

JOHN A. LOVE
Governor



A. RALPH OWENS
State Engineer

DIVISION OF WATER RESOURCES

232 STATE SERVICES BUILDING
1525 SHERMAN STREET
DENVER, COLORADO 80203

21 November 1968

Mr. A. Ralph Owens, State Engineer
State of Colorado
101 Columbine Building
1845 Sherman Street
Denver, Colorado

Dear Mr. Owens;

I submit herewith my annual report of activities in Irrigation
Division No. 2 for the 1968 water year.

Respectfully submitted,

Rudy Styduhar
Division Engineer
Irrigation Division No. 2

I. PERSONNEL

1. Associate Water Resources Engineer (Division Engineer) Rudolph Styduhar was promoted to Senior Water Resources Engineer (Division Engineer) effective 1 April 1968.
2. The promotion from Associate to Senior Water Resources Engineer (Division Engineer) was on a temporary basis and examinations should be held to make the appointment permanent.

11. GROUND WATER REGULATION AND ADMINISTRATION

1. No actual ground water regulation and/or administration occurred on the main Arkansas River or in Irrigation Division II during the Water Year 1968.
2. There were no verbal and/or written calls from any of the decreed priorities within the Division requesting the regulation and/or administration of underground water sources.
3. Some applications for well permits, as forwarded by the Underground Water Section of the State Engineers Office to the Division Engineers Office, were investigated as to whether or not approval should be granted by the State Engineers Office.
4. There has been an increasing number of inquiries and requests from various area housing developers for permission to tap underground water sources and/or to construct various water collecting devices on some marginal drainage areas and in intermittent streams in an effort to supply their developments with adequate domestic water. Administration in such areas is becoming more cumbersome and time consuming. The State Engineers Office personnel should develop clear cut guide lines relative to this problem.

III. MAIN ARKANSAS RIVER CALL CHART

1. The Division Engineer has completed a river call chart for the main Arkansas River which includes the names of all adjudicated ditches diverting water from the main Arkansas River, the amount decreed to each ditch, and the appropriation date for Water District No. 11, 12, 14, 17 and 67.

2. The chart is arranged in such a manner that any interested party, with a knowledge of the actual Arkansas River flow at Salida, Canon City, Pueblo, La Junta or Lamar, can set the date of the river call for each individual district along the Arkansas River or for the entire Arkansas River. Furthermore, it can be immediately determined which ditches should be allowed to operate and the amount that each operating ditch can divert from the main Arkansas River.

3. The call chart, as prepared by the Division Engineer, has been published by the Southeastern Colorado Water Conservancy District as their Brochure No. 6 entitled "Statutes, Policies, Decrees and Records, Division No. 2, Main Stem Arkansas River, Colorado. In addition to the call chart, Brochure No. 6 has included the following data;
 - a). Arkansas River Transmission Mileage and Losses.
 - b). Summary of Irrigation, Non-Irrigation and Storage Decrees, Main Stem Arkansas River, Colorado, Districts 11, 12, 14, 17 and 67.
 - c). Method of determination of the Arkansas River Call.
 - d). Total precipitation at major Arkansas River cities.
 - e). Yearly ditch diversions in Districts 11, 12, 14, 17 and 67.
 - f). Yearly trans-mountain diversions from Colorado River Basin to Arkansas River Basin.
 - g). River flow at major Arkansas River gaging stations.
 - h). Excerpts from Colorado Revised Statutes, 1963.
 - i). Ground water activity in the Arkansas Valley.

4. The distribution of Brochure No. 6 by the Southeastern Colorado Water Conservancy District has been beyond expectancy and from all indications the Brochure has proven valuable to those concerned with administration on the Arkansas River and as a possible model to other drainage basins in Colorado.

5. Within the next year, it is hoped that this main Arkansas River call chart can be expanded to include all tributary flow within each Water District along the Arkansas River.

IV. WATER DISTRICT LINE DIAGRAMS

1. The Division Engineer has prepared more accurate, precise and efficient line diagrams for the main Arkansas River and some of the larger tributaries to the main Arkansas River.
2. Present line diagrams, in contrast to past line diagrams, are constructed on U. S. G. S. topographic maps with all usual line diagram information included, (i.e., ditch name, priority number, appropriation date, decreed amount, adjudication date, etc.).
3. A line diagram atlas for the main Arkansas River in Water Districts No. 11, 12, 14, 17, and 67 is nearly completed.

V. DITCH DIVERSION CHARTS

1. For all practical purposes, it may be stated that all diversions out of the main Arkansas River in Water Districts 11, 12, 14, 17 and 67 have been adequately flumed and recorded.

2. Commencing with the 1969 irrigation season, the Water Commissioners of Water Districts 11, 12, 14, 17 and 67 will complete their weekly Arkansas River ditch diversion charts and together with the weekly report forms will forward to the Division Engineers Office where a weekly summary will be prepared. This accounting is intended to accomplish the following;
 - a). To satisfy the Division Engineer that the District Water Commissioners are administering ditch diversions in accordance with current river calls and that ditch diversions do not exceed decreed amounts. It is possible, although improbable, that in order to maintain harmonious relations in certain areas, the tendency towards disregarding undesirable aspects of river calls requiring ditches to cease or curtail river diversions is present. Furthermore, administration will be improved in that there will be no irregular diversions and all diversions will be within the river call.
 - b). It is becoming increasingly necessary to maintain an up-to-date record of diversions from, not only the Arkansas River, but from all streams and rivers. Usual practice has been to receive all ditch charts from all Water Districts in the Division and then forward to the State Engineers Office for storage.
 - c). It is possible that the Arkansas Valley Ditch Association will supplement their daily river report with a weekly ditch diversion report, similar to their weekly reservoir report, for all Water Districts along the Arkansas River.

3. Sample weekly report forms are illustrated on subsequent pages.

STATE OF COLORADO
OFFICE OF STATE ENGINEER
DIVISION ENGINEER - DIVISION 2
Pueblo, Colorado

WEEKLY REPORT OF TRANS-MOUNTAIN IMPORTS, DITCH DIVERSIONS
and ARKANSAS RIVER GAGING STATIONS

WATER DISTRICT 11

WEEK ENDING 19

AVERAGE DAILY DISCHARGE IN SEC. FT.

Name of Ditch	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Otero-Homestake Pipeline							
Kraft							
Riverside & Allen Ext.							
Martin							
Young & Smith							
Williams & Hamm							
Champ							
Pioneer							
Upper River							
Younger No. 1							
Younger No. 2							
Derry No. 1							
Wheel							
Langhoff							
Harmony							
Helena							
Salida							
Wells & Starr							
Bray & Allen							
Dry Field							
Sunnyside Park							
Bob Berry							
Cogan & Day							
Eckstine							
Section House							
Arkansas River at Wellsville							

RESERVOIRS

Clear Creek Reservoir							
Twin Lakes Reservoir							
Sugar Loaf Reservoir							

TRANS-MOUNTAIN IMPORTS

Homestake Tunnel							
Twin Lakes Tunnel							
Busk-Ivanhoe Tunnel							
Wurtz Ditch							
Ewing Ditch							
Columbine Ditch							
Larkspur Ditch							

Remarks:

STATE OF COLORADO
 OFFICE OF STATE ENGINEER
 DIVISION ENGINEER - DIVISION 2
 Pueblo, Colorado

WEEKLY REPORT OF TRANS-MOUNTAIN IMPORTS, DITCH DIVERSIONS
 and ARKANSAS RIVER GAGING STATIONS

WATER DISTRICT 12

WEEK ENDING 19

AVERAGE DAILY DISCHARGE IN SEC. FT.

Name of Ditch	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Ideal Cement							
Minnequa & Union							
Fremont County							
Hannenkratt							
Canon City Hy. & Irri							
City of Canon							
Canon City & Oil Creek							
So. Canon Ditch (Incl. Lincoln Park Pump & Lincoln Park Crooked D.)							
Canon Mill							
John Mansville							
Rogers No. 1							
Brewer & Kelso							
Lester & Atterbury							
Pleasant Valley							
Pickett							
Clayborn Extension							
Hayner							
Phelps							
Porter-Woodriff-Tells							
Southern Colorado Power							
Arkansas River at Canon City							

Remarks:

 WATER COMMISSIONER

STATE OF COLORADO
 OFFICE OF STATE ENGINEER
 DIVISION ENGINEER - DIVISION 2
 Pueblo, Colorado

WEEKLY REPORT OF TRANS-MOUNTAIN IMPORTS, DITCH DIVERSIONS
 and ARKANSAS RIVER GAGING STATIONS

WATER DISTRICT 14

WEEK ENDING 19

AVERAGE DAILY DISCHARGE IN SEC. FT.

Name of Ditch	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Booth-Orchard Grove							
Bessemer (River)							
(Reservoir)							
Hamp-Bell							
Oxford Farmers							
Pueblo Water Works No. 1 (S. Side)							
Pueblo Water Works No. 2 (N. Side)							
Hobson							
West Pueblo							
Riverside-Dairy							
Collier							
Excelsior							
Colorado (River)							
(Reservoir)							
Wheel Ranch							
Rocky Ford Highline							
(Reservoir)							
Arkansas							
Centennial							
Lake Henry							
Lake Meredith							
Arkansas River at Pueblo							
Salt Creek							
Pueblo Sewage Return							

Remarks:

 WATER COMMISSIONER

STATE OF COLORADO
OFFICE OF STATE ENGINEER
DIVISION ENGINEER - DIVISION 2
Pueblo, Colorado

WEEKLY REPORT OF TRANS-MOUNTAIN IMPORTS, DITCH DIVERSIONS
and ARKANSAS RIVER GAGING STATIONS

WATER DISTRICT 17

WEEK ENDING 19

AVERAGE DAILY DISCHARGE IN SEC. FT.

Name of Ditch	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Rocky Ford							
Las Animas Town-Consolidated							
Catlin							
Holbrook							
Otero							
Fort Lyon							
Potter Irrigation							
W. J. Baker							
Baldwin Stubbs							
Ft. Lyon Storage Canal							
Consolidated Extension							
Adobe Reservoir							
Dye Reservoir							
Holbrook Reservoir No. 1							
Horse Creek Reservoir							
Great Plains Reservoir							
Arkansas River at Nepesta							
Arkansas River at La Junta							

Remarks:

WATER COMMISSIONER

OFFICE OF STATE ENGINEER
 DIVISION ENGINEER - DIVISION 2
 Pueblo, Colorado

WEEKLY REPORT OF TRANS-MOUNTAIN IMPORTS, DITCH DIVERSIONS
 and ARKANSAS RIVER GAGING STATIONS

WATER DISTRICT 67

WEEK ENDING 19

AVERAGE DAILY DISCHARGE IN SEC. FT.

Name of Ditch	Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
Keesee							
Peterson							
Lamar							
Lamar Power Plant Return							
Buffalo Creek							
Fort Bent							
Amity							
Hyde							
X.Y. - Graham Ditches							
Sission & Stubbs							
Manvel							
John Martin Reservoir							
Two Buttes							
Arkansas River at Las Animas							
Purgatoire at Las Animas							
Arkansas River below J. Martin Res.							
Frontier Ditch							
Arkansas River at Coolidge							

Remarks:

 WATER COMMISSIONER

VI. WATER ACCOUNTING PROCEDURES

1. The Division Engineers Office presently maintains the following weekly records;

- a). Trans-mountain diversions
 - 1. Daily diversions (CFS) (AF) of 7 tunnels and/or ditches.
 - 2. Trans-mission losses.
 - 3. Allowable storage (AF)
- b). Mountain Reservoirs (Clear Creek, Twin Lakes, Sugar Leaf)
 - 1. Allowable weekly storage
 - 2. Releases
 - 3. Exchanges
 - 4. Cumulative weekly totals

These reports (a and b) are computed weekly and copies are provided to all interested parties. During the irrigation season, when all trans-mountain diversions are operating, it requires an average time of one entire day to compute the recorded charts, perform the necessary computations, complete the necessary report forms, prepare copies and to mail to all concerned. An attempt is made, dependent on erratic mail schedules, to have all reports in the mails on Monday evening of each week.

- c). Reservoir content report of all reservoirs in Division 2.
- d). Water District ditch reports of water diverted.

2. The Division Engineers Office presently maintains the following monthly records;

- a). Trans-mountain diversions (Total of weekly records)
- b). Mountain reservoirs
 - 1. Total weekly records
 - 2. Reservoir evaporation losses
- c). Division payroll
- d). Division mileage

3. The Division Engineers Office presently maintains the following miscellaneous records;

- a). Reservoir release orders
- b). Reservoir exchange orders

4. The Division Engineers Office in conjunction with the Bureau of Reclamation (Frying-Pan Project) maintains a special accounting sheet relating to the operation of Sugar Loaf Reservoir and the trans-mountain diversions affecting the operations of the Sugar Loaf Reservoir. (Illustrated on following page)

5. The Division Engineers Office will, prior to the 1969 irrigation season, consolidate all the data on one single, comprehensive sheet.

OFFICE OF THE STATE ENGINEER
IRRIGATION DIVISION NO. 2
PUEBLO, COLORADO

RESERVOIR STORAGE REPORT

Report No. _____ Reservoir _____ Date of Report _____

-
-
1. CORRECTED (THEORETICAL) STORAGE ON _____, _____ Ac. Ft.
(date of last report)
 2. Transmountain diversions* From _____ to _____
_____ to _____
_____ to _____
(date)
 3. Total diversion _____ Acre Feet
 4. Transmission loss _____ Acre Feet
 5. TRANSMOUNTAIN STORAGE PERMITTED (3-4) _____ Ac. Ft.
 6. Natural flow storage** from _____ to _____
_____ to _____
_____ to _____
(date)
 7. Total diversion _____ Acre Feet
 8. Transmission loss _____ Acre Feet
 9. NATURAL FLOW STORAGE PERMITTED (7-8) _____ Ac. Ft.
 10. GROSS RESERVOIR STORAGE (1+5+9) ----- Ac. Ft.
 11. EVAPORATION LOSSES FOR MONTH OF _____; -- _____ Ac. Ft.
 12. RESERVOIR RELEASES FROM _____ to _____
_____ to _____
_____ to _____
(date) _____ Ac. Ft.
 13. THEORETICAL RESVR. STORAGE AS OF DATE OF THIS REPORT (10-11-12) _____ Ac. Ft.
 14. ACTUAL RESVR. STORAGE AS OF DATE OF THIS REPORT ----- Ac. Ft.
 15. REQUIRED RELEASE TO BALANCE THEOR. STORAGE WITH ACTUAL (14-13) _____ Ac. Ft.

* Derived from Twin Lakes Tunnel and/or exchanged with the Columbine, Wurtz, Ewing, Busk-Ivanhoe, or Larkspur Ditches (underline as necessary).

** Twin Lakes storage rights and/or exchange with Sugar Loaf, Clear Creek, or Mt. Pisgah Reservoirs (underline as necessary).

Division Engineer
Irrigation Division No. 2

VII. RESERVOIR EVAPORATION LOSSES

1. The preceding 1968 water year is the first year of a five year plan during which there will be no evaporation charge assessed thru the winter period on Clear Creek, Twin Lakes and Sugar Leaf Reservoirs. During this five year period the Bureau of Reclamation will operate their Twin Lakes Reservoir weather equipment and hopefully secure sufficient evaporation data to allow determination of whether or not the present system, now in use, should be revised.
2. Atabulation of monthly evaporative losses at Clear Creek, Twin Lakes and Sugar Leaf Reservoirs is illustrated on the following page.
3. Only three reservoirs in the entire division are presently being assessed monthly evaporation charges; and in view of the fact that transportation losses are charged on reservoir runs in order to not damage the rivers, it follows that evaporation charges should be assessed to all reservoirs in all Divisions of the State of Colorado.

VIII. 1968 MONTHLY EVAPORATION LOSSES (ACRE FEET)

<u>MONTH</u>	<u>TWIN LAKES</u>	<u>CLEAR CREEK</u>	<u>SUGAR LOAF</u>
JANUARY	0	0	0
FEBRUARY	0	0	0
MARCH	0	0	0
APRIL	0	0	0
MAY	88	118	154
JUNE	134	154	230
JULY	108	112	152
AUGUST	69	36	117
SEPTEMBER	78	95	136
OCTOBER	62	73	106
NOVEMBER	0	0	0
DECEMBER	0	0	0
<u>TOTAL</u>	<u>539</u>	<u>588</u>	<u>895</u>
<u>6 MONTH AVERAGE</u>	<u>90</u>	<u>98</u>	<u>149</u>
<u>JUNE AVERAGE</u>	<u>173</u>		

IX. STREAM GAGING

1. Construction of the Frying-Pan Project is continuing and it has become necessary to determine the Division Engineers needs as to new Main Arkansas River gaging stations and also tributary gaging stations. These gaging stations will, primarily, be selected by the Division Engineer in conjunction with the Bureau of Reclamation and the Southeastern Colorado Water Conservancy District at a meeting to be held on 16 December 1968. Those gaging stations required solely by the Division Engineer for administrative purposes should be installed by the State of Colorado State Engineers Office. Those gaging stations required jointly by either the State Engineers Office, Bureau of Reclamation and the Water Conservancy District should be installed on a cost share basis. Operation and/or maintenance of all gaging stations should be assigned to the Hydrographic Section of the State Engineers Office.
2. On conclusion of gaging site selections by the State Engineer, Bureau of Reclamation and the Conservancy District; other interested agencies, i.e., Water Conservation Board, Geological Survey, etc., will be notified with a view towards joint use.
3. Telemetering equipment was installed in the present Arkansas River at South Side Water Works at Pueblo gaging station in April 1968. The installation costs were borne by the S. E. Water Conservancy District and the monthly rate is shared jointly by the City of Pueblo Water Works and the S. E. Water Conservancy District. Telemetering stations are also located at the Arkansas River at Canon City station and the Arkansas River at Wellsville station. The Wellsville station is maintained and operated by the Geological Survey. There is a definite need for telemetering equipment at the Granite and Nepesta stations on the main Arkansas River.
4. Major tributaries to the main Arkansas River, i.e., Cottonwood Creek, South Arkansas, Texas Creek, Grape Creek, Four Mile Creek, Six Mile Creek, Hardscrabble Creek, Fountain River, St. Charles Creek, etc., should, in the opinion of the Division Engineer, be gaged at their junction with the main Arkansas River. The Division Engineer is also of the opinion that tributary streams require no other gaging stations.

X. DAILY ARKANSAS VALLEY DITCH ASSOCIATION REPORT

1. The daily report of the Arkansas Valley Ditch Association has been re-designed in order to better serve the Arkansas Valley.

2. It is hoped that the Ditch Association will include a weekly summary of total ditch diversions in all districts along the main Arkansas; a report of which will be maintained on the basis of recorder charts on all diversions by the Division Engineers Office. (See V., Ditch Diversion Charts).

XI. RESERVOIR RELEASES TO DOWNSTREAM USERS

1. The following problems require research;

a. Transit Time

The time of transit from reservoir to downstream canal is widely variable and has resulted in loss of water to certain canals. The Division Engineer is of the opinion, that the Hydrographic Section of the State Engineers Office, should be assigned to the tracking of all releases and cut-outs from source to point of delivery. This is a major problem that will be aggravated by future Conservancy District water deliveries.

b. Return Flow

This occurrence, although not a problem at the present time, will with the advent of Conservancy District water deliveries, bring about serious problems due to the fact that the S. E. Conservancy District plans to re-sell return flows.

c. Transit Losses

Presently, as ordered by the "sunnyside" case in the Salida District Court, there is a transit loss of 0.07% per mile charged to all reservoir releases and trans-mountain water. This charge, in the opinion of the Division Engineer, is considered as valid thru Districts 11, 12 and in District 14 to the Arkansas River at South Side gaging station. Downstream from the South gage this transit loss charge of 0.07% per mile is not sound. Losses from Pueblo east are much greater than the amount being charged. The Hydrographic Section of the State Engineers Office should conduct a series of seepage runs at varying river flow stages and try and determine a more realistic transit loss charge.

d. Reservoir Release Limits

The Division Engineer is of the opinion that any reservoir run down the main Arkansas should be limited to a minimum amount of 50.0 CFS. Small releases of under 50.0 CFS are impossible to track and consequently with an unrealistic transit loss charge from Pueblo east, conditions are ideal for illegal diversions from the Arkansas River. Therefore, it is recommended that any reservoir run be limited to a minimum of 50.0 CFS.

XII. DIVISION II RECORDER INSTALLATIONS

1. In April 1968, the Division Engineer ordered the installation of 15 stream gage recorders on the main Cucharas River and 35 on the main Huerfano River both in Water District No. 16. The order was extended for one year in order to allow those water users affected by the order ample time to attempt to secure participation by the Soil Conservation Service in the purchase of the necessary recorders. The SCS has declined to participate on the grounds that the recorders are a portable item and that a recorder is not an essential feature of a measuring device. All those affected by the original order in April of 1968 are being reminded that those diversions not having operating recorders in place on April 15, 1969 will not be permitted to divert water.
2. Eleven additional recorders were installed throughout the Division during the year 1968.

XIII. RESEARCH SUBJECTS FOR ASSIGNMENT TO DIVISION ENGINEERS

1. To brief all Supreme Court decisions regarding water and, furthermore, to brief those cases which have had a major influence in the development of water case law. Division Engineers certainly are not expected to perform as attorneys, however, they should be familiar with all major court decisions.
2. To re-design the Water Commissioners Field Books, the annual Ditch Report form and the Annual Reservoir Report form.
 - a. Segregate used ditches from unused ditches.
 - b. Alphabetical order of ditches on each main stream and tributary.
 - c. Provide space for monthly totals of each ditch diversion.
 - d. Provide adequate spacing.
 - e. Names and addresses shown in both the report forms and the field books.
 - f. Unused reservoirs should be segregated from used reservoirs.
3. Better communications from State Engineers Office to Division Engineers Office to Water Commissioners thru a system of weekly reports and monthly staff meetings.
4. Prepare an outline illustrating an ideal Division Engineers Annual Report.
5. Prepare an illustrative report on methods of determination of evaporative losses from reservoir surfaces.

XIV. INCOMPATIBLE ACTIVITIES AND INTERESTS OF WATER COMMISSIONERS

1. Activities and interests of Water Commissioners in fields other than water administration should under no circumstances be allowed when such activities and/or interests reflect upon the character of the State Engineers Office and also require more time than the Commissioner will devote to his job of water administration. Such activities if allowed to continue, will within a short time create an unnecessary and unwanted scandal.

2. It is recommended that the State Engineers Office require all full time Water Commissioners to sign an affidavit prepared by the State Engineers Office or the Civil Service Commission that the Water Commissioners have no such interests and/or activities.

Walsenburg Rancher Plans \$500,000 Luxury Motel

By CAROLYN NEWMAN
WALSENBURG (C-SJ) — "I believe Walsenburg will be the recreation area for the Southwest," says Joe Faris of Walsenburg. "Our greatest assets are beauty and climate, and I am going to provide a place

for people who want to spend a few extra days here."

Faris, in backing up what he believes, is "betting my ranch" on a half-million dollar investment in a 40-unit luxury motel complex on Walsenburg's western edge.

Excavations for the foundations began Wednesday.

Marlboro Inn Motel is planned on a knoll surrounded by mountains. Floor-to-ceiling windows have views toward the Spanish Peaks on the south or to Greenhorn Mountain on the north.

The extra-large rooms will contain double queen-size beds and color television. Large executive suites, a sauna bath and an outdoor pool complete the facilities.

To be finished by April 10, the 12-acre complex includes living quarters, restaurant, lounge and coffee shop, all with western motifs. Bill Thach Jr. of Denver will do the interior decorating of the lounge and restaurant.

In the future a curio shop, antique shop and store will be added in a shopping center. Next spring Santi Motor Co. of Walsenburg will construct a Phillips 66 station at the site according to Faris.

Marlboro Inn will provide horseback riding; the municipal golf course in Lathrop State Park is just across U.S. 160, and hunting and fishing are nearby for vacationers. Buffalo in the park herd help provide the western touch, also.

"Vacationers are getting tired of going to overcrowded resorts where reservations have to be made far in advance for every activity. Out here we have room to move, yet plenty to do," Faris emphasizes.

This is a separate development from Faris Marlboro Country Estates, of which Faris also is president. Out-of-state visitors to the Estates will stay overnight at the Marlboro Inn.

James K. Holst of Pueblo is the architect, and Marino Construction Co. of Pueblo is the contractor.

XV. TABULATION OF WATER COMMISSIONERS ANNUAL REPORT FOR 1968

District Number	ACRE FEET USED BY CANALS DURING SEASON*				
	1964	1965	1966	1967	1968
10	48,661	51,815	55,684	63,435	64,140
11	123,796	153,210	139,321	133,985	139,974
12	361,811	370,722	391,135	389,406	383,300
13	30,341	71,503	69,739	28,811	38,157
14	207,778	414,548	259,003	262,571	297,121
15	21,793	28,932	16,727	20,286	40,153
16	38,392	71,041	58,628	47,384	84,410
17	300,778	426,592	378,712	433,275	474,509
18	5,656	9,575	7,210	8,744	16,142
19	55,372	92,673	72,696	56,945	105,452
66	1,958	2,870	988	2,660	2,004
67	69,430	148,185	229,478	215,538	164,896
	<u>1,265,766</u>	<u>1,841,666</u>	<u>1,679,478</u>	<u>1,663,040</u>	<u>1,810,618</u>

* Includes municipal, industrial and agricultural uses, as well as that water diverted thru a feeder canal for storage purposes.

NOTE: Cost of operation of Division II during water year 1968 amounted to \$137,314.69. Cost of administration per acre foot of water diverted amounts to 0.10¢.

This cost of 0.10¢ per acre foot should not be considered as absolute. Many refinements are still needed both in fiscal accounting and water management to arrive at a true and absolute cost of administration per acre foot of water.

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-EWING DITCH-

1968

<u>PERIOD</u> <u>ENDLINE</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (G)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
5-10-68	7.82	15.64	1.925	0.30	15.34
5-25	19.78	39.56	"	0.76	38.80
6-1	45.38	90.76	"	1.74	89.02
6-8	85.80	167.60	"	3.22	164.38
6-15	68.86	137.72	"	2.64	135.08
6-22	66.92	133.84	"	2.57	131.27
6-29	53.49	106.98	"	2.05	104.93
7-6	35.41	70.82	"	1.36	69.46
7-13	26.16	52.32	"	1.00	51.32
7-20	20.44	40.88	"	0.78	40.10
7-27	15.55	31.10	"	0.60	30.50
8-3	15.29	30.58	"	0.59	29.99
8-10	16.15	32.30	"	0.62	31.68
8-17	14.57	29.14	"	0.56	28.58
8-24	13.62	27.24	"	0.52	26.72
8-30	9.98	19.96	"	0.38	19.58
	513.22	1,026.44		19.69	1,006.75

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-COLUMBINE DITCH-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (GFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
6-1-68	41.50	83.00	2.09%	1.73	81.27
6-7	165.04	330.08	"	6.90	323.18
6-14	132.20	264.40	"	5.53	258.87
6-21	208.60	417.20	"	8.72	408.48
6-28	110.20	220.40	"	4.61	215.79
7-5	48.48	96.96	"	2.03	94.93
7-12	34.27	68.54	"	1.43	67.11
7-19	22.75	45.50	"	0.95	44.55
7-26	14.86	29.72	"	0.62	29.10
8-2	19.29	38.58	"	0.81	37.77
8-9	27.51	55.02	"	1.15	53.87
8-16	30.90	61.80	"	1.29	60.51
8-23	14.69	29.38	"	0.61	28.77
8-29	10.47	20.94	"	0.44	20.50
	<hr/> 880.76	<hr/> 1,761.52		<hr/> 36.82	<hr/> 1,724.70

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-WURTZ DITCH-

1968

<u>PERIOD</u> <u>DURING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
5-18-68	2.57	5.14	1.64%	0.08	5.06
5-25	28.07	56.14	"	0.92	55.22
6-1	137.61	275.22	"	4.51	270.71
6-8	279.20	558.40	"	9.16	549.24
6-15	183.40	366.80	"	6.02	360.78
6-22	186.70	373.40	"	6.12	367.28
6-29	94.10	188.20	"	3.09	185.11
7-6	44.09	88.18	"	1.45	86.73
7-13	32.60	65.20	"	1.07	64.13
7-20	17.86	35.72	"	0.59	35.13
7-27	16.58	33.16	"	0.54	32.62
8-3	25.57	51.14	"	0.84	50.30
8-10	32.90	65.80	"	1.08	64.72
8-17	32.51	65.02	"	1.07	63.95
8-24	10.08	20.16	"	0.33	19.83
8-30	6.17	12.34	"	0.20	12.14
	<u>1,130.01</u>	<u>2,260.02</u>		<u>37.07</u>	<u>2,222.95</u>

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-LARKSPUR DITCH-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
6-9-68	30.89	61.78	1.40%	0.86	60.92
6-15	19.34	38.68	"	0.54	38.14
6-22	15.06	30.12	"	0.42	29.70
6-29	10.84	21.68	"	0.31	21.37
7-4	6.36	12.72	"	0.19	12.53
	<u>82.49</u>	<u>164.98</u>		<u>2.32</u>	<u>162.66</u>

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-BUSK-IYANNOE TUNNEL-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
4-8-68	2.88	5.76	0.63%	0.64	5.72
4-15	5.53	11.06	"	0.67	10.99
4-22	5.53	11.06	"	0.67	10.99
4-27	3.95	7.90	"	0.65	7.85
5-4	30.68	61.36	"	0.40	60.96
5-11	41.96	83.92	"	0.54	83.38
5-18	34.54	69.08	"	0.44	68.64
5-25	36.03	72.06	"	0.45	71.61
6-1	118.90	237.80	"	1.49	236.31
6-8	493.10	986.20	"	6.22	979.98
6-15	497.40	994.80	"	6.27	988.53
6-22	740.30	1480.60	"	9.33	1471.27
6-29	569.60	1139.20	"	7.26	1131.94
7-6	288.20	576.40	"	3.64	572.76
7-13	138.60	277.20	"	1.74	275.46
7-20	66.65	133.30	"	0.83	132.47
7-27	44.77	89.54	"	0.56	88.98
8-3	74.10	148.20	"	0.94	147.26
8-10	95.11	190.22	"	1.19	189.03
8-17	121.90	243.80	"	1.54	242.26
8-24	62.20	124.40	"	0.78	123.62
8-31	43.84	87.68	"	0.56	87.12
9-7	1.82	3.64	"	0.67	3.57

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-BUSK-IVANHOE TUNNEL-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
9-14-68	1.82	3.64	0.63%	0.07	3.57
9-21	1.82	3.64	"	0.07	3.57
9-28	65.94	131.88	"	0.88	131.00
9-30	11.33	22.66	"	0.14	22.52
	<u>3,598.50</u>	<u>7,197.00</u>		<u>45.64</u>	<u>7,151.36</u>

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-TWIN LAKES TUNNEL-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
10-2-68	128.70	254.83	0.87%	2.22	252.61
10-15	85.11	168.52	"	1.47	167.05
10-22	208.59	412.83	"	3.59	409.24
10-29	19.63	38.87	"	0.34	38.53
11-5	82.15	162.66	"	1.42	161.24
11-12	40.84	80.86	"	0.70	80.16
11-19	63.01	124.76	"	1.09	123.67
11-26	42.94	85.02	"	0.74	84.28
12-5	55.60	110.09	"	0.96	109.13
12-19	48.90	96.82	"	0.84	95.98
1-2-69	56.97	112.80	"	0.98	111.82
1-16	104.02	205.96	"	1.79	204.17
1-26	55.98	110.84	"	0.96	109.88
2-9	70.15	138.90	"	1.20	137.70
2-23	81.38	161.13	"	1.40	159.73
3-1	37.37	73.99	"	0.64	73.35
3-15	68.93*	136.48*	"	1.19	135.29
3-29	55.30	110.60	"	0.96	109.64
4-9	42.43	84.86	"	0.74	84.12
4-16	36.38	72.76	"	0.46	72.30
4-21**	10.40	20.80	"	0.18	20.62
4-27	25.30	50.60	"	0.44	50.16
5-4	45.15	90.30	"	0.79	89.51

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-TWIN LAKES TUNNEL-

1968

<u>PERIOD ENDING</u>	<u>TOTAL WEEKLY FLOW (CFS)</u>	<u>TOTAL WEEKLY FLOW (AF)</u>	<u>TRANSPORTATION LOSS (AF)</u>	<u>TOTAL WEEKLY LOSS (AF)</u>	<u>ALLOWABLE STORAGE (AF)</u>
5-11	121.81	243.62	0.87%	2.12	241.50
5-18	197.72	395.44	"	3.44	392.00
5-25	686.90	1373.80	"	11.95	1361.85
6-1	1719.11	3438.22	"	29.91	3408.31
6-8	3318.90	6637.80	"	57.75	6580.05
6-15	2788.60	5577.20	"	48.52	5528.68
6-22	3257.10	6514.20	"	56.67	6457.53
6-29	2927.20	5854.40	"	50.93	5803.47
7-6	1569.30	3138.60	"	27.13	3111.47
7-13	1234.80	2469.60	"	21.49	2448.11
7-20	728.15	1456.30	"	12.67	1443.63
7-27	681.80	1363.60	"	11.86	1351.74
8-3	1048.45	2096.69	"	18.24	2078.45
8-10	903.77	1807.40	"	15.72	1791.68
8-17	865.04	1730.08	"	15.05	1715.03
8-24	408.56	817.12	"	7.11	810.01
8-31	343.10	686.20	"	5.97	680.23
9-7	282.86	565.72	"	4.92	560.80
9-14	134.29	268.58	"	2.34	266.24
9-21	167.46	334.92	"	2.91	332.01
9-28	18.08	36.16	"	0.31	35.85
9-30	6.68	13.36	"	0.12	13.24
	<u>24,874.82</u>	<u>49,724.29</u>		<u>432.23</u>	<u>49,292.06</u>

* 1.98 conversion factor used to this date.
 ** To 0600 hours of last day of period. -2-

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-HONESTAKE TUNNEL-

1968

<u>PERIOD</u> <u>ENDING</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
4-17-68	64.86	129.72	0.27%	0.35	129.37
4-27	664.44	1328.88	"	3.59	1325.29
5-4	1379.40	2750.80	"	7.43	2743.37
5-11	1577.67	3155.34	"	8.51	3146.83
5-18	1588.21	3000.42	"	8.10	2992.32
5-25	885.99	1611.98	"	4.33	1607.65
6-1	161.84	323.88	1.60%	5.17	318.71
6-8	161.44	322.88	1.87%	6.05	316.83
6-15	361.19	722.38	0.27%	1.97	720.41
6-22	450.80	901.60	"	2.43	899.17
6-29	297.62	595.24	"	1.60	593.64
7-6	219.94	439.88	"	1.19	438.69
7-13	468.55	937.10	"	2.53	934.57
7-20	470.27	940.54	"	2.55	937.99
7-27	486.05	912.10	"	2.19	889.91
8-3	302.97	605.94	"	1.65	604.29
8-10	223.28	446.56	"	1.19	445.37
8-17	112.34	224.68	"	0.61	224.07
8-24	78.99	157.98	"	0.42	157.56
8-31	75.53	151.06	"	0.42	150.64
9-7	98.23	196.46	"	0.54	195.92
9-14	111.84	223.68	"	0.60	223.28
9-21	113.84	227.68	"	0.63	227.25

ALLOWABLE STORAGE OF TRANS-MOUNTAIN DITCH AND/OR TUNNEL FLOW

-NONSTAKE TUNNEL-

1968

<u>PERIOD</u> <u>ENGINE</u>	<u>TOTAL WEEKLY</u> <u>FLOW (CFS)</u>	<u>TOTAL WEEKLY</u> <u>FLOW (AF)</u>	<u>TRANSPORTATION</u> <u>LOSS (%)</u>	<u>TOTAL WEEKLY</u> <u>LOSS (AF)</u>	<u>ALLOWABLE</u> <u>STORAGE (AF)</u>
9-28-68	117.51	235.02	0.275	0.61	234.41
9-30	33.86	67.72	"	0.18	67.54
	<u>18,254.96</u>	<u>20,509.92</u>		<u>64.84</u>	<u>20,445.08</u>