartage	100.	
Misc. material	25.	
Equipment	200.	
Labor 8 men, 8 hrs. @ 3.00	190.	
Profit & overhead	300.	$ 2365.
Total -- Unit 1		113085.
Engineering & Contingencies 15%		17000.
		$ 130085.

MAINTENANCE AND OPERATION -- UNIT 1

The estimated cost of maintenance and operation of the plant is as follows:

Electricity for pumping	$100. per year
Electricity for misc. motors	200. " "
Labor	1800. " "
Misc. repairs & replacements	100. " "
Total	$ 2200. per year

If it becomes advisable to perform a portion of the work as a first step, and then to follow later with the remainder, the following could be constructed without materially duplicating the construction.

STEP 1 UNIT 1

Secondary Clarifier	$ 13200.
Control House	17350.
Pump Pit No. 2	3250.
Alter existing filter outlet trench	610.
Replace Sewer across Trestle	2365.
	36775.
Contingencies	3680.
	40455.
Engineering*	8500.
	$ 48955.

*Engineering design is included for the entire plant, since it would be advisable to complete the design to be sure all units

will operate together properly.

This construction would increase the capacity of the plant only slightly, but it would improve the chlorination and final settling, and to some extent the aeration of the filter. With these changes the plant might serve for several years before the other additions become necessary.

Frank E. Alderman

TABLE I

BREA TREATMENT PLANT

LABORATORY TEST RESULTS

(All tests are from Smith-Emery Reports, Exhibits 1 A - D incl., except as noted.)

	5-day B.O.D. p.p.m.	Suspended Solids p.p.m.	Settleable Solids ml./liter	Chlorine Demand p.p.m.	Dis. Oxygen p.p.m.	P H
Raw Sewage						
8:25 A.M. 8/25/50	99					
9:30 A.M. "	191		5.0			7.8
9:55 A.M. 9/22/50	356	250				
8:20 A.M. 8/24/50			4.0			7.8
See footnote	258	257	7.0	6.0		7.7
Effluent from Imhoff						
8:30 A.M. 8/25/50	71					
9:55 A.M. 9/22/50	180	102				
8:20 A.M. 8/24/50			0.7	24	0	7.5
9:30 A.M. 8/25/50			0.3	23	0	7.4
Effluent from Filter						
8:35 A.M. 8/25/50	10.9					
10:00 A.M. 9/22/50	18	32				
8:40 A.M. 8/24/50			0.2	8	4.0	7.4
9:30 A.M. 8/25/50			0.1	8	4.0	7.2
Discharge to Creek						
10:10 A.M. 9/22/50		28				
8:40 A.M. 8/24/50				Residual	4.0	
9:30 A.M. 8/25/50				Residual	4.0	
See footnote	41	43	0.9			

Footnote: From page 118 of Orange County Sewerage Survey of July 1, 1947. Composited for 24-hour period on December 19 and 20, 1946.

FORM 3

LABORATORY REPORT

SMITH-EMERY COMPANY

CHEMISTS - ENGINEERS
920 SANTEE STREET
LOS ANGELES 15

LABORATORY No. 325990

Date September 5, 1950

Sample WATER Marked Sewage "Effluent" "from Filter, August 24th.1950 8:30 AM"

Received 8-21-50

Submitted by City of Brea,
c/o Frank E. Alderman,
Rialto Theater Building,
Oxley at Fair Oaks.,
South Pasadena, California.

ANALYSIS

ANALYSIS OF DISSOLVED SOLIDS	PARTS PER MILLION	HYPOTHETICAL COMBINATIONS	PARTS PER MILLION
Silica (SiO_2)	16.0	Silica SiO_2	16.0
Aluminum Oxide (Al_2O_3)	Trace	Aluminum Oxide Al_2O_3	Trace
Iron Oxide (Fe_2O_3)	0.2	Iron Oxide Fe_2O_3	0.2
Calcium (Ca)	36.0	Calcium Bicarbonate $Ca(HCO_3)_2$	145.8
Magnesium (Mg)	2.4	Calcium Sulphate $CaSO_4$	None
Sodium (Na)	248.4	Calcium Chloride $CaCl_2$	None
Sulphate (SO_4)	231.3	Magnesium Bicarbonate $Mg(HCO_3)_2$	14.6
Chlorine (Cl)	141.0	Magnesium Sulphate $MgSO_4$	None
Carbonate (CO_3)	None	Magnesium Chloride $MgCl_2$	None
Bicarbonate (HCO_3)	244.0	✓Sodium Bicarbonate $NaHCO_3$	168.0
		Sodium Carbonate Na_2CO_3	None
		× Sodium Sulphate Na_2SO_4	342.2
Total Solids	919.3	× Sodium Chloride $NaCl$	232.5
		Total Solids	919.3
Total Non-Volatile Solids	795.3	Total Hardness as $CaCO_3$	100.0

DETERMINATIONS

Carbon Dioxide (CO_2) uncombined in p.p.m.	5.0	Color	5
Hydrogen Sulphide (H_2S) in p.p.m as rec'd	Present	Odor	Organic
Specific Electrical Conductance ($K \times 10^{-5}$)	140.0	Taste	n.d.
Hydrogen Ion Concentration (pH)	6.2	Turbidity	5
Boron (B) in p.p.m.	0.9	Suspended Matter	Filtered

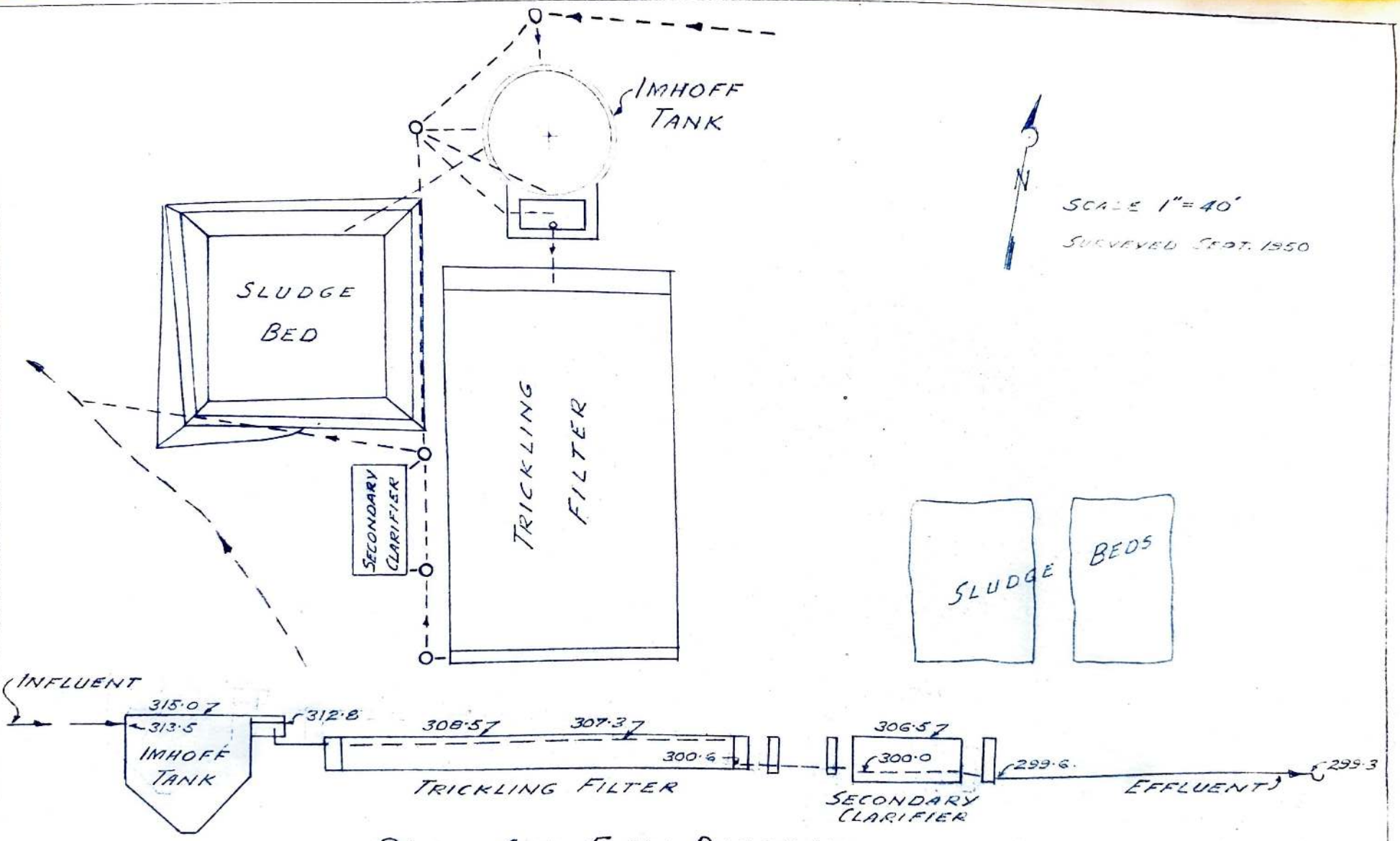
Total Nitrogen (N) ---------- 12.6 ppm

Respectfully submitted,

Chemists and Engineers.

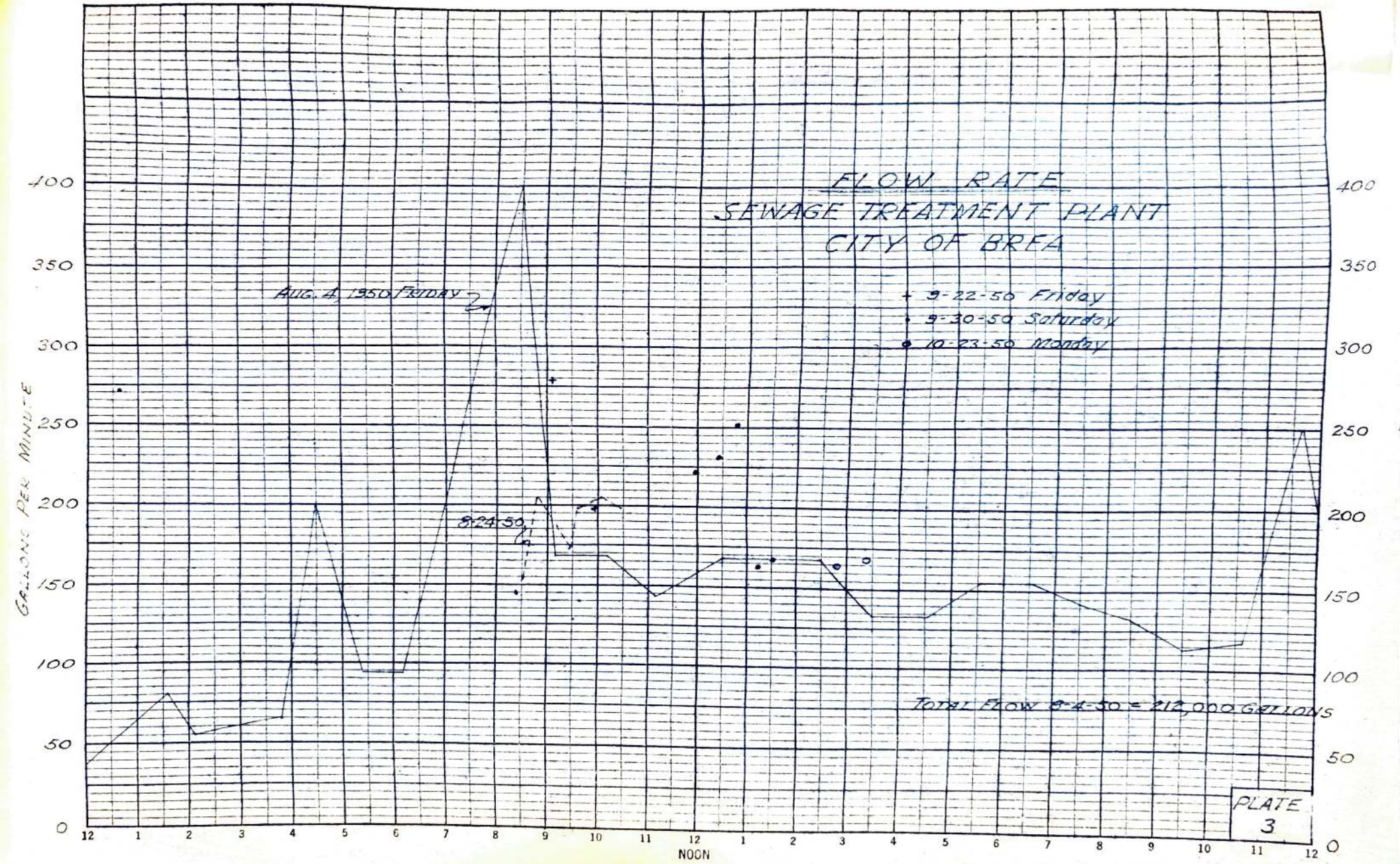
TABLE II

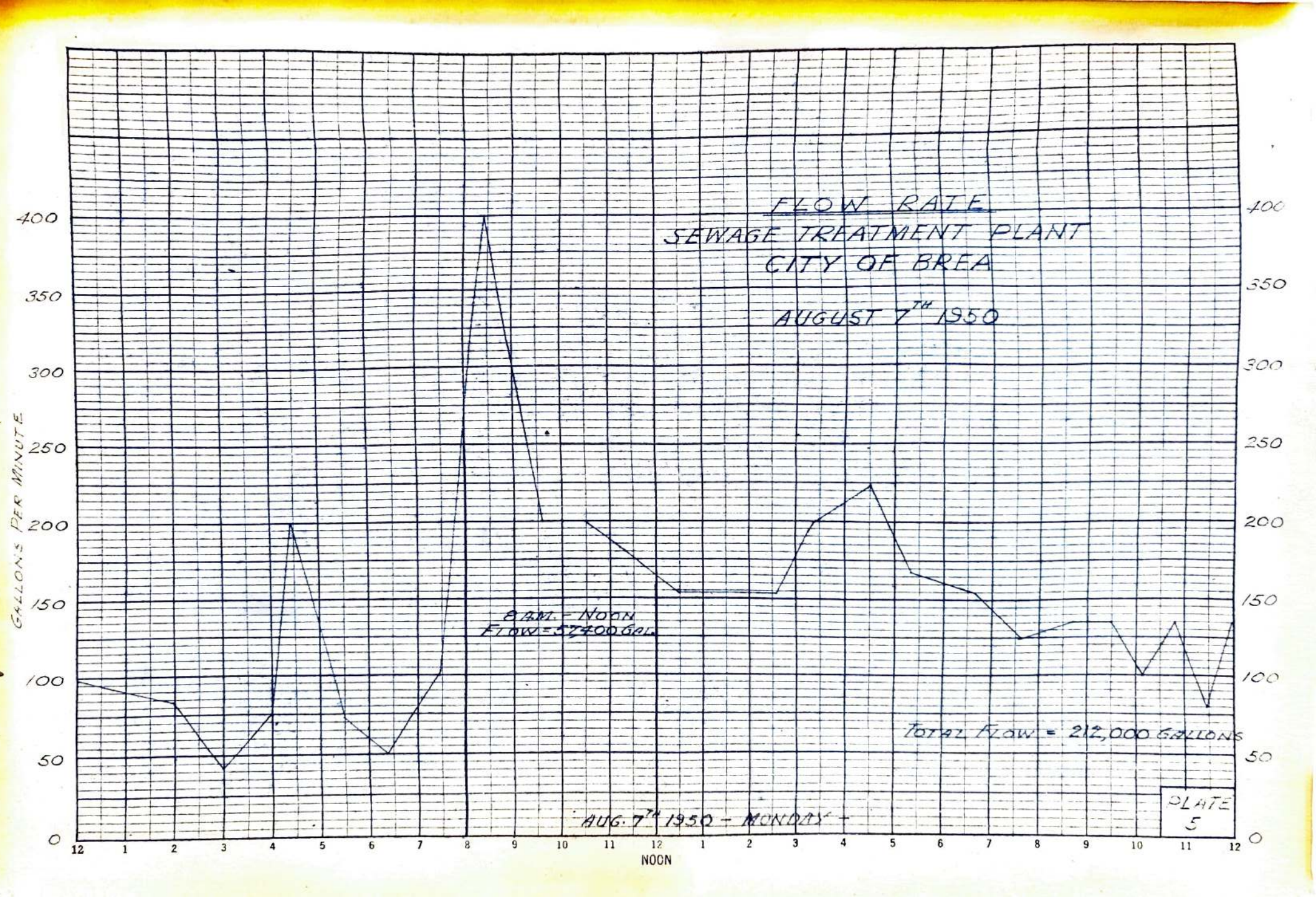

La Habra
BM 325
CENTRAL
UNION OIL
TANK FARM
PACIFIC
AVENUE
Brea Canyon
Brea
ELECTRIC
Olleo
Brea-Olinda
Union High Sch
BREA - OLINDA
SAN JUAN CAJON
CITY
Mejor Mining
DONAHUE
PARK CEM
ANA
DESERT
Mexican Sch
292
Easterbury
Ranch
ARMAVIR
FULLERTON
FULLERTON
PLATE
1.
1 MI.



PLAN AND FLOW DIAGRAM
EXISTING SEWAGE TREATMENT PLANT
BREA, CALIFORNIA.

PLATE 2


FLOW RATE
SEWAGE TREATMENT PLANT
CITY OF BREA
+ 9-22-50 Friday
• 9-30-50 Saturday
o 10-23-50 Monday
AUG. 4, 1950 FRIDAY
8-24-50
TOTAL FLOW 8-4-50 = 212,000 GALLONS
GALLONS PER MINUTE
0
50
100
150
200
250
300
350
400
12 1 2 3 4 5 6 7 8 9 10 11 12 NOON 1 2 3 4 5 6 7 8 9 10 11 12
PLATE 3


FLOW RATE
SEWAGE TREATMENT PLANT
CITY OF BREA
AUGUST 7TH 1950
GALLONS PER MINUTE
400
350
300
250
200
150
100
50
0
8 A.M. - NOON
FLOW = 57,400 Gal.
TOTAL FLOW = 212,000 GALLONS
AUG. 7TH 1950 - MONDAY -
12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
NOON
PLATE 5

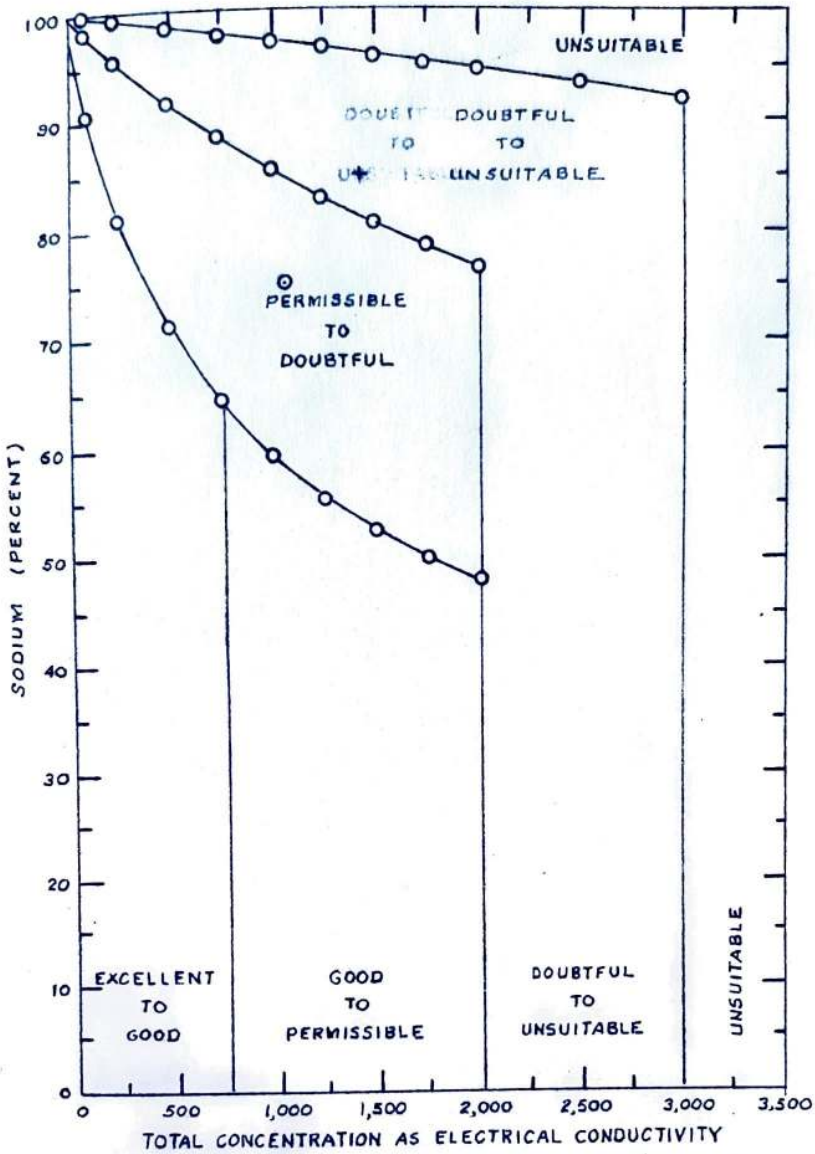
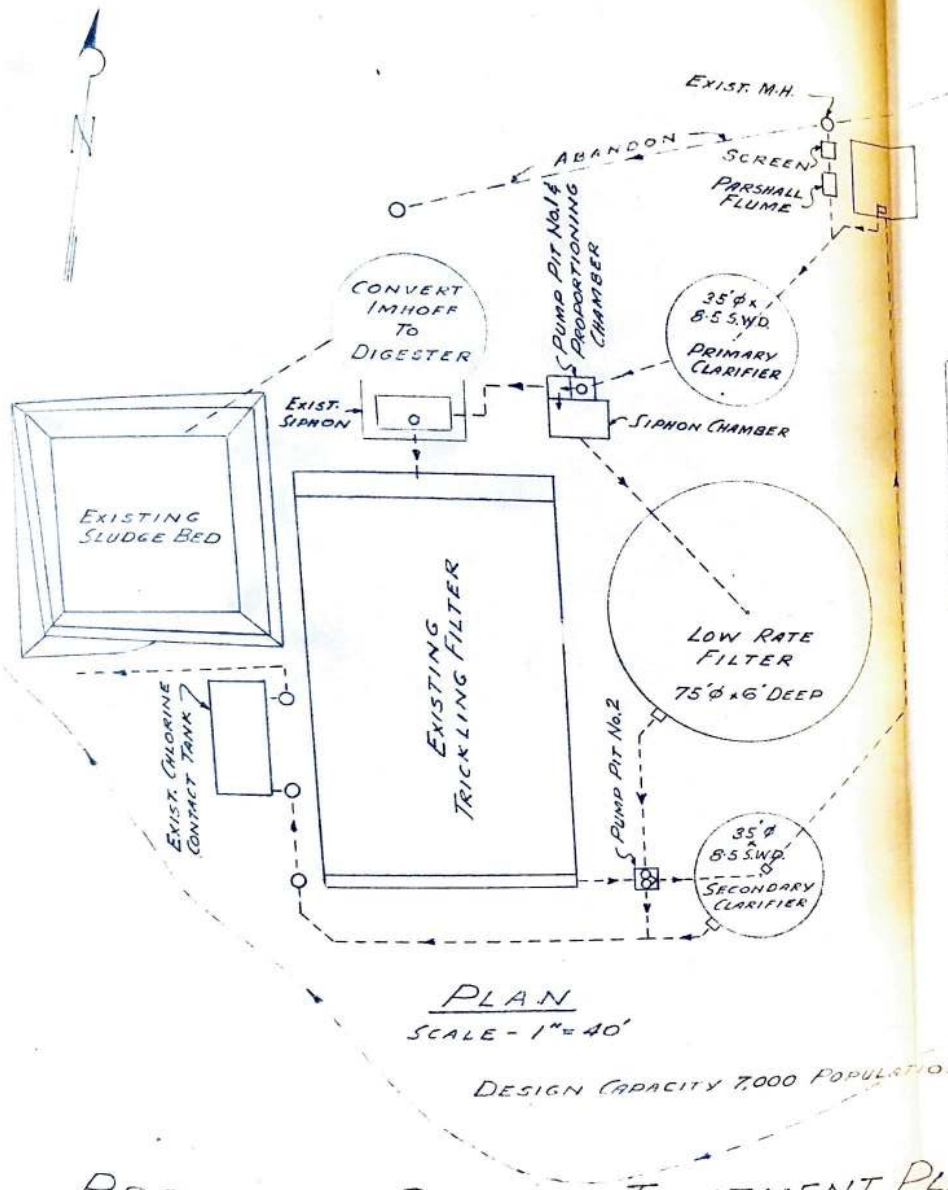


DIAGRAM FOR USE IN INTERPRETING THE ANALYSIS OF IRRIGATION WATER
CIRCULAR 784, U.S. DEPARTMENT OF AGRICULTURE.

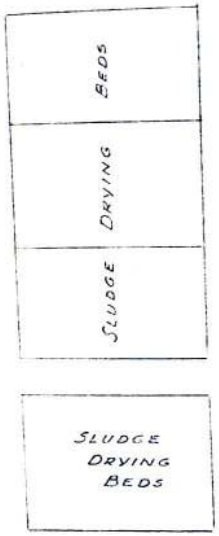
\+ BREA SEWAGE PLANT EFFLUENT
O SOFTENED METROPOLITAN WATER 1949-50

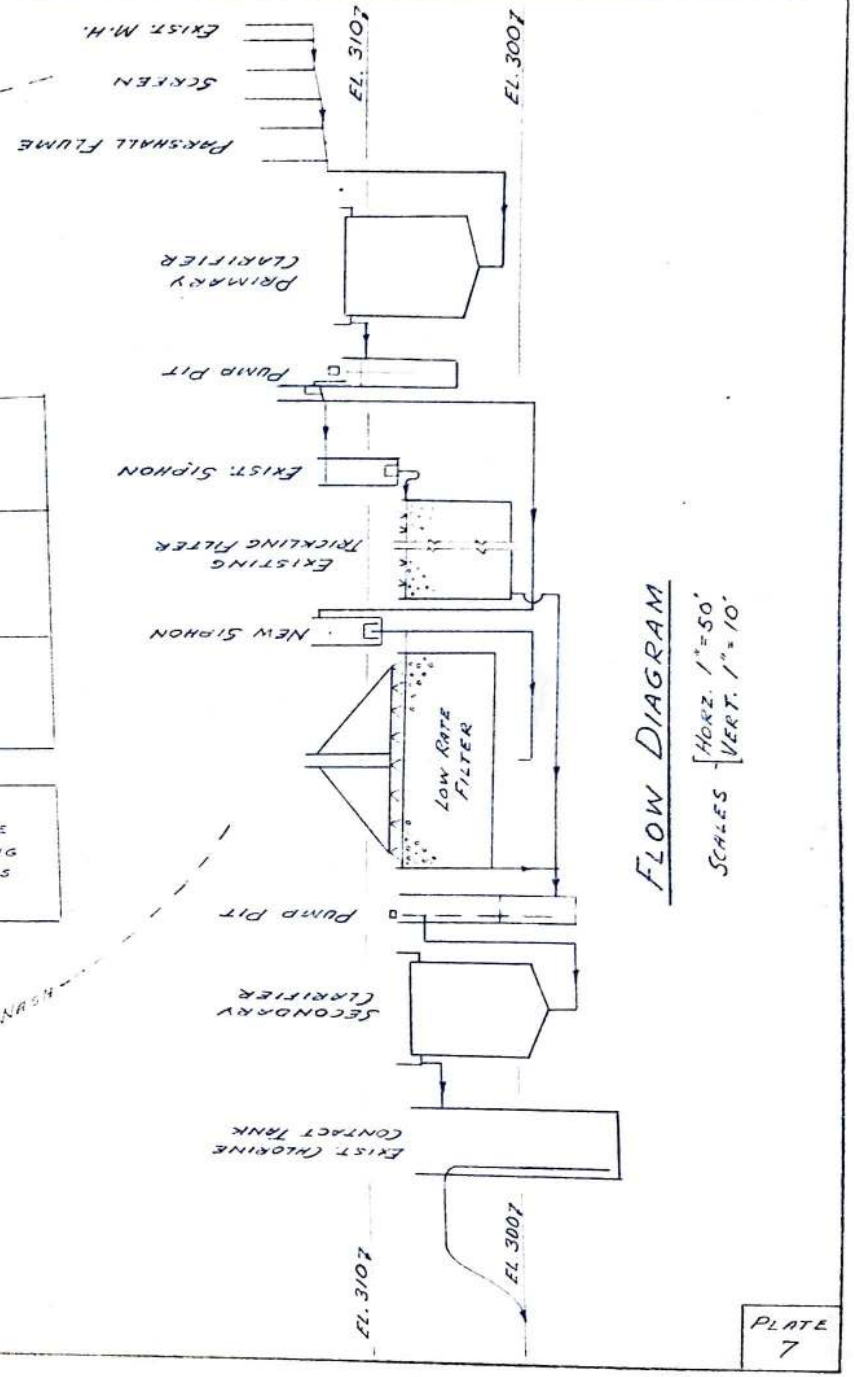
PLATE 6



PLAN

SCALE - 1"= 40'





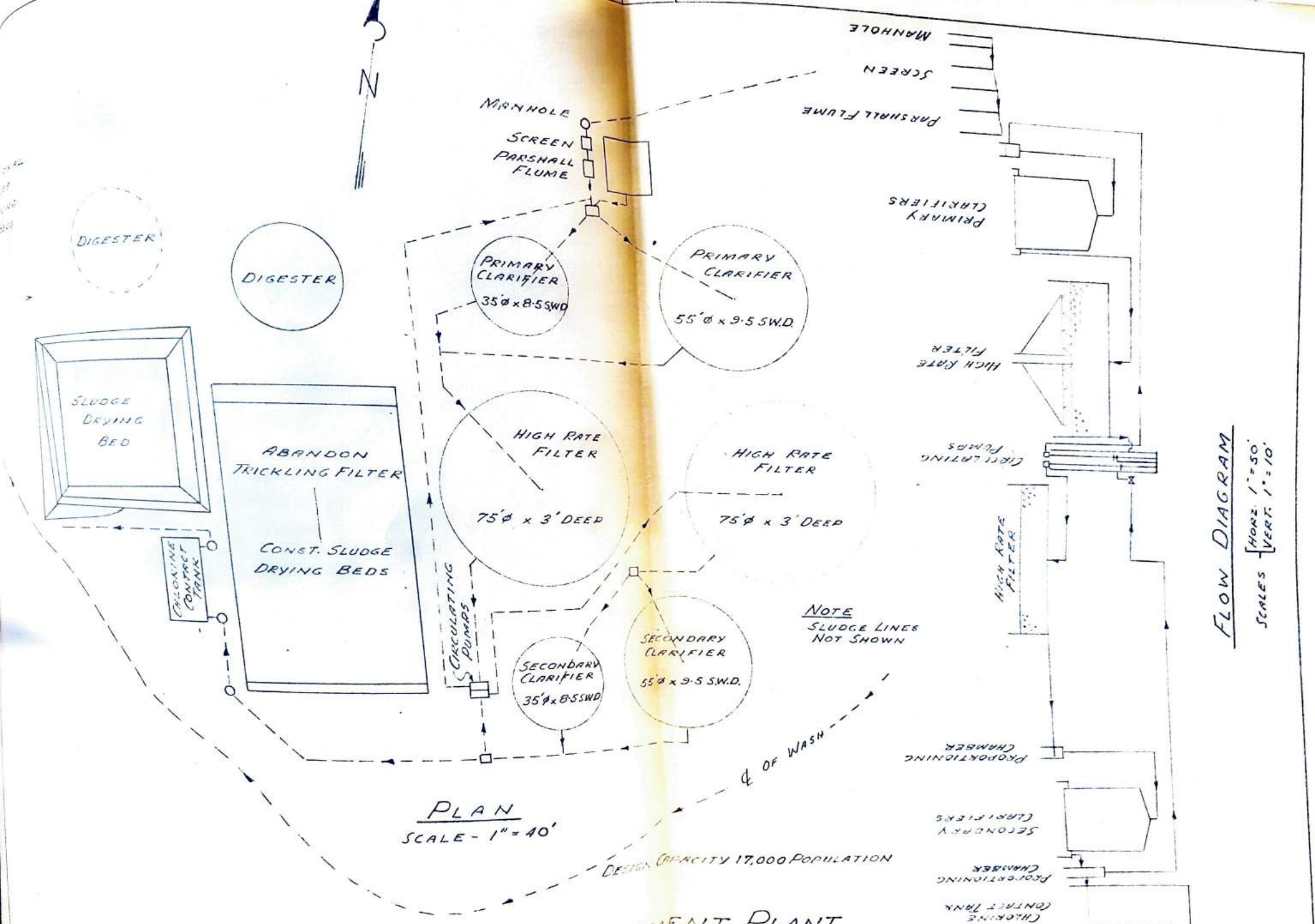
FLOW DIAGRAM

SCALES [HORZ. 1"=50'
VERT. 1"= 10'

PROPOSED SEWAGE TREATMENT PLANT

BREA, CALIFORNIA

PLATE 7



PLAN
SCALE - 1" = 40'

FLOW DIAGRAM
SCALES [HORZ. 1" = 50'
VERT. 1" = 10'

FUTURE SEWAGE TREATMENT PLANT
BREA, CALIFORNIA

PLATE 8

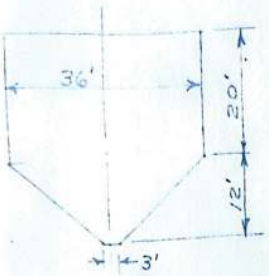
BREA SEWAGE TREATMENT PLANT

COMPUTATIONS - UNIT 1.

F.E.A. 11-16-50

DIGESTER (Converted from Imhoff Tank)

Size of tank = 36' ϕ × 20' SWD + 12' deep sloping bottom.



Vol. = $\pi \times 18^2 \times 17$ = 17300

$\pi (18^2 + 18 \times 3 + 3^2) \frac{12}{3}$ = 4860

22160 Cu. Ft.

Capacity Unheated:

22160 ÷ 4.5 = 4900 Persons

Capacity Heated:

22160 ÷ 3 = 7350 Persons

PRIMARY CLARIFIER

Flow during max. 4-Hr. period (from Plate 5) = 57,400 gal.

57400 × 6 ÷ 3215 = 107 g.c.d.

For 7000 population 7000 × 107 = 750,000 Gal./day

From design nomograph for 2-Hr. detention and overflow rate of 800 gal./sq.ft./day

Use 35' Diam. × 8.5' S.W.D.

SECONDARY CLARIFIER

Same dimensions as Primary Clarifier

FILTER

Allowing 0.15 lb B.O.D./capita/Day.

7000 × 0.15 = 1050 lbs. BOD./day.

Assuming 35% removal in primary clarifier

1050 × .65 = 683 lbs. to filters

Assuming a loading of 0.27 lb. B.O.D./cu.yd. of rock

Vol. filters req'd. = 683 ÷ .27 = 2530 cu. yds.

Vol. exist. filter = 64 × 110 × 5.8 ÷ 27 = 1510 " "

Vol. new filter req'd = 1020 " "

At 6' deep $27 \times 1020 = 6 \pi R^2$ $R = 38$ Use Diam = 75'

PUMP PIT NO. 1.

Present max. flow = 400 g.p.m. with 3215 pop.

Present min. flow = 50 " " " "

For 7000 pop. est. max. = $\frac{7000}{3215} \times 400 = 870$ g.p.m.

Use 2 - 500 g.p.m. pumps in 6' × 6' × 6' pit (5' variation water depth)

At pres. min flow pumping time = 6 × 6 × 5 × 7.5 ÷ (500 - 50) = 3 min.

" " " " filling " = 6 × 6 × 5 × 7.5 ÷ 50 = 27 "

At ult. max. flow pumping time = 1350 ÷ (1000 - 870) = 10.4 min.

" " " " filling " = 1350 ÷ (870 - 500) = 3.6 "

(for second pump - 1 pump running continuously).

PUMP PIT NO. 2.

Same dimensions and pump capacities as No. 1.

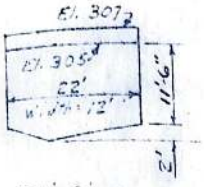
PLATE 9

BREA SEWAGE TREATMENT PLANT
COMPUTATIONS - UNIT I (CONTINUED)

13-A

11 Nov 50

CHLORINE CONTACT TANK



Existing
Sec. Settling Tank.

Cap. below elev 305 :

22 × 12 × 11.5 × 7.5 = 22,800 gal.

½ × 2 × 22 × 12 × 7.5 = 1,980

24,780 "

At pres. max. flow detention time =
24780 ÷ 400 = 62 minutes.

At max flow for 17,000 pop. det time =
$\frac{3215}{17000} \cdot 62 = 12-$ min.

Use existing Sec. Settling Tank with
Water Elev = 305.

SLUDGE DRYING BEDS

Area of existing beds :

50 × 50 = 2500

2 × 30 × 45 = 2700

5200 sq. ft.

At 1.5 sq. ft./cap. for 7000 pop. = 10500 sq. ft.

5200

Additional Area Req'd = 5300 sq. ft.

PLATE
9-A

BREA SEWAGE TREATMENT PLANT
COMPUTATIONS - FUTURE EXPANSION
For 17,000 Population.

C.E.A. 11-16-50

PRIMARY CLARIFIER

Max. 4 Hr rate 17,000 × 107 = 1820,000 gal/day.
Recirc 17,000 × 66 = 1120 000 " "
Total 2940 000 " "
Less cap of Unit ! Clar. @ 2-Hr Det. 750 000 " "
2,190,000 " "

From design nomograph
Use 55' diam × 9.5' SWD.

SECONDARY CLARIFIER

Use same size as primary clarifier

FILTER

Assume 0.15 lb. BOD. / cap./Day. 17,000 × 0.15 = 2550 lbs/day.
" Filter loading = 1.7 lbs BOD / cu.yd. and
35% removal in pri. clar.
B.O.D. to filters = 2550 × .65 = 1660 lbs/day. 1660 ÷ 1.7 = 975 c.y.
Vol. Unit 1 filter 3' deep = 3π × 37.5² ÷ 27 = 491 "
Use 75' Diam. × 3' deep both filters 485 "
Area each = 37.5² π ÷ 43560 = 0.101 Ac.
Application rate = 2.94 ÷ 0.101 = 29 MGD./Ac. O.K.

DIGESTER

Total Vol. Reqd. = 17000 × 3 = 51000 Cu.Ft.
Vol. 1st Unit. 22160 " "
Additional Req'd = 28840 " "
Use 40' diam.

SLUDGE DRYING BEDS

17,000 × 1.5 = 25500 Sq Ft.
Available in abandoned filter area 60×110 = 6600
Existing west sludge bed 60×60 = 3600 10200 " "
Additional Area Req'd. 15300 " "

PLATE 10

LABORATORY REPORT

FORM 1

SMITH-EMERY COMPANY

CHEMICAL ENGINEERS AND CHEMISTS
METALLURGICAL AND TESTING ENGINEERS
920 SANTEE STREET
LOS ANGELES 15

326950-3

Date September 28, 1950

Sewage
9-21-50

Marked

City of Brea,
c/o Frank E. Alderman
Rialto Theater Building,
South Pasadena, California.

REPORT OF DETERMINATIONS

	5 Day Biochemical Oxygen Demand	Suspended Solids
Sewage Influent to Imhoff, 9:55 AM 9-22-50" ------	356 ppm	250 ppm
ient from Imhoff, 9:55 AM 9-22-50" -----	180 ppm	102 ppm
ent from Filter, 10:00 AM 9-22-50" --------	18	32 ppm
uent from Secondary Settling Tank, 10:10 AM 9-22-50" -------		28 ppm

Respectfully submitted,

SMITH-EMERY COMPANY

CHEMISTS AND ENGINEERS

325990

	8-24-1950 Time	Dissolved Oxygen parts/million	8-25-1950 Time	Dissolved Oxygen parts/million
from tank -	8:20 AM	None	9:30 AM	None
from	8:20 AM	4.0	9:30 AM	4.0
to	8:40 AM	4.0	9:30 AM	4.0

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	Time	pH	Time	pH
to plant --	8:20 AM	7.8	9:30 AM	7.8
from tank ---	8:20 AM	7.5	9:30 AM	7.4
from filter ----	8:30 AM	7.4	9:30 AM	7.2

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ts of samples taken 8-24-50 and 8-25-50, after removing Settleable Solid

Location	Suspended Solids grams per 100 ml.
Influent to plant ----------	0.0085
Effluent from Imhoff tank ----------	0.0043
Effluent from Filter ----------	0.0022

-continued

EXHIBIT I-C

City of Brea 325990

-continued

Location & Date:	5 Day Biochemical Oxygen Demand, parts/million:
Influent to plant, Aug. 25, 1950, 8:25 AM	99
Influent to plant, Aug. 25, 1950, 9:30 AM	191
Effluent from Imhoff Tank, Aug. 25, 1950, 8:30 AM	71
Effluent from Filter, Aug. 25, 1950, 8:35 AM	10.9

For analysis of effluent from filter, see attached report.

Respectfully submitted,

CHEMISTS AND ENGINEERS:

EXHIBIT I-D

PROPOSED PARTICIPATION IN CONSTRUCTION
OF J. O. S. TRUNK SEWERS
BY
CITY OF BREA
CALIFORNIA

Total Construction Cost to City of Brea

Item	Est. Cost	City of Brea %	City of Brea Cost
Magnolia Trunk Sewer -	$ 2,538,078	6.56	$ 116,498
1960 & 1970 Euclid Trunk Modifications -	258,268		79,106
Purchase Rights in Euclid Trunk (1970) -			156,181
Allowance for future Expansions	503,259	15.46	77,804
Brea-Fullerton Trunk	461,600 +	60.81	280,840
TOTAL -			$ 760,429
Credit -			
Chap. 20 and Chap 47 Funds -	$26,439.32		
Less Sewage Pump Plant -	3,000.00		
	$23,439.32		$ 23,439.32
Net cost to City of Brea -			$ 736,989.68

Bonded Indebtedness - Legal Limit

Assessed valuation - $3,500,000 (Approx.)	
Legal limit = 15% of Assessed Valuation =	$ 525,000
Present Bonded Indebtedness = $ 95,500	
Reserve for Water, Etc. = 150,000	245,500
Available for Sewer Trunks -	$ 279,500

Proposed Deferred Expenditures

Euclid Trunk Modifications:	
1960 - (Approx.)	$ 64,000
1970 - "	15,000
Purchase of Rights in Euclid Trunk - 1970 -	156,181
	$ 235,181

Estimated Future Assessed Valuation

Estimated 1960 Assessed Valuation:
7600 @ $990/capita - $ 7,524,000

Estimated 1970 Assessed Valuation:
12,900 @ $990/capita - 12,771,000

Present Bond Requirements

Total Estimated Cost to Brea- (Net)		$ 736,989.68
Less:		
Deferred Expenditures -	$ 235,181	
Present Bonding Capacity -	279,500	- 514,681.00
		$ 222,308.68

Brea - Fullerton Trunk

Estimated Cost:		
Present bonds by Brea -	$	461,800 (Approx)
"		58,500 "
Present cost to Fullerton -	$	403,300 "
Fullerton - Cost req'd. by Design Flow -		180,960
" - Flow rights to be sold to Brea at later date -	$	223,340

Effect of Omission of Brea from Present Bond Election

Omission of Brea would not change size of pipe in Magnolia Trunk:
No change in cost.

Present estimated allowance for future expansions -	$	503,259
Cost to Brea of Magnolia Trunk -		166,498
	$	669,757

Allowance for Future Expansion -			$ 503,259.00
Fullerton's share =	37.73% =		189,879.62
Brea's share =	15.46% =		77,803.84
Omit Brea - then Fullerton's share becomes			
$37.73 \times \frac{100.00}{84.54} =$	44.63% =		$ 298,912.55
			189,879.62
			$ 109,032.93

Therefore, even if no part of Brea - Fullerton trunk is built, omission of Brea means a direct increase at present time in cost to Fullerton of $109,032.93. Assistance to Brea in amount of $223,340 (reimbursable in 10 or 20 years) means present construction of Brea - Fullerton trunk with direct benefit to Fullerton.

1. Brea Sewage Disposal by Sewage Treatment Plant discharging into La Brea Canyon creek. Plant constructed 1924. Population capacity 3700 persons.

2. City Brea aware for some years of fact that population approaching max. for which plant was designed. So stated at meeting called Mar. 11, 1946, Santa Ana, by State Board Public Health. For 4 years the City waited for progress on plans being discussed, first, for County, and later, for Sanitation Districts. Throughout the various proceedings City Brea ready to cooperate in such program.

3. Approx. a year ago, after 4 years which had shown little true progress toward completion of Sanitation District program, it became clear that Brea must proceed to enlarge plant.

   a. At that time was little agreement on ocean outfall and treatment works.

   b. J.O.S. Magnolia-Cannery trunk was under discussion but amounts required of Brea to get connection to J.O.S., assuming Fullerton might have been willing to participate in the proposed Brea-Fullerton trunk, were in excess of legal department limitation.

      (1) Brea Council discussed this with Fullerton Council, showing clearly that if this problem could not be solved, expansion of Brea plant at early date with continued discharge into La Brea Canyon imperative. -- Answer promised by Fullerton - never received.

   c. Brea population 1950 - 3260. Subdivisions then under way would add 640. Population 1951 - 3900.

4. Proposed Expansion-

   (1) a. Two clarifiers
   b. Filter 75'ϕ x 6' deep
   c. Improved chlorination
   d. Digester with floating cover for gas storage
   e. Pump pits and pumps

   (2) Permission for expansion applied for - filing with Reg. Water Pollution Control Board No. 8. Mar. 7, 1951.

      a. Copies letters from various agencies setting forth conditions which Brea must fullfill to secure approval include Regional Water Pollution Control Board No. 8, State Department of Public Health, Orange County Health Department and State Division of Water Resources.

5. Flow Down La Brea Canyon.

   (1) Present Flow (July 7, 1951) extends to pt. Nly of Loma Vista Cemetery - about 4000' below pt. discharge and less than 500' inside City Fullerton.

      a. Property adjacent ot stream on south side has been partially dependent on this flow for irrigation for many years.

      b. End of stream is about 10,000' from Brea Dam.

   (2) Flow through City Fullerton - Data from Orange Co. Flood Control.

(3) Crest Bren Dam El. 264 - Area subject ot overflow extends 1000' plus north Fullerton Hdry. Area adjacent to stream therefore not to be used for anything but agriculture.

(4) Fernando Formation Tight - little percolation - no underflow at Dam.

U.S.B.D. (Williams - Harry Thompson, Asst.)

7/9/51

HAROLD A. McCABE
ATTORNEY AT LAW
520 CHAPMAN BUILDING
FULLERTON, CALIFORNIA
PHONES: 568 OR 730

June 21, 1950

Brea City Council
Brea, California

Attention: Mayor McCart

Gentlemen:

In connection with the Council's request to investigate the sewer situation with the thought in mind of possibly bringing an action particularly to prevent the sale of the bonds, I have made a considerable investigation therewith and because of its extended detail, I thought perhaps it might be better to give you a written report, which report I think for the present at least should be for the exclusive and confidential use of the Council.

An attempt to solve the sewerage problem as it pertains to Orange County approximately eight separate districts were organized within the county each one having a governing board and with the thought and purpose in mind that they would cooperate jointly in the building and maintaining of a sewer system.

After the organization of the various districts bonds were voted by a separate vote in each of the districts for the limited purpose of doing certain construction work which ~~was~~ pertained principally to the sewerage disposal and treatment after it was gathered together from the various districts.

I feel certain that so far as the general public is concerned that they felt first that this was a solution of their sewerage problem and that further, I believe, a great many of them were of the opinion that the bond issue as voted was sufficient to take

care of that problem.

In operation at the time of the formation of the district was what is commonly referred to as a joint outfall sewer, or J. O. S., which is separated by some of the cities and sanitary districts within the county.

The law provides the various districts may, by contract, join together for the purpose of disposal of their sewerage, however, with approximately eight separate districts involved each with heard one ~~born~~ of its own, this would require the unanimous consent of each district or majority of each district's board. This alone is a very unwieldy and impractical situation, but in addition thereto the general purpose was to acquire the facilities of the J. O. S. in connection with the over all program which would be a practical necessity, unless there was to a considerable extent at least a duplication. Because of the personalities and politics involved this added complication is one of the principal factors.

The J. O. S. is at the present time proposing and has tentatively set for the latter part of August or the first of September a bond issue to be voted within the cities and districts comprising the J. O. S. to build the Magnolia trunk line and to do other work so that the J. O. S. will be in a position to take care of its problem regardless of the working out of the new over all program.

I feel that it is the opinion of at least some of the more aggressive members of the J. O. S. that they have this program it will solve our problem regardless of the carrying out of other programs and that we like it just as well and for various other personal and other reasons I believe just their feeling is that they like it a little bit better.

Almost immediately upon the coming out in the paper that

Brea was going to investigate the stopping of the issuance of bonds I was called by two or three people including Mr. Turner, the attorney for the J. O. S. who stated to me that his concern was not for the over all picture but due to the fact that the J. O. S. had itself planned a bond issue to construct Magnolia line and make other construction down towards the ocean so that the J. O. S. would be in a position to continue its operations and solve its problems stating that in effect that if that was done that the parties whom he represented would have nothing to worry about in any event. He also stated that he thought it was the intention of the J. O. S. to attempt to work out some kind of a deal where Brea could come into the line upon a rental or other basis, if this were worked out there would be sufficient capacity. He said further because of the general complication of the bond issue he was afraid that although the J. O. S. and the new over all sewer picture were separate entities, that he was afraid that it might complicate the approval of their bonds for sale if voted.

I talked to Grover Walters, Mayor Eddington and Hugh Warden, the latter being Fullerton's representative on District Two's Board, also Mr. Hapgood and Bob Bonnet of Anaheim. Bob Bonnet is on the Anaheim Council and is the head of the joint outfall sewer board organization. Their statement was "well if we can get the necessary bonds voted for the Joint Outfall Sewer we are okay regardless of the county plan" and this seemed to be the general opinion of all of these parties. Each also stated that if that could be worked out that they felt some arrangement could be made to take care of Brea in the Joint Outfall Sewer.

When I went to a meeting last week in Anaheim, at which time District Two and Three were represented, Judge Mark was there representing the proposed County Sewer System and tere was a considerable discussion about the sewer system buying out the Joint Outfall with nothing really accomplished and some tentative agreements which it was admitted would have been changed were presented and received tentative approval.

I talked at quite some length with Mr. Ogle, County Council who stated to me that he was very glad to be rid of this work that he had felt from the very first and so expressed himself that the organization was unworkable.

I spent considerable time discussing the matter with Mr. Rhone in the Attorney General's office in Los Angeles who has been handling the present sewer litigation in Orange County as well as elsewhere for the State Board and whom I have known for years.

In discussing Brea's problem with him he said that he would be glad to assist in any way possible on it, however, that so far as the present action was concerned he was quite frank to say that he knew definitely in his own mind what the circumstances were, that all fuss about hiring outside engineers and other matters involved made the picture clear to him but that proving it was another matter and that particularly since the passage of the Dickey Bill he felt that at the present time at least, the action was stymied and that there could be nothing more done about it until there was pollution down at the beach and then the only thing they could do would be to get after them enough so that somebody would have to clean it up. That, a mandamus action would not lie because there was a matter of discretion vested in the Board and there was no way to control that by such litigation.

I also explained to Mr. Rhone Brea's position and stated that I had quite frankly said that I felt that under the circumstances where the bonds had been voted for a particular purpose in mind to wit: the solving of the sewer problem and where that purpose had failed for a period of nearly two years andthere was no foreseeable probability of its being remedied, that we had a good chance of stopping the sale of the bonds to all of which he agreed with me and offered any cooperation which they might be able to give.

I likewise discussed the entire matter with Mr. James Beebe the bond attorney who has been hired by the parties to pass upon the bond proceedings already voted in connection with the county districts and whom the J. O. S. has retained to pass upon the bond in connection with their proposed issue.

The only way in which Mr. Beebe would pass upon the bonds as marketable would be first there would have to be a definitely irrevocable agreement on the part of each of the separate districts whereby it was agreed that these funds would be used for the purpose set forth in the notice calling the bond election and furthermore that there be an organization set up and created whereby this purpose could be carried out. To date, of course, no such agreement or organization has been set up and so far as it can be ascertained they are little if any closer to it than they were at the date the bonds were voted. I voiced to Mr. Beebe the objections so far as Brea is concerned and that would be an additional matter that he would want to clean up before the bonds were issued and I promised to send him a memorandum or letter in connection therewith. He agreed to notify me in case there was any serious step taken towards the sale of the bonds.

My statement to all of the parties has been that the City of Brea, one of the parties whom I represent, has no feeling either for or against the J. O. S. or for or against necessarily the Joint Outfall Sewer Organization but that from a practical matter Brea has had a treatment plant for many years, and it needs enlarging and remodeling, that from every present indication there was no hope of Brea's sewer problem being solved by the country-wide set up even assuming that it should start to function which assumption would be unwarranted because; further it would be prohibitive to connect up therewith and, secondly, even though eventual connections could be made considerable expenditure would have to be made to take care of the present problem involved, and that in any event if the treatment plant was not used that then it would be a question of renting or making some kind of an agreement for the use of the J. O. S. line which eventually might be merged with the general county set up. But that would be just a matter of whether the J. O. S. would be willing to take Brea on or not and, of course, depend upon the contemplated J. O. S. bond issue being approved and there seems to be a considerable doubt in the minds of some of the people who are pushing it, particularly in view of the present muddled situation as to whether or not they can get the necessary two-thirds majority to authorize the bonds.

I assured each and every person that we had no thought in mind of attempting to jeopardize anybody's program and that would only be done when it became necessary to protect the interests of Brea. Contrary to Mr. Turner's contention, Mr. Beebe said that he did

feel that an action taken by Brea or a citizen would jeopardize any bond issue by the J. O. S. because the J. O. S. and the new county set up are distinct and separate in themselves and just by way of passing one of the tough problems to get over in my opinion if they ever get that far is how much and when and how the county system is going to pay for the J. O. S. lines. It should not be but I am convinced that that's going to be a real problem.

There seems to be an unanimous opinion which even the ardent proponents of one side or another cannot really deny and that is that one of the troubles is fundamental in that the entire system is set up wrong with eight separate boards and eight separate heads and under those circumstances it would be very difficult to work out with the prejudice and other motives behind so many individual actions. That kind of a set up just doesn't make sense. But, their answer to really correcting that is that "we can't do it now it takes too much time". I don't really believe that's a very good answer. It could have been done in the last year or two and be further along then we are today.

I have given considerable thought to the act under which the district is formed, it says specifically that no part of the district may withdraw unless they have been in existence for ten years. Also provides for incorporated territory to petition and then vote upon withdrawal. The act likewise provides that the Board of each district shall each year report to the Board of Supervisors the amount of money necessary to maintain and meet the over all expenses of the District and that it shall then be the duty of the Board to levy a tax accordingly each year. It is from this

tax levy that the expenses in connection with the District including the engineers, attorneys and executive officers, and Board expenses, have been paid.

In my opinion, the most practical position for the City to take is to oppose the sale of any bonds or any further assessment upon the following grounds:

1. That the bonds were voted for the purpose of solving the sewer problem.

2. That the purpose for which the bonds were voted has not been carried out and because of this delay even a sale at this time would not accomplish the intended purpose.

3. There is necessity for an immediate program so far as Brea is concerned.

4. There has been a change in the contemplated plan in accordance with the notice calling the election.

5. The District has failed to agree as contemplated.

6. There is evidence that they don't intend to agree.

7. The J. O. S. in going ahead with its new construction has to a certain extent at least abandoned the other program so far as its members are concerned.

Due to the fact that there is no immediate prospect for the sale of the bonds, it will be some time before an assessment can be levied, that the longer the delay on the part of the districts in getting together places Brea in a stronger position. In other words it is not going to operate because it hasn't operated. I would recommend that the filing on action to stop the sale of the bonds or levying of assessment be held up until one or the other or both become imminent. From a practical standpoint in that way

a suit is always a threat and win, lose or draw, if the necessity arose such an action could certainly raise havoc at a strategic time. I make this statement only with the view in mind of protecting the community's interests in whichever direction these may lie.

Since the City is not itself a tax payer but is merely a part of the District, in any court action that would be filed I feel it would be preferable if not necessary to have notonly the City but a taxpayer join as party plaintiff.

In view of the foregoing I can see nothing for the City of Brea to do except go ahead and solve its problem either by expanding the treatment plant, joining the J. C. S. or in what other way may be necessary. The county-wide system appears at this time at least to be too uncertain and too late. Then when the opportune time arrives in view of the further developments, take whatever action seems indicated to protect against duplicate assessments and taxes.

I think that at the present time at least it unwise and would to a certain degree defeat our strategic position by making this report public.

Awaiting your further instructions, I am

Sincerely yours,

HAM:S

HAROLD A. McCABE