

Before the Division of Water Resources  
Department of Public Works  
State of California

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In the Matter of Application 10143 of Homer C. Jack to Appropriate  
Water from the Pit River, Tributary to Sacramento River in  
Lassen County for Irrigation Purposes

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Decision A. 10143 D. 509

Decided *February 24, 1944*

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APPEARANCES AT HEARING HELD AT BIEBER, CALIFORNIA, TUESDAY, MAY 25, 1943

For Applicant

Homer C. Jack

In propria persona

For Protestants

Big Valley Water Users' Association)  
Kate Gerig )

Hon. Oliver Carter

Examiner

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

O P I N I O N

General Description of Project

Application 10143 of Homer C. Jack was filed with the Division of Water  
Resources on March 13, 1941.

As originally filed and as advertised it proposed an appropriation of  
10 cubic feet per second of the waters of the Pit River to be diverted from  
March 1 to August 1 of each season at a point within the SW $\frac{1}{4}$  of SE $\frac{1}{4}$  of Section  
3, T. 38 N., R. 7 E., M.D.B. & M., in Lassen County for the irrigation of 220

acres of land within Section 25, T. 38 N., R. 7 E., M.D.B. & M.

On March 31, 1941, at the request of the applicant the amount of water applied for was reduced to 2 cubic feet per second and the area to be irrigated was reduced to 120 acres and new advertising notices were prepared on this basis.

On October 8, 1942, Mr. Jack amended the season of diversion by reducing it to the period from March 1 to July 1 of each season.

The application in its final amended form therefore and as presented at the hearing proposes an appropriation of 2 cubic feet per second of the waters of the Pit River to be diverted from March 1 to July 1 of each season at a point within the SW $\frac{1}{4}$  of SE $\frac{1}{4}$  of Section 3, T 38 N, R 7 E, M.D.B. & M. in Lassen County for the irrigation of 120 acres of land described as follows:

80	acres	within	the	N $\frac{1}{2}$	NW $\frac{1}{4}$ ,	Sec. 25,	T38N,	R7E,	M.D.B. & M.
20	"	"	"	SE $\frac{1}{4}$	NW $\frac{1}{4}$ ,	"	"	"	"
20	"	"	"	SW $\frac{1}{4}$	NW $\frac{1}{4}$ ,	"	"	"	"

#### Protests

The protest of the Big Valley Water Users Association was filed with the Division on May 5, 1941. The rights claimed are based upon riparian ownership, prior applications, and use of the waters of the Pit River as set forth in the "Agreement Determining Rights to Water and to the Use Thereof From Pit River in Big Valley in Modoc and Lassen Counties, California" dated October 10, 1933. The protestant alleged in effect that there was insufficient water flowing in Pit River to meet the needs of the members of the Association and that during the irrigation season the supply was uncertain because of the upstream diversions for use in Hot Springs Valley and on the South Fork of Pit River.

The protest of Kate Gerig was filed with the Division on May 15, 1941. She states that under the provisions of "Agreement Determining Rights to Water and to the Use Thereof from Pit River in Big Valley in Modoc and Lassen Counties, California" dated October 10, 1933, she has the right to divert 6.03 cubic feet per second for the irrigation of 320 acres from April 1 to November 1 of each year and to divert water for stock watering purposes throughout the year. She alleges in effect that the entire flow of the Pit River in Big Valley is used by the water users in Big Valley under the agreement and that any additional appropriations would result in depriving her of the water to which she is entitled. Mrs. Gerig stated that her protest might be dismissed provided the application was approved subject to the provisions of said agreement.

Applicant in a letter dated May 13, 1941, stated that he would be willing to stipulate that any permit which might be issued in approval of Application 10143 be subject to the supervision of the Division of Water Resources in accordance with the "adjudication of water rights on Pit River". Letters were then addressed to the protestants directing attention to the proposed stipulation but the offer was not accepted by any of them.

One of the directors of the Big Valley Water Users Association set forth his view of the matter in a letter written by him for the signature of the Secretary of the Association but it was the opinion of the secretary that the letter did not reflect the opinion of the entire group and it was filed in this office unsigned. In effect this letter set forth the following claims:

- (1) There is a decided shortage of water in Pit River necessary to care for existing and riparian rights along the river; and this condition exists every year.
- (2) Several of the riparian land owners in Fall River Valley object to any more permits being granted by the Division on this stretch of the Pit River.
- (3) An unfair burden would be placed upon the riparian land owners and appropriators if further permits are issued.
- (4) The results of the Pit River Investigation indicate that there is no unappropriated water available for applicant's use and to issue further permits would only create hard feelings and result in legal action.
- (5) Willingness to cooperate with the proper safeguards has been indicated but a separate agreement, which would have to be defended in the courts should not be necessary and if the Division insists upon approving Application 10143, the matter might as well be carried to the courts at this time and a decision obtained.
- (6) If a permit is issued by the Division it would carry with it the implication that there is water available for the use of the party to whom permit is issued.

Under date of October 18, 1942, four of the five directors of the Big Valley Water Users Association, W. H. Gerig, Ernest G. Babcock, L. W. Kramer and R. L. Nichols, withdrew their protest to the application as amended. The fifth director, Mr. Roderick McArthur, did not sign the request for withdrawal.

Kate Gerig under date of October 13, 1942, informed the Division that her protest would be continued even though the season of diversion described in the application was reduced. She was of the opinion that it was unfair to consider additional permits in view of the fact that a watermaster district had been formed and expenditures had been made to conserve the water supply. She stated that there had been no year during which the interval between irrigations in May or June had not been too far apart.

Hearing Held in Accordance with Section 1a of the Water Commission Act  
(Now Sections 1340 to 1353 of Water Code)

Application 10143 was completed in accordance with the provisions of the Water Commission Act and the Rules and Regulations of the Division of Water Resources and being protested was set for public hearing in accordance with Section 1a of said Act (now Sections 1340 to 1353, inclusive, of the Water Code), on Tuesday, May 25, 1943, at 10:30 o'clock A. M. in the Firemans' Hall, Bieber, California. Of this hearing applicant and protestants were duly notified.

History

Requests to the State Division of Water Rights for an investigation of the water supply of the portion of Pit River stream system in Modoc and Lassen counties were made in April, 1928, by the Modoc County Development Board and the Lassen County Board of Supervisors.

Following a preliminary investigation the Director of the State Department of Finance on June 16, 1928, authorized the expenditure by the Division of the funds necessary to investigate that part of the Pit River system in Lassen and Modoc counties upstream from the west boundary line of Lassen County near Pittville, California, and to report concerning the utilization of the waters thereof in furtherance of a general or coordinated plan looking toward the development, utilization and conservation of the water resources of the state and to conduct the investigation so as to include therein such subjects of study as might be deemed pertinent to such a general or coordinated plan.

Agreements were entered into on November 13, 1928, and on November 14, 1928, between the Division of Water Rights (now Division of Water Resources) and the boards of supervisors of Modoc and Lassen counties, respectively, pro-

viding for a three-year investigation of the Upper Pit River stream system. The report on the investigation was published by the Division of Water Resources in its Bulletin 41 entitled, "Pit River Investigation 1933".

Soon after commencement of the Pit River Investigation, a substantial number of water users from Pit River in Big Valley initiated a movement to provide a basis for watermaster service in that area. The Division cooperated with a committee of water users in the preparation of an agreement setting forth a tentative plan of distribution of the waters of Pit River in Big Valley for the 1930 irrigation season under the supervision of the Division. The committee circulated the agreement among the water users, who executed it and filed it with the Division in October, 1929. The Division administered the plan of distribution pursuant to the agreement under authority of Section 226 of the Water Code (formerly Section 10a of the Water Commission Act).

Collection of records of diversion and use of water from Pit River in Big Valley was continued by the Division during the irrigation seasons of 1931 to 1934, inclusive, through supervision of progressively improved plans of distribution of water in accordance with agreements therefor entered into each successive year by the interested water users.

The scope of the Pit River Investigation included the following:

"To develop such data as to the present use of water as would be necessary to define all existing water rights from Pit River and its tributaries within the two counties." (Page 16, Bulletin 41 of Division of Water Resources).

The data and records collected and tested under the Pit River Investigation,

and the five years of supplementary investigation pursuant to the above mentioned supervision of distribution of water, developed complete information relative to water requirements for all reasonable beneficial uses of all lands irrigated from Pit River in Big Valley under facilities for diversion then existing. The records included a map of the irrigated lands and diversion and distribution systems made from a planetable survey, map of soil types from soil surveys made by the University of California and U. S. Department of Agriculture, measurements of water supply, channel losses, consumption of water, water required as a vehicle for spreading, return flow, waste water, observation of crop growth, crop census, and other information pertinent to a determination of the duty of water of all lands receiving irrigation water from Pit River in Big Valley.

It was the generally expressed desire of the water users from Pit River in Big Valley that advantage be taken of the above mentioned information collected by the Division to effect a permanent settlement of their relative water rights along the lines of the perfected plan of distribution tried out during the 1934 season. The Division in consultation with the water users drafted an agreement, based on the records of the Division and all available pertinent information, providing for permanent determination of the relative rights in and to the waters of Pit River in Big Valley. The allocations of water in the agreement were based on the various duties of water that from the records and information had been determined for the area embraced in the settlement. The agreement, entitled, "Agreement Determining Rights to Water and to the Use Thereof From Pit River in Big Valley in Modoc And Lassen Counties, California", was executed by the owners of 8,699 acres of land receiving bene-

fit by irrigation and subirrigation from the waters of Pit River in Big Valley. The owners of 303 acres of land receiving irrigation water from Pit River in Big Valley did not subscribe to the agreement, although provision is made therein for an allocation, including channel losses, of 7.99 cubic feet per second for this area. The agreement provides for the signatory parties a total allocation, including channel losses, of 150.71 cubic feet per second.

The lands and rights of the water users signatory to the agreement, containing the above mentioned settlement of their relative rights, have been included in a watermaster service area and the provisions of the agreement have been enforced through statutory watermaster service during the past nine years. The records and information collected during the nine years of statutory watermaster service confirm previously determined duties of water on which allocations were based in "Agreement Determining Rights to Water and to the Use Thereof From Pit River in Big Valley in Modoc and Lassen Counties, California." The changes that have occurred during the nine years last past are minor and have effected a slight decrease in water requirements through improvements in the irrigation systems.

#### Physical Features - Big Valley

Pit River flows in a southerly direction for about 26 miles through Big Valley from Gouger Neck on the north to Muck Valley on the south. The schematic diagram and map, annexed hereto as Exhibts 1 and 2, show the stream and distribution systems for this area. All of the irrigated lands, except lands of applicant/<sup>and</sup> a part of the Gouger Neck area, are also shown on Exhibit 2. There are at present six diversion dams in the channel of Pit River in Big Valley.

The Lookout Dam, which is the uppermost, is located about six miles south of Gouger Neck. The lowermost, known as the Thompson Dam, is situated about four miles north of Muck Valley. The Gerig Dam is located about three miles north of the Town of Bieber and the Bieber, McArthur, and Avilla dams are to the south, between Bieber and the Thompson Dam. The Fulcher and the Merritt Dams have not been in use in recent years.

Taylor Creek flows into Big Valley from the north and terminates in Gooch Swamp about two miles west of the Town of Lookout. Egg Lake Slough heads in Gooch Swamp and flows southerly to join and become an integral part of the Fulcher Pipe distribution system, which diverts from the west bank of Pit River about one mile north of the Gerig Dam.

Widow Valley Creek debouches on to the floor of Big Valley on the Carrie Kramer Ranch about two miles southwest of Gooch Swamp. This creek loses its identity on the Kramer Meadow and then reappears a short distance to the south as the head of Bull Run Slough. Bull Run Slough also flows southerly to join and become an integral part of the Fulcher Pipe distribution system about one mile west of the Gerig Dam. The drainage from lands irrigated under the Fulcher pipe distribution system flows from one tract directly to the next and is available for utilization on ten successive tracts served thereunder. The unconsumed portion of the water eventually returns to the river below all irrigated lands in Big Valley between the Thompson Dam and Muck Valley.

Ash Creek flows into Big Valley from the east and is tributary to Pit River at a point immediately above the Gerig Dam. Juniper Creek is also tributary to the river from the east at a point between the McArthur and Avilla dams.

Water is diverted from Pit River above the Lookout Dam through the Oilar Ditch, which leads westerly to Gooch Swamp, and through Roberts and Three-Corners Sloughs, which lead southeasterly through an area served with water by means of sub-irrigation therefrom. The back-water above the Lookout Dam also serves to sub-irrigate lands adjacent thereto. The Joiner Pump diverts intermittently from the upper end of the back-water. Any excess water that may be diverted through Roberts and Three-Corners Sloughs flows southerly and returns to the river via Ash Creek immediately above the Gerig Dam.

The back-water of the Gerig Dam irrigates the two Gerig Meadows by over-bank inundation on the east side of the river and also enables diversion through the Fulcher Pipe, the Watson Ditch and Hollenbeak Swale. The drainage from the Gerig Meadows and Hollenbeak Swale returns directly to the river. There is little or no usable drainage from the non-riparian lands served under the Watson Ditch.

The Bieber Dam and its supporting dam in the Ricketts Channel enable diversion through a box on the west bank of the river to fourteen irrigated tracts lying on the west side of the river between Bieber and Muck Valley. Water is conveyed through a series of meandering sloughs from one tract to the next along with the drainage from the upper tracts. The unconsumed portion of the water eventually returns to the river below all irrigated land between the Thompson Dam and Muck Valley.

The back-water of the McArthur Dam and its supporting dam in Gobel Slough irrigates by over-bank inundation on both sides of the river on the

McArthur Ranch and the west side on the Merritt Ranch. A portion of the drainage flows directly to the Avilla Ranch on both sides of the river and a portion returns to the river above the Avilla Dam. A portion of the lands of Ernest G. Babcock on the west side of the river also receives water from the McArthur Dam. The Avilla Dam, which has a similar method of diversion, is operated simultaneously with the McArthur Dam to obtain the most effective irrigation. All drainage from the diversions of the Avilla Dam returns to the river above the Thompson Dam, which is next downstream and the lowermost in Big Valley.

#### Irrigation Practice in Big Valley

Two methods of utilization of water are in general practice in Big Valley, namely, sub-irrigation and wild flooding. Water is received on 1346 acres by sub-irrigation and on 7656 acres by wild flooding.

Advantage is taken of ditches and natural channels and sloughs in applying the water by sub-irrigation. The water level is checked up in the channels, sloughs and ditches to cause lateral subsurface movement of water. The rate of seepage, which limits the rate of utilization of water by this method, has been found to be a maximum of 12.50 cubic feet per second from which 1346 acres receive benefit. This area is devoted primarily to the production of alfalfa.

The area of 7656 acres receiving surface irrigation from Pit River in Big Valley is devoted almost exclusively to the production of meadow hay and meadow pasture. Structures are placed across the river in which flashboards can be inserted to form a dam when diversion is desired. Water is either forced over the river banks to flood adjacent land, or the water is

diverted into main ditches and branch sloughs, from which it is spread on the irrigated lands. In both cases no preparation of the lands for irrigation is made other than construction of check dams across the many sloughs and swales to effect further spreading of water. Each basin thus formed covers an area of somewhat uneven terrain and comparatively large heads of water are required for efficient irrigation.

It is not feasible to install the uprights and flashboards in the river dams when the flow therein is in excess of 400 cubic feet per second. As soon as possible after April first of each year, the river and auxiliary dams are raised and irrigation is commenced. The meadows are inundated for a few days until adequate penetration of water in the heavy soil is obtained through the root zone of the plants. The water level is then dropped for about ten or twelve days, then another inundation is commenced. One complete irrigation cycle of filling the checks for complete inundation, holding for penetration, and release and aeration requires 18 to 30 days in accordance with climatic conditions. Four irrigations with a total application of about 2.4 acre feet per acre are desirable during the period from April 1 to July 1 for maximum crop production. The maximum rate of diversion occurs during the last eighteen days in June and the minimum rate during the month of April.

Simultaneous diversion of desirable irrigation heads is made by all water users from Pit River in Big Valley until the flow of the river above the Lookout Dam recedes to 160 cubic feet per second, at which stage of flow rotation in the use of water is commenced. As the flow continues to recede, the diversions to non-riparian lands are gradually closed and the

number of irrigation heads simultaneously operating is gradually decreased to one or two as the stage of flow approaches 100 cubic feet per second. Due to the availability of supplemental tributary supplies and surface drainage it is ordinarily not necessary to reduce irrigation diversions to non-riparian land until the river stage above the Lookout Dam recedes to less than 124 cubic feet per second.

All diversions from Pit River in Big Valley, except the Thompson Dam, are included under statutory watermaster service whenever necessity for such service is found to exist. Watermaster service has been rendered each year during the period from 1935 to 1943, inclusive, from such time after April first that the stage of flow made it feasible to install the river dams and until October 1 of that year. The watermaster enforced the provisions of "Agreement Determining Rights to Water and to the Use Thereof From Pit River in Big Valley in Modoc and Lassen Counties, California" during the nine years last past insofar as not inconsistent with the duty to eliminate waste. The watermaster necessarily took into consideration the water supply utilized on the lands embraced in the agreement from supplemental sources and from surface drainage from irrigated lands in the prevention of wasteful diversion of water from Pit River.

All lands riparian to Pit River in Big Valley, which it is physically possible to irrigate under the now existing diversion facilities, are included in the above mentioned agreement. There are 303 acres of riparian land included in the agreement, but which are excluded from the watermaster service area. The allocation made in the agreement for this land is adequate to meet the requirements for all reasonable beneficial uses there-

on. The owners of this area of 303 acres of riparian land have received water in accordance with the provisions of the agreement, have cooperated with the watermaster, and have acquiesced in the plan of distribution for nine years.

#### Water Supply

Pit River is the main source of water supply for lands irrigated from the river in Big Valley. A substantial amount of water is also normally available for a major portion of the same land from Ash, Taylor, Widow Valley and Uniper creeks during the months of April and May. Drainage from irrigated lands is also important in supplying water requirements in this area whenever the combined diversions from the river and the four tributaries in Big Valley are less than 158.7 cubic feet per second.

#### 1. Surface Drainage

The allocations in first priority class under the above discussed water right settlement on Pit River in Big Valley of 25 cubic feet per second are largely consumed. The allocations in second priority class of 99.4 cubic feet per second result in surface drainage, varying with climatic conditions, of 40 to 50 cubic feet per second when full allotment is diverted. The average consumptive use for this area under full water supply conditions during the period from April to June, inclusive, is set forth in

Table 15 on page 55 of Bulletin 41 of Division of Water Resources as 1.7 acre feet per acre of irrigated land. This is equivalent to an average rate of consumption on the area of 5979 acres with allocations in second priority class of 56 cubic feet per second and an average rate of drainage of 43.4 cubic feet per second under full water supply conditions as has occurred during four of the fourteen years of record. The irretrievable surface drainage necessarily lost under the existing distribution systems and methods of irrigation is approximately 11 cubic feet per second. There is no appreciable deep percolation on the heavy soils under surface irrigation systems and the average rate of surface drainage from riparian lands available for reuse is approximately 32.4 cubic feet per second when the water supply available for diversion exceeds the combined allocations of 124.4 cubic feet per second in first and second priority classes. The actual water supply then available for use, including usable surface drainage from riparian lands, is nearly 157 cubic feet per second, which is more than adequate to fully supply all allocations in third priority class at the same stage of flow. The usable surface drainage from the lands irrigated under allocations in third priority class is in turn more than adequate to make up the deficiency for allocations in fourth priority class.

## 2. Tributaries in Big Valley

It is set forth on page 10a of the report by the Division on "Water Supply and Use of Water on Ash Creek and Tributaries, Modoc and Lassen

Counties, California", dated February 26, 1938, that the mean natural flow of Ash Creek and its tributaries during the months of April and May will approximate 23,600 acre feet. It is set forth on page 55 of Bulletin 41 of the Division that the estimated net consumption of water during April and May in this area, when adequate water is available, is 1.10 acre feet per acre of irrigated land. The normal consumption on 14,161 acres irrigated from Ash Creek and its tributaries, including 898 acres partially supplied from Pit River, is calculated to be approximately 15,600 acre feet. The normal contribution of Ash Creek into Pit River is thus approximately 8,000 acre feet during April and May. This flow from Ash Creek into Pit River is not susceptible of exact measurement because it occurs in a swale slightly over one-half mile in width. This indicated normal contribution is equivalent to a continuous flow of approximately 65 cubic feet per second during April and May.

The first irrigation during April in Gooch Swamp with a storage capacity of about 1,000 acre feet is normally supplied from Taylor Creek before any water is diverted from Pit River for this area. Early in the season, some water is normally spilled through the Gooch Swamp Dam into the Fulcher Pipe diversion system leading to the lands of Carrie Kramer. The lands of Carrie Kramer also receive some water from Widow Valley Creek under normal runoff conditions during the early part of the irrigation season. The continuous flow equivalent of the amount of water received in April in Gooch Swamp is approximately 16 cubic feet per second. The amount of water received on the lands of Carrie Kramer is uncertain because no measurements other than intermittent observations have been made.

No measurements have ever been made of the contributions in water supply from Juniper Creek to Pit River. Juniper Creek is not normally a living stream during the irrigation season. At frequent intervals of short duration, after heavy spring storms, considerable water is delivered into the lower portion of Big Valley from this source. However, this source of supply is not an important consideration in this instance, because whenever water is available from this source for lands irrigated from Pit River in Big Valley, applicant's water requirements for direct diversion are fully supplied under his rights on Dark Canyon Branch of Juniper Creek and no diversion is necessary under Application 10143.

The aggregate net effect of the above mentioned supplies tributary to Pit River in Big Valley may be calculated for the moderately dry year of 1930 by taking the difference between the flows of Pit River at Gougher Neck and at Muck Valley, Tables 4 and 14, respectively, in "Report on Supervision of Diversions from Pit River in Big Valley, Modoc and Lassen Counties, California, 1930 Season" as follows:

Station	Mean Monthly Flow in Cubic Feet per Second			
	March	April	May	June
Muck Valley (Lower end Big Valley)	379	127	82	40
Gougher Neck (Upper end Big Valley)	680	137	67	11
Difference	301 Gain:	10 Gain:	15 Loss:	29 Loss:

The aggregate net effect of the tributary supplies in 1930, was to contribute more than 300, and 10 cubic feet per second, respectively, over and above all consumption of water in March and April. The average flow of 11

cubic feet per second at Muck Valley in June, 1930, represents surface drainage irretrievably lost under the irrigation systems then existing, because there was practically no contribution from tributaries during that month. The tributary supplies furnished adequate water to supply all but 15 cubic feet per second of the average rate of consumption during May, 1930.

### 3. Pit River

Records of mean daily discharge in Pit River during the season from March 1 to June 30 are on file in the office of the Division of Water Resources for stations at Gouger Neck and Muck Valley in 1930 and 1931, and at Canby from 1932 to 1943, inclusive. Records are also available of the flow at the Canby Station during 1930 and 1931 for part of March and from April 1 to June 30.

The periods of simultaneous records of flow in Pit River at Canby and at Gouger Neck, with a lag correction of one day, indicate no material difference of flow between the two stations for stages below 100 cubic feet per second between April 1 and June 30. For stages of flow in excess of 100 cubic feet per second between March 1 and May 31, there was a material inflow from tributaries between the two stations. There was also material inflow between the two stations during the month of March at stages of flow below 100 cubic feet per second. A comparison of the record flows at the two stations at various stages between March 10 and May 31, with a correction for lag of one day, is set forth in the following tabulation:

: Stage of Flow at	: Inflow Canby to Gouger Neck Cu.Ft.per Sec. :		
: Gouger Neck	:	:	:
: Cu. Ft. per Sec.	: March	: April	: May
: 160 to 270	: 106	: 48	: 52
: 101 to 159	: No record	: 26	: No record
: 60 to 100	: 63	: 0	: 0

The average discharge in cubic feet per second of Pit River at Gouger Neck in 1930 and 1931, and at Canby from 1932 to 1943, inclusive, during each of the four normal irrigation periods in Big Valley follows:

: Year	: April 1 to 30	: May 1 to 23	: May 24 to June 12	: June 13 to 30
: 1930	: 127.0	: 88.0	: 44.5	: 45.4
: 1931	: 9.9	: 8.7	: 7.5	: 6.7
: 1932	: 288.0	: 689.0	: 305.0	: 97.6
: 1933	: 40.6	: 83.3	: 31.5	: 14.7
: 1934	: 1.3	: 9.2	: 9.0	: 16.4
: 1935	: 658.0	: 347.0	: 283.0	: 182.0
: 1936	: 506.0	: 267.0	: 66.9	: 115.0
: 1937	: 347.0	: 50.0	: 44.5	: 14.8
: 1938	: 1884.0	: 1280.0	: 643.0	: 221.0
: 1939	: 89.2	: 33.0	: 43.7	: 26.0
: 1940	: 390.0	: 98.0	: 48.0	: 58.0
: 1941	: 131.0	: 240.0	: 234.0	: 105.0
: 1942	: 503.0	: 521.0	: 621.0	: 188.0
: 1943	: 714.0	: 636.0	: 360.0	: 215.0
: 14 Yr:	:	:	:	:
: Avg. :	: 406.0	: 311.0	: 196.0	: 94.0
: Avg. :	:	:	:	:
: 1932):	:	:	:	:
: 1936):	: 329.0	: 324.0	: 163.0	: 94.0
: 1940):	:	:	:	:
: 1941):	:	:	:	:

The above 14-year period of record embraces two critical dry years, 1931 and 1934, in which there was a complete failure of water supply for irrigation purposes. It also includes the very wet year of 1938 of extraordinary floods.

The period also includes four years with runoff conditions approximating normal--1932, 1936, 1940 and 1941, four dry years of 1930, 1933, 1937 and 1939, and three wet years of 1935, 1942 and 1943. The measured water content of the snow crop in the Upper Pit River watershed on the three snow courses at Cedar Pass, Eagle Peak and Adin Mountain, and the measured runoff of Pine Creek near Alturas from April 1 to July 31, during the period from 1930 to 1943, compared with the respective normals are set forth in the following tabulation to indicate the relative wetness and dryness:

Year	Average Water Content of Snow Cedar Pass, Eagle Peak & Adin Mt. on April 1st.		Measured Runoff of Pine Creek April 1 to July 31	
	Inches	% of Normal	Acre-Feet	% of Normal
1930	10.0	50	5,890	68
1931	5.5	28	2,620	30
1932	17.3	87	10,300	120
1933	14.9	75	5,660	66
1934	1.4	7	3,450	40
1935	20.8	105	9,290	108
1936	22.8	115	9,300	108
1937	18.6	93	5,510	64
1938	25.6	129	12,890	150
1939	9.7	49	4,600	54
1940	11.5	58	6,800	68
1941	14.3	72	7,180	84
1942	16.0	81	9,880	115
1943	20.9	105	13,620	158
14 Yr. Average	14.9	75	7,650	89
Normal	19.9	100	8,600	100

The above normals have been calculated by comparison with records of runoff of Pit River at Ydalpom over the past 54 years. Continuous records of runoff of Pine Creek have been collected by the Division for the past 25 years. The snow crop in the Pit River watershed has been subnormal in 10 of

the above 14 years, and the runoff of Pine Creek has been subnormal in 8 of the 14 years.

Duty of Water

The gross duties of water and water requirements for the lands receiving benefit from waters of Pit River in Big Valley, as determined from the above mentioned detailed investigations from 1928 to 1934, and confirmed under statutory watermaster service from 1935 to 1943, are set forth in the following tabulation:

Designation of Tract	Irrigated or sub-irrigated Acreage	Gross Duty Acres Per Cubic Foot Per Second	Gross Water Requirements Cubic Feet Per Second
Riparian sub-irrigated land above Lookout Dam	540	106	5.10
Non-riparian sub-irrigated land under Threecorners and Roberts Sloughs	806	109	7.40
Irrigated land under Oilar Ditch non-riparian	958	54½	17.60
Irrigated under Watson, Three- corners and Roberts Slough- non-riparian	719	59	12.20
Irrigated riparian land, in- cluding 303 acres of non- signatory users	5979	60	99.50
<b>Totals</b>	<b>9002</b>	<b>—</b>	<b>141.80</b>

The above gross water requirements for diversion from Pit River in Big Valley were determined and tested under a wide range of water supply

conditions. There are no appreciable transportation losses, with the exception of approximately 1.30 cubic feet per second in diversions for irrigation of non-riparian land through the Oilar and Watson ditches. The gross duty approximates the net duty for all riparian and sub-irrigated land. In addition to the above gross water requirements for diversion, it was determined that losses of 16.90 cubic feet per second were incurred in the channel of Pit River between the Lookout Dam and the Thompson Dam in maintaining channel storage at maximum capacity above the various diversion dams, stock watering consumption, and percolation, evaporation and plant transpiration along the course of the channel. The above duties of water are all based on peak demand during the last irrigation before haying from June 13 to 30, inclusive. An average water supply of 158.70 cubic feet per second is thus required during the period of peak demand to meet the aggregate water requirements for the area. This quantity of water was at the time of the duty of water determination, and is now, adequate to supply peak demand requirements for all reasonable beneficial uses of all irrigated and sub-irrigated lands that receive benefit from waters of Pit River in Big Valley under diversion facilities then and now existing.

Ordinarily four irrigations of 0.6 acre foot per irrigation are necessary between April 1 and June 30 for maximum crop production. The length of time between irrigations varies with climatic conditions, the cycle becoming shorter as the season progresses and higher temperatures prevail. The most favorable practice is to complete the first irrigation during the month of April, the second between May 1 and 23, inclusive, the third between May 24 and June 12, inclusive, and the fourth during the last eighteen days in June.

The maximum number of irrigations received on any lands irrigated from Pit River in Big Valley during the last fourteen years has been four, irrespective of water supply conditions. The first irrigation during the month of April is often omitted if heavy storms occur during that month.

A substantial portion of the lands served with waters of Pit River in Big Valley has sources of supply other than Pit River which are in fact normally used, particularly during the months of April and May, to partially satisfy the water requirements. The owners of 898 acres served with water from Pit River by means of the Gerig Dam and Watson Ditch with water requirements of 18.75 cubic feet per second are also entitled to divert from Ash Creek in lieu of diversion from Pit River, and do in fact, during years of normal runoff, receive a substantial portion, and often the entire amount, of their full water requirements from Ash Creek during the months of April and May. During the early portion of the irrigation season a large portion, and often the entire water requirements of 14.66 cubic feet per second on 794 acres in Gooch Swamp, is received from Taylor Creek. Likewise a well sustained flow in the early part of the irrigation season is normally available in Widow Valley Creek and Taylor Creek to supply the water requirements of 8.48 cubic feet per second on 367 acres of Carrie Kramer. Also some water is occasionally available in Juniper Creek early in the irrigation season to supply water requirements of 20.40 cubic feet per second on 1035 acres below the McArthur Dam.

The amount of 12.50 cubic feet per second utilized from Pit River in Big Valley for sub-irrigation of riparian and non-riparian lands is largely consumed and no appreciable portion thereof again becomes available for use

in the form of return flow or drainage. This represents the maximum rate of sub-irrigation for these areas. Likewise none of the 16.90 cubic feet per second utilized between the Lookout Dam and the Thompson Dam, for stock watering purposes and to maintain storage at maximum capacity back of the diversion dams, is recoverable for use for any other purpose.

The surface drainage from 7656 acres of lands served with surface irrigation from Pit River in Big Valley varies from 40 to 50 per cent of the water diverted when full water requirements are applied thereto. A major portion of the surface drainage is conveyed directly to the next downstream tract without return to the river. It is provided in the above mentioned "Agreement Determining Rights to Water and to the Use Thereof from Pit River in Big Valley, in Modoc and Lassen Counties, California" as follows:

"The owners of the various irrigated areas shall maintain facilities on their respective lands for passing all carry-over water and surface drainage flow in a direct manner for the utilization of the next successive water user."

Such facilities for passing surface drainage flow are maintained and the drainage from the upstream lands is used over and over again down to the 79 acres under the Thompson Dam and the lowermost of the lands of Ernest G. Babcock. The duties of water above set forth were individually determined for the lands of each owner and the water supply to meet the requirements may be partially derived from surface drainage from upstream lands. When the water supply in Pit River at a point immediately above all irrigated land in Big Valley is equal to, or greater than 158.70 cubic feet per second, then return flow and surface drainage are not needed to meet the requirements for all reasonable beneficial uses now existing in the area. The return flow and surface drain-

age under full water supply conditions are a convenience in providing larger irrigation heads in that little care is required in application of water to the irrigated land.

The surface drainage and return flow from the irrigated land become increasingly important as the water supply available for diversion from Pit River and its tributaries in Big Valley recedes below 158.7 cubic feet per second. It is set forth in the "Report on Water Master Service on Pit River in Big Valley, Modoc and Lassen Counties, California, 1936 Season" as follows:

" . . . Prior to about May 16 the flow in Pit River available for irrigation greatly exceeded the total allotments. Toward the end of May rotation of diversions was employed and continued until June 12 when the supply increased from upstream runoff induced by heavy rains early in June. Thereafter the supply was in excess of demands and all lands received full allotments during the last two weeks of June except the lands of James Holl where an important support dam in Egg Lake Slough failed on June 20 and the west side water was lost for the remainder of the irrigation season before haying."

The flow of Pit River at Canby during the 46-day period from May 16 to June 30 in 1936, fluctuated between 37 and 163 cubic feet per second and the average was 93 cubic feet per second. Nevertheless through utilization of supplemental tributary sources of supply, surface drainage, and return flow, it was possible to deliver two complete irrigations of 0.6 acre foot per acre per irrigation to 5979 acres of riparian land and at the same time

continuously supply 25 cubic feet per second to allocations in first priority class. Also full allocations were supplied to non-riparian owners for 18 days during this 46 day period. Thus with an apparent average water supply in Pit River at Canby of 93 cubic feet per second, the actual average water supply available for use during this 46 day period on lands irrigated in Big Valley was 117 cubic feet per second, not including an estimated loss of 8 cubic feet per second of surface drainage from the lands of James Holl during the last 10 days in June due to failure of a check dam in Egg Lake Slough.

Water Supply Compared with Water Requirements

Assuming that the entire water requirements of the total area of 9,002 acres of irrigated land is to be supplied solely from the waters of Pit River, i.e., excluding return flow, surface drainage and water available in supplemental tributaries in Big Valley, then the average water supplies in the river necessary to deliver each of the four irrigations of 0.6 acre foot per acre of surface irrigation and other uses is as follows:

Classification of Water Requirements	Average River Discharge for Period-Cu. Ft. per Sec.			
	April 1 to 30	May 1 to 23	May 24 to June 12	June 13 to 30
:Sub-irrigation	: 12.50	: 12.50	: 12.50	: 12.50
:Maintain Channel Storage	: 16.90	: 16.90	: 16.90	: 16.90
:Ditch Losses	: 1.30	: 1.30	: 1.30	: 1.30
:Surface Irrigation	: 77.00	: 100.00	: 115.50	: 128.00
:Total Requirements	: 107.70	: 130.70	: 146.20	: 158.70

The existing diversion systems are adequate to handle the entire flow of the river up to a stage of about 400 cubic feet per second. Flashboards are customarily pulled from the river dams when the flow exceeds 400 cubic feet per second for protection of the structures. If the average water supplies of Pit River are equivalent to the above average requirements for each

of the four irrigation periods, then no diversion from supplemental supplies or surface drainage is necessary to meet all requirements of reasonable beneficial uses of all lands in the valley under diversion facilities now existing.

A comparison of the above requirements with the water supply of Pit River at Gouger Neck and at Canby, hereinbefore tabulated for the same irrigation periods for the 14 years of record, clearly indicates that during four of the years there was a large quantity of surplus water throughout the period from April 1 to June 30. During six of the 14 years there was a large surplus from April 1 to June 12, and in one-half of the years there was unappropriated water from April 1 to May 23. In ten of the 14 years there was surplus water throughout the month of April and in four of the years there was no unappropriated water. With due consideration to the existence of supplies from supplemental tributaries and surface drainage, the surplus water would actually be greater, but such consideration is unnecessary because the unappropriated water in each of the periods when it occurs is large and well sustained. It appears that in years of average runoff conditions, even ignoring surface drainage and supplemental supplies, the discharge of Pit River will be greater than all requirements of reasonable beneficial uses under existing irrigation systems in Big Valley from April 1 to June 12.

The only water requirements on the lands irrigated from Pit River in Big Valley during the month of March are the continuous flow allocations in first priority class of 25 cubic feet per second set forth in the above mentioned agreement containing the water right settlement. The water supply

records show surplus water throughout March in all of the years of record except 1931 and 1934. There was surplus water during the first 25 days in March, 1931, and during the first 2 days of March, 1934. The water requirements under existing rights during the month of March are on a constant flow basis primarily for stock watering purposes. The water requirements for surface irrigation from April 1 to June 30 are on a volumetric basis and water is customarily taken at the rate of availability up to a stage of 400 cubic feet per second until a total volume of approximately 4,600 acre feet is received for each irrigation.

#### Availability of Unappropriated Water

To the extent that testimony at the hearing places protestants in the position of protesting on the ground that granting the application would enable permittee to infringe their presently unused riparian rights, this objection is without merit. All permits are issued subject to vested rights and if protestants have in fact such unused riparian rights, any right acquired by permittee would be subject thereto, provided that permittee would be entitled to use the water until such time as the downstream riparian owners have actual need for it. This is now fundamental, and requires no citation of authority. It is therefore unnecessary to consider whether or not protestants are the owners of presently unused riparian rights. There are no diversion and distribution facilities now in existence for diverting and conveying water from Pit River to any non-irrigated riparian land.

Since the foregoing discussion clearly indicates the existence of unappropriated water, there remains only the determination of whether there is reasonable prospect that such flows will recur at such intervals and in

such quantities as to be of substantial value to applicant, and whether his use of the unappropriated water is subject to adequate safeguards to prevent infringement of presently exercised rights of use.

Applicant has other partial sources of supply in the form of storage for the lands included in Application 10143. Applicant also has a right to direct diversion from a tributary of Juniper Creek. The present rights of applicant are inadequate to fully supply the water requirements of his lands. Applicant has obtained permission from the owners of the Watson Ditch to effect the diversion proposed under his application. The ditch has been sufficiently enlarged by applicant to carry the additional water sought by him. In view of the supplemental storage available for lands of applicant, any direct diversion received under his application would be of substantial value to him, because it would extend his present limited season of use. During ten of the fourteen years of record unappropriated water was continuously available from a minimum of 61 days to a maximum of 122 days.

The Watson Ditch that applicant proposes to use is now included under statutory watermaster service and will continue to be regulated by watermaster whenever necessity for regulation exists. All existing rights in the Watson Ditch are allocations of third priority class under the above mentioned agreement containing the water right settlement. The water supply records at Canby show that usually when water was available for rights in third priority class there was considerable surplus water. During the 14 years of record, the discharge of Pit River at Canby, from March 1 to June 30, exceeded 124 cubic feet per second for <sup>an</sup> average of 68 days, whereas it exceeded 159 cubic feet per second for an average of 63 days. The records show that there is either a rather large surplus or no surplus at all. There will

therefore be little or no additional effort for the watermaster to adjust the flow in the Watson Ditch to include therein unappropriated water for applicant when it is available. It has been demonstrated through many years of experience in these matters that watermaster service is the most practical and positive safeguard against late appropriations infringing rights superior in priority or paramount in right.

The point has been raised that water users in Fall River Valley below Big Valley also object to any more appropriations from Pit River in Big Valley. This objection obviously cannot be supported, because it is common knowledge that the water supply fails in Big Valley before a shortage ever occurs in Fall River Valley.

#### Summary and Conclusions

In years of normal runoff, water is available for appropriation by applicant continuously from March 1 to June 12 and in wet years continuously from March 1 to July 1.

None of the water users in Big Valley are at present in a position to divert and apply to beneficial use any of the surplus waters of Pit River.

Diversion of unappropriated waters of Pit River can be made by applicant under existing watermaster supervision without infringing any presently exercised rights of use.

Unappropriated water occurs in Pit River in Big Valley at frequent intervals in large quantities over well sustained periods.

Diversion of unappropriated water under Application 10143 would be of substantial value to applicant, because a right to additional water assures

him of a more dependable supply than he now has.

There is no necessity for restriction of season of diversion because of the existing watermaster supervision.

ORDER

Application 10143 for a permit to appropriate water having been filed with the Division of Water Resources as above stated, protests having been filed, a public hearing having been held and the Division of Water Resources now being fully informed in the premises:

IT IS HEREBY ORDERED that Application 10143 be approved and that a permit be issued to the applicant subject to such of the usual terms and conditions as may be appropriate.

WITNESS my hand and the seal of the Department of Public Works of the State of California this 24<sup>th</sup> day of February, 1944.

EDWARD HYATT, STATE ENGINEER

BY

Harold Conkling  
Deputy State Engineer

TRS:GG

