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Provo City v. Hubert C. Lambert et al : Abstract of Record

Utah Supreme Court

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IN THE SUPREME COURT OF THE
STATE OF UTAH

PROVO CITY, a municipal corporation of the State of Utah,

Plaintiff and Respondent,

vs.

HUBERT C. LAMBERT, State Engineer of the State of Utah; PROVO RIVER WATER USERS ASSOCIATION, a corporation; KENNECOTT COPPER CORPORATION, a corporation; SALT LAKE CITY, a municipal corporation; CENTRAL UTAH WATER CONSERVANCY DISTRICT, UTAH LAKE DISTRIBUTING COMPANY, a corporation; UNITED STATES OF AMERICA, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR, HUGH McKELLAR, as Provo River Commissioner; and PROVO RESERVOIR WATER USERS COMPANY, a corporation,

Defendants and Appellants.

Case No. 14,605

ABSTRACT OF RECORD

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IN THE SUPREME COURT OF THE
STATE OF UTAH

PROVO CITY, a municipal corporation of the State of Utah, :

Plaintiff and Respondent, :

vs. :

Case No. 14,605

HUBERT C. LAMBERT, State Engineer of the State of Utah, :
et al, :

Defendants and Appellants.

ABSTRACT OF RECORD

Defendants-Appellants submit this Abstract of the Transcript of Record. The order of presentation in this Abstract follows the order of appearance of the witnesses at the trial. Reference is made to the applicable pages in the transcript of the record as (R. 13). It should also be noted that much of the testimony at the trial was testimony from transcripts of previous evidentiary hearings before the state engineer which were read into the record, or were submitted into the record at trial. In preparing this Abstract, we have tried to point out where such testimony was read as opposed to live witnesses. Where the testimony at the state engineer's hearing was read into the record at trial, such testimony appears twice in the record, and both page references will be given.

WITNESSES FOR PLAINTIFF

It should be noted that for the first evidence, Plaintiff sought to introduce and read from transcripts of the hearing before the state Engineer. At such hearing before the state engineer, Plaintiff also read from portions of the transcript of the record in the Morse Decree case (Civil No. 2888). Defendants objected that such testimony was beyond the scope of the remand from the Supreme Court, and that Mr. Howard was attempting to retry the whole case. The objection was overruled. (R. 954-958)

DIRECT EXAMINATION OF HUGH A. MCKELLAR (From State Engineer's Transcript)

Mr. McKellar is a resident of Orem. He is 59 years of age and holds an engineering degree from the University of Utah. He is presently and has been Superintendent of the Provo River Water User's Association since 1971. Mr. McKellar was the former Provo River Commissioner appointed by the State Engineer. (R. 944-945; 644-645)

In 1969 he was the River Commissioner who refused to deliver the 4(c) 16.5 c.f.s. to Provo City for Irrigation purposes. He didn't know how the previous commissioners delivered this water although he had examined some of Mr. Wayman's notes. (R. 946; 646)

His responsibilities were to see that the water from the Provo River was delivered in accordance with the Provo River Decree (Morse Decree). He read and interpreted the Decree to mean that the 4(c) water was a nonconsumptive power right. (R. 946; 647) The 4(c) water is separate from 4(a) and 4(b) water, and it was only meant to be used nonconsumptively for power purposes. He arrived at this conclusion

from reading the Decree because that is all he had to guide him. He interpreted the Decree and distributed the water according to his interpretation. (R. 949; 649)

He had access to most of the records of the previous water commissioners, most of whom are dead, but some of the records were not available. (R. 949; 649) He only checked Mr. Wentz's and Mr. Wayman's records to see how they had delivered the water. The records showed that Wayman had delivered the 16.5 c.f.s. to Provo City from 1958 to 1969 and these deliveries were made even though the power uses had ceased. (R. 949-950; 650-651) He concluded that to deliver the 16.5 c.f.s. was an erroneous interpretation of the Decree. (R. 951) No cross examination was made.

DIRECT EXAMINATION OF DEAN WHEADON
(From State Engineer's Transcript)

Dean Wheadon is Director of Water and Waste Water for Provo City. He has held that position for nine months and before that was Assistant Engineer. (R. 952; 653)

Referring to an aerial photo, later to be admitted as Exhibit 3, Wheadon testified that it is one of the devices he used in investigating the boundaries of Provo City in 1921. From these investigations he concluded that in 1921, the total area within Provo City was approximately 7,360 acres. (R. 962; 655)

In determining which water was used within and without the Provo City Boundaries in 1921, Wheadon plotted the existing canal system and city boundaries as they existed in 1921. The total area within the city limits was 7,360 acres. (R. 965-966; 660) From that total he subtracted the city lots which totaled 499.9 acres. The acreage

of the city lots was taken from the Provo River Decree and no attempt was made to compute that acreage. (R. 967; 662) The area cross-hatched in orange on Exhibit 3 is the area he determined to be the city lots. (R. 967; 662) The city lot acreage excluded areas covered by streets, but did include area covered by buildings. It included all lands except for streets. (R. 969; 664)

Exhibit 4 sets forth the present irrigation systems of the city. On Exhibit 4, the purple line represents the Lower East Union Canal and the long green line is the Factory (Mill) Race. (R. 970; 665)

CROSS EXAMINATION OF DEAN WHEADON
(From State Engineer's Transcript)

Wheadon admits that he is neither a licensed engineer nor land surveyor nor has he received any degree in those fields. (R. 974; 669) In computing the acreage figures on Exhibits 3 and 4, the city lot acreage was determined by the city engineer, and Wheadon himself computed the green-hatched area by interpolating the area on the aerial maps according to scale. (R. 974; 669) The measurements are less accurate towards the edges of the photo. The acreage in the green-hatched area could vary as much as 20%. (R. 973; 670) The acreage computed for the green-hatched area includes buildings, streets, etc. (R. 973; 670) The green-hatched area is south of the railroad tracks on 6th South and west of the railroad tracks as they run diagonally. (R. 973; 670-671) Wheadon states that according to some city council minutes in 1921, some of the land in the green-hatched area was irrigated from the Provo City system. (R. 975-976; 672-673) Wheadon states that some of the green area shown is actually marshland in

Provo Bay but he thinks that it might have been irrigated in the summer. (R. 980; 676)

Mr. Howard then digressed and read from the Morse Decree Transcript (Civil No. 2888) which was read into the record at the state engineer's hearing. The testimony read was that of a Mr. Swan who was the Provo City Water Master in 1921. (R. 982; 619) Swan described the Factory Race and that it begins near the start of the East Union Canal and heads in a southerly direction through the city. Swan testified that the Factory Race irrigated irregular lands comprising a number of blocks lying north of Center Street and west of the canal. (R. 983; 620) It also irrigated the first tier to the west of the Factory Race with the exception of block 11, plat A, it also irrigates some land in what is called the First Ward Pasture, and some lands west of the First Ward Pasture. Swan then described the power uses made of the water by the various factories on the race. The water was definitely used for power purposes. (R. 984; 621)

Mr. Howard continues reading from the Morse Decree of the transcript. (R. 988; 627) He reads portions of the testimony of a Mr. Goddard, who is 58 years old in 1921, and was a former Water Master. Goddard testifies that water out of the Factory Race was also used for irrigation. (R. 988; 628-629) At this point the court noted that the First Ward Pasture Company had a separate water right from Provo City, but Mr. Howard stated that additional lands were irrigated in the area. (R. 991)

Goddard also testified that an arrangement had been worked out where irrigators exchanged water with the mills in the evenings and

on Sundays, and this took place during low water. (R. 991-992; 630-631) Goddard says that Provo City never wasted any of its water and that the volume of water in the East Union Canal and the Factory Race had remained nearly constant over the years. (R. 992; 631) Since the first Morse Decree, the city turned water into the Factory Race for the operation of the mills. This was done during the irrigation season. Such stream of water, in the Factory Race had been used night and day, and was turned to the irrigators. (R. 993; 632) Goddard stated that during the high water period 75-80 c.f.s. had been turned into the Factory Race and used by the factories to generate power. As the water in the river went down the amount diverted was decreased in proportion to the city's rights. To Goddard's knowledge this had always been the practice. (R. 994; 633) The exchange between the farmers and the power company took place when the Provo River was at its low stage. Goddard further testified that during the low water stage the factories sometimes had trouble getting enough water to run their mills, but the 12 c.f.s. could run the mills effectively. (R. 994-995; 634)

Mr. Howard then reads from the Morse Decree Transcript, covering the portions of the testimony of a Mr. Thompson, also a Water Master for Provo City. (R. 996; 635) Thompson states that the water from the Factory Race was distributed on written notice. The Factory had to be administered a little differently from the East Union Canal. (R. 997; 636) Thompson testified that when the water ran short, water use was reduced proportionately, but some of the water was taken away from the mills and given to the irrigators. (R. 997-998; 636-637)

As water master he would shut off the mills when circumstances demanded. He did not get the mill's permission; he just did it, although he explained the situation to the mills. At such times the water was needed to save the farmer's crops. (R. 998-999; 637-638)

Mr. Howard then read a Stipulation from the Morse Decree proceedings whereby Provo City and the various mills stipulated that the water rights which the power companies used were owned by Provo City, but that the mills had a right of use under grants from the city. The Stipulation also recognized the exchange that had occasionally been made in the past between the power users and the irrigators. (R. 999-1000; 638-639).

Mr. Howard then proceeded to read portions of the testimony of a Mr. Flyger, from the Morse Decree Transcript (R. 1000; 639) Mr. Flyger was an employee of the Knight Woolen Mills. Mr. Flyger testified that the water for the mills was in the Factory Race from September through May. (R. 1000; 640) During the remainder of the year the mills had from 1,000 to 2,000 acre feet of water. (R. 1001; 640) The mills always utilized the water in the Factory Race for power. Flyger states that during the low water stage, at night, the water was turned down to the farmers. (R. 1001; 641)

Mr. Howard then concluded his reading from the Transcript of the Morse case. Mr. Novak moved to strike all that Mr. Howard had read on the grounds that such was beyond the scope of the remand from the Supreme Court. The motion was denied. (R. 1002)

DIRECT EXAMINATION OF J. EARL STUBBS
(Before the State Engineer)

Mr. Stubbs is 78 and a lifelong resident of Provo. He grew up near 11th West and 1030 South. He still lives four or five blocks from that location presently. (R. 1003; 677) He has been a farmer all his life. His father's first farm was located at 11th West and 1030 South. The land which Stubbs irrigated is outlined in red on Exhibit 3. (R. 1004; 678) The land irrigated comprised of 673 acres. Stubbs farmed all 673 acres over the past 40 years. He stated that he is fairly familiar with the Provo City irrigation system and the ditches which serve the various areas. (R. 1005) Water from the Factory Race was used to irrigate property lying west of 5th West. (R. 1006; 680) The division works were near the Provo Brick Yard. Stubbs identifies the Eggertson Ditch which takes off from the 5th West Ditch at 4th South and runs west and south to the railroad tracks along 6th West. (R. 1006-1007; 681) There was some confusion between Mr. Hansen (state engineer), Mr. Howard, and the witness, as to whether or not the 5th West Ditch took off from the Tanner Race or the Factory Race. (R. 1007; 682)

Mr. Stubbs states that he has been taking water from the Eggertson Ditch since 1911. 6.0 c.f.s. were turned into the Eggertson Ditch at 4th South, the balance went on down the 5th West Ditch. (R. 1009; 682-683)

Mr. Stubbs is also familiar with the Nelson Ditch which takes off at the 5th West Ditch, south of the railroad tracks on 5th West. The water in the Nelson Ditch is diverted west from the 5th West Ditch and some water is also diverted east along 5th West to the Lake.

(R. 1009; 683) Stubbs says that 6.0 c.f.s. was diverted into the Nelson Ditch from the 5th West Ditch. The Nelson Ditch ceased to exist 16 years ago. (R. 1010; 684) At this point there was still some confusion as to whether these ditches came off the Factory Race or the Tanner Race. It was finally agreed that the 5th West Ditch is fed from the Factory Race but Mr. Novak preferred to let the record speak for itself as to the amounts of water diverted from the Eggertson and Nelson Ditches. (R. 1011-1012) Mr. Novak pointed out that the water actually came from the City Race, and Mr. Howard pointed out that the City and Factory Races have the same source. (R. 1012)

Stubbs testified that after 6.0 c.f.s. has been diverted into each of the Nelson and Eggertson Ditches, there was 6.0 c.f.s. left in the 5th West Ditch. Thus, at the Nelson headgate there was 12.0 c.f.s. in addition to the 6.0 c.f.s. taken out for the Eggertson Ditch. (R. 1013; 685) 17.0 c.f.s. was put into the East Union Canal back as far as 1944 to 1945. (R. 1013-1014; 685-686) Stubbs states that even as a boy he was familiar with the property that lies south of the railroad tracks, which was marked in green cross-hatch on the diagram, and that water for the green-hatched area came from the Factory Race. (R. 1015-1016; 687) Stubbs also stated that part of the First Ward Pasture and other lands in that area were irrigated from a diversion dam downstream from the Smoot Lumber Company near 4th West. (R. 1016; 688) The Fred Stubbs farm was located from 6th South to about 1050 South and west of University Avenue. The Fred Stubbs farm got its water from the Factory Race. (R. 1016; 689)

The witness was also familiar with the John Goddard farm and the water for that property came partly from the Factory Race and partly from the 5th West Ditch. (R. 1017-1018; 689) The diversion dam that diverted water for these farms could have dried up the Mill Race, but it did not always do so. (R. 1019; 690-691) This dam was about two blocks south and one half block east of the Smoot Lumber Company. (R. 1019; 691)

Stubbs stated that the farmers in the area were always short of water and that he never saw any water from the Mill Race going to waste. (R. 1020; 692) Stubbs is also familiar with Provo City's water use on its Golf Course because Stubbs and his sons planted the course. (R. 1020; 692) To water the Golf Course, they used to pump out of the Mill Race, and later they sprinkled. (R. 1020-1021; 692) The Golf Course was built after 1921 but before 1926. Prior to the Golf Course, water was used on the First Ward Pasture by flood irrigating from the Mill Race through wooden headgates. Stubbs himself diverted water on the First Ward Pasture by this method. (R. 1021; 692-693) At this point, Mr. Novak argued that there was a separate decreed right for the First Ward Pasture in the Morse Decree. Mr. Howard claimed part of that was a Provo City right. (R. 1022; 693-694)

Mr. Howard then asked Mr. Stubbs how many acres Fred Stubbs irrigated, and the witness didn't know. Mr. Novak objected to any further attempts to solicit an estimate of the irrigated acreage from the witness, which estimate was 30 or 40 acres. The objection was overruled. (R. 1022-1024; 694-695) Mr. Goddard watered about 10 or 12 acres out of the Mill Race. (R. 1025) Stubbs did not know the

total number of acres irrigated from the Nelson Ditch, Eggertson Ditch, or the 5th West Ditch. (R. 1030; 697)

CROSS EXAMINATION OF J. EARL STUBBS
(From State Engineer Hearing)

The amounts of water Stubbs said were in the East Union Canal were amounts of water put there from 1945 on. He never measured the stream of water and had never been a Water Master, and the testimony he gave with regard to the flows of water that went into the ditch were based on what someone else told him. (R. 1031-1032; 695) The period he testified to was from 1945 on. In 1945 none of the mills along the Factory Race were operating. They had all shut down. (R. 1032; 698)

As to the lands outlined in red on Exhibit 3, which Stubbs claimed to have irrigated, he did not determine the acreage therein. He took those acreage figures off of water tickets. (R. 1032-1033; 699) All lands which Stubbs irrigated were irrigated from a Provo City water right and the water tickets were issued by Provo City. (R. 1033; 700) Stubbs stated that the total acres he irrigated was over 400 and then changed that figure to 600+ acres and all of those acres were irrigated. As Stubbs understood it, all of the lands which he irrigated were lands included under the Morse Decree for Provo City irrigation. (R. 1034; 700)

Stubbs has traced the Factory Race all the way to its south end where it empties into Utah Lake. He stated that there are times, even today, when water flows through the Race into Utah Lake but not generally during the irrigation season. (R. 1035; 701-702) During the irrigation season all of the water was needed, but he only saw the

ditch outlet periodically during the irrigation season. (R. 1036-1037; 702)

After some confusion the witness states that both the Eggertson and Nelson Ditches terminate in Utah Lake, but since 1945 Stubbs had never seen water from the Eggertson or Nelson Ditches running into the Lake during the irrigation season. (R. 1039-1040; 706). The 5th West Ditch also terminates in Utah Lake. Mr. Howard and Mr. Novak then explained to the court the significance of whether or not the water from these ditches flowed into Utah Lake, going to the issue of consumptive vs. nonconsumptive use. (R. 1040-1042)

Stubbs further testified that under normal conditions the water from the 5th West Ditch flows into Utah Lake (R. 1043; 707), but not during the irrigation season. Stubbs did not know exactly when the mills along the Factory Race ceased operation. (R. 1044-708)

REDIRECT EXAMINATION OF J. EARL STUBBS
(Before State Engineer)

Stubbs has been familiar with the Mill Race, Nelson, Eggertson and 5th West Ditches for about 65 years. Stubbs knew about the city lot development prior to 1921. He says that in 1921 the city lot development was not as extensive as shown on the map in orange. (R. 1045; 710) The city's northern extent was near the new hospital and high school. The area to the west of the railroad tracks was not developed in 1921. (R. 1046; 710-711)

DIRECT EXAMINATION OF LEON STUBBS
(Before State Engineer)

Leon Stubbs is the son of Earl Stubbs. He is 46 years old and is a lifelong Provo resident. (R. 1047-1048) He assisted his father

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in farming, and can remember the Eggertson, Nelson and 5th West ditches from the time he was six years old. (R. 1048; 713) The Eggertson Ditch takes off from the 5th West Ditch at 4th South and 5th West and flows west. The remainder of the water in the 5th West Ditch flows south to the railroad tracks where it is divided again, with part going into the Nelson Ditch west along the railroad tracks and then south, and the remainder continuing down the east side of 5th West. (R. 1048-1049; 714) There was also a diversion dam at 11th West and 1600 South. This diversion dam was put in to stop any water from flowing into Utah Lake as waste water. (R. 1049; 714) Water from this last diversion dam watered 40 acres that Stubbs owned. As far back as he can remember, no water from the 5th West Ditch ever went into Utah Lake. (R. 1050; 715)

The witness could not recall any of the mills being in operation during his lifetime. (R. 1050; 715) He does recall water from the Mill Race being used to irrigate farms between 5th West and the railroad tracks to the east. Water also went over to the First Ward Pasture through one diversion. Some water went to the Stubbs farm through another diversion, and some other farms below that were watered from the Mill Race. (R. 1051; 715-716) Under normal conditions, during the irrigation season, he never saw any water in the Mill Race that was not used for irrigation. (R. 1051; 716)

DIRECT EXAMINATION OF ELMER MORGAN ROBERTS
(Before the State Engineer)

Mr. Roberts is 78 years old and a lifelong resident of Provo. He has been familiar with the Provo City system in water rights since

he was a boy. He still irrigates approximately 7 1/2 acres out of the Provo East Union Canal. (R. 1052; 717) He lives near the end of the East Union Canal and has lived in that area all of his life. At one time he had land at the very end of the canal. (R. 1053; 718) During his lifetime, he can never recollect any water from the East Union Canal going to waste or going into Utah Lake during the irrigation season. (R. 1053; 718) He is not too familiar with the Mill Race, although he did work for a time on the Fred Stubbs farm when he was a boy. He remembers swimming in the Mill Race as a boy near the Brick Yard. (R. 1054; 719) To his recollection, south of 6th South Fred Stubbs and Goddard irrigated from the Mill Race, and he doesn't recall any water in the Mill Race going to waste. (R. 1054; 719)

CROSS EXAMINATION OF ELMER MORGAN ROBERTS
(Before State Engineer)

Roberts is not too familiar with the use of water under the Mill Race system below the Brick Yard. He does not recall when the mills ceased to operate. (R. 1054-1055; 719-720) He never actually irrigated any land from the Mill Race, and his only farming in the area was when he thinned beets on the Fred Stubbs farm as a boy. (R. 1055; 719-720)

DIRECT EXAMINATION OF JUDGE MAURICE HARDING
(Before State Engineer)

Judge Harding is 73 years old and is a lifelong resident of Provo. He has practiced law for 51 years. He is a former mayor of Provo from 1941 to 1945. (R. 1056; 721) He was employed by the Provo Brick and Title Company from 1920 to 1940. He was also

employed by Provo City as an attorney to make an evalutaion of their water rights. (R.1056; 722) In evaluating the water rights, he checked the Provo City, County, and state engineer records and also checked the minutes of the City Commission from the beginning up to 1938. (R. 1057; 722) He made a report on the water rights which the city published in book form. Mr. Howard then offered Exhibit 7, which is the report on the Provo City water rights from 1853 to 1938, prepared by Judge Harding. (R. 1056; 722-723) The defendants only consented to the admission of certain marked pages, those pages being 203, 212 and 213. (R. 1057-1058)

Some of the Provo City Commission minutes which Judge Harding examined in preparing the report refer to water utilization from the Mill Race for irrigation subsequent to 1921. (R. 1059-1060; 724) A minute entry of July 14, 1902 designates the amount of water that was distributed to each canal in Provo City. (R. 1060; 724) Judge Harding then read from the minutes which stated that when the capacity of the Provo River was 10,000 feet, the Provo Water Master was to divide the water as follows: Factory Race 1,194 feet, Tanner Race 796 feet, East Union Canal 796 feet, City Race 637 feet, totalling 3,423 feet or the Provo City decreed share. (R. 1061; 724) It was also recommended that the Water Master should take water from the Factory Race and turn it out for irrigation wherever needed each week from Saturday night to Monday morning and it was recommended that it was not being used by the mills or was running to waste through the race. (R. 1061; 725-726)

Judge Harding next read from the city minutes of July 14, 1928. (R. 1062; 726) This was a protest from the Provo Ice and Cold Storage Company protesting the city's depriving the Company of water for power purposes. This was because unusual conditions had created a hardship for irrigated lands. The company was willing to temporarily forego the use of its water, but the company thought just compensation should be paid. (R. 1062-1063, 726-727) Judge Harding next read from the minutes of May 6, 1925, which was a letter from the Provo Ice and Cold Storage Company declining to accept the city's offer of settlement for the loss of water from the Factory Race in 1924. (R. 1063;727) On April 25, 1925, there was a minute entry discussing a similar offer of settlement with the Smoot Lumber Company. (R. 1064; 728) These were the only city minutes that refer to the Factory Race.

Judge Harding started practicing law in Provo in 1924. However, he was living and working in Provo in 1921. He is familiar with where the city lots were in 1921 on the west and south sides of the city, but was not too familiar with the east side of the city. (R. 1065; 729)

Judge Harding helped plot the city lot boundaries on Exhibit 3 and he pointed them out as the areas outlined in orange. In 1921, the Judge lived at 232 North 7th West, which is west of 5th West. (R. 1065-1066; 729-730) He used city water to irrigate a garden and a small farm which was located a little further west. (R. 1066;730) Both the garden and small farm were within the area blocked out in orange, but without the cross-hatching on Exhibit 3. The Judge was somewhat familiar with the Mill Race. He walked along it and fished there as a boy, but he was not familiar with all the diversions.

(R. 1066; 731) He does not recall when the mills ceased to use water for power purposes, but all the mills on the race had ceased operation by the time he became mayor in 1941. (R. 1067; 731)

In his investigations of the Provo water rights, he became familiar with the Morse Decree, including provisions 4(a), (b) and (c). (R. 1068; 736) In 1924, he was employed by Provo Brick and Tile Company to make a protest to Provo City because the city had taken the 16.5 c.f.s. out of the Factory Race. (R. 1069; 734) The water thus taken out of the Factory Race was used for irrigation because the river was low. He has no other information as to the 16.5 c.f.s. being used for irrigation purposes. After passing the wheel of Provo Brick and Tile, then it went on down to the Provo Ice and Cold Storage Company and the other mills. The Provo Brick and Tile Company was at the very start of the Factory Race. One of the laterals went back into the Provo River. The 5th West Ditch has one power plant on it called the Provo Foundry and Machine Company on 5th West and Center Street. During periods of drought, no water at all was let down the Factory Race and it was left in the river to get to lower diversions or put in the upper East Union Canal. The Provo Brick and Tile Company had another power right in addition to the 16.5 c.f.s. It had its own right to 50.0 c.f.s. of water that it used to put through its penstock so that it had a total of about 65.0 c.f.s. of water for its power plant. When the water was taken out of the Factory Race, it also deprived any farmers on the Factory Race of the right to use that water for irrigation purposes. The water was diverted through other canals. It may have been that in 1924, when the water use was cut

back, that it was simply a reduction of flow rights. (R. 1070-1073; 734-736)

Provo City allocates the water among its irrigators by distributing water tickets. The owner of land does not have any tangible evidence of ownership of the water right. (R. 1074; 738)

The Judge does not know of his own knowledge that the 16.5 c.f. s. was used both for power purposes and for irrigation purposes. (R. 1075; 739) As Provo City became more metropolitan, and people relinquished their rights to use irrigation water, the city tried to convert it to domestic use through exchange and change applications. They tried to serve people through a pipeline with lawn water instead of taking irrigation water. (R. 1075; 739-740)

Provo City had a great many parks and public lands for which there were sprinkling systems. The development of parks required a conversion from irrigation to culinary type facilities. (R. 1076; 741) The Judge thinks that the area being irrigated under the present system is about the same as in 1922, but today the irrigation takes place through the city culinary pipelines as people sprinkle lawns and water flowers and gardens around their home; however, the Judge does not know whether these lawn irrigating needs are being supplied under the 4(a), (b) or (c) rights. The city has purchased more rights.

CROSS EXAMINATION OF JUDGE MAURICE HARDING
(Before State Engineer)

In 1921, all of the property within the outer orange line on Exhibit 3 had been developed into city lot property where residences were built and people were living. The north University Avenue and

north 5th West areas were not blocked, but residences were facing each other on both sides of the road. The area cross-hatched in orange on Exhibit 3, had been fully developed into residential lots in 1921. (R. 1078-1079; 743) Within the entire cross-hatched area, there were considerable buildings that would not require water in 1921, such as business establishments. The same would apply to the area within the orange outline, but there were a few open spaces and a few vacant lots. (R. 1079; 743) The Judge doesn't know exactly what percentage of the land within the city lot area was irrigated in 1921. (R. 1079-1080; 744)

From the Provo Brick and Tile Company immediately beyond the penstock, there was a ditch that went directly back into the Provo River. (R. 1080; 745) Water was returned via that ditch into the Provo River for uses down below. (R. 1081; 745) These lower uses were uses awarded under the Provo Decree. A part of the water was therefore diverted into the Factory Race, used for power purposes and was then returned to the Provo River below the penstock, and this was the practice for upwards of 20 years. The Judge fished in the area and knows this ditch well. (R. 1081; 745-746)

REDIRECT EXAMINATION OF JUDGE HARDING
(Before State Engineer)

Some of the water which returned to the river via the above mentioned ditch was the 50.0 c.f.s. of water for power purposes which the Provo Brick and Tile Company owned under its own filing. (R. 1082-1083; 747)

DIRECT EXAMINATION OF MARION J. CLARK
(Before State Engineer)

Marion J. Clark is 63 years of age and is a resident of Orem. He is an engineer, and is the former Provo River Commissioner, from 1953 to 1958. He succeeded T. F. Wentz. The engineer which followed him was Mr. Wayman. (R. 1085-1086; 748)

At the time he succeeded Mr. Wentz, he acquired his books and records. (R. 1086; 748) Mr. Wentz had died, so he did not have an opportunity to discuss these records with Mr. Wentz. After Mr. Wentz's death, Mr. Clark reviewed his records and the decree. (R. 1086; 748-749) Mr. Clark made a determination as to what allocation of water Mr. Wentz had been making to Provo City. Mr. Clark made a flow distribution sheet of his own which he utilized from 1953 to 1958. This was after his review of Mr. Wentz's records. (R. 1086; 749) During the time that Mr. Clark was water commissioner, he distributed the same amount of water to Provo City that Mr. Wentz had distributed. Mr. Wentz had been water commissioner from 1921 to 1953. (R. 1087; 749)

At this point Exhibit 8 was introduced which was Mr. Clark's flow distribution sheet. The Exhibit was received over Mr. Novak's objection. (R. 1088-1089) Mr. Clark made the distributions in accordance with what he understood the decree to require. (R. 1089-1090; 751) At the time Mr. Clark ceased to be Provo River Commissioner, he turned over all his official records to his successor Mr. Wayman. (R. 1090; 751) Mr. Howard then asked the court to take judicial notice of the commissioner's reports on the Provo River from 1921 through 1969. These were part of the state engineer's

record submitted to the court. (R. 1091)

Mr. Clark states that some of Mr. Wentz's records had been lost or disposed of. As long as Mr. Clark was Provo River Commissioner, the 16.5 c.f.s. was delivered to Provo City, but it was combined in the total amount of the distribution awarded to the city. (R. 1092; 751)

CROSS EXAMINATION OF MARION J. CLARK
(Before State Engineer)

The total quantity which was delivered to Provo City by Mr. Clark first totalling 63.08 c.f.s., was based on the acre duty amount of the acres shown in the decree. This included the 16.5 c.f.s. under paragraph 4(c). (R. 1093; 752) However, there is no acre duty amount set forth in paragraph 4(c) for the 16.5 c.f.s. Mr. Clark says there was some supporting data available in Mr. Wentz's notes which consisted of summaries of acreages in various areas. (R. 1093; 752) Paragraph 4(a) of the Provo River Decree contains the number of acreages of farm lands that were to be irrigated under that right. (R. 1094; 753)

Paragraph 4(b) contains the number of acres in the city lot area to be irrigated under that award. (R. 1094; 753) Those two acreages when compared to the duty that was found by the court in the Provo River Decree fixed the flows in second feet as to the amount of water to be diverted to Provo City under paragraphs 4(a) and 4(b). The 16.5 c.f.s. under 4(c) was in addition to those amounts. (R. 1094; 752) The flows which Mr. Clark determined under Exhibit 8 did therefore not provide for a duty allocation for any acreage under paragraph 4(c). He simply added an additional 16.5 c.f.s. to the

quantity set forth in paragraphs 4(a) and 4(b) to determine Provo City's share of the river. (R. 1094-1095; 754) However, there were some of Mr. Wentz's supporting notes available. (R. 1095; 754) He turned these documents of Mr. Wentz's over to Mr. Wayman when Mr. Wayman became commissioner and they have since been lost. (R. 1095; 754) These data sheets of Mr. Wentz were accumulated data for the decree during the time he worked for the court on establishing the decree. (R. 1095; 754)

Defendants then offered to the court Exhibit A which was an outline of the proposed determination, ^(DISTRIBUTION) in Utah Valley in 1916. (R. 1096) The Exhibit was received by the court, however, all the figures on it were crossed out. The Exhibit was used just to show the type of form that was used. (R. 1099) The exhibit was also received by the state engineer. Mr. Clark does not know whether Exhibit A was the type of documentation that he used to determine that an additional 16.5 c.f.s. should be distributed to Provo City, but he can't remember exactly what documents were used in making that determination. The notes of Mr. Wentz were hand written notes. (R. 1100-1101; 756-757) In distributing the water to Provo City Mr. Clark never made a determination of the number of acres of lands that were being irrigated with Provo City water. (R. 1101; 757) He never made an investigation to see whether or not Provo City was complying with the duty set forth in the decree as far as the number of acres that were being irrigated and the flow in second feet that was being delivered. He distributed the water as per his interpretation of the decree. (R. 1101; 757) In making an interpretation of the decree Mr. Clark did not ask for

direction from the Utah State Engineer as to the proper interpretation of paragraph 4 (c). He made his own determination in part using the notes of Mr. Wentz. (R. 1102; 758)

Mr. Clark did not deliver the full 16.5 c.f.s. in addition to paragraph 4 (a) and 4 (b) during the entire irrigation season. He based his deliveries on a percentage of the natural flow in the river when the river became low. (R. 1102; 758)

Mr. Clark during his time as Provo River Commissioner never went all the way down the Factory Race after he had turned water into it to determine whether or not any of the water was being wasted. (R. 1103; 759) He never made a determination as to whether water from the Factory Race flowed into Utah Lake. He says that would be hard to determine because there is so much inflow into the Factory Race. (R 1103; 759) He never had occasion to observe water flowing through the Factory Race into Utah Lake during the period he was commissioner. (R. 1103; 759) He simply turned the water into the head of the canal and didn't do anything further with the water beyond that point. That was up to the Provo City Water Master. (R. 1104; 760) The Provo City Water Master would tell him how much water was needed at any one diversion point. (R. 1104; 760) At the time Mr. Clark was commissioner, there was no power use being made of the water turned into the Factory Race, because all the mills had ceased operation at that time. (R. 1104-1105; 760-761)

Mr. Clark is familiar with the ditch of which Judge Harding spoke, which took off just below the penstock of the Provo Brick and Tile Factory which took water back into the Provo River from the

Factory Race. (R. 1105; 761) There were several lines that were turned in that same area, and he doesn't know which particular one it was, so he could not say that he observed water going through that particular ditch back into the Provo River during the irrigation season. (R. 1105; 761) He does remember one other ditch taking off from the Factory Race which returned water back into the Provo River. The ditch he was thinking about is at 1050 North, but he never had an occasion to personally observe water going through that ditch back into the Provo River, because he never had occasion to go there. (R. 1105-1106; 761-762)

The commissioner reports, which he prepared during the time he was Provo River Commissioner, would show the quantities of water that he diverted daily during the irrigation season into the Factory Race. (R. 1106; 762) These daily reports make a breakdown as to the quantities which went into the Factory Race and the upper East Union. (R. 1106; 762) Mr. Clark had no authority beyond the river headgate, and he did not know what happened to the water or what use was made of it after it was turned into the Factory Race. (R. 1107; 763)

REDIRECT EXAMINATION OF MARION CLARK
(Before State Engineer)

In preparing the documentation for the Provo River Decree Mr. Wentz prepared a great many data sheets and surveys of the water uses and acreage, and a lot of data in the Decree was taken from those records. (R. 1108; 764)

He still cannot remember the data of Mr. Wentz on which he based his determination that the 16.5 c.f.s. should be delivered to

Provo City even after the power uses had ceased. (R. 1110; 765) The water in 4(a) and 4(b) was not always used in the same canal, but the water in 4(c) always was turned into the Factory Race for power purposes. (R. 1110; 766)

DIRECT EXAMINATION OF ROBERT S. WORWOOD
(Before State Engineer)

Mr. Worwood is 37 years old, and is the Provo City Water Master. He has held that position since 1962. (R. 1113-1114; 768) His duties are to supervise the distribution of water which is allocated to Provo City for irrigation purposes. From 1962 to 1969, approximately 16.5 c.f.s. was turned into the Factory Race for irrigation purposes. (R. 1114; 768) The water was used by irrigators through various ditches including the 5th West, Nelson, Upper Third, Upper Seventh, and laterals on the west side. (R. 1114; 769) The water was all used for irrigation purposes, and the only time water would go to waste would be when hay was down and no water was needed. (R. 1115; 769) From 1962 to 1969, none of the water in the Factory Race was allowed to go on into Utah Lake during the irrigation season. It was all used for irrigation. (R. 1115; 769)

Mr. Worwood then went to the map, Exhibit 4, and traced the distribution system under the Factory Race as it existed from 1962 on. (R. 1115-1116; 770) The other water master is more familiar with the distribution under the Factory Race. (R. 1116; 770)

Mr. Worwood succeeded Elmo Johnson as Water Master. All other former Water Masters are dead or incapacitated. (R. 1117; 771)

CROSS EXAMINATION OF ROBERT S. WORWOOD
(Before State Engineer)

In his duties as Provo City Water Master it was his responsibility to divide whatever water was turned into the main ditch among the various users. He distributed such water to both town lots as well as fields. (R. 1117; 772) He was in charge of the east side of Provo City, east of First West. He has never made a determination as to the total number of acres actually irrigated under the system in the area which he distributes water. (R. 1118;772) Some of the waters from the Factory Race are distributed to areas over which he has responsibility, and he takes daily readings on the wiers. (R. 1118; 773) With respect to the water turned into the Factory Race, the quantity so diverted into the Factory Race was determined by him. The total Provo Rights were divided equally in the system and he tried to distribute it all more or less evenly so that everybody would get their equal share. (R. 1118-1119; 773) Once they determined how much water went into each ditch they communicated their wishes to the Provo River Commissioner as to how much water should be turned into the ditch such as the Factory Race. (R. 1119; 773) The Provo River Commissioner makes the determination as to the total quantity to be delivered to Provo City, and the Water Master advises the commissioner as to what portion of the total quantity he wants diverted into each of the respective canals. (R. 1120; 774) Provo City has two diversions from the Provo River. (R. 1120;774-775) He does not have any say as to under which water right water is diverted from the Provo River into the Provo City system. (R. 1121; 775) In dividing the water among the various Provo diversions, ditches are filled up and wier readings taken, and if a certain ditch is short, instructions are sent to the

Provo River Commissioner to send more water down. (R. 1122; 776-777)

FURTHER EXAMINATION OF ROBERT S. WORWOOD

Provo City does not give a direct order to the Commissioner to put so much water in a particular ditch. (R. 1123; 777) Provo City merely directs that water be put in the Mill Race, for example, and the river commissioner knows in advance how much water to put into that ditch. (R. 1123; 777-778) The Tanner diversion is the last Provo City diversion on the stream. Any rights that are below that are made up from return flow. (R. 1123-778)

DIRECT EXAMINATION OF TERRY L. HERBERT
(Before State Engineer)

Mr. Herbert is 35 years old, a resident of Provo and has been the other Provo City Water Master since 1969. (R. 1125; 779) He is primarily in charge of distributing water to the west side of Provo which is everything west of 2nd West. (R. 1126; 780)

Mr. Herbert then goes to Exhibit 4 to explain how the Factory Race system operates south of the power plant. He describes the various diversion points which previous witnesses have described. (R. 1126; 1127; 780-781) None of this water generally went to waste in the literal sense, and if any ran into the lake it was because someone did not take their water turn. (R. 1128; 782)

The witness did not know whether the diversions which are presently being used were in existence at the time the mills were in operation. (R. 1129; 783)

FURTHER DIRECT EXAMINATION OF J. EARL STUBBS
(Before State Engineer)

Mr. Howard then recalled Mr. J. Earl Stubbs to ask him some additional questions.

In 1921 the Provo Water Master was Walter B. Peay. The next Water Master was Joe Gagen. (R. 1130; 784) All the former water masters are deceased. Other water masters included J. W. Goddard, Hi Tangren, Milt Perry and Elmo Johnson. They are all either dead or incompetent. The witness remembers talking with Provo River Commissioner Wentz and sometimes went with him on an inspection of the river. He never discussed the 16.5 c.f.s. with him however. (R. 1131 1132; 786) The Provo River Commissioner's responsibility ceased at the Tanner diversion. (R. 1132; 786-787)

DIRECT EXAMINATION OF JOHN W. GODDARD
(Before State Engineer)

Mr. Goddard is 83 years old and is a lifelong resident of Provo. His father was the first Provo Water Master and testified in the Morse Decree proceedings. (R. 1133-1134; 802-803) When he was first married in 1913, he lived near the Golf Course. (R. 1134; 803) His father had a farm located on about 9th South and 2nd West and another farm down Center Street. He irrigated about 10 acres. (R. 1134; 803) In the farm on 9th South and 2nd West they started farming about 1915. The water for that land came out of the 3rd West or 4th West Ditch. (R. 1135-1136; 804-805) The water for those ditches came out of the Mill Race or Factory Race. (R. 1136; 805) The 3rd West Ditch was south of Center Street. (R. 1137; 805) At the start of the 3rd West Ditch they had a diversion dam which in those days was some planks and some telephone poles put across the main ditch to divert water into the 3rd

West Ditch. (R. 1137; 805-806) The First Ward Pasture also used to divert water from the Factory Race near the end of 9th South and University Avenue. (R. 1138; 806) The Smoot Lumber Yard and a flower mill had a diversion dam on 5th South and put their dams in to take water. (R. 1137; 807) Some water was turned below the Smoot Lumber Yards to the Stubbs people and the First Ward Pasture. (R. 1139; 807-808) About 25 acres was irrigated through the Stubbs Ditch. (R. 1139-1140; 808) The Stubbs Ditch took off from the Mill Race at about 9th South and 1st West. (R. 1140; 808) The Strong people also watered land out of the Mill Race. They got their water from the 3rd West Ditch and part of the water came from the First Ward Pasture Ditch and the Stubbs Ditch. The Strong's irrigated about 30 or 35 acres. (R. 1142; 810-811) In some dry years the irrigators ran short of water and used sewage water. (R. 1143; 811)

Mr. Goddard's present land is now located at 165 West 920 South. He has been at that location since 1929 and at that location there are approximately 19 or 20 acres. He got the water for this 20 acres from the 3rd West Ditch which took off from the Mill Race near Center Street. (R. 1144; 812-813) Tom Leonard also watered out of the 3rd West Ditch. His farm was between 3rd and 1st West and about 7th South. He had about 12 acres. (R. 1145; 813) The Jensens, Shoemakers, Kings and Carters also irrigated from the 3rd West Ditch but all this land amounted to only about 10 additional acres of irrigation. (R. 1146; 814-815)

Goddard still waters out of the Mill Race today. To Goddard's memory, none of the water in the Mill Race ever went to waste.

(R. 1147; 815-816) The dam on the Mill Race for the First Ward Pasture was about 900 South University Avenue. (R. 1147-1148; 816)

DIRECT EXAMINATION OF GRANT S. LARSEN
(Before State Engineer)

Mr. Larsen is a resident of Provo City. He has been a school teacher for 20 years and more recently has worked for the Pacific State Iron Company and he has worked there for 18 years. (R. 1149; 817) He has been the secretary of the Advisory Water Board for Provo City. In 1933 he farmed a piece of property near the Provo City Power Plant. He took water out of the ditch on 1st West and irrigated a garden plot. He took water out of the Mill Race. (R. 1149-1150; 818) Another man, Mr. Gee, also took water out of the Mill Race to water ground on the corner of University Avenue and 8th North. (R. 1150; 818)

DIRECT EXAMINATION OF STANLEY ROBERTS
(Before State Engineer)

Mr. Stanley Roberts has lived in Provo for 72 years, at a location just east of the Riverside Country Club. Prior to that, as a child, he lived near the B.Y.U. Furnace Building. His age is 75. (R. 1150; 819) In 1903 his parents bought a piece of ground from Thomas Leonard. This property was located at 2600 North. (R. 1150-1151; 820) For the past few years he has been chairman of the Provo Canals Commission and Water Master and Secretary of the upper East Union Irrigation Company and Water Master for the Timpanogos Canal and also Water Master and Secretary for the Faussett Field. (R. 1151; 820) He has prior knowledge as to the Provo distribution system from

the Olmstead to the lake. He can trace diversion dams and diversion points down through the Mill Race. (R. 1151; 820-821) He farmed a piece of ground for Mr. Gee on 8th North and 1st West. He was acquainted with the Morse Decree. (R. 1152; 821) He became acquainted with the irrigation uses of Provo City from the Mill Race after 1921. When there wasn't enough water for power it went to irrigation or municipal use. (R. 1153; 822) He knows of irrigation uses for water contemporaneous with power uses. (R. 1153; 822) The same water was used for irrigation in the evening when it wasn't being used for power. The power use stopped at about 6:00 p.m. (R. 1154; 823) Water for irrigation was only used when it was not being used for power. (R. 1154; 823) Land was also irrigated near the Riverside Motel near 50 West and 12th North. (R. 1155; 824) Water from the Factory Race irrigated land in this area. Land was also irrigated near where the vocational school property lot is near University Parkway. All of this land was irrigated with water from the Factory Race (R. 1157; 825-826) The diversion point which brought water to the Gee property was south of the Provo Ice and Cold Storage on 12th North. (R. 1158; 827) He farmed this land in the early 30's. The water was also used for power purposes, and when power was being used the stream was small and he had to use his turn at night. (R. 1158; 827) Mr. Howard then asked the witness if the water he used came out of the 16.5 c.f.s. The court allowed Mr. Howard to read the witness's answer over the objection of Mr. Novak. The witness stated that the water that was used was water that was dumped by the power companies when they did not need it. (R. 1159-1160; 828-829)

The witness was acquainted with the Tom Leonard property south of the railroad tracks. (R. 1161; 829) Mr. Leonard got the water for his land from the Mill Race. (R. 1162; 831)

After the main channel of the Factory Race passed the railroad tracks it was used to irrigate land south of the railroad tracks. (R. 1164; 833) The witness then went to the map and showed where the diversions were for the land south of the railroad tracks. These were west of University Avenue. (R. 1165; 833-824) Those diversions would water land as far as 4th West and as far south as Utah Lake. (R. 1165; 834) The State Engineer then stated that the land may have been irrigated, but that the water used to irrigate it might have come from a different source than the Factory Race. (R. 1165-1166; 834) To his knowledge, none of the water in the Factory Race went to waste. (R. 1166-1167; 835) These same uses of water continued after 1940. After the mills shut down, they did not have to worry about the water being used for power purposes. (R. 1165; 836)

The witness stated that when there wasn't enough water for power it was used for irrigation. However, he could not testify as to the exact amount of flow in the Factory Race system at the time that there was not sufficient water to provide power. There was always sufficient water in the spring time, but the flow would decrease in the summer. (R. 1167-1168; 836)

CROSS EXAMINATION OF STANLEY H. ROBERTS
(Before State Engineer)

The Provo Ice and Storage Company was located just north of 12th North. Their diversion was out of the Factory Race near Reams Store.

(R. 1168; 837) After the factory used the water it was returned to the Mill Race. He cannot recall when the Provo Ice and Storage Company ceased operation. (R. 1169; 838)

The E. J. Ward and Sons Factory was located facing 4th South on Second West and the railroad tracks. They used water for woodworking machinery. They diverted from the Factory Race along 2nd West.

(R. 1170; 839) E. J. Ward and Sons were about the first factory to quit, but he cannot pinpoint the date, although it was prior to World War II. (R. 1170-1171; 239-240)

The Knight Woolen Mills was located north of 1st South right alongside of the Factory Race. (R. 1171-1172; 840) Their water wheel was in the Factory Race itself. When the water wasn't going through the power turbine it was going through a slot on the side. (R. 1172; 841) The Knight Woolen Mills ceased operation in 1928 or 1929. The E. J. Ward and Sons ceased to use water before the Knight Woolen Mills. The Provo Ice and Storage Company ceased to use water after the Knight Woolen Mills. (R. 1173; 841-842) The Excelsior Roller Mills ceased operation in the early part of the 1930's. (R. 1173, 842)

There used to be a ditch which channeled water from the Factory Race directly back into the Provo River, but it has been destroyed. (R. 1174; 842) There were several, but one took off just opposite the lower end of the B.Y.U. trailer court where George Baum used to take his water out. That would be north of the Brick Yard property. (R. 1174; 843) There were two ditches which he can remember which diverted water back to the river from the Mill Race. He saw these ditches on numerous occasions over a period of years, and he saw

water from these ditches going from the Mill Race back into the river. (R. 1175; 843-844) He could not estimate what the flow was in these ditches, and there might have been some other water in these ditches. (R. 1177; 846) The flume in the Provo Ice and Storage Company was about 6 feet deep and 8 feet wide. (R. 1179; 847-848)

At this point Exhibit 9 was offered and received over the objection of Defendants. Exhibit 9 was a protest of Provo City to an application of Columbia Steel Company to appropriate water in the Factory Race in 1925. At this point the court ruled on several of the earlier Exhibits that had not as yet been admitted. (R. 1186-1187)

At this point Mr. Howard concludes reading his portions of the State Engineer's transcript and begins to call his live witnesses.

DIRECT EXAMINATION OF THOMAS RICE

Thomas Rice is 28 years old, is a second year law student at Brigham Young University and is Mr. Howard's law clerk. He is also employed by Provo City to work on water matters. (R. 1188) In doing research on this case he has researched the transcript of the Morse decree and has also searched the records of the Provo River Commissioner and the records of the State Engineer's office concerning distribution of water in the Provo River. (R. 1188) All this has been done under the direction of Provo City and Jackson Howard. (R. 1189) Mr. Rice identifies Exhibit 10 as being a copy of the record that was in the State Engineer's office, which is a compilation of Provo City's water rights made by T. F. Wentz in the year 1935. He obtained this copy from the State Engineer. Mr. Wentz was the former

Provo River Commissioner from 1914 to 1952. (R. 1189) Exhibit 10 was received without objection.

The witness then identified Exhibit 11 as being a copy of an original copy and is similar to Exhibit 10. It was received without objection. (R. 1191)

The witness then identified Exhibit 12 which is a letter from the City Engineer to Mr. Wentz. It was found in the Provo City files. Exhibit 12 was held in abeyance until a further foundation could be laid. (R. 1195)

The witness next identified Exhibit 13 which is five xerox copies of the distribution sheets of the Provo River Commissioner which purports to show how the 16.5 c.f.s. along with other water was distributed to Provo City prior to 1968. (R. 1196) The Defendants object to Exhibit 13 for among other reasons that the actual distribution is not shown by these documents. It merely shows what they intended to distribute. The objection is noted and overruled. (R. 1198-1199) Mr. Rice then explains Exhibit 13 to the court over the Defendant's objection. (R. 1200) The Exhibit purports to show separate amounts distributed under paragraphs 4(a), 4(b) and 4(c) of the Provo River Decree. (R. 1201)

DIRECT EXAMINATION OF JESSE JOSEPH BLACK

Mr. Black is a resident of Provo and is 24 years old. He is a draftsman with a degree in drafting and design. He is employed by Provo City as a draftsman for the Water and Waste Water Department. (R. 1202-1203) Exhibit 14, which is the same as appendix F on the State Engineer's Report, is received in evidence. This is a

hydrograph prepared by the State Engineer. Mr. Black interpreted the hydrograph and made graphs of his own which purport to more clearly show the amounts delivered under paragraphs 4(a), (b) and (c). These various graphs are marked as Exhibits 15a, b and c. (R. 1204) The green portion of the graphs show the 4(a) and (b) rights and the blue portion of the graph shows the 4(c) rights. The red line shows the actual diversion by Provo City and the black line shows the actual diversion into the Factory Race. (R. 1204) The witness states that these figures are taken directly off the State Engineer's hydrograph. He states that they merely show in a wider form the same graphs as the State Engineer's drawing. (R. 1205) He alleges that there is no difference between this hydrograph and the State Engineer's hydrograph, except that his graph is much wider and easier to read. (R. 1205) Mr. Novak asks for a recess to check the accuracy of these various graphs. (R. 1206)

The witness then identifies Exhibit 16 which is another chart made from the State Engineer's hydrograph showing averages of hydrographic information. (R. 1207) The information is by year, not by the month. He has condensed into a year all of the months which were reflected in the hydrograph. (R. 1209)

After a recess, Mr. Howard offers Exhibits 15a, b, and c. Mr. Novak objects that the Exhibits are not accurate representations of the State Engineer's hydrograph and attempts to voir dire the witness to that effect. (R. 1212-1214) However, the court ruled that this was to be done on cross examination and overruled the objection. (R. 1214) Exhibits 15 a, b, and c are received in evidence over objection of Defendants. (R. 1215) The witness proceeds to explain

to the court the various charts. The red line represents the actual diversion into the Provo City Canals and lists the canals by name. (R. 1215) Defendants object that the witness does not know the actual amounts diverted. The objection was overruled. (R. 1215-1216) The green graph portrays the amounts to be diverted under the Provo River Decree, paragraphs 4(a) and 4(b). The blue graph represents the amount set forth under paragraph 4(c) only. (R. 1216) The red line is, ^{THE COMBINATION BETWEEN} ~~a total~~ of the blue and green lines. (R. 1217) The black line represents the actual average monthly diversion into the Factory Race only. (R. 1219) The witness then goes through Exhibit 16 and states that the green represents the flow under paragraphs 4(a) and (b) of the Provo River Decree. (R. 1220) The red represents the average of actual diversions into Provo City's Canal. (R. 1221) The blue line on Exhibit 16 represents the total flows under paragraphs 4(a), (b) and (c) of the Provo River Decree. (R. 1221)

Mr. Novak points out on voir dire that the red line on Exhibit 16 is not an average flow in second feet during the sixth or seventh month period for that particular year. It is a high average period, that is, Mr. Black took the highest monthly flow for the year and plotted that straight across for the full year. (R. 1223) The witness admits that his graph is not completely accurate. (R. 1223)

The court is confused by the graphs and asks the witness to go back and explain them again. (R. 1226) The red line represents an estimated average of the actual water diverted. (R. 1227) The blue line represents the average flows under paragraphs 4(a), (b) and (c) (R. 1227)

Mr. Novak renews his objection that the graphs do not accurately show the State Engineer's hydrographs. The objection was noted and overruled. (R. 1228-1229)

CROSS EXAMINATION OF JESSE J. BLACK

It is finally decided to reserve further consideration of these Exhibits and reserve a right to recall Mr. Black after the State Engineer testifies as to his hydrograph. (R. 1231)

DIRECT EXAMINATION OF SIDNEY BELMONT

Mr. Belmont resides at Springdale in the Provo Canyon. He is 72 years of age and was formerly associated with the Provo Brick and Tile Company. (R. 1233-1234) He was the president of the company. He worked there from 1920 until 1964. He had no knowledge of the water rights of the company on the Factory Race other than what he was told. (R. 1234) He says that during the irrigation season, irrigation took precedence, and the only water they got was water that came into the Mill Race and below the penstock. It ran through the penstock to get to the Mill Race and the 5th West Ditch. (R. 1235) The Provo Pressed Brick Company is right at the top of the Mill Race. He received half a second foot of irrigation water and did irrigate some lands in the area. (R. 1236) However, this water was had through an arrangement with the Provo City Water Master. (R. 1236-1236) The water was used to irrigate approximately 4 acres. The water power usually went off about the 20th of June. (R. 1237) After the 20th of June the water dropped, and the company ran its machines with a steam engine for the remainder of the summer. (R. 1238) The company

converted to electric power prior to World War II. The witness thinks that the Knight Woolen Mills ceased to use water power to operate its machinery after the big fire in 1914. (R. 1238)

CROSS EXAMINATION OF SIDNEY BELMONT

To his knowledge the mills were not rebuilt after the fire of 1914, and water was not used in the mills since 1914. (R. 1238) The Alfred Young Ditch, under which the witness irrigated the 8 acres of land, is not a Provo City Ditch, but the water was taken out of the mouth of Provo Canyon. (R. 1239) This was a separate water right from Provo City. It had nothing to do with a Provo City water right. (R. 1239) The 4 acres irrigated around the factory was irrigated under a trade for a right the company had independently under the Decree. (R. 1239-1240)

The Brick Company had a separate water right for 100 c.f.s. which they filed on in 1903. This water was to be used for power purposes and was separate from the Provo City right. (R. 1240)

REDIRECT EXAMINATION OF SIDNEY BELMONT

In 1921 the city limits ended at 12th North. (R. 1241)

DIRECT EXAMINATION OF EDITH BELMONT TREGEAGLE

Mrs Tregeagle is a resident of Provo City and at the time she was married she lived on 12th North at 250 West. This was in close proximity to the Provo Ice and Cold Storage Company. (R. 1242) The Plaintiff introduces Exhibit 17, which is a photograph showing the witness's oldest son when he was six month old with the Provo Ice and Cold Storage Company in the background. The son was born in 1932.

At the time she moved to the vicinity of the company in 1932, she

does not remember any water wheel or anything ever operating at that time. (R. 1243) Her father worked at the Provo Brick and Tile Company. She drove her father to work. She does not remember any activity at the Ice and Cold Storage Company although she passed there every day. Exhibit 17 is received in evidence. (R. 1244)

DIRECT EXAMINATION OF LEROY HOOVER

Mr. Hoover lives at 189 North 3rd West and is 76 years of age. His father was one of the partners of the Excelsior Roller Mills. This was also known as the Hoover Mill. (R. 1246) The mill ceased to operate with water power when it burned down in February of 1930. (R. 1246)

DIRECT EXAMINATION OF WILFORD BRUCE HAWS

Mr. Haws is a resident of Provo and is 82 years old. He was once employed by the Smoot Lumber Company. He worked there from 1908 until approximately 1920. (R. 1247) Smoot Lumber Company was located near 6th South and University Avenue. They ceased to use water power shortly after 1920, although he could not give an exact date. (R. 1248) He is familiar with the E.J. Ward and Sons Lumber Company and they ceased to use water in approximately 1921 or 1922. (R. 1249)

DIRECT EXAMINATION OF RICHARD L. MAXFIELD

Mr. Maxfield is a Provo attorney. He is the previous attorney representing Provo in the present action. In such representation he examined exhibits and inspected records and documents pertaining to Provo City's water. (R. 1252) The witness identifies Exhibit 12 as a copy of a document that was in the home of Commissioner Wayman, Provo River Commissioner. These documents apply to Provo City.

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water rights. (R. 1253) The Plaintiff offers Exhibit 12, the Defendants object on the grounds the witness cannot properly identify the document and that the document comes within the hearsay rule. The objection is overruled and the Exhibit is received. (R. 1254-1255)

DIRECT EXAMINATION OF JOHN A. ZIRBES

Mr. Zirbes is a resident of Provo and is 43 years old. He is the City Engineer in Provo. He has a degree in Civil Engineering and is a Registered Engineer in Utah. (R. 1259) He had been City Engineer for 5 1/2 years.

The witness is shown Plaintiff's Exhibit 18 which he identifies as an aerial photo of Provo City and the area surrounding Provo City (R. 1260) Several irrigation systems are marked on it. The Exhibit is received after some discussion over the objection of the Defendant (R. 1261-1263)

The witness is then shown Exhibit 19 which is a map of Provo City dated 1921 which shows Provo City as of that date. (R. 1264) The witness and his department have measured the acreage in that map from the East Union Canal west to the Little Dry Creek Irrigation System in 1921. (R. 1264) The area measured was outlined in red. (R. 1265) The area outlined in red was the area between the East Union Canal and the Little Dry Creek system and the area south to the meander line of Utah Lake. (R. 1265) The witness has calculated the acreage in the red area. (R. 1270) Over the Defendant's objection, the witness states that there are approximately 4,758 acres within the red boundaries. From that the witness subtracted the 4(a) acres in the Decree, which was 2,058.6 acres. (R. 1271) The witness also

deducted from the acreage figure of the area outlined in red 499.91 acres which were the city lots covered under paragraph 4(b) of the Decree. (R. 1272-1273) Over the objection of the Defendants, the witness testified as to the margin or error which he calculated in estimating the irrigated acres. (R. 1273) The witness also subtracted 147 acres for the First Ward Pasture right which is a separate right under the Provo Decree. (R. 1274) After subtracting all of this, the remainder was 1,407.87 acres that was unaccounted for by the Morse Decree within the area outlined in red. (R. 1274) Over the objection of the Defendants, Exhibit 20 is received in evidence. (R. 1276) The Defendants objected to Exhibit 20 on the grounds that it contained facts not in evidence and it was based on assumptions by the witness and that there had not been a proper foundation laid. (1275-1276)

The witness further states that there is land south and west of the meander line of Utah Lake that is irrigated land.

CROSS EXAMINATION OF JOHN ZIRBES

In computing the acreage which was deducted for existing roads (478 acres) they estimated on scale the amount of area covered by roads and railroad tracks. The staff people did this at the witnesses instruction. (R. 1278) He checked these figures personally but did not scale all the roads personally. (R. 1279) In the areas except for the city lots they did not determine the amount of ground covered by buildings and subtract that from the irrigated acreage. (R. 1279) The witness did not determine whether all of the acreage within the city lots comprising the 499.91 acres was in fact

irrigated. (R. 1280) Some of the land within the red area could have been irrigated from other sources. (R. 1280) There are some artesian wells in the area and the Little Dry Creek system. (R. 1280-1281) The witness has no idea how many acres could have been irrigated from other sources. (R. 1281)

The witness simply computed the total area between the red lines shown on Exhibit 19 without regard to whether or not those lands were in fact irrigated. (R. 1281-1282) The witness does not know whether some of the lands within the red area are irrigated from the Little Dry Creek system. (R. 1282) There is a possibility that a 1940 map is in existence which shows the irrigated land under the Provo system to be approximately 1700 acres. (R. 1282-1283)

The adjustment which the witness made for margin of error of 33% was an arbitrary figure. (R. 1283) It was not based on any data or investigation. (R. 1284) The total area in red was not surveyed. It was taken off a map using engineering planimeters and measuring devices which compute the acreage. (R. 1248) There was no verification of the accuracy of those acreages calculated by any field survey or field inspection. (R. 1248) The witness did not consult or examine any other documents or maps to determine the acre figures between the red lines on Exhibit 19. (R. 1249) However, the witness then stated that he did consult other aerial photos and the existing 1921 map, which is one of the Exhibits. (R. 1285-1286) Some of the old aerial photographs were not dated and the witness did not know who made the flights. (R. 1286) Some of the data was based on what other people told him and his staff. (R. 1288) The Defendants on the basis of cross examination, moved that the testimony relating to acreages be stricken and that Exhibit 19 and 20 be stricken. The

motion is overruled. (R. 1288)

DIRECT EXAMINATION OF DEE C. HANSEN

The witness is first declared to be an adverse witness to the Plaintiff.

Mr. Hansen is a Civil Engineer and is the State Engineer of the State of Utah. He has held that position for 2 1/2 years. He has an Engineering Degree from Utah State University. The State Engineer has prepared and rendered a report to the court. In the report the State Engineer concluded that the mills had all ceased their operations by the early 1940's. (R. 1290-1291) In making his investigation for the report, the State Engineer held and conducted hearings and asked all parties to give all relevant information. (R. 1291) The notice of the hearing stated that the Engineer was going to attempt to establish when the mills ceased operation and the use of the water following the cessation and operation of the mills. The ^{ENGINEER} court welcomed information from anybody who could supply it. (R. 1292) The Engineer did not talk to any of the witnesses which Mr. Howard produced earlier in the day, but the Engineer stated that he would have been happy to speak with them had he been aware of their testimony. (R. 1292) The State Engineer had the impression that the decrease in water use for power started in the early 1940's, but the trend may have started earlier than the 1940's. (R. 1292-1293) After Deer Creek Reservoir was built, Provo City would get its full 4(a), (b) and (c) rights, however, there would not be any excess water above those rights which Provo may have used prior to the construction of the reservoir merely because no one was using it. (R. 1293)

The State Engineer did not have personal knowledge of the irrigated acreage in Provo City in 1921, and the State Engineer's staff had to interpolate the 1921 court proceedings. (R. 1294) In making his investigation, the State Engineer obtained certain maps from Provo City, but they did not have acreage compilations on them. The State Engineer made his own acreage compilations on the 1937 maps. (R. 1295) The acreage calculated was the acreage which could have been irrigated in 1937. This was also done with a 1921 map. The land which could have been irrigated on the 1921 map was measured. The land actually irrigated was also measured. (R. 1295)

In determining the amount of irrigated land in the city lots, the 499.91 acres set forth in the Morse Decree were used. (R. 1296) There are approximately 190 blocks in the city lot area. Of this, 499.9. acres were irrigated, according to the Morse Decree, but there is no way of telling which part of each block was actually irrigated. (R. 1296)

The State Engineer states that according to his hydrograph, Exhibit 14, there probably would not have been any water in the Mill Race for the years shown on the hydrograph that would have operated any mill during the months of July, August, or September if any mill required anything more than 10.0 c.f.s. to run its machines, although the Engineer did not have a chance to observe every year. (R. 1299-1300) During the summer months the flow was very low. The State Engineer states that water turned down the Mill Race during the summer months may have been used for irrigation, but there is nothing to prove that the water thus turned down was 4(c) water. It could have been 4(a) and 4(b) water being turned down the Mill Race. (R. 1300)

It is possible that during the summer months, water which went down the Mill Race was used for irrigation purposes. (R. 1300-1301) In the 1950's and 60's the hydrograph shows significant amounts of water being turned down the Mill Race, but there is an explanation for that. (R. 1301)

Exhibit A of the State Engineer's report shows every area that was irrigated in 1921 and the State Engineer's staff tabulated it. (R. 1302) In computing the irrigated acreage, there were areas which were not served by the Provo City system, these were deleted in the State Engineer's compilations. (R. 1303-1304)

In the areas which the State Engineer investigated, which were served by the Provo City system, under rights 4(a), (b) and (c) the State Engineer did not find any land which was not irrigated, except land that was under buildings or roads, etc. (R. 1304) In the early 1930's the hydrograph shows a substantial amount of water delivered to Provo City in excess of its rights under paragraphs 4(a), (b) and (c) of the Morse Decree. (R. 1304)

At the State Engineer's hearing, certain witnesses testified that they did see water going into Utah Lake, and that if the water goes into Utah Lake it is not wasted because other users use it. (R. 1305)

Just because the hydrograph indicates that water was delivered to Provo City and witnesses state that they used water for irrigation, one cannot draw the conclusion that that water was the 16.5 c.f.s. under paragraph 4(c). The water could very well have been 4(a) or 4(b) water. (R. 1306) There was an indication that the Provo River Commissioner distributed the 4(a), (b) and (c) water on a percentage basis, although there was some confusion on this point. (R. 1310)

CROSS EXAMINATION OF DEE C. HANSEN

The witness proceeds to explain to the court what his hydrograph, which is Exhibit 14, shows. The red line shows the average actual diversions into the Provo City canals, which includes the lower East Union, the City Race, the Factory Race and the Tanner Race. The black line indicates the average actual monthly diversions into the Factory Race only. These are all taken from the Provo River Commissioner's Reports. As the river flows decrease, the hydrograph shows that under those awards that right would also decrease, which shows the actual amount of water that should have been diverted at any particular stage of the river under awards 4(a), (b) and (c). (R. 1311-1312) When the river is at 100%, all of the Class A rights are being satisfied to their maximum amount. (R. 1312) Thus, when the flow of the river is the total of all the Class A rights, the river is at 100% for the Class A rights. (R. 1313) There were periods when the river did not total the total of the Class A rights and therefore the river was not at 100% for the Class A rights. This is reflected on the hydrograph. (R. 1313) The duties under the decree vary during the irrigation season. From June 20 to July 20, the duty is 63, from July 20 to May 10 there is a duty of 70 acres. In determining the flows under these duties, for 4(a), (b) and (c) for May through June 20, the total flow would be 62.62 c.f.s. Using just 4(a) and 4(b), the total is 46.12 c.f.s., the difference being the 16.5 c.f.s. From June 20 to July 20, 4(a), (b) and (c) totals 59.1 c.f.s. and subtracting the 16.5 c.f.s. for the total of (a) and (b) is 42.68 c.f.s. (R. 1314)

The Defendants then offer Exhibit B, which is a tabulation of the Provo City diversion rights under paragraphs 4(a), (b) and (c) for the periods May 10 to June 20 and June 20 to July 20, and July 20 to September 1, and September 1 to May 10. Exhibit B is received in evidence. (R. 1315)

The blue line on Exhibit 14 has been adjusted to reflect the reduction and flow of the river below a 100% Class A right. Defendant's Exhibit B shows the full flow under all Class A rights to a 100% delivery. The blue line on Exhibit 14 represents the reductions that would have been made at any particular stage of the river so the blue line could be less indicating that the river was less than 100% of the Class A rights. The blue line is a summation of 4(a), (b) and (c) adjusted by the total water availability in the river. (R. 1316-1317) The blue line will therefore reflect what percentage of the total rights under 4(a), 4(b) and 4(c) that were being satisfied from the river from the flows during that time. This could vary and the percentage at any one time cannot be given. (R. 1317) If the river was only 80% instead of 100% then each of the Class A rights would be reduced by 20%. The green line on the hydrograph, Exhibit 14, shows the same thing as the blue line but only shows the flows of 4(a) and 4(b). It represents the same type of percentage of cut if the river drops below 100% of the Class A rights. (R. 1318)

The black line on Exhibit 14 shows the actual diversion into the Factory Race. This is a measured diversion. The black line is related to the red line in that the red line shows all diversions into the city system, the black line only shows the diversions into

the Factory Race. (R. 1318) On the hydrograph, when the red line is higher than the blue line, it indicates that Provo was diverting in excess of its 4(a), (b) and (c) rights. This happened quite often when the river was high and there was more water than everybody could use. (R. 1318) The separate power rights of Provo Pressed Brick Co. (100 c.f.s.) are separate from the Provo City right and are not included in the hydrograph, Exhibit 14. (R. 1319)

On Exhibit 14, when the red line is below the green line it means Provo City did not ask for all the water to which they were entitled, since the green line represents the water that would have been available to Provo City under awards (a) and (b) based on the river flow. The green line shows how much water Provo City could have used and the red line shows the amount of water which they actually diverted. (R. 1319)

Looking specifically on the hydrograph for the year 1968, during that year Provo City never diverted water in excess of its 4(a) and 4(b) rights. This is shown by the red line being below the green line in all cases which indicates they could have asked for water up to the green line but didn't. They could have been delivered that much water by the river commissioner but they failed to call for it. (R. 1319)

One would have to assume that any time Provo did not call for water to which it was entitled, that they simply did not have a need for it or they would have called for it. (R. 1320) If there was a wet year and they did not need as much water, they would not call for it. (R. 1320) When the red line on Exhibit 14 is below the green line, it merely shows that Provo City did not call for the water.

It does not state why they did not call for it, although one would have to assume that if they needed it they would have called for it. (R. 1320-1321)

There is a trend reflected in Exhibit 14 relative to the waters that were actually delivered to Provo City from the year 1930 through the year 1969. This is demonstrated on Exhibit 14. (R. 1321) During the year of 1937 or 1938, during the spring runoff, there is water diverted far in excess of the awards for rights 4(a), 4(b) and 4(c). The State Engineer concludes that this water was diverted and used for power purposes. Following 1939, the amounts of water actually diverted declines and it gradually decreases until in 1951 the actual amount diverted starts to fall below the green line indicating that the amount actually diverted was not the full amount Provo City was entitled to under rights 4(a) and (b). This decrease continues until 1969, where the red line falls significantly below the green line on many occasions. All those years would not have been wet years necessarily. (R. 1321)

Since the green line reflects the amounts of water actually available to Provo City, if the green line is higher it would indicate a wetter year, where the green line peaks and drops off sharply, that indicates a dry year. If the green line stays at a high level it would indicate a wetter year. There is no year shown on Exhibit 14 where through the entire irrigation season a 100% of Class A rights were delivered. (R. 1322) Therefore, in all years except 1941, there was an adjustment downward from the combined quantities of 4(a) (b) and (c) water. (R. 1323) Both the green line and the blue line

are adjusted to reflect river flow availability. The blue line represents total water available under 4(a), (b) and (c); and the green line shows the water available under 4(a) and (b). (R. 1323)

To avoid confusion, the witness explains that when the river is 100% of the Class A rights, Class A does not refer to the water rights awarded to Provo City under paragraph 4(a) of the Morse Decree. Class A rights on the Provo River are all rights which have a first priority or first call on the river. Thus, Class A includes other rights which are not owned by Provo City. When the river is 100%, that means all the Class A rights on the whole river are being satisfied, and any excess water can be used to satisfy the Class B users on the Provo River. The water awarded to Provo City under paragraph 4(a), (b) and (c) are all Class A rights. (R. 1323)

In comparing the red line with the green line on Exhibit 14, the witness explains those years when the actual delivery to Provo City was less than the total amounts available to Provo City under the combined 4(a) and 4(b) rights. This occurred periodically through the 1950's and 60's. It occurs more so in the 60's. (R. 1325-1326)

The witness is shown Defendant's Exhibit C and identifies it as excerpts from the river commissioner's reports for the period of 1921 to 1969. These records were obtained from the State Engineer. Exhibit C is part of a report which was submitted to Judge Sorenson in 1975. The information shown on Exhibit 14 was taken from data which is contained in Exhibit C. Exhibit C was received with no objection. (R. 1327)

The State Engineer then proceeded to point out several inaccuracies in Plaintiff's Exhibits 15a, b and c. (R. 1327-1328) For

example, the Engineer points out that on Exhibit 15a, in May of 1931, the 4(a) and 4(b) rights were supposedly represented as 29 c.f.s. Exhibit 15a shows approximately 38 c.f.s. or a 10 c.f.s. error for that particular month. (R. 1328) At this point the court suggested that the Exhibits be turned over to the State Engineer to have him make any corrections where there was error. It was agreed to mark the Exhibits with a yellow pen wherever there was error. (R. 1329-1330) The Provo City employee who prepared the maps would also participate in the examination. (R. 1330) An examination was also to be made by both parties of Exhibit 16 to check for any error. (R. 1331)

The State Engineer was then shown Defendant's Exhibit D and identified as the report submitted by the State Engineer's office to Judge Sorenson in response to his direction in 1972. Defendant's Exhibit D contains the appendices that were a part of the total report that was submitted to Judge Sorenson. (R. 1332) Exhibit D accurately reflects the finding that the State Engineer made based on the investigation which he conducted pursuant to the remand from Judge Sorenson. (R. 1332) Exhibit D is admitted into evidence. (R. 1333) Mr. Howard notes that he does not agree with the conclusions of the report.

Finding No. B on page 18 of Defendant's Exhibit D was based on the evidence submitted to the State Engineer during two days of hearings plus whatever evidence they were able to glean from the records of the Provo City Engineer's office and the State Engineer's office (R. 1333-1334)

At the hearing conducted by the State Engineer, evidence was offered as to the dates when the various mills ceased operation.

Judge Harding said in his testimony that the mills had all ceased by the early 1940's. There was some other testimony indicating that some of the mills had ceased in the early 1930's. This testimony however does not change the conclusions or findings which the State Engineer made relative to the investigation and study comprising Exhibit D. (R. 1334)

With regard to Finding No. D on page 19 of Exhibit C, apparently in 1921 and the period following, the Factory Race was used for a limited amount of irrigation. The State Engineer found on the 1921 Provo City map that there were approximately 206 acres being irrigated under the Factory Race. Following the cessation of the operation of the mills many of the laterals from the Factory Race were extended to include lands that prior to that time had been irrigated by the City Race and the Factory Race was used to pick up those lands. (R. 1335) Exhibit 14 shows how this transition took place. Up to the early 1940's, during the heavy irrigation period in the middle of the summer there was very little water diverted into the Factory Race system. Starting in 1945, the amount of water being diverted through the Factory Race increased substantially, pointing out that water was being diverted through the Factory Race system to supply these other lands and that continues to the end of the hydrograph. (R. 1336-1337) A small amount of water from the Factory Race was used to irrigate portions of the First Ward Pasture, primarily the Stubbs farm which was immediately west of University Avenue. That was included in the tabulation. (R. 1336)

The witness then steps to Exhibit 5 and states that this was a 1921 map submitted as Exhibit 58 in the Morse Decree proceedings

and it showed the lands and ownership of those lands which supposedly were irrigated at the time of the decree. The State Engineer retabulated all of the acres that are shown on the map and traced the lower East Union Canal and the Factory Race, the City Race and the Tanner Race and made them different colors. On Exhibit 5, the red area is irrigated from the Factory Race in 1921. The green area is the City Race system and the yellow is the Tanner Race. (R. 1337) Exhibit 5 shows the total number of acres which the State Engineer determined from his investigation that were irrigated under the canals that were part of the Provo City system in 1921. (R. 1337) The total acres were 2,069.9 acres. ~~The award in the Provo Decree was for 2,069.9 acres.~~ The award in the Provo Decree was 2,058.6, indicating that the State Engineer in his present tabulation included 10 acres too many. (R. 1338) The 2,069.9 acres did not include the acreages within the city lots. (R. 1338)

The State Engineer then explains how the court in the Morse Decree arrived at the figure of 499.91 acres for the city lot irrigated acres. (R. 1339) The acreage of 499.91 for the city lots is not included in Exhibit 5. (R. 1339) There are areas in Exhibit 5 which are not irrigated. Over Plaintiff's objection, the witness was permitted to show which areas were not irrigated and therefore not included in the total tabulation. The area in the First Ward Pasture was not included because there was a separate water right described for the First Ward Pasture. Much of that land did not have a ditch system going to it. Where lands had a ditch system contiguous to it, even touching the corner of the property, the State Engineer included the whole piece of property. There was no such ditch system

indicated in the bigger area of the First Ward Pasture and much of the land is very unlevel terrain and is not susceptible to irrigation, except by sprinkler system, and certainly not in 1921. (R. 1340-1341) These were other areas which were not irrigated in the city near the railroad yards and much of the land did simply not appear to have any ditch system to get water to it or was not amenable to irrigation. (R. 1341) The areas on Exhibit 5 which do not contain little green figures with arrows show as not being irrigated. (R. 1342) In completing his study, the State Engineer obtained maps of irrigated acreage that were furnished by Provo City. The years of these maps were 1937-1938. Those maps were included as appendices in the report which was submitted to Judge Sorenson. (R. 1342) The base map for Exhibit 5 was an Exhibit in the Morse Decree proceedings and the State Engineer in the present case superimposed on the base map information shown in the various colors. (R. 1347) In ascertaining the 499.91 acres of the lots, that information was taken from the testimony in connection with the Morse Decree proceedings. The State Engineer was able to ascertain from the investigation the location of the 499.91 acres. (R. 1349) The 499.91 acres was contained within 190.5 blocks. The original determination was that that area contained 701.4 acres. That area was disputed, a resurvey was made and they came up with 505.73 acres. Further studies reduced the acreage to 499.91 acres. (R. 1352-1343) The fact that these city blocks were surveyed appears in the transcript of the Morse Decree proceedings. (R. 1353)

It seemed important to the State Engineer to be able to arrive at the total acres irrigated by Provo City because the 4(c) award

failed to give an acreage and a duty and the State Engineer felt he had to determine the total number of acres under the total system. He made that determination. It turned out to be slightly more than 2,558.6 acres awarded under the Decree. The State Engineer in his investigation, did not find any additional acreage being irrigated anywhere under the Provo City system. (R. 1360) In arriving at his finding of 2558 acres as it relates to Plaintiff's Exhibit 5, the State Engineer reviewed Plaintiff's Exhibit 5 in detail following out each of the ditch systems into each piece of property and totalled those acres individually as they appeared on the map with the exception of the block area of the city lots, which acreage was taken from the Morse Decree. (R. 1360-1361) The numbers that appear in green on Exhibit 5 with little arrows represent the acreage tabulated within those particular quarter corner section area and are listed throughout the map. He ascertained the extent of the irrigated acreage by following each ditch system that was indicated on the map and the lands which were indicated as being irrigated. He then tabulated the total of all the irrigated acreage which was ascertained from Exhibit 5. (R. 1361) The total numbers which the State Engineer came up with was 9 acres over the 2,558.6 acres in the Morse Decree. (R. 1361)

The witness identified Defendant's Exhibit E as a map obtained from the Provo City office showing the Provo City irrigation system and defining such area. (R. 1362) The Exhibit E contains a whole series of red and green numbers which the State Engineer put in. The red numbers indicate the acreage within the city blocks upon examination of each of those city blocks. The green figures indicate the

acres found in the farm land areas. (R. 1362) The information on Exhibit E is accurate to the best of the State Engineer's abilities. (R. 1362) The figures on Exhibit E were ascertained by personnel from the State Engineer's office under his direct supervision. Exhibit E is a part of the appendices which are attached to the report to the court. (R. 1364) The figures on Exhibit E were taken from the 1938 maps from the Provo City Office. (R. 1364) There were no figures on the maps, the State Engineer put those figures on the maps. (R. 1366) The figures which were put on the map were based on measurements of the blocks as they were surveyed in 1938. (R. 1366) The figures do not purport to represent measurements of the blocks in 1921, only in 1938. (R. 1366) Exhibit E is received in evidence. (R. 1367)

The State Engineer is shown Defendant's Exhibit F and it is identified as copies of the 1938 maps found in the Provo City Engineer's office. Provo City was asked to supply these maps and they complied. The request was made as a part of the investigation which the State Engineer was conducting. (R. 1367) Defendant's Exhibit F is a part of the appendices that were attached to the report submitted to the court. (R. 1367) Over the Plaintiff's objection, Exhibit F is received in evidence. The green figures on Exhibit F indicate the tabulated acreage for each of the blocks found in the accompanying maps. That is the irrigated acres served from the irrigation system. It did not include that area irrigated from the pressure system of the Provo City pipeline or any areas irrigated from wells. There were quite a few wells but these were not included. For example, Exhibit F, Map No. 1 has a legend indicating all the areas and how

they were irrigated and from what source. Also indicated is whether there was alfalfa, pasture, a house, garage, driveway, etc. Thus, the area for each block which was irrigated was tabulated. (R. 1375) On Exhibit F, the red figures indicate individual tabulations of acreage. (R. 1376) Looking at page 29 on Exhibit F Block 87 Plat A shows a block with no irrigated acreage. This was the old Woolen Mill block. There was no irrigation whatsoever in that block. (R. 1377) Block 63 Plat A again shows a block with 0 irrigated acreage. This is the Provo High School block and the majority of such block was covered with buildings. The lawns on that block were irrigated from the pressurized system and had no surface irrigation. (R. 1377) There is coding on these plats which shows "L" for lawns watered from the pressure systems, "D" is driveway, "Y" is yards. This coding appears on Exhibit F. In another block selected at random, the witness states that in block 119 Plat A, there was quite a bit of surface irrigation. Again, this is shown from the coding. (R. 1377-1378)

Exhibit F contains at least 68 plats showing all the city blocks and from these, the State Engineer was able to determine the irrigated acreage from the surface system in these particular blocks. (R. 1378) The State Engineer tabulated these irrigated acres and they total 570.78 acres. (R. 1378-1379) The information on irrigated acres shown on Exhibit F is also shown on Exhibit E. This is shown by the red figures indicating the area covered by the 1938 map. (R. 1379) The total acreage reflected by the figures shown in red on Exhibit E total 570.78 acres. (R. 1379)

The figures shown in green on Exhibit E represents the remaining area served under the Provo City system from the Lower East Union, the Factory Race, the City Race and the Tanner Race. Those acreages are tabulated and indicated in green showing the area that was served by the Provo City system as indicated by the ditch markings. (R. 137) These acreages were calculated by either reading primarily or scaling directly. (R. 1379-1380) The areas in green represent primarily farmland and acreage surrounding the city. The figures in red indicate lot irrigation. (R. 1380) The figures in red were all taken from the 1918³ map and transferred on to Exhibit E. (R. 1380) The total farmland irrigation determined from the 1937 map totalled 1,732.6 acres. This would be the summation of all the figures shown in green on Exhibit E. (R. 1381) The total irrigated acreage as shown by the 1937-1938 Provo City maps would be 2,303.38 acres. (R. 1381-1382)

The witness identifies Defendant's Exhibit G which is a hydrographic survey made by the State Engineer's office in 1969 through 1970 in connection with the adjudication of Utah Lake and Jordan River. (R. 1382) These hydrographic surveys are generally made from aerial photographs which are very accurately controlled. Actual measurements are made on the ground measuring the distance between known points on the photograph to establish proper scale. (R. 1383) Actual field examination together with the aerial photographs are put together to calculate irrigated acreages. These hydrographic survey maps are required by statute to be prepared by the State Engineer as part of the general adjudication proceedings. (R. 1384) Thus, Exhibit G shows the irrigated acreage under the Provo City system in 1969.

The court noted that under the Supreme Court opinion, the State

Engineer was to make a determination of the water use since the mills ceased operation, and this exhibit would show what the present use was. Exhibit G is received in evidence over the Plaintiff's objection. (R. 1387) The area covered by Exhibit G is the same area covered by the previous Exhibit. (R. 1387-1388) The witness goes on to explain how the various maps are indexed and set up. (R. 1388).

Sheet 113 on Exhibit G shows the Lower East Union Canal and the area served thereby. The diversions are shown in red. (R. 1388) The Factory (Mill) Race is indicated and the City Race is indicated and the diversion for the Tanner Race on the river is indicated. The red figures on sheet 113 D of Exhibit G indicate the tabulated acreage of the irrigated lands, not restricted simply to surface irrigation but includes all of Provo City irrigation. (R. 1389) It covers all of the irrigated land regardless of source. The Factory Race is shown on sheet 113 of Exhibit G. On that Exhibit and sheet, the Factory Race is indicated as the Mill Race and is shown by a line with arrows indicating the direction of flow and the various diversions are also shown, and one can trace the total ditch system under the Factory Race. (R. 1391) Sheet 113 B of Exhibit G also shows the land irrigated under the Factory Race, which area is below the Factory Race Ditch and north of 12th North and south of 12th North, but some of the subdivision areas may be served from other sources.

Exhibit G does not cover all the areas served under the Provo Irrigation System, but it does cover the areas which have been discussed in the previous Exhibits. (R. 1392)

The sheets in Exhibit G do include all of the area which is irrigated under the Provo City Surface Irrigation System comprising

the four or five ditches which have been discussed in the case. (R. 1392) There is also a code which shows the ownership of each particular tract of land. (R. 1392) The figures in red on Exhibit G show the acreage irrigated under the Provo City Surface Irrigation System for the whole area. It covers all irrigated acreage under the system without regards to source. (R. 1393)

Using Exhibit G, the State Engineer compiled a total of the irrigated acres shown on Exhibit G, and Exhibit H comprises a detailed tabulation of those acreages. (R. 1393) The total amount of irrigated acreage tabulated on Exhibit H from the maps comprised in Exhibit G totalled 2,143.61 acres as of 1969. Of that total figure, 816.11 acres are lawns. 1,338.45 are in crops. (R. 1395)

Under questioning from the court, Mr. Novak explained that the claim of the Defendants is that Provo City has never irrigated more than 2,558.6 acres covered by the Provo River Decree and the three separate studies in 1921, 1937 and 1969 show this to be true and that those acres were covered by paragraphs 4 A and 4 B of the Mors Decree. (R. 1395)

After a short recess, the witness detected an error in the total figure to which he previously testified. This was caused by typographical error. The correct figure is 2,154.56 acres rather than 2,143.62 acres. Page 7 of Exhibit H was corrected accordingly. (R. 1396)

The State Engineer recalls the testimony of Mr. Stubbs relating to the irrigation of approximately 600 acres. Of those 600 acres, the hydrographic survey includes all of them except the acres located west of the Big Dry Creek area, because those were outside

of the Provo City system. (R. 1400) Certain areas west of the Big Creek drainage cannot physically receive water from the Provo City system because of their location. (R. 1402)

In speaking of the word "duty" of water for a certain tract of land, there are two definitions of the word "duty". The first definition relates to the number of acres which can be served by the flow right such as 1 cubic foot for each 70 acres of land, and the other meaning of the word duty is the number of acre feet allowed annually which is required to mature crops. This is arrived at through various methods. (R. 1405) The Morse Decree refers to duty as the first definition; that is, the number of second feet for a specified number of acres. (R. 1405)

It is possible to convert a second foot duty into an acre foot duty. The State Engineer converted the duty in second feet for rights for A and B to an acre foot duty. (R. 1406) Under rights for A and B assuming 100% supply under the decreed periods of time, that flow would supply 2,558 acres with 6.2 acre feet per acre per year. From the investigations which the State Engineer made, this acre foot duty is not only adequate to irrigate those lands, it is excessive. If the 16.5 c.f.s. under the 4(c) right were added to the 4(a) and 4(b) acre foot duty, that would raise the duty to 8.76 acre feet per acre per year. This would be excessive. (R. 1407)

REDIRECT EXAMINATION OF DEE C. HANSEN

At the request of Mr. Howard, the witness goes through his calculations on converting a second foot duty to an acre foot duty. (R. 1407-1408)

The Morse Decree does not specify an acre foot duty, but merely states the duty in second feet per acres. (R. 1410) The acre foot duty is not a different duty from the second foot duty. It is merely the second foot duty converted into acre foot duty. The overall duty is the same, it is merely stated in different terms. (R. 1411)

The witness draws a line showing the westerly extension of the area which was included in the State Engineer's evaluation of the acreage amenable to irrigation with 4(a), (b) and (c) water. The land was measured west of this black line. (R. 1412) The State Engineer measured to the Little Dry Creek drainage system in making his calculations (R. 1413) To the south, the State Engineer stopped measuring when he reached the end of the ditch system of the Provo City system. (R. 1413-1414) The area served from the Provo City ditches was quite close to the meander line of Utah Lake. (R. 1414-1415) The State Engineer did not measure any land which did not have a ditch system reaching it. (R. 1415) Any field at the very end of an irrigation ditch was included. (R. 1416) The area south of the meander line of Utah Lake is mostly cattails and water grass resulting from the high water table of the lake. The State Engineer doubts that there is any irrigation south of the meander line, but if any lands south of the meander line had a ditch system through them, they were measured and included in the State Engineer's determination whether or not they were south of the meander line. (R. 1416-1417) Such ditch system might not have shown up on the irrigation map of 1928. (R. 1417) There is presently about 151 acres of golf course irrigated in the First Ward Pasture at present. (R. 1420) In 1921 there was 147 acres named in the decree as being the First Ward Pasture. The Engineer

did not know exactly how many acres there were in the First Ward Pasture. (R. 1420) But in 1921, according to the decree, there was 147 acres being irrigated in the First Ward Pasture. (R. 1420) From the terrain of the land it is highly improbable that all of the 400 acres Mr. Howard claims was in the First Ward Pasture to have been irrigated. (R. 1421) Much of the land in the First Ward Pasture area is cattails and other water grass. (R. 1421) Much of the land in the First Ward Pasture today is highly irregular and is not susceptible of irrigation. (R. 1422)

In calculating the area irrigated in the City lots, in 1937 and 1938, the State Engineer did not purport to project those figures backward to 1921. (R. 1423) The State Engineer was following the remand of the Supreme Court in determining the use of water following the cessation of the mills. 1938 appeared to be the period immediately following the cessation of the operation of the mills, and that's why the State Engineer used those years in measuring the irrigated acreage. (R. 1423)

The witnesses attention is directed to Exhibit E block 63. This shows the block as having no irrigation from the surface system. (R. 1425) The State Engineer does not know what use is being made of that property is 1921. The Exhibit merely shows that there was no irrigation in that block in 1938. (R. 1425-1426) All lands south of the meander line which had a ditch system to them were included in the State Engineer's tabulation of the irrigated acreage. If no ditch system existed for delivering water, the areas were not included as irrigated acres. (R. 1427) Much of the land south of the meander line is swampy land with cattails etc. (R. 1429) Mr. Howard points

to some land on Exhibit 18 and the witness says that they appear to be cultivated. The State Engineer says that these were probably included in his adjudication map, but it is hard to tell because of the different scales on the different maps. (R. 1429-1430)

Exhibit 5 was a 1921 map which was an Exhibit in the Morse Decree proceedings. Land shown as being irrigated on that map may have been irrigated in 1921, but such lands may have subsequently subdivided. And thus, would not appear on later maps of irrigated acreage. (R. 1431-1432)

The Strong Estate, which was testified to earlier which appears at the bottom of Exhibit 5 was irrigated with waste water from the Factory Race. (R. 1431) The State Engineer did not draw any conclusions from the testimony of Mr. Stubbs, Mr. Goddard, or Mr. Roberts. The Strong Estate may have been irrigated, but it wasn't necessarily irrigated from the Provo City system. (R. 1432)

The State Engineer did not feel that he had to defend his decision. He was asked to make a report on water use and he did it as honestly and as unbiasedly as he could, and there is nothing to indicate that it was not done in an honest and forthright manner. The State Engineer feels his decision is correct. (R. 1433) The State Engineer's report concluded that Provo City does not have a 41 irrigation right. (R. 1434)

Exhibit 21 is received in evidence over the objection of Defendants. It is a letter from Bryce Montgomery, the area engineer to Mr. Hugh McKeller, directing him to give the 4(c) water back to Provo City. (R. 1435)

Mr. Howard reviewed the testimony of Mr. Goddard in the State Engineer's transcript as to the irrigation of the Strong property. (R. 1436) According to Goddard, the Strong Farm was irrigated from the third west ditch which is part of the Provo City system. (R. 1437) There was nothing in the testimony which suggested that the Strong property was irrigated all the way down to Utah Lake. (R. 1437)

The State Engineer's hydrograph illustrates that prior to the time the mill ceased operation there were times when Provo City diverted waters sufficient to equal the combined flows of paragraph 4(a), 4(b) and 4(c). (R. 1438)

Mr. Howard questions the trend in the State Engineer's hydrograph referred to earlier because the present testimony states that the mill ceased approximately ten years earlier than Judge Harding indicated in his testimony before the State Engineer. (R. 1440) However, the State Engineer says that he did the best he could with the witnesses which Mr. Howard presented at the hearing before him. (R. 1440-1441)

At the State Engineer's hearing, the State Engineer told all those present that he was making an investigation and was gathering information to try and establish the use made of the water after cessation of the mills. (R. 1441-1442) The State Engineer had to rely on testimony which was supplied at that hearing. (R. 1442) The Engineer did make an independent research to determine when the mills ceased operation. (R. 1442) The testimony which the Engineer based his opinion as to when the mills ceased operation, was based on witnesses such as Judge Harding. (R. 1443) The general trend found by the State Engineer was that the total flow of water diverted began

to decrease after the mills ceased operation. (R. 1443) However, if the mills had ceased operation in 1931, there were years between 1931 and 1940 when the flows diverted did exceed 4(a), 4(b) and 4(c). (R. 1444) The statement in the State Engineer's report is based on the assumption that that mill ceased operation in the early 1940's as Judge Harding testified. (R. 1444) The hydrograph also shows that the general diversion pattern on the Factory Race changed after the mill ceased operation. This is true from the evidence submitted to the Engineer at the time he wrote the report. The change occurs about 1939. (R. 1444) It is possible that during the 1930's there were excess flows in the river which Provo City diverted, and since everybody had enough water, the State Engineer would not restrict such diversions. (R. 1445) The decree indicated that it took 16.5 c.f.s to run the mills. (R. 1446) There isn't anything on the hydrograph that would indicate that any mill could have operated from 1931 to 1969 from the water that was diverted into the Factory Race. However, the witnesses testified that during the low period of irrigation season, it was quite often the practice to cut the mills off and use the water for irrigation purposes, but this didn't mean that they were diverting water in excess of the wards 4(a), 4(b) to supply the irrigation demands. (R. 1447)

In those years, when there was a need for a percentage cut in the river, without the 4(c) rights, the rights received under 4(a) and 4(b) would have been perhaps smaller.

RE-CROSS EXAMINATION OF DEE C. HANSEN

The witness points out the Strong property on Exhibit 5.

This property is labeled the John Strong property on Exhibit 5.

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(R. 1451) Some of this property was included in the irrigated acreage which the State Engineer compiled. This is shown by the green arrows of which indicate what acreages were in the areas served by the ditch. The ditch is shown in an orange line. (R. 1451) The William Strong property to which Mr. Howard referred the witness during his examination was quite a ways north from the John Strong property. The John Strong property is in the vicinity of the Goddard property. Both the Goddard and John Strong property are included within the irrigated acres that the State Engineer used relating to Exhibit 5. (R. 1452) The straight green lines and the red lines which border the various properties indicate ditches. They are shown in different colors indicating the different ditch systems which supplied them. (R. 1452) These ditch systems were taken directly off Exhibit 58 in the Morse Decree proceedings. (R. 1453) There are several Strong farms in the area of the John Strong property, and Mr. Goddard could possibly have been talking about several different of the Strong brothers. (R. 1453)

RE-DIRECT EXAMINATION OF DEE C. HANSEN

Some of the State Engineer's staff did go to the area south of 5th west and west of 5th west to investigate the irrigated property but they never talked to any of the irrigators. (R. 1454)

Under questioning from the court, the State Engineer states that the basis of the acreage determinations on which he based his report is to show that there were only so many irrigated acres under the Provo City system, so that if Provo was entitled to 16 and one half second feet for irrigation, there was more water than there was even land available to use it on. (R. 1455)

The court then asked the Engineer what difference it made to distinguish between the two different duties. (R. 1455-1456) Since paragraph 4(c) failed to define the acreage or duty, the State Engineer's investigation went to find out if there was, in fact, more acreage irrigated than was described in paragraphs 4(a) and 4(b), and if that was not found, was there a need for paragraph 4(c) water to supplement the supply to the land listed under paragraphs 4(a) and 4(b). Paragraphs 4(a) and 4(b) supplied 6.2 acre feet per acre without paragraph (c). Since this was more than adequate, the conclusion was that paragraph 4(c) was not needed to go along with the acreage described in 4(a) and 4(b) and was simply a non-consumptive power right. (R. 1456) This concluded the testimony of the State Engineer.

When the court reconvened the next day, Mr. Howard submitted Exhibits 15A, B, and C. These had been gone over by the representatives of Provo City and the State Engineer's office to correct and revise them. The corrections were made. (R. 1459) The Defendants agree that Exhibits 15A, B and C now conform to the information shown on the hydrograph marked Exhibit 14. They are received in evidence. (R. 1460) Exhibit 16 is withdrawn. (R. 1461)

WITNESSES FOR DEFENDANTS

The Defendant then proceeds to put on its case in chief. The Defendants first introduce certified copies of their various water rights, over the objection of Plaintiffs. The purpose of these exhibits was to put in evidence the claimed water rights of the Defendants to establish their standing in the waters of the Provo River that will be effected by the decree of this court relative to the

16.5 c.f.s. These exhibits are Exhibits I through Exhibit O.
(R. 1465-1492)

DIRECT EXAMINATION OF JACK M. GARDNER

Mr. Gardner is 54 years of age, a resident of Granger, Utah, and is ^{ASSISTANT} superintendent of the Provo River Water Users Association. (R. 1492) He is also Secretary/Treasurer of the Provo River Distribution System. The Provo River Distribution System is a statutory organization organized by the water users on a stream in conjunction with the State Engineer's Office. This agency assesses and finances the cost of distributing the water through the water commissioner under the direction of the State Engineer. The Provo River Distribution System is just such an organization. (R. 1493) He has been the Secretary of the Provo River Distribution System since 1965. He has served as assistant project superintendent of the Provo River Water Users Association since 1964. He was employed by the Utah Water and Power Board in 1948 through 1953. In 1954 he was inspector on the construction of the Freemont Mill Dam near Freemont, Utah and was also the engineer on the project. In 1955 he was employed by the State Engineer's Office and was eventually the appropriations engineer for both surface and underground water. (R. 1493-1494) As appropriations engineer, he helped make decisions as to whether or not applications would be approved or rejected. (R. 1494) He has had other construction/engineering experience in the early 1940's. (R. 1495)

As assistant superintendent of the Provo River Water Users Association, he assists the superintendent in the general operation of the project. He is also given the duty to see that the water is

distributed to the association under its various water rights. (1495)
The Provo Reservoir Canal diversion is located just below Vivian Park.
He is not too familiar with the location of the Provo City diversion
or its irrigation system. (R. 1495-1496)

As assistant superintendent of the Provo River Water Users Association and as secretary of the Distribution System, he has made a study of the existing water rights of the Provo River Water Users Company. He is familiar with paragraphs 34-42 of the Provo River Decree, which are the rights of the Provo Reservoir Water Users Company. (R. 1496)

Mr. Gardner is familiar with the distribution of water from the Provo River. He has gained that familiarity over the years in connection with his serving in the capacity of secretary/treasurer of the Distribution System and the assistant superintendent of the Provo Water Users Association. (R. 1501)

If the 4(c) right was received along with all other rights based on its pro rata share, its percentage of the river through 1969 it would not be depriving them anymore now than it had up through 1969. (R. 1504)

Over the objection of Mr. Howard, Mr. Novak introduces several exhibits which purport to show how the defendant's water rights will be harmed if Provo City is awarded the 16.5 c.f.s for consumptive irrigation use. After a rather lengthy discussion (R. 1504-1511) Mr. Howard concedes that if Provo City doesn't get the water it goes into the river. The court then noted that the water rights of the defendant would be affected by the decision of the court one way or the other.

(R. 1511-1512)

CROSS-EXAMINATION OF MR. JACK M. GARDNER

Mr. Gardner attended Westminster College for two years and one quarter at the University of Utah and has taken a correspondence course on civil engineering. He does not possess an engineering degree nor license, nor is he a registered land surveyor. (R. 1512)

At this point, the defendants offer in evidence the testimony of the witnesses who appeared and testified before the State Engineer at the hearings that he conducted beginning with the witness Hugh McKeller starting at page 856 of the record. The other witnesses in the Transcript were Robert White and John McCoy. These transcripts were not read into the record, but were made part of the record. The objections to exhibits P-V which are exhibits B-H in the State Engineer hearing were reserved and the court was to rule on each objection as it read the transcript. (R. 1521)

The following is an abstract of the testimony offered by Defendants at the State Engineer hearing. The page numbers given will be the page number in the official record. The transcripts of the proceedings for the State Engineer was attached to the State Engineer's report to the district court as appendix B. The exhibits introduced at the State Engineer hearing were re-introduced in court, but were given different letters. (R. 1514)

DIRECT EXAMINATION OF HUGH A. MCKELLER
(Before State Engineer)

This witness was previously called by Mr. Howard and is now recalled by the defendants. Mr. McKeller is the superintendent of the Provo River Water Users Association. He has served in that capacity over three years. Prior to that time he was a consulting

engineer and served as Provo River Water Commissioner for the four years prior to the time he became superintendent of the association. (R. 856)

The witness is shown defendant's exhibit B (exhibit P) in the district court) and the witness identifies it as a series of hydrographs of the Provo River showing the irrigation water diverted as taken from the River Commissioner's report. It is a copy of a map prepared by the State Engineer's Office on which was superimposed the decreed rights under the Provo River Decree showing the amount of water to which Provo City canals are entitled during the irrigation season according to the decree. The items marked in red are the plottings of the average flow during a particular month. The lines in blue are the decreed rights for those same months. The blue outline contains the mean monthly average of the total of the 4(a) and 4(b) waters. (R. 857) Therefore, it is not really a hydrograph but is a record of the diversion of flows from the Provo River into the Provo City canals. This was based on an earlier hydrograph prepared by Mr. Norseth of the State Engineer's Office at an earlier point in the proceeding. (R. 858) This information was re-traced on exhibit B except for the blue outline which is the summation of the 4(a) and 4(b) rights. In looking at Mr. Norseth's hydrograph, there was an error for the year 1968 in that for that year the water is measured in acre feet instead of second feet, but such measurements are, indeed, accurate. (R. 858-859)

Exhibit B (exhibit P in court) covers a period from 1902 to 1979. However, there are gaps for several years. 1907, 1909, 1912

and 1913. These were left blank. (R. 870) ⁶ Exhibit B (exhibit P) accurately demonstrates in hydrograph form the ^{COMPARISONS ON A} mean monthly basis during the irrigation season between the quantities of water actually diverted into the Provo City system and the summation of the 4(a) and 4(b) rights. (R. 861) In preparing exhibit B, periods of time when the river was not at 100% were taken into consideration, but such information was not included on Exhibit B (Exhibit P). (R. 861)

At this point in the court proceedings, Mr. Howard made an objection to some of Mr. McKeller's testimony, but the compiler of this abstract of the record cannot find anywhere in the record where Judge Tibbs ruled on the objections of Mr. Howard which were also made before the State Engineer. Therefore, it is assumed that all evidence which was admitted before the State Engineer was admitted into the record before the court. (R. 1520-1521)

Mr. McKeller goes on to testify that the hydrograph shows a trend in that in 1920-21 and 22 the amounts diverted considerably exceed the decreed rights from the Provo River. This excess continued although to a lesser extent, until about 1938. From 1938 on there was a steady decrease in the amount of water diverted by Provo City for irrigation purposes. The trend continues steadily and drops off and continues to decrease up to 1969. (R. 861-862)

In plotting the blue line, Mr. McKeller states that this is a 100% flow if the 4(a) and 4(b) rights had been received. The blue shows the maximum Provo was supposed to take. He did not consider the river flow in arriving at the figure, but took the decreed figure. (862-863) The blue shows the total amount decreed under 4(a) and 4(b) without respect to the flow of the river. (863) The base data shown on exhibit B (exhibit P) comes from the Provo River Commissioner's

reports. These commissioner reports show the period each year when the river was 100% or below 100%. (R. 864) Mr. McKeller did make some study along the line of showing when the river was at 100% or less than 100% as relating to exhibit B (exhibit P). In some years there was 100% flow during the power season, but between 80 and 85% of the years there was less than 100% river. (R. 864) In many of the years there was less than 100% flow on the river during the irrigation season. (R. 866) In the spring, there is more than 100% flow from the run off. From July to the end of the irrigation season is when the river would normally drop below 100%. (R. 866) Therefore, once the high water season was over, usually in July, in most of the years there was a decrease in the amount of water, and a 100% river was not available to all the water users. But generally speaking, during the months of April, May and June, a 100% was available for diversion under the Provo City rights. (\$. 867)

CROSS-EXAMINATION OF HUGH MCKELLER
(Before State Engineer)

In Mr. McKeller's opinion, when he was River Commissioner, award 4(c) under the Provo River Decree is not an irrigation right. (R. 868) The witness was Provo River Commissioner from 1968-1971. When Mr. McKeller ceased to deliver the 16.5 second feet to Provo City, the water users down below got the benefit of that 16.5 c.f.s. (R.869) The Provo River Water Users Association's diversion was above the diversion of Provo City. (R. 869) The decision to cut-off the 16.5 c.f.s. was in the end the decision of the State Engineer's Office. (R. 870)

The Metropolitan Water District has some storage rights in Deer Creek Reservoir further up on the Provo. (R. 871) Of this

Metropolitan Water District water, a portion of such water is allotted to Provo City. The exhibit B does not show this water as being delivered to Provo City because this was in effect Metropolitan Water District water, not Provo City water. (R. 872) It is doubtful that the construction of Deer Creek Reservoir had any effect on the charts in Exhibit B because the natural flow of the Provo River is passed through the storage facility. (R. 872) The benefit of Deer Creek Reservoir to Provo City and other water users is a smoother flow of water through the system than was available before the dam was there. It eliminates peaks and valleys in the flow. (R. 873)

When the water was taken from Provo City, the downstream users got the benefit of the 16.5 c.f.s. left in the river. There are several irrigation systems below Provo City's point of diversion, however, so it is hard to demonstrate that any particular water user would be a direct beneficiary. All users share in extra water in the stream. (R. 874)

DIRECT EXAMINATION OF ROBERT WHITE
(Before State Engineer)

Mr. White is 56 years old and is a resident of Springville, Utah. He is a hydrologic engineer with the Bureau of Reclamation. He has a degree in engineering from Utah State University. (R. 877-878) He has worked with the Bureau of Reclamation since the late 1940's in hydrology work. Since 1968, he has been in water rights. (R. 878)

In his work, he did have occasion to make a study relative to the flows of water in the 11th West ditch, the University Avenue ditch, the 5th West ditch and the Factory Race. (R. 878-879) This

study took place from 1952 until 1966. The purpose of this study was to determine the inflows into Provo Bay for the purpose of developing the Provo Bay dyke portion of the Central Utah Project. (R. 879) The witness identified exhibit C (exhibit Q) as a quad sheet of the U. S. Geological Survey. It was revised in 1969 from a base map that was made in 1948. Mr. White had made this exhibit up himself. The exhibit shows the location of the 11th West ditch, the University Avenue ditch, 5th West ditch and the Factory Race. (R. 879) The information shown on exhibit C (exhibit Q) is marked off from field observations, and is accurate. (R. 880) The triangles on each of the ditches on the map represent the approximate location of the measuring point where the flow from each of these ditches was measured. The measurements were made by Mr. White and the measurement was of the actual quantity of water in the ditches regardless of source. It was measured whether it was return flow or water coming down the ditch. (R. 881)

The witness is shown exhibit D (exhibit R) and identifies this exhibit as tabulations of flows which were measured at the various points in each of the four ditches over the years. (R. 881-882) In determining these flows, they try to select a measuring point which was below all of the diversions from the ditch and all visible inflows into the ditch so that the measurement would represent the flow which went into the lake. They placed staff gauges in the ditch and at various times they went in and read the gauge ^{HEIGHTS} ~~hikes~~. They also took current water measures to determine the rating curve at each of the measuring stations. The tabulations of those measurements is shown on exhibit B (exhibit R). These measurements cover the period

from 1952 until 1966. (R. 882) Exhibit D (exhibit R) contains a tabulation of the flow in the Mill Race at a point designated by the triangle on defendant's exhibit C (exhibit Q). (R. 882-883) The information on the exhibits is accurate. The witness also notes that in 1952 or 1953 the measurements in the Mill Race included out flows from Provo City sewer. At that time, the Provo City Sewer Disposal Plant was not in operation. The sewage disposal plant did go into operation in 1956. Thus, the years when the sewage effluent was going in to the Mill Race were excluded. (R. 883) This exhibit shows that there was water in some amount which was returned to Utah Lake through these various ditches. (R. 884)

The witness then identifies exhibit F (exhibit S) as a hydro-graph of the flows which were measured from the various ditches. The flows were plotted at the time they were measured, and then the points were connected with a line to form a graph. It indicates the high flows, the low flows and the relative flows of the streams. The measurement point is the same shown on the map, and it is therefore a visual interpretation of the data already submitted on the two previous exhibits. (R. 884-885) The small sheet that is attached to and a part of exhibit F is additional measurements made under Mr. White's direction after he was transferred to another department by another person in the bureau who was a student at B.Y.U. working for his master's degree. The information was used as back up materials for his thesis. (R. 885-886) These measurements covered the years 1970-1972. (R. 886) The student worked under Mr. White, and Mr. White feels confident that the water measurements for these last three years were accurate. (R. 888) The bureau relied on the measurements

for the later three years made by Mr. Riley in conducting its study of Utah Lake. (R. 889) To the best of the witness's knowledge, the information is reliable and accurate. (R. 889)

The witness is shown exhibit E (exhibit R) and identifies it as the summary of the measurement of the flow which was made in the previous studies previously discussed for the Mill Race, University Avenue ditch, 5th West ditch and 11th West ditch. Exhibit E contains a tabulation in acre feet during the water year for the years indicated on exhibit D (exhibit R) for the Mill Race. (R. 890)

The studies which Mr. White and the Bureau of Reclamation made generally show that the minimum flow in the Mill Race over the period of time covered by the study was 1.49 c.f.s. on May 19, 1960. The maximum flow was 38.76 c.f.s. on February 16, 1960. The flow was quite variable. The maximum or highest flow was generally in the winter time. From the winter time it would decrease in March and April and then pick up again in June and early July. From there it would diminish to the summer and pick up again in the fall. (R. 893) The other three ditches followed a different pattern from the Mill Race. Their pattern of flow was relatively slow in the winter time and increased in the summer time. This indicated that the flow in those ditches came mostly from irrigation water. (R. 893) From his studies, Mr. White concluded that there was water going past Provo City into Provo Bay which was not being used by the City. Those quantities are reflected in the documents which Mr. White prepared and which were put in evidence. (R. 893-894)

CROSS-EXAMINATION OF ROBERT WHITE
(Before State Engineer)

Exhibit C (exhibit Q) was made under Mr. White's direction

Mr. White personally went out to the 11th West ditch and saw that ditch himself. It wasn't really a ditch, but was more of a drain. There is a channel on 10th West and whether it is on 10th or 11th West it is the same ditch, and that is the ditch which they measured. (R. 894)

Mr. White cannot tell from his measurements how much of the water which was measured was run-off water from Rock Canyon or other sources. (R. 895) The purpose of the study was to determine the inflows into Provo Bay from all sources, and these are the flows which were measured. (R. 896)

DIRECT EXAMINATION OF JOHN MCCOY
(Before State Engineer)

John McCoy is 46 years old and is a resident of Orem, Utah. He is a soil scientist and land classification man with the Bureau of Reclamation. He has held that job for twenty years. He has a degree from Utah State University in agronomy, dated 1953. He has been employed with the Bureau ever since he graduated from college. (R. 897-898) He was transferred to the Central Utah Project Office in 1960, and at that time the office was finishing up the land classification work done for the Provo River Project prior to the Central Utah Project. The witness identifies defendant's exhibit G (exhibit T) as a map showing land classification in Provo. The map has a lot of cross-hatching and coloring on it. The map shows the canal companies in the area and the colors show the various areas served from the various ditches and canals. (R. 898) Exhibit G (exhibit T) comes from files of the Bureau of Reclamation, relating to the studies conducted under the Provo River Project. The exhibit contains a code

designating the color and cross-hatching. The areas shaded in brown shows the Provo City Irrigation Company. It represents the Provo City irrigation boundaries served by the Provo City Irrigation Company. All the land within that area is not irrigated, but there is no distinction between irrigable and non-irrigable land. (R. 899) Near the bottom of the exhibit, the area shaded in blue and the area shaded in tan immediately to the north, shows the boundary between the arable and the non-arable land based on the specifications used for this classification. The line between the tan and the blue is the southern boundary according to the classification of the arable land under the Provo City Irrigation System. (R. 900)

CROSS-EXAMINATION OF JOHN MCCOY
(Before State Engineer)

The information contained on the exhibits came from the records of the Bureau of Reclamation. The witness did not make this map personally. The witness does not know who made the notations on the maps. (R. 901) The red line shows the Provo Bay boundary after 1960. (R. 903)

The witness is shown exhibit H (exhibit U) and identifies it as the land classification for the Provo Bay area using revised standards and specifications. This map updates the map which is exhibit G (exhibit T). This map includes only those lands which were included in the project. That is, the area or portion of the area of Provo Bay that would be developed. (904-905) Most of the land classifications shown on exhibit H are the product of the witness's own personal work, done under the supervision of a Mr. Mohlman. The area cross-hatched with the slanted lines on exhibit H is irrigated land.

In the northern boundary of the area outlined in red, there is about 56 irrigated acres in the vicinity of Dry Creek. (R. 905) This is shown on the key of the map. (R. 906)

The witness identifies exhibit I (exhibit V) as a tabulation of the various acreages of the land classifications shown on exhibit H (exhibit U). These tabulations are accurate as taken from the land classification map. The map was made from aerial photographs and the lands were tabulated on the aerial photograph. These tabulations were taken from the aerial photographs. (R. 907)

This is the end of the defendant's testimony for the State Engineer. We now go back to live witnesses before the court.

FURTHER WITNESSES FOR PLAINTIFF

DIRECT EXAMINATION OF JESSIE BLACK

Mr. Black is the City Official who made the acreage measurements on the Provo City maps earlier in the proceeding. He has made certain measurements of land located in Provo City that are not shown on exhibit E by the engineer. He was asked to relate the areas not measured by the engineer to the area shown on exhibit 18. (R. 1528) He was asked to extract from the aerial photograph that land which would have been shown on exhibit E had exhibit E been projected to the shores of Utah Lake. This was done by using a Provo City map of 1937. This is the same map the State Engineer used to calculate his figures. (R. 1529) The witness identifies plaintiff's exhibit 22 as an inlay from the 1937 map showing the acreages which were measured. These acreages lie south of the acres measured by the State Engineer. (R. 1529-1530) Mr. Novak objects as to the total acreages encompassed within the area ~~because there is no evidence to show that any of that~~

land was ever irrigated or was irrigated from the Provo City System. The objection is overruled. (R. 1530-1531) The acreage within that area is 820 acres. A reduction was made of 147 acres leaving a net figure of 673 acres. The 147 acres deducted was for the First Ward pasture which has a separate water right from Provo City. (R. 1531-1532)

CROSS-EXAMINATION OF JESSIE BLACK

Mr. Black measured the area on exhibit 22 with a planimeter. He took the particular area delineated on the aerial photograph marked exhibit 18. He transferred that information to exhibit 22. This was done under the direction of Mr. Howard. Mr. Howard showed Mr. Black the specific area he wanted transferred from exhibit 18 to exhibit 22. (R. 1532) The area which he calculated is all the acreage within that area, without regards to whether it is road, dry land or whether there is any irrigation. It is just the total acreage within those particular boundaries. (R. 1533)

DIRECT EXAMINATION OF TERRY LYNN HERBERT

Mr. Herbert is a resident of Provo City, and has been Senior Provo City Watermaster for six and one-half years. (R. 1534-1535) As watermaster, his duties require him to divert the water into all the streams to make the necessary diversions into the proper streams so that the farmers can irrigate their property.

The witness steps over to exhibit 5 to identify the Earl Stubbs property. The Stubbs' property was near 100 West and approximately 1500 South where the Tanner Race empties and runs toward the lake. (R. 1535) There is a ditch going east along the bottom point of the Tanner Race. This ditch runs east for about 250 yards, and

then runs south toward the lake and then east again to the corner of Walter Jefferson's property according to the 1937 map. The witness marks in red where the ditch emanates or ends. (R. 1536) This is the ditch to the Stubb's property. (R. 1537) The witness is familiar with how the water runs from there down to Utah Lake. The witness steps to exhibit 18 and shows where the piece of property would be on that particular exhibit. The witness describes how they put in a dam to back the water up and divert the water on to Stubbs' property. They push the water in the southeast direction across the land and it goes as far as it can toward the lake. (R. 1537)

With regard to the First Ward pasture property, the witness has been over the land a number of times. Just a small portion of the First Ward pasture is now covered with bull rushes and marshes. The bull rushes are near the railroad tracks. (R. 1539) There are at the present time irrigation systems within the First Ward pasture area although Provo City doesn't necessarily use them but the systems do exist. (R. 1539) The witness has not seen a large portion of the First Ward pasture irrigated. However, a system is present to irrigate the ground. This is an old system. (R. 1540)

CROSS-EXAMINATION OF TERRY LYNN HERBERT

As to the Stubbs' property, Mr. Herbert's testimony relates to the condition which presently exists. He has been watermaster for six years. (R. 1541) He does not know what the condition was with respect to the irrigation of any of the Stubbs' property in 1938, 1931 or 1921. (R. 1542) Mr. Herbert, himself, made an investigation of the irrigated acreage in Provo City to see what water users were

doing with the water. His total number of acres was approximately 2,000 irrigated acres within the Provo City system. (R. 1543-1544) As watermaster he issued a water ticket to Mr. Stubbs to irrigate the property previously discussed. (R. 1544) The Stubbs' property at the very end of the ditch contained a certain amount of acreage and since it was on the end of the ditch they kept a tight dam and the water ran over the property towards the lake. (R. 1545) All the irrigation of this land at the end of the ditch was done on their own and was not done under the Provo City System. No water or irrigation ticket was issued to them and they never paid for it. (R. 1454) The Stubbs are usually allotted 26 hours of water to irrigate the land marked in red on exhibit 22. This would be enough water for approximately 26 acres. (R. 1547)

There are more than 147 acres in the First Ward pasture. There are no water tickets issued for the irrigation of the First Ward pasture other than for the golf course. (R. 1548)

Dean Wheaton, the Provo City Director of Water and Waste Water was re-called to the stand by Mr. Howard and testifies that the exact acreage of the First Ward pasture as calculated by his staff is 459.61 acres. (R. 1549) This was the end of testimony in the proceedings.

It was then decided that the parties would submit written memorandums to the court. The court set final oral arguments for ~~DECEMBER~~ ⁹ January 11th in Salt Lake City. (R. 1552-1554) On that oral arguments were made, and the court rendered its decision.