

Boise Artesian Hot & Cold Water Company's Natatorium Park Wells



T03N R02E



2003 Aerial Photo
with 1912 Sanborn
Map Depiction of
Natatorium Park

07/10/2009

IDAHO DEPARTMENT OF WATER RESOURCES
RECOMMENDED WATER RIGHTS ACQUIRED UNDER STATE LAW

RIGHT NUMBER: 63-31797

NAME AND ADDRESS: UNITED WATER IDAHO INC
8248 W VICTORY RD
PO BOX 190420
BOISE ID 83719-0420

SOURCE: GROUND WATER

TRIBUTARY:

QUANTITY: 2.630 CFS

PRIORITY DATE: 06/01/1895

POINT OF
DIVERSION:

T03N R02E S14 SENE Lot 7 Within ADA County

~~The point of diversion for this right and Right Nos. 63-169F, 63-243E, 63-243H, 63-2500, 63-2506, 63-2576, 63-2595, 63-2605, 63-2668, 63-2703, 63-2808, 63-2874, 63-2892, 63-2915, 63-2954, 63-2956, 63-2989, 63-3064, 63-3073, 63-3105, 63-3112, 63-3128, 63-3164, 63-3172, 63-3202, 63-3239, 63-3291, 63-3292, 63-3293, 63-3295, 63-3411, 63-3448, 63-3494, 63-3562, 63-4015, 63-4414, 63-4424, 63-4752, 63-7066, 63-7067, 63-7204, 63-7282, 63-7348, 63-7479, 63-7577, 63-7589, 63-7658, 63-8059, 63-8236, 63-8432, 63-8990, 63-9147, 63-9204, 63-9205, 63-9219, 63-9223, 63-9671, 63-9855, 63-10386, 63-10405, 63-10533, 63-19456, 63-31797, 63-31798, 63-31856, 63-31857, and 63-31879 are also diverted through the forty three (43) points of diversion described in Right No. 10386.~~

PURPOSE AND
PERIOD OF USE:

<u>PURPOSE OF USE</u>	<u>PERIOD OF USE</u>	<u>QUANTITY</u>
MUNICIPAL	01/01 12/31	2.630 CFS

PLACE OF USE:

Place of use is within the service area of United Water Idaho as provided for under Idaho law. The place of use is generally described as within the city limits of Boise and the surrounding service area.

OTHER PROVISIONS NECESSARY FOR DEFINITION OR ADMINISTRATION OF THIS WATER RIGHT:

To the extent necessary for administration between points of diversion for ground water, and between points of diversion for ground water and hydraulically connected surface sources, ground water was first diverted under this right from the Natatorium Park wells and infiltration galleries located in T03N, R02E, S14, NENE.

This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.

EXPLANATORY MATERIAL : BASIS OF CLAIM - Beneficial Use

Right includes accomplished change in point of diversion pursuant to Section 42-1425, Idaho Code.

Draft

09/20/2005

IDAHO DEPARTMENT OF WATER RESOURCES
PRELIMINARY RECOMMENDATION OF WATER RIGHTS ACQUIRED UNDER STATE LAW

RIGHT NUMBER: 63-31797

NAME AND ADDRESS: UNITED WATER IDAHO INC
8248 W VICTORY RD
PO BOX 190420
BOISE ID 83719-0420

SOURCE: GROUND WATER

TRIBUTARY:

QUANTITY: 2.630 CFS

PRIORITY DATE: 06/01/1895

POINT OF DIVERSION:

T03N R02E S14 SENE Lot 7 Within ADA County

PURPOSE AND
PERIOD OF USE:

PURPOSE OF USE
MUNICIPAL

PERIOD OF USE
01/01 12/31

QUANTITY
2.630 CFS

PLACE OF USE:

Place of use is within the service area of United Water Idaho as provided for under Idaho law. The place of use is generally described as within the city limits of Boise and the surrounding service area.

OTHER PROVISIONS NECESSARY FOR DEFINITION OR ADMINISTRATION OF THIS WATER RIGHT:

This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.

EXPLANATORY MATERIAL: BASIS OF CLAIM - Beneficial Use

State of Idaho
Department of Water Resources
REQUEST FOR EXTENSION OF TIME
TO FILE ADJUDICATION CLAIM(S)

The Idaho Department of Water Resources will consider this form as a request by the claimant for an additional period of time in which to file claim(s) beyond the 90 days allowed by Section 42-1409(10), Idaho Code.

United Water Idaho Inc. (208) 362-1300
Name of Claimant Phone Number

8248 W. Victory Road, P.O. Box 190420 Boise, Idaho 83719-0420
Mailing Address City State Zip

Ada Approximately 1989
County(s) where place of use is located Date claim originally due

63-2915, 63-3239, 63-31797, 63-31798
Identify water right(s) for which extension is requested

State why an extension of time is requested explaining how a diligent effort has been made to meet the deadline:

Research by the company recently uncovered new information regarding each of these claims. United Water purchased Rights 63-2915 and 63-3239 in 1977. However, the change of ownership was never entered in IDWR's database. These two licensed rights currently are unclaimed in the SRBA. Rights 63-31797 and 63-31798 are beneficial use rights associated with historical diversion at United Water's Marden Water Treatment Plant site.

Claimant requests an extension to December 31, 2003

(John Marshall) November 14, 2003
Signature Date of request

Attorney for United Water Idaho Inc.
Title

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

The above request for extension of time is hereby [X granted] [_____ denied] for the following reasons:

and if granted the filing deadline is extended to March 1, 2004
Signed this 18th day of Nov, 2003

(Signature)
Director or his designated agent

Mail to: Idaho Department of Water Resources
1301 N. Orchard Street
Boise, Idaho 83706

COPIED
NOV 10 2003

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF THE
STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

**IN RE THE GENERAL ADJUDICATION
OF RIGHT TO THE USE OF WATER FROM
THE SNAKE RIVER BASIN WATER SYSTEM**

CIVIL CASE NUMBER: 39576

Ident. Number

Date Received

Receipt Number

63-31797

11-14-03

6071661

**NOTICE OF CLAIM
TO A
WATER RIGHT
ACQUIRED UNDER STATE LAW**

Please type or print clearly

1. Name of Claimant(s) United Water Idaho (UWID) Phone (208) 362-1300
Mailing Address 8248 W. Victory Road, P.O. Box 190420, Boise, ID Zip 83719-0420
2. Date of Priority (only one (1) per claim) June 1, 1895
3. Source of water supply (a) Ground water
which is tributary to (b) (not applicable)
4. a. Location of existing point of diversion is: Township 3N Range 2E Section 14,
1/4 of SE 1/4 of NE 1/4, Govt. Lot, B.M., County of
Additional points of diversion if any: _____
b. If instream flow, beginning point of claimed instream flow is:
Township _____ Range _____ Section _____, _____ 1/4 of _____ 1/4 of _____ 1/4,
Govt. Lot _____ B.M., County of _____
ending point is: Township _____ Range _____ Section _____, _____ 1/4 of _____ 1/4 of _____
1/4, Govt. Lot _____ B.M., County of _____
5. Description of existing diversion works (Dams, Reservoirs, Ditches, Wells, Pumps, Pipelines, Headgates, Etc),
Including the dates of any changes or enlargement in use, the dimensions of the diversion works as
constructed and as enlarged and the depth of each well. This claim is a beneficial use claim for water
produced from shallow wells and a collector system at the site of the current Marden Water Treatment Plant.

RECEIVED

NOV 18 2003

6. Water is claimed for the following purposes

(both dates are inclusive)

(cfs)

(acre feet)

For Municipal purposes from 1/1 to 12/31 amount _____ or _____
For _____ purposes from _____ to _____ amount _____ or _____
For _____ purposes from _____ to _____ amount _____ or _____
For _____ purposes from _____ to _____ amount _____ or _____

7. Total quantity claimed (a) 2.63 (cfs) and/or (b) _____ (acre feet)

8. Total consumptive use claimed is (not applicable) acre feet per annum.

9. Non-irrigation uses; describe fully (eg. Domestic: Give number of households served; Stockwater: Type and number Of livestock Etc.) Municipal uses within municipal service area

10. Description of place of use:

a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.

b. If water is used for other purposes, place a symbol of use (example: D for Domestic)

in the corresponding place of use below. See instructions for standard symbols.

TWP	RNG	SEC	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	
							Within the Service Area of United Water Idaho Inc.												

Total number of acres irrigated (not applicable)

11. In which county(ies) are lands listed above as place of use located? Ada County

12. Do you own the property listed above as place of use? Yes _____ No ✓

If your answer is No, describe in Remarks below the authority you have to claim this water right.

13. Describe any other water rights used at the same place and for the same purposes as describe above.

See "Remarks" section or None ()

14. Remarks:

1. UWID is a municipal water provider and claims this right as a municipal right under the Municipal Water Rights Act of 1996 and/or the common law.

2. UWID operates and integrated water supply network involving numerous ground water rights throughout its service area

3. See attached Exhibit A.

Last Name UWID Ident. No. 63-31797

SCANNED

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Scale: 2 inches equals 1 mile **Please see Exhibit B**

A full page of blank graph paper. The grid consists of small squares formed by thin solid lines. A thicker solid line runs horizontally across the middle of the page, dividing it into two equal halves. Another thicker solid line runs vertically down the center, dividing the page into four equal quadrants. Faint dashed lines are visible within each square of the grid, likely serving as guides for handwriting or drawing.

Ident. No. **63- 31797**

NOV 18 2003

15. Basis of Claim (check one) Beneficial Use ☒ Posted Notice _____ License _____ Permit _____
Decree _____

If applicable provide IDWR Water Right Number 63-31797

Court _____ Case Number _____ Decree Date _____

Plaintiff vs Defendant _____

16. Signature(s)

(a.) by signing below, I/We acknowledge that I/We have received, read, and understand the form entitled

"How you will receive notice in the Snake River Basin Adjudication." (b.) I/We do _____ do not _____

wish to receive and pay a small annual fee for monthly copies of the docket sheet.

Number of attachments _____

For Individuals: I do solemnly swear or affirm that the statements contained in the foregoing document are true and correct.

Signature of Claimant(s) _____ Date _____

_____ Date _____

For Organizations: I do solemnly swear or affirm that I am John M. Marshall

_____ Title _____

of Givens Pursley LLP, attorneys for United Water Idaho Inc., that I have signed the foregoing

_____ Organization _____

document in the space below as Attorney of United Water Idaho Inc.

_____ Title _____ Organization _____

and that the statements contained in the foregoing document are true and correct.

Signature of Authorized Agent John M. Marshall

Title and Organization John M. Marshall, Attorney for United Water Idaho Inc.

Date 11-14-2003

State of Idaho/or _____)

) SS.

County of Ada)

Subscribed and sworn (or affirmed) before me this 14th day of November 2003

SEAL

Notary Public Lisa A. Hughes

Residing at Boise, Idaho

My Commission Expires 3-22-2007

17. Notice of Appearance: Please Print Name

Notice is hereby given that I, Christopher H. Meyer will be acting as attorney at law on behalf of the claimant signing above, and that all notices required by law to be mailed by the director to the claimant signing above should be mailed to me at the address listed below.

Signature _____

Address Christopher H. Meyer, Givens Pursley LLP
277 N. 6th St. Ste 200, Boise, ID 83702

Date 11-14-2003

Last Name UWID Ident. Number 63-31797



NOV 18 2003

EXHIBIT A

This is a claim for a water right developed by application of water to a beneficial use beginning in 1895 by the Boise Artesian Hot and Cold Water Co., a predecessor in interest of UWID. At that time the Boise Artesian Hot and Cold Water Co. owned and operated a series of wells and collectors near the site of UWID's existing Marden Water Treatment Plant to supply water for municipal purposes to the City of Boise. From historical documents we know the company had facilities at this site capable of supplying 1,700,000 gallons per day (2.63 cfs) as of 1895 and 2,700,000 gallons per day (4.18 cfs) in 1899.

Excerpts from relevant historical documents are attached. The first is the first ten pages from an engineering report dated October 5, 1904, titled the *Report on Valuation of Boise, Idaho Water Works System* ("Valuation Report"). This excerpt presents an overview of the system owned and operated by the Boise Artesian Hot and Cold Water Co. in 1904. The report indicates the maximum daily water demand for Boise at that time was 3,000,000 gallons per day, 90% (about 2,700,000 gallons per day) of which was produced by the well system at the current Marden site. Valuation Report at 2, 7. The other 10% was supplied from artesian wells in Hulls Gulch. The report goes on to describe the facilities at the Marden site as two wells with pumping engines each capable of producing 1,000,000 gallons per day and two boilers of 85 horse power each. Valuation Report at 3. The wells were connected by an "underground gallery," which apparently produced the additional 700,000 gallons per day. Valuation Report at 6-7.

The second excerpt is selected pages from the *Composition of Unit Field Costs, Boise Artesian Water Company, Historical Valuation of Property as of May 31, 1921*. This excerpt demonstrates one of the pumps and its associated steam boiler were purchased and delivered in 1895. The other set was purchased and delivered in 1899. The report also makes reference to a "rock gallery" at the site of the steam plant, which we assume is the "underground gallery" referenced above. There is no date associated with the rock gallery.

This claim is for 1,700,000 gallons per day, which equates to 2.63 cfs, with a priority date of June 1, 1895. This claim is based on 1,000,000 gallons per day (1.55 cfs) associated with the first pump and steam plant delivered in 1895 and the 700,000 gallons per day (1.08 cfs) associated with the rock gallery, which we assume was in place and producing water prior the installation of the well and pumping plant in 1895. This is a reasonable assumption given the description of demand and water production facilities in the Valuation Report indicating only 300,000 gallons of production came from the Hulls Gulch artesian wells. The additional water had to have been produced at the Marden site.¹ Because the documents do not give a specific date in 1895 when the pump was installed, we selected the midway point in the year, June 1, for the priority date. We have filed a second beneficial use claim, 63-31798 to cover the additional 1,000,000 gallons per day (1.55 cfs) installed in 1899.

Over time UWID replaced these facilities at the Marden site with newer, higher capacity collector wells and obtained an associated licensed water right to recognize the diversion for these improved facilities. This right, number 63-2892, includes a diversion rate of 15.0 cfs and carries a February 7, 1952 priority.² UWID

¹ The Valuation report states that per capita water demand in Boise in 1904 was 375 gallon per day. Valuation Report at 5. The report estimates population in 1890 as 2,311 and 5,957 in 1900. Splitting the difference, population in 1895 was approximately 4000. At per capita demand of 375 gallons per day, system demand in 1895 would have been 1.5 million gallons per day. With only 300,000 coming from the Hulls Gulch facilities, substantial water had to have been produced at the Marden site at this time.

² Right 63-2892 also includes alternate points of diversion at a site downstream on the Boise River known as the "Veterans Collectors." The Veterans Collectors are not related to this claim.

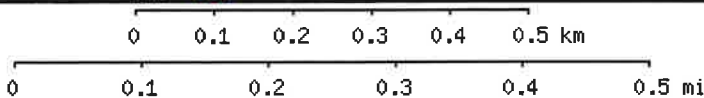
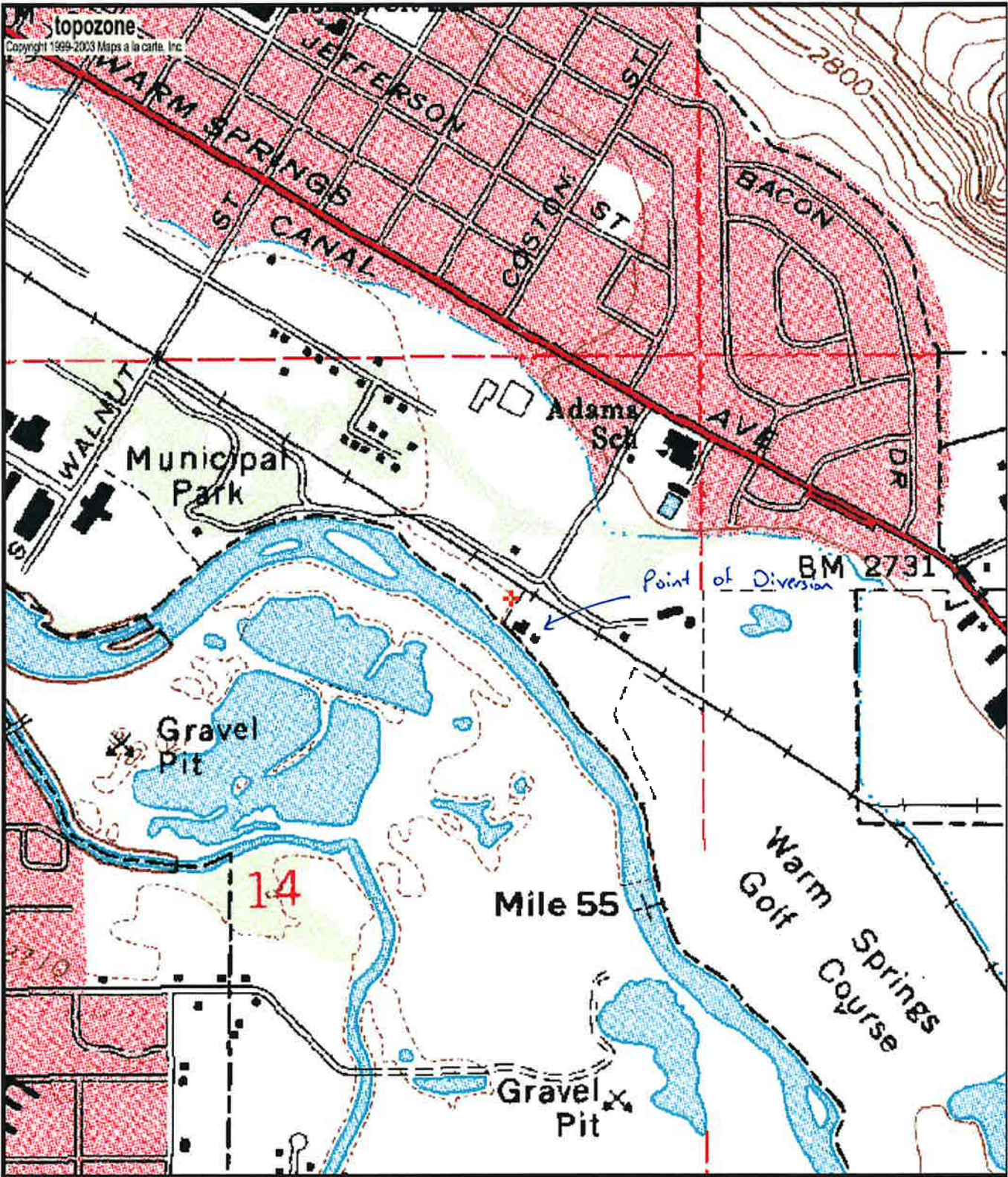
63-31798

NOV 10 2003

obtained this license for the full capacity of the diversion works even though existing beneficial use rights already covered a portion of the diversions from this site. In this way, United Water obtained a junior license that overlaps with the existing senior beneficial use rights. Accordingly, the recommended diversion rate for right 63-2892 should be reduced by the quantity recommended for claims 63-31797 and 63-31798.

SCANNED

NOV 13 2003



Map center is UTM 11 566387E 4827847N (WGS84/NAD83)
Boise South quadrangle - TopoZone Pro elevation display
Projection is UTM Zone 11 NAD83 Datum

M=15.521
G=0.567

EXHIBIT B

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SAMUEL M. GRAY'S
Report On Valuation Of
BOISE, IDAHO,
WATER WORKS SYSTEM

-----oOo-----

SCANNED

NOV 16 2003

Providence, R. I., October 5, 1904.

His Honor the Mayor, and
Special Water Committee of
the City Council,
Boise, Idaho.

Gentlemen:

At your request I herewith present my report upon the valuation of your Water Works System and its adaptability to your requirements, together with a report upon the Perrault and Boise City Canal Systems.

In August, 1904, my principal assistant, George H. Leland, C. E., visited your City for the purpose of collecting the information necessary to compile a report and estimate the value of the Water Works plant.

INTRODUCTION

Boise City, the capital of Idaho, is located on a fertile plain in the Boise River Valley, about four miles from the Boise Canyon. It is partially supplied with water for domestic purposes and amply supplied with water from two canal systems for irrigating the many beautiful parkways, with their shade trees, lawns and gardens, for which the City is noted.

The present water works are owned and operated by the "Boise Artesian Hot and Cold Water Company," a private corporation which has been supplying water in your city for about fourteen years.

Water for domestic purposes is now being supplied from two sources: Eight artesian wells located in Hull's Gulch north of the City, and from large covered wells and filter galleries constructed in the gravel beds in the Boise River Valley near the Natatorium in the southeast portion of the City.

Two covered reservoirs built by the Water Company in Hull's Gulch are used in connection with the artesian well system. No. 1 reservoir

is 169 feet in elevation above Main and Ninth Streets, and has a capacity of 520,000 gallons. No. 2 is at an elevation of 80 feet above Main and Ninth Streets and has a capacity of 220,000 gallons. Water from the artesian wells flow into these reservoirs at an estimated minimum rate of 300,000 gallons per 24 hours.

There is also a covered reservoir called No. 4, located near the Penitentiary grounds, and built at the same elevation as the No. 2 reservoir in Hull's Gulch. This reservoir was designed to hold 525,000 gallons, but a portion of it has been cut out of use on account of the walls having slid in on the upper side, so that the storage capacity has been reduced to 210,000 gallons; the three reservoirs making a total combined storage at the present time of 950,000 gallons.

The daily consumption of water in August, or during the irrigating season is estimated at 3,000,000 gallons per day, about 10 per cent. of which is supplied by gravity from the artesian well system, and the balance pumped from the well system above referred to.

The distribution system contains 31.8 miles of piping, ranging in sizes from 10 inches in diameter down to pipe $\frac{1}{2}$ inches in diameter. The larger sizes, from 3 inches to 10 inches in diameter, are Kalamein pipe, and the smaller sizes are laid with the common wrought iron screw pipes. About 55 per cent. of the system is from 4 to 10 inches in diameter, and 45 per cent. from $\frac{1}{2}$ to 3 inches in diameter.

The distribution system was commenced in 1891 and 1892 and additions made from time to time as needed. It is stated by Water Company that new Kalamein pipes were laid under all paved and macadamized streets at the time those improvements were made.

The system is well supplied with gates and hydrants, the latter appurtenances being furnished by the City, but set by the Company at the City's expense.

The system comprises a pumping station built of brick, located

at the well system at the Natatorium, and is supplied with two Worthington horizontal, duplex, compound pumping engines, each of 1,000,000 gallons capacity per 24 hours, and two boilers of 85 horse power each. The station contains a small upright engine and the necessary tools for making repairs.

The water company furnishes water free for protection from fire and for street sprinkling, its only source of revenue being from private consumers.

VALUE OF THE PRESENT PLANT.

Having given a brief outline of the Water Company's plant as it now stands, the value of the same will be considered under two divisions; first, the value of the "Physical Plant," or cost of its reproduction less the depreciation; and, second; the value of the "Going Concern."

First: The value of the Physical Plant. It is estimated that with the present prevailing prices of labor and material the Physical Plant can be duplicated for \$218,886.71, (See pages 1 and 2 Appendix), including all the pipe lines, gates, reservoirs, wells, pumping machinery, real estate, etc. From this amount should be deducted a sum for depreciation, equal to an accumulation of a sum of money set aside each year, at 5 per cent. compound interest (for the time the plant has been in use), that will reproduce the plant at the end of the life of the various materials that go to make up the system, as follows:

For the reservoir built of masonry there should not be much, if any, depreciation. Exceptions are made in No. 4 reservoir, as this has partially collapsed. (See page 6 Appendix).

For cast iron pipe the life is usually taken at 75 years. For Kalamein pipe in your soils, a life of thirty years is estimated to be a fair average. For small screw pipe of three inches and less, the life is taken at 20 years, not so much on account of its total

destruction by that time, but more on account of larger pipe being required in its place. For water meters the life is taken at 30 years; services at 40 years; valves and hydrants at 40 years; while that of pumping machinery is estimated at 50 years.

The depreciation made up on this basis amounts to \$54,074.22 (See pages 5 and 6 Appendix), which, deducted from the cost of reproduction, makes the estimated value of the Physical Plant at the present time equal to \$154,812.49.

Second: The value of the "Going Concern."

It is customary to estimate this value upon what it would cost, in the way of interest and maintenance upon a new plant, of equal capacity, from the time the works are started to the time when the new plant will have acquired the same income as that which would be received by the old company, amounting, as will be seen by the estimates, to \$25,213.56. (Page 8 Appendix).

The total value of the Company's plant is obtained by the addition of these two sums, amounting to \$208,026.05.

But some consideration should be given to the fact that the distribution system is composed of a large amount of small pipes, and that some additions and reinforcements to the pipe system must be made before the plant can be said to be all that the City needs in the way of a first class Water System for fire protection. However, the Water Company have certain water rights which they have acquired by use for several years, and without any question as to their legal rights to take such waters from the wells in the river basin; and, now that water is becoming more valuable for use in irrigation, there might be some legal objections to the taking of water from the river basin at a new locality. Therefore, in my opinion, these water rights have a certain value which might offset in a way the cost of making the necessary additions and changes to the system, and are more fully described in the Appendix, page 9.

The manner in which all of these estimates have been made are fully shown in detail in the Appendix to this report.

CAPACITY OF THE PRESENT WORKS

The present system of works may be said to have practically reached its limit in the quantity of water that it is capable of supplying. The pipe system needs to be extended to meet the increasing demands, and larger storage capacity is required to meet any sudden demand for water, as in case of a fire, or to carry the daily consumption over a time when an accident might occur to the pumping machinery, or a break in the main pipe line.

Should the City decide to acquire the Water Company's plant, the question will at once arise as to the best method of obtaining more water and extending the pipe system to meet the present as well as the future demands for a pure and ample supply of water.

FUTURE NEEDS

In planning for the future it is necessary to take into account the past growth of the City and to then project a probable line of increase for the next 25 years, which is as far as it is wise, in my opinion, to look ahead.

The U. S. Census Report gives the following population of Boise City:

	In the year	1880,	1,500.
	" "	" 1890,	2,511.
	" "	" 1900,	5,957.
Estimated	" "	" 1925,	8,000.

By projecting the rate of increase in population above indicated to 1925, it is estimated that the population of your City will have increased to 25,000.

The City consumes approximately 3,000,000 gallons per day in the summer months or during the irrigating season, or at the rate of 375 gallons per capita, large quantities being used on lawns and for street sprinkling; and this consumption would be even greater

were the system extended and the supply increased. The winter consumption is not accurately known, but in all probability the per capita consumption for that period does not exceed 125 gallons per capita per day; making an average for the entire year of 225 gallons per capita per day; or an average of 1,800,000 gallons per day. 2,000,000 gallons is assumed, however, as a proper amount to estimate upon.

At this rate the probable maximum consumption for the City will increase to about 2,375,000 per day, and the average to 5,625,000 gallons per day during the next 25 years.

It is believed that a full development of the water supply has reached its limit in Hull's Gulch and that the City should turn its attention to other sources of supply.

SOURCES OF SUPPLY.

Robie, Daggett, Cottonwood Creeks, and Perrault Canal have been suggested as possible sources of supply, but have been discarded on account of an insufficiency of water and the excessive cost of obtaining it from these sources.

Boise River Valley affords the best available source of supply, and two independent projects are presented for your consideration, either one of which will insure an abundant supply of pure water.

First: A supply from wells and galleries, constructed in the river banks on the eastern side of the City near the Natatorium, being an extension of the present system.

Second: A supply from filter galleries built at the upper end of the Boise Canyon nearly opposite the mouth of Moore's Creek.

First: Source of supply from the River Basin near the Natatorium.

At present nine-tenths of the water used comes from the first source, consisting of two wells, one at the pumping station, 26 feet

in diameter and 17 feet deep, and one a short distance southerly from the pumping station 20 feet in diameter by 21 feet deep. These two wells are connected by an underground gallery which also furnishes a large quantity of water. This system is now supplying about 2,700,000 gallons or more per day if needed.

By extending this system of wells and galleries into the gravel beds nearer the river an unlimited quantity of water can be obtained, the amount of which will depend upon the number of wells and the extension of the galleries. Water taken from this source will at all times be clear and free from any sedimentation, but great care should be taken that no cess pools, sewers or drainage of any kind be allowed to come in contact with the ground within a large radius of the wells or galleries, as the gravel is coarse and any bad drainage in or near the supply would be liable to contaminate the water. There are now certain structures located not far from the second well, which, while they may not prove to be dangerous, should for safety be removed at once.

Water from this source will require pumping, either direct into the pipe system depending upon the pumps for pressure, or into a reservoir having a sufficient elevation to give a safe pressure for fire protection; the latter proposition being much more desirable.

The present pumps are working against an ordinary pressure due to 20 feet head in the reservoirs, but in case of fire these reservoirs are shut off by means of valves placed in the pipe lines and the pressure is maintained direct from the pumps.

There are serious disadvantages to this method, such as delay in reaching and closing the valves to the reservoirs, and in telephoning to the engineer at the pumping station; also the liability of a fire occurring at a time when the fires under the boilers are banked, and hence the delay in obtaining the required pressure. It

from the business portion of the city. In general, it is best to have one or more reservoirs constructed

is always considered safer to have a constant pressure on the pipe system at all times to respond promptly to the demands caused by fire. In my opinion, on this small system of pipes, the pressure should be due to a static-head of 200 feet above the business portion of the City.

The pumping of the water from this source can be done by electric power furnished by some of the power companies, or by direct steam power, as at the present time, or by water power furnished from the Perrault Canal, the choice of which is dependent upon the cost of maintenance and the reliability of the power. In case electricity or water power were used, it would be necessary to have a steam pump in reserve.

The reservoir, in my opinion, should have a capacity of 6,000,000 gallons for present purposes, and so constructed that additions can be made when required. It should be covered to prevent the growth of algae, which are sure to occur in uncovered reservoirs when ground water is exposed to the sunlight and air. The presence of algae imparts a very disagreeable odor and taste to the water. The reservoir may be covered with wood or concrete arches, the latter being more durable and sanitary and but slightly more expensive in the first cost. In the long run the concrete will prove to be as economical as the wood.

A very good and desirable location for a reservoir was found at an elevation of 200 feet above Main Street in the Valley about 13,000 northeasterly from the Court House on Jefferson Street. This site affords ample area for present as well as for future needs. It also admits of easy and economical construction by reason of its being almost all in earth excavation, which would tend to make the structure safer. It should be lined with concrete, both slopes and bottom, and concrete arches are recommended for the roof.

One important advantage for this location would be that a direct line of pipe could be laid from the reservoir to the center of the City through Jefferson Street, aiding very materially in reinforcing the system, there being no water pipe at present in this street.

The question of pumping the water from this source by water power derived from the Perrault Canal has been fully discussed under the subject of "Irrigating Canals," and need not be repeated here.

To raise the water at an average rate throughout the year of 2,000,000 per 24 hours to the proposed reservoir 200 feet above Main Street would require 70.4 net horsepower, and with the present steam pumps would consume 4.6 tons of coal per day, and at \$7.00 per net ton, would cost at the rate of \$167 per horse power per annum; or, to express it in another way, would cost \$0.016 per 1,000 gallons. Some allowance should be made for friction in the pipes and machinery, which would bring the actual cost to about \$0.02 per 1,000 gallons, for cost of fuel only.

The present pumps are not as economical in the coal consumption as would be the case with a more expensive pump of the fly wheel type. A good type of fly wheel pump ought to do the same work for about 60 per cent. of coal consumption, or about \$100 per annum per horse power.

The present pumps can be run with a saving of 10 or 15 per cent. in fuel by installing a surface condenser on the main pipe line.

It is believed that satisfactory arrangements can be made with some of the electric power companies of Boise, whereby the water can be pumped by electricity for a much less cost than by steam power, probably for a sum not exceeding \$80.00 per horse power in which case a new electric pump for this purpose would be required. Steam power should be held in reserve to provide against any

VOLUME II
COMPOSITION OF UNIT FIELD COSTS

BOISE ARTESIAN WATER COMPANY
HISTORICAL VALUATION OF PROPERTY
AS OF MAY 31, 1921

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ENGINEERS

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BOISE ARTESIAN WATER COMPANY

HISTORICAL VALUATION OF PROPERTY

AS OF MAY 31, 1921

SUPPORTING DATA FOR UNIT FIELD COSTS

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BOISE ARTESIAN WATER COMPANY

HISTORICAL VALUATION OF PROPERTY
AS OF MAY 31, 1921

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COMPOSITION OF UNIT FIELD COSTS

UNIT Steam Pumps - Steam Plant

ACCOUNT NO. W124

ITEM		UNIT	NUMBER OF UNITS	UNIT COST	TOTAL COST	REF.	
						VOL.	PAGE
MATERIAL							
Worthington compound duplex steam pump, size 10 x 16 x 12 x 10, #56825, 2" steam feed, 3" steam exhaust, 10" suction, 8" discharge (Purchased in 1895)		ea	1	802.68	802.68	3	35
Worthington pump, same as above, #112851, (Purchased in 1899)		ea	1	802.68	802.68	3	35
FREIGHT							
San Francisco to Boise - 1895		lot	1	136.10	136.10	3	35
San Francisco to Boise - 1899		lot	1	85.14	85.14	3	35
1. TOTAL MATERIAL (INCLUDING FREIGHT)					1826.60	-	-
LABOR		job	1	60.00	60.00	3	35
2. TOTAL LABOR					60.00	-	-
3. TOTAL MATERIAL AND LABOR					1886.60	-	-
SUPPLY EXPENSE (1% of 1)					18.27	3	8
LIABILITY INSURANCE (2.90% of 2)					1.74	3	8
UNCLASSIFIED (0.94% of 2)					0.56	3	8
CONSTRUCTION EQUIPMENT (2.17% of 2)					1.30	3	8
4. TOTAL ABOVE ITEMS					1908.47	-	-
CONTINGENCIES AND OMISSION (2% of 4)					38.17	3	8
CONTRACT WORK					-	-	-
FIELD COST IN PLACE					1946.64	-	-

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BOISE ARTESIAN WATER COMPANY

HISTORICAL VALUATION OF PROPERTY
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COMPOSITION OF UNIT FIELD COSTS

UNIT A. L. Fish Horizontal Boilers - Steam Plant

ACCOUNT No. W127

ITEM	UNIT	NUMBER OF UNITS	UNIT COST	TOTAL COST	REF.	
					VOL.	PAGE
MATERIAL						
A. L. Fish fire tube type, horizontal boiler, 5'0" x 16'0", 52 - 4" x 16'0" tubes, extended four door front, complete with: 3'0" x 50'0" plate steel, riveted smoke stack and guy rope (Purchased in 1895)	ea	1	1371.70	1371.70	3	39
A. L. Fish boiler (same as above) (Purchased in 1899)	ea	1	1823.17	1823.17	3	39
FREIGHT						
San Francisco to Boise - 1895	lot	1	305.50	305.50	3	39
San Francisco to Boise - 1899	lot	1	199.04	199.04	3	39
1. TOTAL MATERIAL (INCLUDING FREIGHT)				3699.41	—	—
LABOR						
Installing	job	1	100.00	100.00	3	35
2. TOTAL LABOR				100.00	—	—
3. TOTAL MATERIAL AND LABOR				3799.41	—	—
SUPPLY EXPENSE	{ 1% of 1 }			36.99	3	8
LIABILITY INSURANCE	{ 1.40% of 2 }			1.40	3	8
UNCLASSIFIED	{ 0.94% of 2 }			0.94	3	8
CONSTRUCTION EQUIPMENT	{ 2.17% of 2 }			2.17	3	8
4. TOTAL ABOVE ITEMS				3840.91	—	—
CONTINGENCIES AND OMISSIONS	{ 2% of 4 }			76.82	3	8
CONTRACT WORK				-	-	-
FIELD COST IN PLACE				3917.73	—	—

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BOISE ARTESIAN WATER COMPANY

HISTORICAL VALUATION OF PROPERTY
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COMPOSITION OF UNIT FIELD COSTS

UNIT Rock Gallery - Well No. 1 - Steam Plant

ACCOUNT No. W128

ITEM	UNIT	NUMBER OF UNITS	UNIT COST	TOTAL COST	REF	
					VOL	PAGE
MATERIAL						
Description: Rock gallery from well No. 1 running south approximately 220 ft						
Stones	lot	1	11.00	11.00	3	40
Lumber	lot	1	21.80	21.80	3	40
Nails	lot	1	0.60	0.60	3	40
FREIGHT						
1. TOTAL MATERIAL (INCLUDING FREIGHT)	—	—	—	33.40	—	—
LABOR						
	job	1	695.45	695.45	3	40
2. TOTAL LABOR	—	—	—	695.45	—	—
3. TOTAL MATERIAL AND LABOR				728.85	—	—
SUPPLY EXPENSE		(1% of 1)		0.33	3	8
LIABILITY INSURANCE		(2.90% of 2)		20.17	3	8
UNCLASSIFIED		(0.94% of 2)		6.54	3	8
CONSTRUCTION EQUIPMENT		Pumping 16,500,000 gal water		314.60	3	40
4. TOTAL ABOVE ITEMS				1070.49	—	—
CONTINGENCIES AND OMISSIONS		(3% of 4)		32.11	3	8
CONTRACT WORK		Laying 222' rock drain @ \$1.125		249.75	3	40
		Extra excavation by contract		100.00	3	40
FIELD COST IN PLACE				1452.35	—	—

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