

BEFORE THE DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

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In the matter of Application 8156 of Fallbrook Public Utility District,
Application 8205 of Carlsbad Mutual Water Company, and
Application 8418 of the City of Oceanside to
appropriate from San Luis Rey River,
tributary to the Pacific Ocean in
San Diego County.

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DECISION A. 8156, 8205, 8418 D 432

Decided *October 7, 1938*

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APPEARANCES AT HEARING HELD AT OCEANSIDE ON SEPTEMBER 25th AND RECONVENED AT
OCEANSIDE ON OCTOBER 16th, 17th AND 22d AND NOVEMBER 13th, 14th AND 15th, AND
AT LOS ANGELES ON NOVEMBER 18th, 19th AND 20th, 1935.

For Applicants

Fallbrook Irrigation District - Predecessor in interest of Fallbrook Public
Carlsbad Mutual Water Company Utility District
City of Oceanside
Walter F. Haas
Ray C. Eberhard

Maurice M. Meyers and
Walter S. Clayson

For Protestants

Caroline C. Spaulding

Wm. W. Lovett, Jr., and
Francis D. Tappaan

J. S. Alvarado
Fay T. and Betty Lampher
William Fletcher
Pearl Jones
Verna N. Fitzpatrick
Emma Stokes
Kate Johnson
Cora Wakeham
Edward G. and Alberta Fogal
Louis G. Hubbert
Ben F. Hubbert
Daisy G. Fickeisen
Stephen Davies
Peter Berges
Ed Starr
Donald Mills
Emma Mueller

A. W. Rutan

Richard B. Williams)
R. Y. Williams)

R. Y. Williams

San Luis Rey Development Company)
San Diego County Water Company)
San Diego Water Supply Company)
Henshaw Investment Company)
W. E. Gird)

Wright, Monroe, Thomas
and Glenn
by Leroy A. Wright

E. E. Ronsse)
Eunice M. Jones)
Mr. and Mrs. F. G. Bernard)
Mr. and Mrs. John Gordon Ross)
Grace Porteous)
A. E. Stokes)

Rorick, McKeen and
Cottingham
by L. W. Cottingham

Nellie Wilson)
C. R. Wilson)
Clara Woodruff)
Herbert D. and Marguerite Brown)
Sasa Salgado)
Emma M. Claney)
Jenima Kitching)
W. F. Speer)
Mrs. M. Kogler)
Carolina M. Winston)
August F. and Henley M. Jaeschka)
Mrs. J. F. Morrison)
Katherine L. Johnson)
Pearl Jones)
Mr. and Mrs. Faustine L. Poussat)
DeWitt Harlow)
Charles E. Cooper)
William L. Waters)
Mrs. Edith Gilbert)
Charles T. Speer)
George E. Hart)
Louis D. Lighton)
Milton W. Dameron)

No appearance

EXAMINER: Harold Conkling, Deputy in Charge of Water Rights, Division of
Water Resources, Department of Public Works, State of California.

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O P I N I O N

GENERAL DESCRIPTION OF PROJECTS PROPOSED

Application 8156 as presented at the hearing by the Fallbrook Irrigation District proposed to divert waters of the San Luis Rey River throughout the year from 5 wells within the SW $\frac{1}{4}$ of Section 11 and from 5 wells within the SW $\frac{1}{4}$ of Section 20, T 10 S, R. 3 W., S.B.B.M. within the San Luis Rey Basin, at a rate not to exceed 30 cubic feet per second, the total amount so diverted not to exceed 10,000 acre feet per annum. It was also proposed to construct a dam within the NW $\frac{1}{4}$ of Section 12, T 10 S, R 3 W, S.B.B.M. for the purpose of diverting 15,000 acre feet per annum from October 1 to July 1 of each season to underground storage in the so called "Middle Basin" of the San Luis Rey River which applicant claimed had a superficial area of approximately 1,750 acres and would require a water plane 53.57 feet below the surface to accommodate the 15,000 acre feet. Storage was to be induced by conveying the water through main canals and numerous ditches controlled by gates and weirs, spreading through brush and impounding in small ponds where conditions were favorable. The rate of charge to underground basins was proposed at 500 cubic feet per second whenever that amount of water was available. Applicant proposed to irrigate 10,000 acres of land and to use the water for domestic purposes within boundaries of the Fallbrook Irrigation District.

In June 1938, Application 8156 was assigned by the Fallbrook Irrigation District to Fallbrook Public Utility District and on August 16, 1938, an amended Application 8156 was received from the assigned which now proposes to appropriate 10 cubic feet per second but not to exceed 5,000

acre feet per annum from San Luis Rey River at a group of wells within the west half of SW $\frac{1}{4}$ of Section 11, T 10 S, R 3 W, S.B.B.&M. The place of use is upon 4,278 acres in present and proposed boundaries of Fallbrook Public Utility District and the use is for irrigation and domestic purposes.

The storage feature was eliminated from the application except it is indicated that at a future time the 10 second feet appropriated may at times be charged into underground storage in place of being applied to immediate use.

Under Application 8205 the Carlsbad Mutual Water Company proposes to appropriate water from San Luis Rey River either by direct diversion or to storage in a reservoir to be constructed on Calavera Creek; the simultaneous diversions to be made at a rate not to exceed 5 cubic feet per second and the amount of water to be stored in Calavera Reservoir not to exceed 1,022 acre feet to be collected from November 1st to April 30th of each season. Direct diversion is proposed throughout the entire year. It is proposed to apply the full 5 cubic feet per second to direct beneficial use during the periods of full demand and to divert to storage at such times as the demand may fall below this amount. Applicant proposes to pump water from wells within a rectangular area 350 feet by 370 feet within the NE $\frac{1}{4}$ of SW $\frac{1}{4}$ of Section 18, T 11 S, R 4 W, S.B.B.&M. and use it for irrigation and domestic purposes within the town of Carlsbad and territory adjacent thereto. As the district develops, the proportion of domestic use to irrigation use will gradually increase in favor of domestic use and ultimately there may be a greater demand for water for domestic purposes than for irrigation purposes.

Under Application 8418, the City of Oceanside proposes to appropriate 12.5 cubic feet per second by direct diversion throughout the year from the waters of the San Luis Rey River. Of this amount it is proposed to divert 5

cubic feet per second from two of its present wells located in the S $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 13, T 11 S, R 5 W, and 7.5 cubic feet per second from three wells located within the NW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 4, T 11 S, R 4 W, S.B.B.&M. The water will be conveyed to a regulatory reservoir (already constructed) from which it will be distributed to the City's mains and used for municipal purposes within the city limits of Oceanside.

PROTESTS

The following table sets forth the names of the protestants and the applications protested by each of them.

<u>Protestants</u>	<u>Applications Protested</u>		
	<u>: 8156 :</u>	<u>8205 :</u>	<u>8418</u>
Fallbrook Irrigation District	:	X	X
Carlsbad Mutual Water Company	X	:	X
City of Oceanside	X	X	:
Wm. Edward and Nina Allen Gird	X	:	:
San Luis Rey Development Company	X	:	X
F. G. Barnard and Nita Barnard	X	X	X
Henshaw Investment Company	X	:	X
San Diego Water Supply Company	X	:	X
San Diego County Water Company	X	:	X
Nellie Wilson	X	:	:
C. R. Wilson	X	:	:
J. S. Alvarado	X	:	X
Fay T. and Betty Lampher	X	:	X
William Fletcher	X	X	X
Pearl Jones	X	X	X
Clara Woodruff	X	X	:
Herbert D. and Marguerite Brown	X	:	X
John Gordon and Minnie Mary Anne Ross	X	X	X
Sasu Salgado	X	:	:
Verna N. Fitzpatrick	X	:	X
A. E. Stokes	X	X	X
Emma Stokes	X	X	X
Kate Johnson	X	:	:
Cora Wakeham	X	:	X
Grace L. Porteous	X	X	X
Ernest Ronsse	X	:	X
Emma M. Clancy	X	:	:
Jemima Kitching	X	:	:
Eunice M. Jones	X	X	:
Edward C. and Alberta Fogal	X	X	X
W. F. Spear	X	:	X
Caroline C. Spaulding	X	X	X

<u>Protestants</u>	<u>Applications Protested</u>		
	<u>8156</u>	<u>8205</u>	<u>8418</u>
Mrs. M. Kogler	: X	:	: X
Louis C. Hubbert	: X	: X	:
Ben C. Hubbert	: X	: X	:
Carolina M. Winston	: X	: X	: X
August F. and Henley M. Jaeschka	: X	:	:
Daisy C. Fickeisen	: X	: X	: X
Stephen Davies	:	:	: X
Peter Berges	:	:	: X
Ed Starr	:	:	: X
Richard B. and R. Y. Williams	:	:	: X
Mrs. J. F. Morrison	:	:	: X
Katherine L. Johnson	:	:	: X
Donald Mills	:	:	: X
Pearl Jones	:	:	: X
Mr. and Mrs. Faustine L. Pousat	:	:	: X
DeWitt Harlow	:	:	: X
Charles E. Cooper	:	: X	: X
William L. Waters	:	:	: X
Mrs. Edith Gilbert	:	:	: X
Charles T. Speer	:	:	: X
George E. Hart	:	:	: X
Emma Mueller	:	: X	: X
Louis D. Lighton	:	: X	: X
Milton W. Damron	:	:	: X
Walter S. Clayson	:	:	: X
Ray C. Eberhard	:	: X	:
Eunice M. Jones	:	:	: X

The protestants are, for the most part, owners of lands along the San Luis Rey River below Bensall and claim rights to water by virtue of riparian ownership and appropriative rights initiated prior to the effective date of the Water Commission Act. In general it is alleged in effect that should the proposed appropriations be approved, it would result in the diminution of the surface and underground flow of the San Luis Rey River and its basin to such an extent as to deprive protestants of water to which they are entitled and render their lands practically valueless; that the water table would be lowered to such an extent that it would increase the pumping costs; and that there would be an infiltration of salt water from the ocean.

HEARING HELD UNDER SECTION 1a OF THE WATER COMMISSION ACT

Applications 8156, 8205 and 8418 were completed in accordance with the Water Commission Act and the requirements of the Rules and Regulations of the Division of Water Resources and being protested were set for public hearing in accordance with Section 1a of the Water Commission Act on September 25, 1935, at 10:00 o'clock A.M. at the Council Chamber of the City Hall, Oceanside, California. Subsequently the hearing was reconvened at Oceanside on October 16th, 17th and 22d and November 13th, 14th and 15th and at Los Angeles on November 18th, 19th and 20th, 1935. Of this hearing applicants and record protestants were duly notified.

JURISDICTION OF DIVISION OF WATER RESOURCES

The Division of Water Resources administers the Water Commission Act as one of its duties. Section 11 of the Water Commission Act defines the waters of the State of California which are subject to appropriation. Section 42 limits the jurisdiction of the Division to surface waters or water underground "flowing through known and definite channels." Section 16 authorizes the Division to accept protests against approval of an application to appropriate. Section 1a provides that if an application is protested the Division shall act on it only after hearing. Section 20 provides that applications by municipalities for use of water by said municipalities for domestic purposes shall be considered first in right irrespective of whether they are first in time. Section 15 authorizes the Division to insert terms and conditions in a permit which will in the judgment of the Division best utilize in the public interest the water sought to be appropriated, and to reject an application when in the judgment of the Division the proposed appropriation would not best conserve the public interest. The powers given under Section 15 are apparently very broad and the section is here quoted in full.

"Sec. 15. The state water commission shall allow, under the provisions of this act, the appropriation for beneficial purposes of unappropriated water under such terms and conditions as in the judgment of the commission will best develop, conserve and utilize in the public interest the water sought to be appropriated. It is hereby declared to be the established policy of this state that the use of water for domestic purposes is the highest use of water and that the next highest use is for irrigation. In acting upon applications to appropriate water the commission shall reject an application when in its judgment the proposed appropriation would not best conserve the public interest."

This section has been interpreted by the court in East Bay Municipal Utility District vs. Department of Public Works, 1 Cal. (2d) 476, 35 Pac. (2d) 1027. The action of the Division in inserting in a permit to the East Bay Municipal Utility District for a power development near the canyon mouth of Mokelumne River, a condition that this appropriation should be subordinate in right to future domestic and irrigation appropriations was upheld.

Obviously the public interest is best conserved by development of the State's natural resources. In this case water is the natural resource dealt with. It is not of interest to the State whether one or another makes this development but it is of interest that the development be made at the earliest date there is justification for it. The economic phases of a development while interesting are not usually of direct importance to action on an application to appropriate water.

However desirable the utilization of water may be, it should be without infringement of rights already vested in others, and the Division clearly has power to so condition any permit it issues that any development made under the permit shall be ^{made} without unreasonably jeopardizing prior rights. If a permit cannot be so conditioned, and if the stream cannot be administered in accord with conditions which will insure this result, consummation of the project would result in a situation contrary to public interest and it would be the duty of the Division to deny permit.

VESTED RIGHTS ON SAN LUIS REY RIVER

All rights above the area of Bonsall Sector which may be affected by the proposed pumping of Fallbrook Utility District may be disregarded for the purpose of this decision. Those presently exercised may continue to be exercised without interference from permittees below, and those now unexercised but superior to rights of permittees can likewise be exercised in the future when their owners so desire.

Vested rights from the area of Bonsall Sector which may be affected by the pumping of Fallbrook Utility District to the ocean are in a different situation. There are about 2160 acres in Bonsall Sector now using water and many acres riparian to the underground stream not using water at present. In Mission Sector there are the appropriative rights of the City of Oceanside and Carlsbad Mutual Water Company which are claimed to be greater than present use. In addition, there are the vested rights of the area overlying the underground stream and the riparian lands.

Water which is not in use under some valid claim of right is subject to appropriation. If a paramount right attaches to any portion of such unused water this portion may be taken and used by the new appropriator subject to the later taking by the owner of the paramount right when the need arises. This applies equally to riparian, appropriative and overlying rights. Section 11 of the Water Commission Act should be read in the light of numerous court decisions in this and other jurisdictions and particularly in the light of the recent California decisions in Peabody, et al, v. City of Vallejo 2 Cal. (2d) 351; Tulare Irrigation District, et al., v. Lindsay-Strathmore Irrigation District, et al., 45 Pac. (2d) 972, and the Santa Margarita Rancho v. Vail 96 Cal. Dec. 84.

The Division does not have legal power to withhold from an applicant use of water now wasting, except as outlined previously in discussing

public welfare.

DESCRIPTION OF SAN LUIS REY BASIN

San Luis Rey River rises in the highest part of the Peninsular Range of mountains and flows in a generally western direction to the Pacific Ocean. The drainage area is 565 square miles. From the ocean eastward to the mountains is an area of mesas probably originally fairly flat but now dissected by the main stream and its tributaries. This general area, together with the rest of the coastal part of San Diego County, has in past geological ages been rising and falling in elevation. At some period when the terrain was rising the major stream systems, including San Luis Rey River, carved deep, broad canyons or valleys into the mesa in which they now flow. These canyons are now partly refilled with recent alluvium.

Various structural features divide San Luis Rey basin somewhat indefinitely into sectors, particularly below Monserate Narrows, called locally in their order from east to west: Warner Basin, Pala Basin, Bonsall Basin and Mission Basin. In this decision, for clarity of description, the term "sector" has been adopted to indicate the several stream or basin sections and the narrow bottom area between Bonsall and Mission Sectors is called the Narrows or Narrows Sector. The names apply more particularly to the river bottoms.

Henshaw Dam is at the outlet of Warner Basin. Other possible dam-sites occur at Monserate Narrows, situated between Pala Sector and Bonsall Sector, and at Bonsall Narrows situated between Bonsall and Mission Sectors, which indicates their narrowness. Between Mission Sector and the ocean is a similar narrows.

This decision concerns the river below Monserate Narrows primarily. The bottoms of Bonsall Sector are six and one-quarter miles long with an extreme width of 3800 feet. They average 2,400 feet in width between the toes of the bordering hills or mesa which rise 200 to 500 feet above the flooded plain. The bottoms of Mission Sector are five miles long and have an extreme width of 6,500 feet. They average 3,300 feet in width and the bordering hills rise less steeply and are lower than those bordering the bottoms of Bonsall Basin. The bottoms of Narrows Sector are about five miles long and average about 600 to 700 feet in width although considerably wider just above the lower end.

The average depth of recent alluvium in Bonsall Sector is estimated from the few well logs available, to be 70 feet. The greatest depth found in any well log is 100 feet. In the river bottom of Mission Sector the recent alluvium is much deeper. Well logs are not adequate to estimate the average depth but the deepest record shows over 200 feet.

The recent alluvium in both basins is water-bearing and the gravels are most of the time full of water to or near the surface. Almost all the material in the bottoms of Bonsall Sector is sand and gravel, and wells give good yields for irrigation. Similar material is found in the bottoms of the Narrows and Mission Sectors and wells in those sectors also give good yields. However, over a large part of the bottoms of the latter is found a cap of "sea mud" about 20 feet below the surface and with a thickness of 85-100 feet. Above this cap is sand and gravel and below is a thick stratum of good gravel. Testimony given at the hearing indicates that a channel 300 feet in width has been cut by the river entirely through the "sea mud" dividing it into two parts so that the water bearing material above and below is connected. It is presumably connected in other places. In any event it is not impervious. Practically all pumping is done from the strata below the mud.

Profiles across the flood plains of the sectors show almost level ground surface except for the present and former shallow stream channels cut as the stream wandered over the valley floor. The major portion of Bonsall Sector bottoms supports a growth of cottonwood, guatamoto, willows and a small amount of marsh grass and tules. Similar growth occurs in Mission Sector bottoms but a smaller proportionate area is covered. In the Narrows a large part of the bottom land is thus occupied. This growth is found in the lowest part of the transverse section of the recent alluvium where the almost flat water table approaches the surface most closely.

AN UNDERGROUND STREAM IN A DEFINITE CHANNEL

A section at any point across the valley of the San Luis Rey River below Monserate Narrows, except where the broad tributary canyons enter and make bays in the hills, would show the bedrock hills of granite or other material descending sharply to the trough and definitely marking the banks. In some places the width between these banks may be not more than a few hundred feet, in other places half a mile, and in the extreme this width may broaden to more than a mile but with an average as previously noted. The same bedrock would be found to continue across the bottom at depths varying from about 70 feet to over 200 feet below the alluvium which has filled the original channel. A short distance beneath the surface of the alluvium water is found from bank to bank, i. e., across the width of the canyon or valley from hill to hill. Its presence is indicated by the water loving vegetation growing in parts of the bottom lands but forming a continuous band or area from Monserate Narrows and above, almost to the ocean where salinity prevents its growth. The presence of underground flow is also proven by the wells which have been dug. The slope of the underground stream is about 10 feet per mile immediately above

the ocean, gradually increasing upstream to about 14 feet per mile at Monserate Narrows. Movement downstream is very slow but can be deduced from the fact that although the channel is dry above, water appears on the surface at Monserate Narrows, Old Bonsall Crossing, Bonsall Narrows and Oceanside Narrows, and during the winter when evapotranspiration losses are small, forms a stream of considerable proportions which may again disappear below. The water thus appears because the underground channel at these points is too narrow to carry the flow which is moving through the wider and deeper channels above and below.

PRESENT DEVELOPMENT

Henshaw Dam controls the entire discharge from the 206 square miles above it. The impounded water is appropriated and used to an extent in Pala Sector but the major portion used is exported to the Escondido area and Vista Irrigation District. Escondido Mutual Water Company also diverts some of the discharge occurring below Henshaw Dam at a point in the canyon above the irrigable areas of Pala Sector. The City of Oceanside and the Carlsbad Mutual Water Company are exporters from Mission Sector, taking from the underflow. They both serve areas on the south side of the river and fronting the ocean.

Pala Sector contains Pala and Pauma Indian Reservations. The Cooper Ranch, in a broad side valley merging with the bottoms of Bonsall Sector, is the only single development of magnitude in that sector, but there are scattered irrigated areas on tributaries and side hills which aggregate, with the area in the bottoms, 3589 acres. Much of this is on tributaries far distant from the main stream, the water supply is small and the draft on the stream discharge is considered to be about equivalent to 1100 acres at a duty of 1.6 acre feet per acre. In Mission and Narrows Sectors 1500 acres of land are irrigated and exportations are made to the south. All irrigated area except a part of that

in Pala Sector is watered by pumping from the underground supplies. The figures above given for irrigated area are as of 1934.

Most of the pumped supplies are secured from alluvial bottoms, but individuals in Fallbrook Irrigation District have secured water in the disintegrated residual granite underlying the district. The aggregate amount is estimated at about 700 acre feet annually by engineers of the District.

Gaging Stations

Stations have been maintained at many places for various periods and records are sufficient to make estimates of missing years and to estimate the runoff in years prior to beginning of runoff records.

Stream Discharge

This is highly erratic as is characteristic of all streams in San Diego County. In Bulletin 48 of the Division of Water Resources published in 1934 and entitled "San Diego County Investigation" the discharge at Oceanside for 1915-16, the highest year, is estimated at 355,000 acre feet and for 1899-1900 the lowest year, at 5500 acre feet.

In that bulletin the estimated full natural discharge of San Luis Rey River undepleted by exportations or by draft for the irrigated area is estimated for the period 1887-1933. The average annual discharge at Bonsall No. 2 as given in that bulletin referred to is 55,200 acre feet. This includes the 29,300 acre feet estimated to originate above Henshaw Dam, most of which is now alienated from the basin. In addition to the flow at Bonsall No. 2 the estimated annual water crop between there and the ocean is given as 3,370 acre feet. Thus, the average present annual waste into the ocean approximates 29,000 acre feet.

Underground Water

While the underground water is concluded to be a definite stream,

yet the bottoms along the river constitute reservoirs of some magnitude just as are found in a surface stream in its wide, deep and slow moving reaches.

EFFECT OF OPERATION OF
APPLICANTS

The discharge of San Luis Rey River is so erratic that the safe yield of water without cyclic storage is small compared to runoff. Below Henshaw Dam, storage space occurs in the gravels in the bottom of the channel and this is filled by percolation from the stream, inflow from the sides both visible and invisible, and deep percolation of rainfall on the valley floor. All water supplies below Monserate Narrows are secured by pumping from this underground supply.

The project proposed by Fallbrook Public Utility District would lower the water table in the Bonsall, Narrows, and Mission bottoms and thus induce greater percolation from the river. Lowering the water table in Bonsall bottoms would reduce the flow to the bottoms of Narrows and Mission Sectors and unless operation were restricted by proper permit terms would in the drier years cut off entirely that part of it originating east of Old Bonsall Crossing and thus tend to leave the water rights below in those years even more than at present fully dependent on the discharge originating below the Crossing and on the usable storage in the bottoms. Additional taking by the City of Oceanside and Carlsbad Mutual Water Co. will effect the water table in Mission Sector primarily and perhaps to an extent in the lower end of Narrows Sector. This storage would, however, be replenished in the next wet year or series of wet years.

The broad questions which must be answered here are: "Are the intervals between the years of plentiful discharge sufficiently short so that the draft for paramount rights in Bonsall, Narrows and Mission Sectors can be maintained if the Fallbrook project is developed?" and "If this draft cannot otherwise be maintained, what practicable steps can be taken in case Fall-

break receives a permit such that paramount rights whether used or unused, will not be jeopardized?" Similar questions must be answered for Mission Sector in considering the applications of Oceanside and Carlsbad Mutual Water Company.

Present use, plus proposed use by applicants, constitutes a considerable percentage of the average annual supply below Henshaw and therefore the amount of storage available in the gravels is important as no surface storage is proposed. The storage available is not the full capacity of the gravels below Monserate. In Bonsall bottoms it is believed that if the water table is lowered 33 feet below the ground surface, the amount of water which any one pump can secure where the depth of alluvial fill is the average will be decreased about 50 per cent, due to shallowness of the gravel fill. In such case, while water would still be available, yet with present information it would seem that no greater lowering than this 33 feet should be allowed. Only a negligible amount of the storage in the bottoms of the so-called Narrows Sector is naturally available to Mission Sector even if the water table in the latter is lowered considerably, because the length of Narrows Sector (about five miles) and the slow travel of water underground would preclude much of it from reaching Mission Sector in time of drought.

The bottoms of Mission Sector are believed to have less usable capacity than would appear from their superficial area of 2775 acres and the depth of recent alluvium--about 200 feet. It appears from testimony given at the hearing that about 60 per cent of this area is occupied by the cap of "sea mud" previously referred to. In general it appears from the testimony that this is 85 to 100 feet in thickness and its water yield may not be as great as from sand and gravel. In addition to space occupied by the cap just mentioned, a large part of the capacity of the gravels of Mission Sector lies below sea

level and is connected with the ocean by the recent sediments filling Oceanside Narrows which is cut about 130 feet below sea level. Consequently, if the water table in the gravels of Mission Sector is lowered too much, sea water will infiltrate into it. Analyses of water pumped from Oceanside's wells and others in the vicinity now show chloride content up to about 400 p.p.m. but it was not shown at the hearing that this is due to sea water infiltration.

Sea water in general is about $2\frac{1}{2}$ per cent heavier than fresh water and it is assumed to have the same weight off the San Diego Coast. As a result, when the fresh water elevation is not greater than sea level, water from the sea penetrates into the gravels of the basin. The sea water in such case first moves upstream along the bottom and fresh water floats upon it. If pumping east of Oceanside Narrows is from an elevation 125 feet below sea level, the fresh water table must be kept 4.1 ($2\frac{1}{2}$ per cent of 125) feet above sea level. As pumping is done from below the cap of "sea mud" this indicates that the water so pumped comes from an elevation not higher than the 125 foot level and therefore the water table should not be drawn down even to sea level in the bottom lands if danger from salt water infiltration is to be avoided. However, if pumping were concentrated at some distance from the ocean and if the area near the ocean were not pumped it would be possible without influx of salt water to lower the water table in the upper part below sea level for a period of years, or until the hump in the water table between the pumped area and the ocean flattened out due to flow both seaward and upstream.

While the elevation of the contact line between fresh water and sea water may be theoretically calculated, yet there is a certain amount of diffusion and very diluted sea water might reach a higher elevation than calculated although upward diffusion would be very limited. Only about two to three per cent of the chloride found in sea water will make water impetible and toxic to many crops.

To determine whether permittees' projects and especially Fallbrook's project can function as planned with safety to the water supply of presently used rights and unused prior rights below is not easy. To do so involves a very complex analysis in which many of the basic factors must be assumed from experience elsewhere as they have not been determined by investigational work for local conditions. The results of the analysis would therefore depend primarily on values assigned to these factors. Consequently, the Division has first directed its attention to the validity of the assumptions made in the studies which are mentioned below.

At the hearing, studies were presented as to the effect of operation of Fallbrook project on water supplies for others by both Fallbrook Irrigation District predecessor of applicant, and by the City of Oceanside as protestant. Likewise more or less complete studies were presented by other protestants. None of these studies exactly filled the requirements of the Division of Water Resources.

In preceding paragraphs the situation as to the recent alluviums below Manserate, and especially as to Mission Sector, which makes it improbable that there is a large amount of usable storage space in the bottoms, have been discussed. It is the judgment of the Division that information does not warrant an estimate of more than 13,000 acre feet available storage space in the portion of Bonsall Sector bottoms affected by Fallbrook's project, that not more than 8,000 acre feet should be estimated as available in Narrows Sector and that the available storage in Mission Sector is small as compared to apparent capacity and has been taken at 12,000 acre feet.

The Division found it desirable to make an analysis of the problem based on assumptions which it deemed justified with present information.

CONCLUSIONS

The analysis made by this office leads us tentatively, and until additional information indicates otherwise, to conclude as follows:

1. There is surplus or unappropriated water available for appropriation under Applications 8156, 8205 and 8418 which water may be taken with reasonable precaution without undue interference with prior and existing rights.

2. Increase in present draft upon the source below Monserate Narrows, including that by presently unused rights which are paramount to those which may be claimed under these applications, should not exceed 6,000 acre feet per annum.

3. With such a maximum increase in draft under proper control, the underground water supplies below Monserate Narrows would have been seriously depleted in only one sequence of years in the period studied (1883-1937). This sequence began with winter 1896-97 and continued for six years through winter 1901-02, during which period the shortage was extreme. The depletion by new rights, however, would have been small because only a small amount of water would have been available for such rights.

4. If the static water level is not reduced more than 33 feet in the Bonsall and Narrows sectors below the ground surface of the alluviums of these sectors, a full supply of underground water will be available to paramount rights in those sectors.

5. Records of discharge by the U. S. Geological Survey at Bonsall indicate that in dry years the gravels of Mission Sector now receive, and in the past have received, very little replenishment, and hence the diverters of water within this Sector are largely dependent in such years upon storage in the gravels.

6. Any increase in the draft in the Bonsall Sector, and above, will first

reduce the supply available to Mission Sector, but excessive depletion in Mission Sector may be prevented by an appropriate by-pass, either naturally or otherwise, of water from the Sectors above.

7. Decrease in the amount of water which, without pumping under Application 8156, would otherwise naturally reach the underground water supply of Mission Sector, can be allowed in small amount in the preliminary stages of development under a permit, or until draft on Mission Basin increases by 2000 acre feet annually above present draft, but diversions should be so managed after development has reached a certain stage that depletion is made up with only small lag, provided however that before permittee under Application 8156 should be required to deliver water by pumping or otherwise into Mission Sector to prevent excessive depletion it is deemed proper that users within that Sector should install and operate at their own cost and expense such spreading works as can be constructed and operated at reasonable cost within said sector, if they are found to be desirable and necessary to prevent waste.

8. Diversions under Applications 8205 and 8418 should not be permitted to lower the ground water level in Mission Sector to less than 10 feet above mean sea level at the pumps of permittee, unless the static water level between said pumps and the ocean is such as to insure against intrusion of sea water should further recession occur.

9. Due to the constant draft by native vegetation below Bonsall Sector only 2000 acre feet of the total of 6000 acre feet which is apparently available below Henshaw Dam is found in Mission Sector while the remaining 4000 acre feet can be made available in Bonsall Sector. However, until more knowledge is available diversions under Application 8156 should be limited to a much smaller amount than calculations indicate are available in Bonsall Sector.

10. To insure against unreasonable interference with use of water under

rights which are paramount to those under Applications 8156, 8205 and 8418 suitable limitations and conditions should be inserted in any permits issued approving said applications, which limitations and conditions should be subject to modification from time to time as development proceeds on San Luis Rey River, or as additional information becomes available, and diversions under said permits should be under the supervision and control of the Division of Water Resources.

O R D E R

Applications 8156, 8205 and 8418 to appropriate water having been completed and being protested, a hearing upon said protests having been held and the Division of Water Resources being now fully advised in the premises,

IT IS HEREBY ORDERED that Application 8156 be approved subject to such of the usual terms and conditions as may be appropriate and subject to the following special terms and conditions, to-wit:

1. Pending the entry of further order by the Division of Water Resources diversions under said Application 8156 shall not exceed 2500 acre feet per annum, and together with diversions under Applications 8205 and 8418, plus increase in diversion under rights which are paramount to said applications, shall not exceed 6,000 acre feet per annum.
2. Operation of permittee shall not cause unreasonable lowering of the static water table at any point in Bonsall and Narrows Sectors where a well is operated to supply a water right paramount to that of permittee.
 - a. Bonsall Sector extends from the east line of Township 3 West, S.B.B.&M., known as Monserate Narrows to the former highway crossing opposite the post office known, or formerly known, as Bonsall. Narrows Sector extends from the former highway crossing to the westerly boundary of Section 3, Township 11 South, Range 4 West, S.B.B.&M., which is a point about one-half mile downstream from the northwest boundary of Guajome Ranch.
 - b. Unreasonable lowering of the static water table is defined as any lowering in excess of thirty-three (33) feet below the average elevation of the surface of the alluvial bottom land in the vicinity of a well used for a paramount water right.

- c. Operation by permittee which would cause the static water table to recede below the elevation noted in Item 2-b is defined as pumping by permittee under the provisions of Sections 4, 5 and 6 of this permit in any calendar year in excess of that quantity which in addition to pumping by paramount rights in the same year would cause the static water table in that year to recede below the elevation noted in Item 2-b.
3. Operation by permittee shall be such as to insure that the supply to the underground water in the recent alluviums of Mission Sector shall not be unreasonably decreased from that which would naturally reach the underground supply of that sector if permittee were not operating.
 - a. Mission Sector extends from the lower end of Narrows Sector to the ocean.
 - b. Water naturally reaching the underground water in the recent alluviums of Mission Sector is defined as underflow from the lower end of Narrows Sector plus the percolation which would naturally occur from the natural surface flow of the river after it has passed the lower end of Narrows Sector, plus percolation from tributaries entering Mission Sector.
 1. Natural surface flow at the lower end of Narrows Sector is defined as the surface water which would reach this point between July 1st of the year in question and June 30th of the succeeding year if permittee were not operating.
 - c. Natural surface flow at the lower end of Narrows Sector shall be determined as follows:
 1. To the discharge at Bonsall No. 2 from the date in the runoff year in question when water from Monserate Narrows first reaches it at the beginning of the flood season to the last date on which water from Monserate Narrows reaches it at the end of the flood season.

AND

- a. The larger of the two quantities computed as outlined under (1) and (2) following:
 - (1) the total pumpage of permittee from the date in the spring of the preceding runoff year on which permittee starts using water or the date in the preceding runoff year at the end of the flood season on which water from Monserate Narrows ceases to reach Bonsall No. 2 gaging sta-

tion, whichever is the latest, to the date in the runoff year in question when the discharge at Monserate Narrows ceases to reach Bonsall No. 2 gaging station.

- (2) the additional percolation above the eastern limit of Mission Sector caused by permittees operation. This shall be determined as follows: In the parts of the alluvial bottom lands affected by operations of permittee the elevation of water table shall be determined in the fall by measurements at sufficiently small intervals of time so that the approximate elevation just before the date of the first flood of the runoff year in question, passing Monserate Narrows can be calculated. The position of the water table which would have obtained if permittee had not been operating shall also be calculated giving consideration to the accumulated effect of operations in years preceding the year in question. The volume of water between the two water tables just noted shall be calculated on the basis of 25% specific yield in the alluvium and the quantity so found is the quantity to be added.

SUBTRACT

- b. The decrease in consumptive use by native vegetation in the same period described in Section 3-c-a-1 in Bonsall Sector caused by operations of permittee. This shall be calculated as follows until further knowledge indicates a better basis: Divide Bonsall Sector into as many segments as found advisable and divide the year into as many divisions as found advisable. For areas affected by permittees' draft and supporting vegetation dependent on a high water table for its existence, the consumptive use shall be calculated for the observed water table as follows: Assume consumptive use of underground water to be at the rate of three (3) acre feet per annum when water table is one foot below the average surface of the alluvial valley fill in any segment selected, at the rate of two (2) acre feet per annum when water table is four (4) feet below the said alluvial surface, and zero (0) when the water table is twenty (20) feet below said alluvial surface, and that the change in consumptive use is proportional to the depth below the depths just noted. On the basis of 25% specific yield in the alluvial fill calculate the water table which would have existed had there

been no extractions of permittee from the underground supply and calculate the consumptive use which would have occurred with that elevation of water table, in a similar way. The difference between these two quantities is the quantity to be subtracted.

2. From the value found in Section 3-c-1 subtract the decrease in flow of water after passing Bonsall No. 2 brought about by draft to supply prior water rights and evapo-transpiration losses in the portion of Narrows Sector between Bonsall No. 2 and lower end of Narrows Sector.
- d. Natural percolation of San Luis Rey River in Mission Sector shall be determined from measurements of depth to water table and from records of the U. S. Geological Survey at Bonsall No. 2 and at Oceanside and other information until more exact determinations of percolation from the river in Mission Sector proper are made, after which the latter determinations shall be used.
- e. Reasonable decrease in the amount of water reaching Mission Sector is defined as allowing the following: Permittee shall not be required to transfer water from Bonsall Sector to Mission Sector as described in Section 5 following until one of the following occurs.
 1. Passage of three years from the date permittee starts operating its project.
 2. Permittees' draft exceeds 2,000 acre feet per annum.
 3. Draft on Bonsall Sector exceeds 3,000 acre feet per annum additional to draft of 1938.
 4. Draft on Mission Sector exceeds 2000 acre feet per annum additional to draft of 1938.
 5. Draft on Mission, Narrows and Bonsall Sectors exceeds 4,000 acre feet additional to draft of 1938.
4. On or about April 1st of each year the Division of Water Resources shall notify permittee by registered mail as to the tentative total amount of water which permittee may pump for its land prior to April 1st of the succeeding year without exceeding the permissible draft as limited by Sections 2 and 3. The quantity so estimated may be revised by the Division of Water Resources as the season advances.
5. If, on June 1st of any year, it is found that operations of permittee have depleted the underground supply of Mission Sector, except as described in Section 3-e, the Division of Water Resources shall notify permittee by registered mail on or about that date advising the amount

of depletion. Subject to the limitation of Section 2, permittee shall within seven (7) days after receipt of such notice begin pumping water to Mission Sector from any point below Monserate Narrows and above the lower end of Narrows Sector to which it has right of access at a rate which will replenish all accrued depletion by April 1st of the succeeding year provided that such pumping may cease if the water table in Mission Sector rises to full position prior to April 1st from any cause; and provided further that the Division of Water Resources may reduce the total quantity to be delivered by permittee by the extent that waste to the ocean might have been lessened by the construction and operation of spreading works at reasonable cost, the construction of which shall have been previously recommended by the Division of Water Resources.

6. If on June 1st of any year it shall appear to the Division of Water Resources that operations of permittee will cause the static water table at any point in Narrows Sector where there is a well used by a water right or water rights paramount in right to that of permittee to be lowered more than thirty-three (33) feet below the average elevation of the surface of the alluvial fill in the vicinity of the well supplying the paramount right, the Division of Water Resources shall so notify permittee by registered letter on or about that date, advising the amount in acre feet which it is estimated that its operations will lower the water table at such point or points below an elevation thirty-three (33) feet below the ground surface and subject to the limitation of Section 2 permittee shall deliver sufficient water at points in Narrows Sector to be designated by the Division of Water Resources, to maintain the water table at any point where a well used by a paramount right is located in Narrows Sector at a position not lower than thirty-three (33) feet below ground surface until the amount of water estimated by the Division in its notification to permittee shall have been delivered provided it is not so maintained by a lesser amount. Pumping for this purpose may be from any point below Monserate Narrows as described in Section 5.
7. At the close of each irrigation season the additional area which has been placed under irrigation since the close of the preceding irrigation season in the entire watershed of San Luis Rey River and the additional draft on the water supply caused thereby and also by additional diversions of water out of the watershed of said river, shall be determined.
8. Subject to the basic condition that any changes which shall be made shall not materially impair the supply for paramount rights and shall not unreasonably increase their pumping cost, the Division of Water Resources may, after hearing, held after due notice, eliminate or revise any one of the foregoing conditions or may add others as additional information or changed conditions appear to warrant such eliminations, revisions or additions and it may in its discretion call such hearing either on its own motion or on petition of any user of surface or subsurface water from San Luis Rey River below Monserate Narrows.

9. Permittee may not use water under this permit to supply the area in its district now served by water from Santa Margarita River unless full use is being made of the water of Santa Margarita River in that area under any water right which permittee may have at the time of issuance of this permit.

IT IS HEREBY FURTHER ORDERED that Application 8205 be approved subject to such of the usual terms and conditions as may be appropriate and subject to the following special terms and conditions, to-wit:

1. Pending the entry of further order by the Division of Water Resources not more than seven hundred fifty (750) acre feet may be diverted under Application 8205 in any year beginning April 1st except as provided in Section 6.
2. If diversions by permittee under Application 8205 at any time reduce static water table at wells of permittee to less than ten (10) feet above mean sea level, permittee shall cease operations under this permit unless the static water table shall be at least ten (10) feet above mean sea level at the lowest point along some cross section of the alluvial bottoms between permittee's pumps and the ocean.
3. On or about April 1st of each year the Division of Water Resources shall notify permittee, by registered mail as to the estimated amount which permittee may pump during the ensuing year under the special conditions of this permit, which estimate of supply available to permittee may be revised by the Division of Water Resources as the season advances.
4. Subject to the basic condition that any changes which may be made shall not materially impair the supply for prior and existing rights and shall not unreasonably increase their pumping cost, the Division of Water Resources may, after hearing with due notice, called either upon its own motion or upon petition of any user of the surface or subsurface flow of San Luis Rey River below Bonsall Narrows, eliminate or revise any of the foregoing limitations and conditions, or add other limitations and conditions, as changed conditions or additional information may seem to warrant.
5. At the close of each irrigation season the additional area which has been placed under irrigation since the close of the preceding irrigation season in the entire watershed of San Luis Rey River and the additional draft on the water supply caused thereby and also by additional diversions of water out of the watershed of said river, shall be determined.
6. Permittee may pump water in excess of the amount designated in Section 1 during any time such pumping reduces in like amount the water flowing into the ocean.

IT IS HEREBY FURTHER ORDERED that Application 8418 be approved subject to such of the usual terms and conditions as may be appropriate and to the following special terms and conditions, to-wit:

1. Not more than 1250 acre feet may be diverted under Application 8418 in any year beginning April 1st.
2. If diversions by permittee under Application 8418 at any time reduce static water table at wells of permittee to less than ten (10) feet above mean sea level, permittee shall cease operations under this permit unless the static water table shall be at least ten (10) feet above mean sea level at the lowest point along some cross section of the alluvial bottoms between permittee's pumps and the ocean.
3. On or about April 1st of each year the Division of Water Resources shall notify permittee by registered mail, as to the estimated amount which said permittee may pump during the ensuing year under the special conditions of this permit, which estimate of supply available to permittee may be revised by the Division of Water Resources as the season advances.
4. Subject to the basic condition that any changes which shall be made shall not materially impair the supply for prior and existing rights and shall not unreasonably increase their pumping cost, the Division of Water Resources may, after hearing called either upon its own motion or upon petition of any user of the surface or subsurface flow of San Luis Rey River below Bonsall Narrows, eliminate or revise any of the foregoing limitations and conditions, or add other limitations and conditions, as changed conditions or additional information may seem to warrant.
5. At the close of each irrigation season the additional area which has been placed under irrigation since the close of the preceding irrigation season in the entire watershed of San Luis Rey River and the additional draft on the water supply caused thereby and also by additional diversions of water out of the watershed of said river, shall be determined.

WITNESS my hand and the seal of the Department of Public Works of the State of California, this 7 day of October, 1938.

EDWARD HYATT, State Engineer

BY MEROLD GUNKLING
Deputy

(Seal)

HC:MP