3-7-49

Matilija Trial Resumed:

3/7/49

Engineer Criticizes Dam Site

ENGINEERING Consultant Loring Tabor would not have chosen a concrete arch type design for a dam in Matilija canyon, he said in superior court today as the Ventura county flood control district-Donald R. Warren company action over Matilija dam resumed following a week's recess.

Tabor, who was on the witness stand for the district just before the week's recess was called, returned to the stand this morning. From tests of material and general observations of the area, he thought the Mailija site was suitable for an earthfill dam, he said.

Tabor detailed tests he had made at the damsite during the week's recess—how bearing strength tests and cores were taken under "D" and "E" blocks of the dam. He said the tests showed the material under the dam has strength enough to hold the dam structure if the material remains in place.

Wherever the material has a chance to move out, or weaken, paths of percolation can start, he said.

Tabor also reported that he found there have been evidence of earth movement and of the presence of a pressure fault; that tests show water can soften the crushed material under a portion of the dam; and that it is possible that the material will weaken due to softening in the future. He said there was a such short path of percolation at the damsite that he did not feel that a concrete arch type dam was the proper structure for Matilija.

The consultant also was questioned about the grouting program conducted at the dam by the Warren company. He showed from his own work on earthfill dams that the time for grouting was lower at Matilija than on the projects where he had worked. Except for four holes, only about 22 minutes were used for each hole in upstream grouting, as compared with nearly 20 hours and about 30 hours per hole on projects on which Tabor had worked.

Tabor also explained that a different kind of grout mixture was used on dams on which he had worked than on Matilija. Upstream grouting by the Warren company would have filled large fissures but would not have allowed for the filling of small fissures at any depth, he said.

3-8-49

Earlier Surveys Made

3/8/49

Upstream Dam Site Debated

A site 200 feet upstream from Matilija dam was chosen when the firm of Taylor and Taylor, Los Angeles consulting engineers, made a survey of possible water supplies for the city of Ventura several years ago.

This was the testimony of Arthur Taylor, partner in Taylor and Taylor, today when he appeared in superior court as a witness for the Ventura county flood control district in its action against the Donald R. Warren company over building of Matilija dam.

PRELIMINARY PROBE

The witness said the Taylor and Taylor site and another computed in an earlier state study were 200 feet upstream of the site Warren chose. He said the Taylor and Taylor study was in the nature of a preliminary investigation, that topography of the damsite was procured from the state, 10 test core holes were drilled and laboratory tests on soil, earth and rock, compression and absorption were made before the upstream site was selected. An earth and rock fill dam was recommended as the most appropriate design, he said.

Taylor came to the stand after local geologist Henry Neel, who a few weeks earlier had been briefly on the stand to exhibit three samples of earth formations which he said, had been taken in an area extending about 100 feet out from the right abutment after excavation had been made and prior to pouring of concrete.

Neel testified the samples were taken on Oct. 28, 1946. He took them "out of curiosity," he said.

EXAMINED SAMPLES

He later examined the samples under a microscope. Neel testified reporting they appeared to be badly crushed sandstone. Under cross-examination, Neel denied that anyone had asked him to go to the damsite or to get the samples. He also reported he had bagged and marked the samples at the damsite.

The samples have been in his keeping until entered in the court trial and were only shown to a member of the district attorney's office—Don Roff—about three weeks or a month ago, Neel said. He told defense attorneys that it is a usual practice for him to take samples from various sites of excavations.

Neel came to the stand yesterday afternoon after Loring Tabor,

(See TABOR, page 8)

TABOR QUESTIONED ON PERCOLATION TEST

(Continued from page 1)

Los Angeles consulting engineer, completed nearly day-long testimony under direct and cross-examination.

Under cross-examination, Tabor was extensively questioned about the type of test he had made in determining that percolation could be carried in soft material under the dam. He admitted that the success of such tests depended in part on the ability of the person directing them and on the kind of equipment used.

USE OF FIGURE .01

Tabor was also questioned about his use of the figure .01 of a cubic foot per year as being the usual satisfactory rate of percolation in clay-like material and that rock materials usually have less penetration. Using that figure, Tabor had found that the percolation rate on some Matilija dam materials was much higher.

Actually, Tabor said, there is no set standard for permeability; the permeability on a dam depends on what the design engineer designs it for. He said he had used the .01 of a cubic foot per year figure purely for comparative purposes with earthfill structures he knew about. Most of such structures have a rate less than that for retaining water but not for stability purposes.

Tabor also was questioned about his experience with grouting. He said the majority of his experience had been with bentonite grouting and that the best practice in a grouting program was to tentatively set up a program and then modify it in the field to get the best results. Size of the grout mix is one factor in determining the rate of penetration of grout, he said, but is not very important.

OTHER TESTS

Charles Loring, one of Warren's attorneys, wanted to know if Tabor was aware that the district planned to have other sample tests made in addition to his own. Tabor said he had heard a laboratory was to conduct tests but that the laboratory did not have the necessary equipment to perform the tests without larger samples.

He then later told S.V.O. Prichard, the district's attorney, that with larger samples of fractured material the percolation rate would be even greater than with smaller samples as he had used.

Matilija Trial: 3/9/49

3-9-49

Taylor Remains On Stand

CONSULTING Engineer Arthur Taylor was given hypothetical questions to answer while on the stand in superior court this morning as a witness of the Ventura county flood control district in its action against the Donald R. Warren company over building of Matilija dam.

One question was based on testimony introduced at the trial and concerned bulldozer stripping at the damsite before and after Warren's plans and specifications were presented to the district on April 23, 1946. Taylor was asked if such exploratory work for preparation of the plans and specifications had been conducted in accord with good engineering practice.

DISCUSSES COSTS

Taylor replied such practice would have been bad and improper, that the work done was inadequate to reveal information that would be needed by the engineer in designing a dam and by contractors in making an intelligent bid on a dam job.

The witness also reported that if calculations of costs were made on profiles of one damsite and the damsite was changed such calculations would not be good engineering. There would be a difference in cost estimates and differences in quantities of from 35 to 40 percent, he said, if calculations had been made on the damsite proposed by himself in his own Taylor and Taylor report and in an earlier state report and then used on the damsite at which Matilija was constructed.

Taylor reported, in answer to another assumption, that if the Matilija damsite was chosen in February, 1946 after studies of five sites and the estimated construction was placed at $1,128,000, good engineering practice would require that the engineer on the project notify the owner of the project of such estimates.

EXPLORATORY WORK

He reported that it is the general engineering practice for an engineer to give to the project-owner a detailed survey including all items for a dam and estimated costs prior to bids being called for. He also testified that more intensive exploratory work is done after the damsite is selected than is done when a potential damsite is under consideration.

Taylor said he believed seven or eight times the exploratory work should have been done at Matilija dam after the site had been decided upon, in comparison with the preliminary work that had been done for the Taylor and Taylor report recommending a rock and earth fill dam in Matilija canyon. Ten core holes were drilled at the Taylor and Taylor site for making an estimate of the proposed Taylor and Taylor dam and that was the minimum needed, he said.

During yesterday's direct examination, Taylor reported that in

(See ARCH-TYPE, Page 2)

Arch-Type Dam Once Discarded for Matilija

studies of a water supply project for the city of Ventura his consulting company contemplated an arch-type dam for Matilija canyon but discarded the idea after study because the abutments were not considered sound enough.

Taylor also reported that for the Taylor and Taylor report, made several years ago, a study of safe yield was calculated. Taylor said that a safe yield of 4,800 acre feet per year, minus 1,800 acre feet for upper valley vested rights, was calculated for a 6,600 acre foot reservoir. He said that another study was prepared when a "bright assistant recalculated" the figures.

CALCULATE SAFE YIELD

He said the recalculations showed a gross safe yield of 4,400 acre feet, compared to 4,800 acre feet. The net safe yield a year thus became 2,600 acre feet when allowance of 1,800 acre feet was made for upper valley water rights, Taylor declared. He said that the amount of water used by the city of Ventura was not deducted from the safe yield because the study concerned the problem of arriving at an anual safe yield for the city's share.

Taylor said he had made a calculation to show what the safe yield would be in event the capacity of the reservoir was increased from 6,600 acre feet to 7,000 acre feet. He said there would be a gross safe yield of 4,900, from which 1,800 acre feet would be deducted for vested water rights in the upper valley. If the safe yield were being calculated for some other outfit than the city of Ventura, it would be necessary to deduct a quantity of water to represent the city's demands, he reported.

Taylor said he deduced that 1,500 acre feet would have to be subtracted from the safe yield if waters available from a Matilija dam were to be used other than by the city. This amount plus the 1,800 acre feet subtracted for upper valley rights would make a total subtraction of 3,300 acre feet for all rights from the 4,900 acre feet gross safe yield of the dam, Taylor said. That would leave a net yield of about 1,600 acre feet.

NO CONFERENCE HELD

According to Taylor, neither Donald R. Warren nor his representatives talked with him about water rights in regard to the Taylor and Taylor report nor about the adaptability of any site in Matilija canyon or the construction of an arch-type dam.

Taylor was asked if it would be good engineering practice to em-

3-10-49

Taylor Continues To Testify On Type of Dam

This morning's superior court session of the Ventura county flood control district - Donald R. Warren company action over Matilija dam moved slowly.

Arthur Taylor, of the Los Angeles consulting engineers firm of Taylor and Taylor and who was again called as a district witness, continued to be under cross-examination by the defense.

Taylor, whose firm in 1944 proposed to Ventura city an earth and rock fill dam in Matilija canyon as a means of augmenting the city's water supply, was led item by item through the cost units contained in his preliminary report—stripping, trenching, excavation and the like—during cross examination by Defense Attorney Stanley Burrill.

The witness showed estimated unit costs for the proposed low-level earth and rock fill dam to be $1,623,000. He said cost items set forth in a state report for 1932-33 were considered during the Taylor and Taylor study but, even though costs were higher in 1944 than in the earlier period, several lower figures were used by Taylor and Taylor on certain items because the state's figures seemed too high.

Burrill wanted to know if Taylor was going to require sluicing of the dam while it was being constructed. Taylor, indicating that the report was a preliminary one, said he was not going to do so but that his brother, co-owner in the consulting firm, leaned toward such practice and wanted more study done along that line.

In cross-examination yesterday afternoon, Taylor was questioned

(See MATILIJA on page 2)

Matilija Trial Questioning Continues Around Taylor's Plans for Arch-Type Dam

(Continued from page 1)

by Defense Attorney Burrill about the discarded Taylor and Taylor plans for building a concrete arch-type dam in Matilija canyon. Such a dam, Taylor said, was considered for several sites, including the Warren company site, but was discarded because the abutments were not considered firm enough.

He informed Burrill that Taylor and Taylor did not have a geologist study the site.

MASONRY DAM

Taylor said he had never designed or calculated a concrete arch-type dam but said he had calculated stresses thrown in arches in other dams.

Burrill questioned Taylor at length about a Taylor and Taylor proposal made in 1944 in a report for Ventura. In addition to proposing an earth and rock fill dam for Matilija canyon, the report brought up the idea that a masonry dam might also be given consideration.

Taylor said the last masonry dam constructed had been so long ago that his firm was discouraged from going deeply into the plan. Again and again, Burrill sought an answer as to where Taylor and Taylor planed to build such a dam.

According to Taylor, no definite site had been decided on but quantities for such a dam were obtained by using information gained from a cross-section made by Taylor and Taylor a little upstream from the proposed location of the earth and rock fill dam.

SITE DEBATED

Burrill reminded Taylor that his report to Ventura city stated the masonry-type dam's preferred site was about 200 feet downstream. He wanted to know if Taylor considered it good engineering to make computations for a dam that was to be located in a different place from that for which information had been gathered.

Taylor answered he considered it better, in making a tentative sketch, to stay at a place where surveys were known.

The witness indicated that cores taken by Taylor and Taylor were primarily for use for an earth and rock fill dam and that the studies did not tell him whether the entire foundation for the Warren damsite was of firm sandstone. He thought, however, his studies showed that the Warren site was not generally of firm sandstone.

Taylor said he had no idea whether bedrock in the canyon at any location downstream from the proposed earth and rock fill dam was of generally firm sandstone.

3-12-49

Jamison Called Back to Stand In Matilija Trial

Richard Jamison, county hydraulic engineer, was called back to the witness stand yesterday afternoon to again appear for the Ventura county flood control district in its action against the Donald R. Warren company over the building of Matilija dam.

He was on the stand as the case recessed for the weekend. Jamison, who before testified on a safe yield study he had made, this time told of making assumptions for the operation of Matilija dam in the future and the effect that siltation would have. From his assumptions, he said, he estimated probable life of the reservoir at 37 years. He also believed, from his studies, that the dam's outlet works at elevation 1,025 would become submerged with silt and that other outlets would be needed.

FORESTRY FIGURE

Under cross-examination, Jamison said he had used the forestry service's siltation figure of 69 hundredths of one percent of all volume of water carried into the reservoir. If the siltation figures of Consulting Engineer Arthur Taylor, a district witness, had been used instead of the forestry service's figure the life of the reservoir would be about 140 years, Jamison reported.

The figures used in his study represented an average and not the siltation of individual storms, Jamison said. He believed, he said, that for practical purposes it was all right from an engineering standpoint to assume there would be a 100 percent deposit of silt from the volume of water entering the reservoir. There would be times when silt would go out of the reservoir during overflow periods and part of the silt would not come into the reservoir from upstream. These he did not consider in his studies, he said.

BANK STORAGE

If the outlet works did not become valueless, there would be some bank storage, said Jamison, reporting that he had not taken that factor into consideration in his study.

Jamison went on the stand after Taylor. Before Taylor got out from under cross-examination he withdrew several more statements he had made on direct examination. He withdrew the statement that the Warren company had followed poor engineering practice in using the profile it did in computing the amount of mass concrete for Matilija dam and that the Taylor and Taylor damsite had a smaller cross-section profile than the area where Matilija dam was constructed.

Taylor maintained, however, that the Warren company had not built its dam on the site set forth in the zone one report and supple-

Taylor Changes Dam Testimony

3-11-49

Defense Attorney Stanley Burrill forced Engineer Arthur Taylor, Ventura county flood control district witness, to partially back down on a statement made during direct examination as cross-examination of Taylor continued today in the superior court hearing of the district - Donald R. Warren company action over Matilija dam.

Taylor had given direct testimony in which he indicated the Warren company had used crude methods and poor engineering in making quantity and cost estimates on the dam. Taylor, after constant questioning by Burrill and comparison of documents, said he would amend his testimony to say that mass concrete estimates made by the Warren company in 1945 had followed good and not crude engineering practice.

Taylor, would not concede, he said, that the entire computations had been well done because a rounding out figure had been used in reaching the cost of the dam in items other than mass concrete. He admitted, however, he could not tell from the documents on which he based his conclusions, whether other calculations — not shown in the documents—had been made by the Warren company on

(See TAYLOR page 2)

3-11-49

Taylor Under Examination On Testimony

(Continued from page 1)

which to base the "rounded out" figure.

During yesterday afternoon's session, Taylor was cross-examined about his direct testimony on safe yield. He told Defense Attorney Burrill that recent recalculations on the report for the city of Ventura in 1944 and basing figures on a 7,000 acre foot reservoir, showed a "discrepancy" of 400 acre feet in his studies. The reservoir yield would be 4,400 acre feet a year instead of 4,800 from Matilija creek.

He said if 1,800 acre feet were subtracted for upper water users the city of Ventura would get a yearly safe yield of 2,600 feet. Since Taylor had testified on direct examination that any user other than the city would have to provide the city with 1,500 acre feet as its water right if a dam were built, Burrill thought Taylor should subtract that 1,500 acre feet in arriving at a safe yield of new water the city would receive if a dam having 7,000 acre foot reservoir had been built for the city. Burrill thought the amount of new water offered to the city would be 1,100 acre feet.

Taylor denied this was true and said that the city would receive 2,600 acre feet of new water. He said he had taken evaporation figures into consideration in arriving at a safe yield study but had not taken vegetation, seepage nor bank losses into consideration because the evaporation item takes care of the implements of gain and loss.

If there were seepage, Taylor admitted, the seepage in part would be recovered by upper gravity users.

Board Orders Action

SUPERVISORS of the Ventura county flood control district decided today to see if they can obtain J. L. Savage, former chief design engineer for the U. S. bureau of reclamation at Denver and now a consulting engineer, to review the status of much-bungled Matilija dam and to determine what steps should and can be taken to pull the dam out of the mess it is in.

The move to try to hire Savage, considered the world's foremost authority on arch-type dams, came after County Surveyor Robert Ryan had made a report on the responsibility, as he sees it, for work and progress on the dam and the visitation of a delegation from Ojai.

RECEIVE PROMISE

The delegation, concerned over the situation at the dam, where pouring has been stopped because of the discovery of flawy material on the left abutment, and worried for fear the Ojai valley will get no water from the dam, asked and received a promise that county officials will meet with them to go over the dam situation.

Ryan, who told of Savage's record — he was on Boulder among a vast number of dams, said he would try to contact the noted engineer this afternoon to see if he will take over the inspection and investigation job. Ryan also thought that a geologist should be hired to work hand in glove with the selected engineer; he suggested Dr. Berky of Columbia, who has gone over several dam sites in the Sespe.

WELL RECEIVED

This idea was well received by Randall Cremer, visiting Ojai delegate and a civil engineer. He felt it would take the combination of the two men to make a comprehensive report. Supervisors decided to wait and see what Savage's reply would be — and to see if he thought the hiring of a geologist would be a good idea — before any further action.

Cremer's adept stand at the meeting ended up with his being appointed by the supervisors to fill the vacancy on the zone one advisory board created by the resignation of Charles Klatt.

Answering a letter the Donald R. Warren company, project engineers, made public last week and in which the troubles for the late discovery of flawy material on the left abutment were blamed upon the supervisors and Ryan for the county's only having done "superficial stripping" at the time the dam project got under way last summer, Ryan gave a summary of Warren's contract.

PLACES BLAME

"I wish to make it very clear to all parties concerned that the entire responsibility for the engineering and construction of zone one water project rests with the Donald R. Warren company in accordance with the contract entered into Dec. 26, 1945, by the company and the board of supervisors of the Ventura county flood control district," Ryan wrote.

"In the contract, the Donald R. Warren company is referred to as the engineer . . . The engineer is hereby employed by the district as engineer to perform all of the engineering services for the design, layout, supervision and consultation during construction of the two dams (Casitas is supposed to be the second dam) and conduits proposed under the bond election of Oct. 16, 1945."

GROUT EXPERT DUE MONDAY

2-24-48

A. W. Simonds, United States bureau of reclamation engineer, has promised to come from the east to serve as engineering consultant on the completion program of Matilija dam, Robert Ryan, county flood control district engineer, announced today.

DUE MONDAY

Simonds, by telegram, accepted the appointment as consultant and said he would arrive in Ventura Monday night. His acceptance definitely clears the way for a conference to be held next week by state division of dams officials, county officials [illegible] county consultants on the program to be followed in bringing Matilija dam's grouting and core hole drilling program to completion and in making the dam wholly satisfactory for acceptance by the state and for full use by the county.

The conference probably will be held next Wednesday, since Dr. Charles P. Berkey, geological consultant who reported on the damsite's foundations this spring and who has been called back by district officials, is due to arrive in the county on Tuesday.

BEST GROUT MAN

Dr. Berkey and Simonds, who has been termed "the best grout man in the world" by J. L. Savage, chief engineer of the U. S. bureau of reclamation, will meet with state officials, Dr. Thomas L. Bailey, who has been supervising the grouting and core drilling program, Legal Consultant S. V. O. Pritchard, District Attorney M. Arthur Waite, county supervisors and Ryan.

Matilija Progress Scored

THE grouting operation on Matilija dam, now in its 13th day, reportedly has been ineffectual to the extent that there is no semblance of a grout curtain beneath the structure and water is pouring from most of the core holes dug, Dr. Thomas L. Bailey told flood control district supervisors today.

In a brief but wallop-packed report to the board, the county's geological consultant said that in his opinion the grouting is going far too slowly and as yet there is no evidence that a concrete curtain is being formed beneath the dam to prevent water from seeping through.

BAILEY REPORTS

Dr. Bailey's report was augmented by a personal appearance of both Bailey and Randall Cremer, engineer and member of the zone one advisory board. Cremer said "Rome is burning," as he explained to the supervisors that he is "very concerned" over the situation that has developed at Matilija dam.

"Grouting is going entirely too slow," Cremer said. "I am very concerned. So far there are just a few holes and no evidence that a grout curtain is being formed. The grout should flow from hole to hole through seams in the sandstone," Cremer explained, "but instead of grout, water is flowing from most of the holes.

NEED MORE MACHINES

"Instead of two machines now being used to drill and grout," Cremer continued, "there should be 15. The cost is running up too fast. Rome is burning; something should be done. I'm worried."

The report by Bailey and the personal apeparances of him and Cremer apparently caused the supervisors to delay action on a suggestion by John Hallock, project manager for the Donald R. Warren company, that a temporary permit be sought from the state to impound water. Hallock said he had talked with the state engineer's office yesterday and learned that such temporary permits were available. He said the reason for the rush to gain permission to store water was that a six-inch rain storm is predicted between now and Jan. 6, the first rains to begin on about Dec. 21. A major storm is expected New Year's eve, he said.

Supervisor Sanford Butts moved that the application be made, but the move was not seconded and the board decided to wait until this afternoon—until further study—to vote on the motion.

Supervisor Robert Lefever asked "why all the delay" in coring and grouting. Hallock explained that drillers of necessary skill to take cores and operate semi-technical equipment were scarce. He said that the sub-contractor, Frank Howard, is having difficulty obtaining drillers to do the work.

ORDERS SPEED UP

The board ordered Hallock to exert all possible pressure to expedite the coring and grouting; even to the extent of combing the Ventura oil fields for drillers who might be able to lend the zone one project a hand in a pinch.

Hallock took exception to Bailey's report where it stated that there was no grout curtain beneath the dam. "I don't see how he can tell whether or not there is a grout curtain there. He can't see into the bowels of the earth any farther than I can," Hallock said. , He went on to explain that the sandstone formation in the Matilija canyon was "tight" and that grout was being forced into the core holes with even greater pressure than was usually necessary.

Bailey answered Hallock by saying that cores show only flakes of grout in the sandstone seams in the canyon floor. He added that the flowing water was evidence that there was no grout curtain.

Hallock countered with the explanation that he thought the water was coming from springs and not from the lake which is beginning to form behind the dam. "The water is warm and it is sulphur. I'll bet that a dye test would show that the water is not coming under the dam, but is coming from springs," Hallock said.

The board didn't wait for Hallock's answer to cool off until it had passed a motion calling for immediate dye testing of the water above the dam to see if it is flowing beneath the structure and coming out the core holes.

3-14-49

Bonner Tells Qualifications

42

3/14/49

Frank E. Bonner, San Francisco consulting engineer, went on the witness stand today in superior court to appear for the Ventura county flood control district in its Matilija dam action against the Donald R. Warren company.

Bonner, who was hired by the district to review the Matilija dam picture after the Warren company withdrew, gave his qualifications and experiences prior to being questioned about Matilija. He said he worked with the bureau of reclamation, the federal power commission and the engineering service of the U. S. forestry service in addition to 18 years of private engineering practice on water supply, dams and water power works. He also commanded an army regiment in world war II.

The witness took the stand late this morning after Richard Jamison, county hydraulic engineer, completed answering questions on re-direct and re-cross examination on his calculations of what may be the silting problems of the Matilija dam.

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Bonner Undergoes Cross-Examination

43

3/17/49

Frank E. Bonner of San Francisco, consulting engineer for the Ventura county flood control district, was undergoing cross-examination at this morning's session of the district-Donald R. Warren company action over Matilija dam.

Bonner, who wound up direct testimony yesterday, was questioned in detail by Defense Attorney Stanley Burrill about the velocity of water of various-sized floods that would spill over Matilija dam and approximate frequency of such floods, the range being from floods of 5,000 to 60,000 second feet.

Bonner said velocity of the water at the lower edge of the spillway pool would be greater than farther downstream, the velocity, for instance, being about 10 to 15 percent greater at the pool than about 550 feet downstream from the dam. He doubted whether energy generated by the overflow of floods would ever be so dissipated at the pool so that there would be no movement of material. The consulting engineer also reported he felt erosion would be greater in the stream channel now that the dam has been built than before there was a barrier across the stream channel.

Bonner, hired by the district in August, 1948, to review the Mati-

(See BONNER, Page 3)

Bonner Testifies Floods Would Damage Dam

(Continued from page 1)

lija dam picture and especially to study effects of large floods over the dam, said he believed the velocity of water loosed in the first flood would take out a great part of the spoils bank downstream from the dam. He also reported that, depending on the volume and duration of floods, there can be undercutting of the apron of the dam.

From study of geologists' reports and his own observations of rock formation at the downstream edge of the apron and of the cores, there is indication of unsound material under the dam, Bonner said. He reported he took samples of rock near the downstream edge of the apron and they disintegrated in water. He said behavior of the rock was similar to that at St. Francis dam.

Bonner said he had reached no final conclusions yet as to what steps should be taken to make the apron section of the dam safer for passage of large floods. It first seemed probable that the channel downstream of the dam should be lined," Bonner said, adding that geologists feel there is a fault zone in the area and that it would be hard to find a place to make a suitable cutoff. He also does not feel that the channel would stop vibrations of the water falling from the dam's crest onto the apron, and vibration force can be fully as serious as an earthquake might me, he said.

The consulting engineer said he now is studying a plan for possible installation of a tunnel around the right abutment of the dam that would allow for the discharge of 16,000 second feet of water at a point in the channel 1,000 feet below the dam. Water would be discharged from the tunnel's spillway lip outlet before there was any discharge over the dam's spillway, Bonner reported. Such an installation would cost almost $671,000 without gates, and gates would cost about $125,000 or $125,000, he said.

Bonner believes corrective work of some kind is desirable because there are three main hazards: yielding of the abutments or foundation that would allow the arch to collapse, piping through the foundation or undermining of the protective apron and possible undermining back from the apron to the dam.

He said he did not feel the overpour spillway designed by the Warren company was proper for the Matilija project because there is no doubt there is "some precarious rock." Collapse of the dam at its location could cause tremendous damage and loss of life, he said. Bonner declared he preferred the construction of an independent spillway in the case of Matilija dam.

3-16-49

Matilija Water Distribution Plan To Cost $708,000

3/16/49

THE cost of a water distribution system from Matilija dam down Ventura avenue and into the Ojai valley has been estimated at $708,000, according to a report filed with the flood district board of supervisors yesterday by Consulting Engineer Harold Conkling.

The report was requested by the board about a month ago in order to determine what steps should be taken to make available the water being stored behind Matilija dam.

The report lists the total at $703,000. The totals of the five sections comes to $708,000. Neil J. Stiver, zone one manager, said this morning it is obviously a mistake in addition of the sub totals.

Conkling's report lists five sections of the conduit system which are necessary for adequate distribution of the Matilija dam water. They are:

Section one—From Matilija reservoir to the intersection of El Roblar and Tico roads in Meiners Oaks. In this section, 600 feet of 36-inch pipe now on hand could be used, Conkling suggested. He lists the length at 3.52 miles. "No water will be distributed from the section," the report states. "Construction of this section is a prerequisite to service of water anywhere." Cost is estimated at $358,000.

Section two—From the intersection of El Roblar and Tico roads southward through the Ventura avenue district on the east side of Ventura river to Oak View Gardens and Sunset tract. Conkling lists the present market for water in this section at 1,100 acre feet per year with a possibility of considerable increase in the near future. Length of this section is 4.29 miles. The cost is estimated at $148,000.

Conkling says in his report: "It is stated by Mr. (Neil) Stiver (Zone one manager) that the city of Ventura has, of late, evinced little interest in purchase of water from Matilija. Furthermore, there appears to be a strong possibility that practically all the present safe yield of Matilija reservoir will be needed in the Ojai valley and the Ventura river valley in the very near future, assuming, of course, that a protracted wet cycle is not imminent and that a severe economic upset does not occur. If, however ,the city does want some of the water, the pipe line could be extended 2.61 miles to a connection with the city's line. There is sufficient capacity in the line to supply any probable demand by the city."

Section three—From the intersection of El Roblar and Tico roads eastward. This is the first part of an ultimate line which will extend past the city of Ojai. The present market for water from this section is listed as 400 acre feet annually. The estimated cost is $25,000.

Section four—From the eastern end of section three to the inter-

(See CONKLING page 2)

Conkling Reports To Board on Matilija

(Continued from page 1)

section of Aliso street and Foothill road where connection with the Ojai mutual water company should be made. Conkling believes there is no immediate market at present "but it is believed probable that the Ojai Mutual Water company will be in the market in the near future." Cost of this section is estimated at $81,000.

Section five—From the eastern end of section four to Carne road east of Ojai. "There is no present market except Senor canyon Mutual Water company which wishes 100 acre feet annually," Conkling says in the report. Estimated cost of section five is $96,000.

12 MILES LONG

Total length of the conduit system is 12.7 miles, according to the report. Conkling suggests that, if funds are available, plans and specifications for sections one, two and three be prepared immediately. Estimated cost for those three sections is $531,000.

In a letter accompanying the report Conkling states: "If it is desired to have actual construction started by next fall, preparatory work must proceed expeditiously."

The consulting engineer suggested that bids be called for immediately and contracts awarded for furnishing pipe and fittings for the conduits.

In his report, Conkling lists a plan for complete development of the water supply of zone one. That plan includes:

Construction of a reservoir, or reservoirs, on Casitas creek and diversion of surplus water from the Ventura river to Casitas creek watershed by a conduit of "perhaps 200 second foot capacity." Conkling believes this, with the runoff of Casitas creek, would give a safe yield from these reservoirs of 15,000 acre feet;

Satisfaction of the rights of the city of Ventura to water passing Matilija dam with water from Casitas creek reservoir;

CASITAS PIPELINE

A pipeline from Casitas reservoir to connect with the southern end of the pipe along Ventura river described under section three and reversal of flow in that line by means of pumps. "The rights of water users on the east side of Ventura river in water passing Matilija dam would then be satisfied by Casitas water," the report states.

The gravity rights in water passing Matilija creek would continue to be satisfied from that water but if rights of users in Ventura and along the east side of the river were satisfied from Casitas water, the safe yield of Matilija reservoir would be 3,700 acre feet instead of 1,800 feet, Conkling's report says.

That 3,700 acre feet would then be available for use in the Ojai valley from ,and inclusive of, the Meiners Oaks County Water district eastward and southward, according to Conkling.

The ultimate plan includes diversion from Matilija dam at times of flood for spreading in the gravels of Senor canyon cone, and elsewhere in that general area.

"Floods occur at times when demand for water for irrigation and domestic use is small," Conkling states in his report. "At those times there would be considerable capacity in the pipe line to the east to carry flood water."

Conkling warns that constructing the main line from the dam to the fork at Meiners Oaks to serve only the present 1,800 acre feet safe yield at Matilija reservoir may become a bottleneck in the way of spreading water in Senor creek. He suggests a slight additional expense now so it can be given full capacity.

Conkling estimates it will require four man months for surveys in the field, one field augur boring party for one month to get classification of material and 15 man months for preparation of contract drawings before the plans will be ready for the entire conduit system.

3-16-49

Vanoni Testifies On Possible Erosion of Dam

3/16/49

Former county resident Dr. Vito Vanoni, hydraulics professor of California Institute of Technology, believes that if the material downstream from Matilija dam is subject to erosion a maximum flood of 60,000 second feet would have a tendency to rapidly erode the material and undercut the edge of the dam's apron.

So Dr. Vanoni, now on the witness stand in superior court for the Ventura county flood control district, testified in the district's action against the Donald R. Warren company over building of Matilija dam.

APRON EROSION

Confirming testimony of Consulting Engineer Frank E. Bonner Dr. Vanoni said that the water falling over the crest of the dam in such a flood would head downstream at a velocity of about 40 feet per second. That's an extremely, intensively erosive velocity and it would tend to dig a hole downstream of the apron edge, Dr. Vanoni said. The degree that the erosion progressed back toward the dam from the apron's edge would depend on how far the stream had been lowered downstream of the dam, he reported.

The situation would be complicated by the water that would fall on the training wall at the left abutment, the professor said. He believes that as much as 25 percent of that falling water would go over the wall and that the area at the outer edge of the training wall would be subject to erosion.

EROSION POSSIBILITIES

Dr. Vanoni said that as the material downstream of the apron is eroded away, the depth of the overpour spilling pool will be reduced and the velocity of the water heading downstream will increase. He also contended that the dam's placement across Matilija creek increases erosion possibilities of the stream bed. This would be true because most of the silt carried in the stream would be deposited in the dam's reservoir, and water overpouring the dam would be relatively clear so that it would pick up sediment as it headed downstream from the dam, Dr. Vanoni declared.

Dr. Vanoni's testimony was similar to that of Bonner, the previ-

(See CALTECH, Page 2)

CALTECH PROFESSOR TESTIFIES ON MATILIJA

(Continued from page 1)

ous witness on the stand. The latter witness was questioned about several dams which he had designed or on which he had worked that had overpour spillways, with water falling on rock. He acknowledged this was true but said that the water fell on sound rock. These other damsites did not have shattered nor fractured material; there there is no comparison between the character of those damsites and that of Matilija, Bonner said. Bonner said he knew of no concrete arch-type dam in southern California that had an overpour spillway constructed on such material as was indicated at Matilija.

Bonner agreed with the district's attorney, S. V. O. Prichard, that a dam must be designed to meet the maximum flow that may be expected (60,000 second feet is considered the maximum flow for Matilija) and that if the dam does not meet such expectations it is not properly designed. He admitted to Defense Attorney Stanley Burrill that he never had heard of an arch dam in California that failed as a result of vibrations from overpour on a spillway. But he would not concede to Burrill that one 60,000 second floot flood would not undermine the apron and the dam.

There is a possibility that might happen and it might be a probability, Bonner contended. If such a storm did destroy the apron but no more, the apron could be fixed before the next storm, Bonner said. But, he declared, he feels something should be done now as a protective measure, that expenditures against undercutting are justified for the security of persons living downstream of the dam and for property protection.

Lesser storms, such as a 15,000 second foot flood, would undercut the spoils bank downstream of the apron's edge, would lower the spilling pool and alter topography, Bonner said.

3-18-49

County Rests In Dam Suit

3/18/49

The Ventura county flood control district this morning wound up presentation of its side of the Matilija dam controversy, bringing the plaintiff's case to a close on the 39th day of sessions in superior court.

The Donald R. Warren company, designers of the dam, will come to bat next. That side of the story over building of Matilija dam will begin to unfold in court on March 28. Court will be in recess next week.

Attorney S. V. O. Prichard brought the plaintiff's case to a close this morning, with certain reservations, after brief testimony by Robert L. Ryan, district engineer, and Neil Stiver, zone one manager William Holmes of the state division of dams still is to appear as a district witness but will be called later.

Ryan was questioned about July 9, 1946 orders from the board of supervisors requesting him to proceed with plans for a road for Matilija dam. Ryan said the matter was brought before the board after he and the county fire warden had discussed it.

He said he made two surveys for a possible road across the dam but did not draw any plans and specifications for such a road. He reported he talked to Warren about the proposed road and that Warren did not feel the road should cross the dam. After that, Ryan said, he took the road matter before the board again, told them of Warren's feelings and the road proposal was dropped.

With the exception of the proposed road, the supervisors did not refer any question regarding design of matilija dam before or after construction to him, Ryan said. He told of being named interim project engineer after the Warren company resignation in 1948 and of having a consulting board work with him on a grouting program.

As for the district's grouting program, Ryan said he could recall no data from the state in regard to the district's grouting; he thought there had been a letter from the state on core drilling and promised to produce the letter.

Stiver testified that the district in its grouting program had spent $86,516. Before completing the district's presentation, Prichard offered as evidence diaries of John Hallock and Joe Hyde, Warren company leaders on the dam project.

Rush Sill, consulting geologist and engineer, in testimony for the

(See SILL page 2)

SILL SAYS 2 PROJECTS WOULD PROTECT DAM

(Continued from page 1)

district yesterday said he felt two projects should be undertaken to protect Matilija dam.

For one thing, some appurtenance should be installed upstream to lengthen the path of percolation, Sill said. Preliminary studies indicated a concrete cutoff wall could be installed at a minimum cost of about $125,000 to $150,000. Sill said he preferred installation of an impervious apron with a rolled fill blanket. Minimum cost would be between $275,000 and $350,000, he reported, if the blanket was 10 feet deep.

Sill also suggested the extension downstream of the dam's apron as a protective measure. He placed preliminary estimate for the extension work between $100,000 and $200,000.

During his testimony, Sill also presented calculation sheets which showed $2,166,000 was paid to the contractors on the Matilija dam job, as against an original contract bid of $1,279,000. Using Harold Conkling's report of what the safe yield of Matilija dam will be, Sill showed that if 1,800 acre feet of water was sold at $15 an acre foot, that would bring in financial returns to zone one each year of only $27,000 during the 34-year period of the dam bonds.

Then using the figure of 4,000 acre feet, which the district contends Warren gave as the safe yield, Sill showed that the financial return would be $60,000 a year during the 34-year period, a yearly difference of $33,000.

During cross-examination, Sill was questioned about his location of a fault at Matilija damsite. He also was questioned about his experience on concrete arch-type dams and said he had none. Defense Attorney Stanley Burrill spent considerable time questioning Sill about a geological report he had made in an area of the Salinas river, where an arch-type dam was built.

Sill said he had made a geological report recommending as most favorable the site that was chosen for a damsite. He admitted that his report indicated there were no structural weakenness of formation and that the area would support a high dam. Sill said his report was based purely on visual observations and without explorations a year or two before the dam was started.

According to Sill, he did not participate in the design of the dam nor discuss with the design engineer the kind of dam that was to be built. He told Burrill he did not know whether the left abutment of the Salinas dam required a great amount of excavation, whether three faults were found in the area nor whether the abutments had to be extended.

3-19-49

Sill Testifies Earthfill Dam More Suitable

Rush Sill, consulting engineer and geologist who has been assisting the Ventura county flood control district in presentation of its Matilija dam action against the Donald R. Warren company has gone on the witness stand for the district in superior court.

Sill, who began testifying yesterday afternoon, reported that before being hired by the district in the spring of 1948 he previously was employed for observations on Matilija dam by contractors, Atkinson Kier Bressi and Bevanda. He said that late in March, 1947, he had visited the damsite and that in a sump upstream of the dam, toward "E" and "F" blocks, he had seen white, soft material with fault gouge in it.

SAW CLAY STRIPS

He also told of observing conditions at "N" block then and in April and said clay strips were noticeable. In April at "O" block a test hole was sunk at the contractor's suggestion and clay material was encountered there and the area was excavated, Sill reported.

Sill also told of visiting the damsite in August, 1947, when nearly all the apron's area was exposed by excavation. Again he saw white, soft material, a crushed zone and black gouge streaks, he declared. He also told of being at the damsite in November, 1947, when clay was being mined out of the right abutment, the opening being filled with concrete.

FAULT MOVEMENT

From all his trips to the dam, Sill said, he had come to the conclusion that there had been movement of two faults at the damsite. He said he also had come to the conclusion that an earthfill dam would have been more suitable for the site since there would be a longer line of percolation. He said an arch-type dam should have abutments that are not on crushed materials to protect against seepage and structural weakening. He said he did not believe an earthfill dam would be as susceptible to earthquakes as an arch-type dam.

During his testimony yesterday, Dr. Vito Vanoni, assistant profes-

(See Dr. VANONI, Page 2)

DR. VANONI SUGGESTS PROTECTION FOR APRON

(Continued from page 1)

sor at the California Institute of Technology, said he believed that some corrective measures should be taken to protect the apron and dam against possible erosion from high velocity water overpouring the dam in intense storms.

As a tentative suggestion he proposed the dam's apron could be extended downstream a minimum of 75 feet and that a cut-off wall could be placed at the edge of the extended apron. He said under cross-examination that he had made no cost studies for such work but that he felt it would be better planning to do the work now than to hope that the apron, the only protection to the expensive dam structure, would withstand a storm of 60,000 second feet intensity.

Dr. Vanoni under cross examination said his calculations for velocity of water falling on the apron and downstream were made on the assumption there would be no interference from tailwater, on the basis the apron was horizontal and if the earth formation at the apron was poor. His calculations would be modified if the materials proved different from his assumptions, Dr. Vanoni admitted, but he did not believe his conclusions would be modified by the slope of the apron.

Under re-direct examination by the district, Dr. Vanoni said he had given consideration to tail water in dissipation of energy, along with other factors. He said he considered the estimates he made on velocity and erosion were conservative, that he could have used higher rates but he had not done so because there was cross flow that complicated appraisal of energies generated in the spilling pool.

Dr. Vanoni was cross examined about his experience and said he had no practical experience in concrete arch-type dam spillway work. He also was questioned about recommendations he made for La Ballona creek project, undertaken by army engineers. He said he knew that there had been beach front damage from the jetties of the project but that they had been anticipated and mentioned in his report. He was unable to say whether the jetties later had been extended because he had not, he said, followed the project.

One of the quickest witnesses to go on and off the stand for the district was Engineer Vern Freeman of Santa Paula, manager of several water companies. He was shown a portion of the Warren company's zone one report which said it was economically feasible for the Matilija dam project to be undertaken and that studies showed water could be conveyed by gravity flow from the reservoir to Ojai at about $14 an acre foot and to Santa Ana valley at about $15 an acre foot.

Freeman was asked if from his experience in sale of water in this county if $15 an acre foot was a reasonable expectation for cost of water produced at Matilija. It was very reasonable, he answered. The defense elected not to question this statement.

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3-28-49

Matilija Dam Case:

47.

3/28/49

R.C. Cook Testifies In Trial

EX-SUPERVISOR Russell C. Cook was the first defense witness in superior court today as the Donald R. Warren company began to present its side of the Ventura county flood control district-Warren company controversy over Matilija dam. The trial was resumed after a week of recess.

Cook, who served on the flood control board of supervisors—part of the time as chairman—was in office during construction of the dam and until his defeat for re-election in 1948.

Under questioning by Defense Attorney Charles Loring, Cook was queried about discussions at the damsite and in supervisors' meetings with Warren. Cook testified that on visits with Warren to Matilija canyon, prior to the Warren-district contract for drawing of dam plans and specifications, that Warren had discussed building the dam on the site where the dam now is located. He also reported he believed the late Supervisor Percy Dennis was along when one such discussion took place.

Cook also testified that sometime after the Warren-district contract was signed in December, 1945—he didn't recall the exact dates — various members of the board of supervisors at a regular board meeting told Warren they wanted to get the dam built quickly so that water could be stored by the next year.

The witness recalled, somewhat differently than other officials had done when testifying for the district, the matter of stripping of the damsite. Cook said Warren appeared before the board and asked for stripping of the abutments preparatory to "getting plans and so forth" for the dam.

Warren told supervisors at the meeting he wanted a test pit sunk, Cook declared, saying he thought Warren had asked for the test pit to be sunk to bedrock. He said County Surveyor Robert L. Ryan was present, but he could not recall Ryan's saying anything about his not having men or equipment to sink the test pit. Ryan had previously testified he so informed Warren.

Cook also related how he, Ryan and Warren had gone to the damsite. He contended Warren again reported he wanted a test pit sunk and that it was to be near the right abutment. Cook said he told Warren he could obtain a road district bulldozer for the stripping work. He did not recall Ryan's saying anything at that time about not having men or equipment for the test pit work.

Loring asked Cook if, when Warren requested stripping, he advised the board he had employed Dr. John Buwalda, geologist. Cook replied he did not know when Warren had advised the board about Dr. Bulwalda; he said he was not sure whether it had been in the spring of 1946. He said he remembered Warren reading a report from Dr. Buwalda but didn't know when.

Cook said he recalled Warren saying he believed the board could save money by stripping instead of trenching the abutments, but he did not remember Warren mentioning Dr. Buwalda's recommendation on trenching in that regard. He could not recall Warren's making any recommendation that an outside contractor handle the work. Cook said he did not think Warren indicated who should do the work. The board discussed having the district perform the work of stripping in order to save money, he said.

Before Cook stepped to the stand, the defense asked for but lost a motion to have the testimony for the district of John Southworth, ex-Warren company employe, stricken.

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3-29-49

2nd Day on Stand:

Prichard Quizzes Cook

3/29/49

EX-Supervisor Russell C. Cook was questioned about his acquaintance with Donald R. Warren in today's superior court session of the Ventura county flood control district-Warren company trial over Matilija dam.

Under questioning by S. V. O. Prichard, the district's attorney, Cook said he had known Warren since 1942 or 1943, that they had visited at each other's homes and that they had been together on pleasure trips. He indicated such relationships continued after the situation over Matilija dam grew tense.

DENIES CONSULTATIONS

Cook said he had talked with Warren's attorneys but denied he had consulted with them or had gone to their offices. He also denied he had called Walter J. Fourt or Warren's other attorneys about what was happening in the dam picture. He had no recollection, he said, of calling Fourt when Cook and several other supervisors returned from a Sacramento conference with state dam officials.

Prichard showed Cook excerpts from the diary of John Hallock, Warren's Matilija dam project manager, which stated Cook had gone to luncheon with Hallock on the day in September, 1947, when the geological report on Matilija dam was filed by Dr. Thomas L. Bailey. Cook said he probably had had a conference with Hallock but didn't recall it. In answer to another diary notation, he said he and Fourt probably went to the Warren office in Los Angeles after the claim of Warren was filed with supervisors in December, 1947. Cook said he went there a number of times.

Prichard also showed Cook a notation of Jan. 21, 1948, in the diary of Joe Hyde, another Warren employe. It showed Cook had had luncheon with Warren, Fourt, Charles Loring, one of Warren's attorneys, and Carl Nelson, Warren business associate. Cook said he was sure he had been with them and admitted that the Matilija situation was then tense. The diary showed "various phases were discussed on the present situation."

Under questioning by Loring, Cook said the January luncheon was the first time he had met Loring, that he saw him later at a club in Los Angeles and last week at a club here. On only those latter two occasions was there talk about the lawsuit, Cook testified.

CORRECTS TESTIMONY

Stating that Cook's testimony was "hazy" on dates when Cook, Ryan and Warren visited the damsite to discuss stripping, Loring again queried the ex-supervisor about the date of the first visit, reminding him he would have celebrated his birthday on March 12, 1946. That was so, Cook said, adding that he therefore must have had the first discussion at the damsite on stripping and a test pit on March 12, 1946, instead of later.

He also contended he had incorrectly testified yesterday afternoon in saying Warren had told supervisors there would be 4,000 acre feet to sell from Matilija dam; Warren had said there would be 4,000 acre feet annual yield, Cook declared. Cook didn't believe Warren had ever set a specific amount of water available for sale. He also told Loring that when bids for the dam were discussed, supervisors discussed proceeding with the project regardless of cost because water was needed.

Prichard, again questioning Cook, asked him if he had not had a hallway conversation with Warren after his testimony in court yesterday and if Warren had brought up the matter of Cook's birthday and that his testimony on 4,000 acre feet was wrong. Cook said Warren may have mentioned the birthday but he did not think Warren had said anything about the 4,000 acre feet matter.

Prichard also questioned Cook about statements of various supervisors when bids on the dam were discussed in executive session. He said he could not recall what any of the supervisors or Ryan had said. He said at all times he relied on Warren for engineering and geological information "as far as the dam was concerned."

Cook testified yesterday that

(See COOK page 2)

Warren "was unhappy about stripping" prior to his presentation of plans and specifications to the board of supervisors April 23 1946. He believed Warren had advised supervisors they had two choices: to wait for County Surveyor Robert L. Ryan to do the stripping work or to proceed with the plans and do the work as part of construction. He said various board members stated to Warren they wanted him to go ahead with preparation of plans in order to get construction started so that there would be water that winter.

Cook said he didn't hear Ryan say he was unable to sink a test pit at the damsite until about the time stripping was finished and just about the time that plans were presented. He said he never heard that Ryan didn't have the personnel nor equipment to sink the test pit prior to the filing of the district-Warren lawsuit.

EXCAVATION DEPTH

According to Cook, Warren told supervisors when he presented plans and specifications that he did not know how far excavation would have to go to reach bedrock. He said other supervisors were aware the plans called for an assumed rockline. Cook also reported that Warren in executive session on May 28, 1946, when bids for the dam job were opened, made a statement that there would not be enough money from the bond issue to complete the three portions of the dam project and that additional money would be needed. Warren told the board, Cook said, he would make a computation of figures of the additional money that would be needed and would take up the matter with supervisors and the zone one advisory board.

Both in June and July 1946, Warren advised that additional money would be needed to complete the project, Cook said, adding Warren also made a similar report after excavation of the damsite had been completed. No board member said the construction should not proceed, Cook testified. He also reported that Warren told supervisors when bids were being considered that changes and additions to plans would have to be made as work progressed to adapt plans to geological conditions.

Cook said he inspected the floor of the damsite when it was excavated and that the place looked to him like hard material. He also reported that when Warren resigned from the dam job Feb. 6, 1948 he did so at the request of supervisors shortly after a settlement had been reached with contractors on the dam. He said at the time the settlement with the contractors was made supervisors were not advised about the basis for payment.

GROUTING DISCUSSED

After the Warren company resigned and until Cook left the board of supervisors on Jan. 1, 1949, the supervisors received no direction or suggestion for grouting from the state, Cook declared. He also reported that in the summer of 1948 state division of dam leaders told him, Ryan and Supervisors Robert Lefever and Richard Bard that Matilija dam was satisfactory, the state would require no further work and that an application to store water would be granted if made by the district.

Cook reported that both Warren and A. W. Simmonds, grout expert called in by the district, told supervisors that dam leakage could be expected because all new dams leak some. He, too, said, Warren had presented plans and specifications for a rockfill dam when plans and specifications for an arch type dam were considered. According to Cook, Warren said he was presenting both sets of plans to establish comparative costs between the two types of dams and also to try and get a lower bid on the arch-type dam. The district attorney advised the board not to advertise the rockfill dam plans for bid, Cook declared.

Under questioning by Prichard, Cook said that Warren on trips to Matilija canyon prior to the filing of the zone one report had pointed out and discussed only one damsite. He also said he understood the damsite spoken of in the supplemental zone one report was the one used in construction and that Warren had so informed him.

Cook told Prichard there had been board room discussions with Warren about the sale of dam water. He said he believed Warren had told the board they should get the dam built in order to capture rainfall of 1946 and 1947 and that Warren had said there would be 4,000 acre feet for supervisors to sell. Cook thought Warren had advised the board price for the water would range from $15 to $50.

During questioning, Cook told Prichard he had little recollection of dates or sequence of events. He said he believed a Warren-Ryan-Cook trip to the damsite to discuss stripping came after Ryan had been authorized to do the work. He did not recall that Warren at that time said anything about plans and specifications. Cook could not recall whether Warren commented on the use of a bulldozer to do the stripping work.

Prichard asked Cook if, after a May 1947 letter from Warren appeared in a newspaper, supervisors discussed the matter in regard to Warren's disatisfaction with abutment stripping. Cook said he did not remember but believed supervisors probably had discussed the matter. He said he knew one letter was published before supervisors saw it but he thought they "got on their ear" about a later letter. He said the board knew very well Warren was disatisfied with the stripping before that time.

3-30-49

Matilija Trial:

Geologist Says Dam Is Safe

3/30/49

MATILIJA dam was erected on a good damsite and the site is adequate for use in construction of a concrete arch-type dam, according to a witness appearing for the Donald R. Warren company in its superior court controversy with the Ventura county flood control district over the dam.

Hyde Forbes, engineering-geologist, consultant and winner of the James Laurie award of the American Soicety of Civil Engineers, so testified in superior court today as the Warren side of the controversy went into its third day of the hearing.

INSPECTED SITE

Forbes said from his observances of the damsite in 1931, when he did a geological report for the state, and in 1948, when he inspected the area for the Warren company, he considered the site where Matilija dam was constructed was satisfactory for a concrete arch-type dam and that he was not worried about the security of the dam. He also considered the site the only one that should be used in that area and declared it was an economical site.

Forbes said it would not be unusual after a damsite was stripped to alter plans slightly to adapt design to the foundation and abutment rock. It would be unusual if such slight adaptations were not made, he declared. He saw nothing unusual in adaptations made by the Donald R. Warren company from examination of its plans, he said. If only a 14 foot shift was made downstream in the center portion of the dam that would mean the damsite selected originally was a good selection, according to Forbes.

QUERIED ABOUT ROCK

The witness also was questioned about rock material in relation to exposure to air, and was shown a sample of rock that had been introduced in evidence as having been taken from the damsite when the floor was excavated. Forbes said that when rock is exposed to air the binding material breaks down, air gets drawn into the rock and there is more disintegration of the rock. He indicated the sample showed such "weathering."

Defense attorney Stanley Burrill asked Forbes why material similar to the sample shown him would disintegrate in water. Forbes replied that any porous, weathered, material would act the same way when dropped into water without confinement. By pore pressure, the air is drawn out and water is drawn in, he said.

Forbes, who has worked on 500 water projects, said he had made a

(See FORBES, page 2)

Wednesday, March

Forbes Follows Cook as Witness In Matilija Dam Court Action

(Continued from page 1)

geological damsite report of Matilija crew in 1931 in which he assumed the presence of a fault. Since then, he said, by further studying of maps and further field work he had checked up and found there was no fault, that there are no breaks in the sandstone beds across the damsite. He said he had come to the conclusion there is no fault within two miles of Matilija dam.

EXACT SITE

He declared the Warren dam had been located exactly on the damsite that he had recommended in his report, done for the state division of water resources. In his report, he said, he had suggested that a more conservative type structure than an arch-type dam would be desirable and that the damsite was suitable for a rock-fill dam. That statement was made, Forbes declared, because at that time the Santa Barbara earthquake and St. Francis dam disaster were fresh in the minds of the people. It was purely for psychological effect rather than for engineering reasons that he made that statement, Forbes declared.

The enginering-geologist, who investigated the Friant damsite and many others, said it was his opinion from all his experiences that core boring was dependent on the sites, themselves, and the money available for such work. He had said in his report and contended yesterday that no preliminary exploration was necessary at Matilija dam. He favored stripping to core boring.

Forbes also contended there is no standard nor customary practice about core boring at a damsite.

Forbes came to the stand after ex-supervisor Russell C. Cook had been on the witness stand for a day and a half. Before Cook departed, he was questioned by Defense Attorney Charles Loring about a Warren-employe diary notation which said Cook had been at a Los Angeles luncheon Jan. 21, 1948 with Loring, Donald R. Warren, Carl Nelson, Attorney Walter Fourt and others. Loring wanted to know if Cook had gone to Los Angeles at the instruction of the board of supervisors and S. V. O. Prichard, the district's attorney, to discuss the matter of a threatened lawsuit by the Warren company against the district over unpaid fees.

QUESTIONED ABOUT DATES

Cook replied that this was so. Prichard then asked Cook whether he had been sent to the Warren company office in Los Angeles to discuss the matter of Ralph Proctor's possibly being hired to serve on the Casitas dam board of consultants. Cook replied he had gone to Los Angeles on that matter and that Proctor said he would not serve. He could not recall the date of the meeting, however, but said it was not on the day he had had luncheon with Warren and his attorneys.

Prichard also questioned Cook about several notations in the diary of John Hallock, Matilija dam project manager for Warren. He particularly asked Cook about an Aug. 6, 1947 entry which stated Cook had given Hallock confidential information for Donald R. Warren in regard to the district attorney and the grand jury. Cook replied he did not remember whether he did or did not so inform Hallock.

Prichard also read a Nov. 12, 1947 note in Hallock's diary. It said Cook had told Hallock that Prichard had said to supervisors that Warren was evasive, would give no information and had admitted that he had cut Matilija estimates. Cook did not recall talking to Hallock about that matter.

Loring then asked Cook if the entry related to the fact that the Oil Workers union was attempting to pull a strike at the dam and was trying to get an investigation of the dam underway. Cook said he thought the union did pull a strike at one time, that he remembered something about the Oil Workers union asking for an investigation but did not know what happened nor what he had discussed with Hallock. He said he believed the grand jury already had visited the attorney general and had asked the attorney general to conduct an investigation of Matilija dam.

Cook denied to Prichard that he had discussed with Hallock what the grand jury and the district attorney were doing.

Matilija Trial:

3/31/49

Forbes Quizzed On Cores

3-31-49

IT is a good practice to determine overburden on a dam job but it is not necessary to core-bore, Hyde Forbes, engineering-geologist who is appearing as a Donald R. Warren company witness, testified in superior court today during cross-examination in the county flood control district-Warren action over Matilija dam.

Forbes said an idea of depth of overburden may be obtained from wagon drilling or test pits but that even then data may be misleading.

CONTRACT DISCUSSED

He did not believe, however, core borings would be necessary. Fixing responsibiiity for such work depends on contractual terms of the engineer and project owners, he declared. The engineer in charge of a dam project should do the work or make a request that the work be done, he said.

Forbes did not believe that the engineer should force a client to do the work if the client did not do it. It's "no skin off his (the engineer's) nose" and the client will "have to take the consequences," Forbes said. Forbes declared it was not necessary to know the character of ledge rock before a dam is designed nor the extent of weathered rock. It's usual to adapt the design of the dam to meet rock conditions, he said.

The witness said he does not believe it is good engineering practice to advise a client to go by guess-estimate on the amount of exacavation on a project ranging up to a million dollars if the engineer assumes the rockline and the amount of overburden. He also testified that putting into a contract two classes of excavation, one for rough and one for harder material, is exactly the method an engineer should follow.

ESTIMATES DEBATED

He thought contractual bids would be as good whether quantities were made by guess estimates as whether they were made by cores. Forbes said it is good engineering practice for an engineer to make his own engineer's estimate of project cost; he could not conceive of an engineer not making such preparation.

Such estimates should be submitted when the plans and specifications are submitted, he said. He would not say it was bad engineering not to make such an estimate, however, as he said he did not set himself up to say what others ought to do.

Prior to the questioning of Forbes, the district's third amended complaint against the Warren company was approved for filing by Judge L. N. Turrentine. It mainly changes from other previous complaints in that it allows the district to ask for $9,970 for purported work on design plans in the field by Warren men.

Under cross-examination, Forbes reported he has never design-

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FORBES TESTIFIES ON VISITING DAM SITE

(Continued from Page 1)

ed a dam. He said he was sure that in making his Matilija damsite investigation for the state in 1931 he had visited the area more than once. He made one trip with Richard Jamison, now county hydraulic engineer.

On that trip, Forbes said, he found that the stratification of the right and left abutments did not match, and this, he declared was due to an earth-folding process. He declared he could not recall over an 18-year-period whether he had attempted to follow one earth bed formation from the left abutment across to the right abutment. He did not believe that whether the sandstone bedding planes varied in thickness would make the rock any less competent.

QUERIED ON FAULT

Forbes was asked if it were assumed there was no fault at the bottom of the canyon and if there had been no folding process that it would be reasonable to expect earth strata would go down the left abutment and be observable on the right abutment. He said he would conclude there was no fault if strata followed across the canyon without folding but that he never had seen a damsite that followed such lines.

He was asked about character of rock shown in the roadfill cut in the road area leading from the gatekeeper's house to the dam. Forbes said that close to the dam the rock was all stratified rock but said he could not remember clearly from a trip he made a year ago what he did see.

He could not remember whether, when he made his 1931 trip, he had seen anythin in the bottom of the canyon or whether he had climbed up a slope upstream of the dam's right abutment. He said a portion of his 1931 report that referred to contorted and weakened formation was in reference to shale beds a mile upstream of the damsite and not to the damsite.

Forbes declared that in his first examination of the damsite he had come to the conclusion there was a fault but that since he is "not hidebound" and is "willing to change his ideas" if he finds he is "wrong" he had changed his mind about that. He was asked if a movement of a couple hundred feet would indicate a fault, and he replied there could be no such little movement in folded country, that a movement of a couple hundred feet is not a fault.

NOT PREDICTED

He agreed that strength of sandstone underlying a stream could not be predicted from the surface but said he would want to strip the damsite and then do what detail work seemed necessary when the site was bared. He said he would not agree that core holes should be put down because he would not want to spend money for exploration. The abutments and the foundation of a dam must

self, Forbes agreed, but he said abutments can be made water tight, weaknesses can be rectified and there is no sense giving up a damsite because there's some doubt. He admitted that a dam structure could be perfect but the dam could fail if its underlying structure was not good.

Forbes said there are some circumstances where core boring is proper but that he liked to set up his own specifications because drillers are interested only in getting footage. He considered 75 percent recovery on cores would be of value but not less amounts. He said he believed exploration work on Matilija dam prior to start of construction would be a needless expense, that more money could be spent in exploration work than in rectifying what might be wrong or thought to be wrong.

He said the value of water itself, would depend on whether it was economical to do no exploratory work, design a concrete arch-type dam, enter into a contract have the foundation uncovered and then discover there is an inadequate foundation for such a dam. He didn't know what the cost of Matilija dam was for 7,000 acre feet of water.

3-31-49

Warren-County Agreement Called 'Most Deplorable'

By JACK McHENRY 3/31/49

THE Ventura county 1948 grand jury, in its annual report, has charged that the contract entered into between the Donald R. Warren company and the flood control district supervisors for the construction of Matilija and Casitas dams was written, not for the benefit of the county nor the flood control district, but for the benefit of the Warren company.

The contract was labeled a "most deplorable document which is working a hardship on the taxprayers, especially those who will have to pay the taxes in flood control district, zone one."

The 1948 grand jury filed its annual report this morning after its final session. The report was filed with Superior Court Judge Louis Drapeau in superior court at 10 a.m. today. The jury was dismissed shortly after filing the report.

FILED LATE

The reason given for the late filing of the report of the 1948 grand jury was the special attention given to the Matilija project of flood zone one. A special audit of the transactions of the zone from the inception of the Matilija project was ordered late last year.

That audit and a year-long investigation of zone one activities, the report said, led the grand jury in December, 1948, to recommend that the powers of governing the flood control district be taken away from the board of supervisors and placed in the hands of persons elected from each zone.

The grand jury based its recommendation on "the wanton disregard of the use of the taxpayers' money, as evidenced by amounts expended" on the Matalija project.

The grand jury report states that examination of the disbursements of the zone one funds showed many items of expenditure were found where there was no record in the minutes of board approval of payment.

proposed to connect this addition to the front of the existing main building, housing out-patient department, administrative offices, admitting and record department, surgeries an obstetrical services.

"We of the county hospital committe for the 1948 grand jury recommend that this addition be made as soon as possible as it is very badly needed."

The grand jury report also recommends the installation of the hospital's own laundry.

UNIFIED ROAD SYSTEM

The road committees of the grand jury found most of the county roads in good condition except Rice road. The annual report states: "We believe the unified road system is good and should be put into full operation as soon as possible."

The 1948 grand jury studied, at length, the county justice court system. While the annual report makes no definite recommendations, it does suggest that succeeding grand juries study the consolidation of some of the county's justice courts in a move to save money.

The grand jury suggests the consolidation of the Ventura and Ojai justice courts into a Class A court. "By consolidating the townships of Oxnard, Hueneme, Camarillo and Simi we have a registration of 13,510, an estimated population of 35,126, which would also

NO ENDORSEMENT

The report goes on to say:

"Also, (there were) items where the warrants were not completed by the signature of the county clerk or his deputy. In many instances, there were checks or warrants passed through the bank or county treasurer's office without being endorsed by the payee."

The grand jury recommended that more attention be given to endorsements on checks, to protect the county or flood control district zone one from a second claim being filed for the same amount.

"We found the records and accounts so confusing and scattered that it took the services of a special auditor before we could get a clear and overall picture of the entire Matilija dam project," the jury's report states.

The grand jury report also

(See JURY, page 4)

points out that some of the prenumbered minute pages have been removed from the minute book (of the flood control board).

"It stands to reason," the report states, "and is very strongly recommended that the board keep more careful minutes, especially where any transactions are discussed pertaining to the taxpayers' money."

CONTRACT CRITICIZED

In commenting on the Warren company contract, the report had this to say:

"The committee, in going through all of the records pertaining to the Matilija dam and its components, and after studying the Donald R. Warren contract, entered into and signed by the board of supervisors on Dec. 26, 1945, and duly approved by the district attorney, we find that this contract was written not for the county, nor the benefit of the county flood control district, zone one, but for the Donald R. Warren company, as shown in the present trial now being conducted against the company."

The jury found that all bills approved by the Warren company were ordered paid without recourse.

"The routing of such invoices through the county flood control engineer's office was wasted effort, as he was powerless to act," the report states.

Last August, the grand jury recommended that, because of a duplication of effort between the zone one manager's office and the district engineer's office, and a dissemination of misinformation on the part of the zone one flood control management, the district en-