

JOHN V. EVANS Governor

A. KENNETH DUNN Director This Guidance Document is not new law but is an agency interpretation of existing law. For more information or to provide input on the document, please contact the Water Rights Section Manager at 208-287-4800. (Feb.2020)

DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 450 W. State Street, Boise, Idaho

Mailing address: Statehouse Boise, Idaho 83720 (208) 334-4440

ADMINISTRATOR'S MEMORANDUM

Amendment to Transfer Processing No. 7

TO: Regional Offices and Water Allocation Section

State of Idaho

FROM: Norman C. Young $\mathcal{N}\mathcal{M}$

DATE: October 29, 1984

RE: Sample Calculations for Change in Nature of Use.

The purpose of this memorandum is to amend the original version of the memorandum dated September 24, 1982, by replacing the table of data for consumptive irrigation requirements.

The original memorandum included a copy of Table 6 from "Consumptive Irrigation Requirements of Crops in Idaho," by R.J. Sutter and G.L. Corey, University Of Idaho Bulletin 516, July 1970, p.8. Recently a report has been released entitled "Estimating Consumptive Irrigation Requirements for Crops in Idaho," by R.G. Allen and C.E. Brockway, published by the University of Idaho Water and Energy Resources Research Institute, August, 1983. Information contained in this report has been utilized by Bill Ondrechen to prepare Table A, attached, which describes the Seasonal Crop Water Use Statistics for Alfalfa Hay. This table, which includes Consumptive Use (CU) and Consumptive Irrigation Requirement (CIR) data, should replace Table 6 in the abovereferenced Administrator's Memorandum.

The column of data that should be utilized in the analysis of a change in nature of use transfer from irrigation to another use is the third column, Mean CIR.



State of Idaho DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS Governor

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Mailing address: Statehouse Boise, Idaho 83720 (208) 334-4440

September 11, 1984

MEMO

TO: DAVE TUTHILL, WATER ALLOCATION SECTION

FROM:

BILL ONDRECHEN, HYDROLOGY SECTION WTC

SUBJECT:

NOTES ON DETERMINATION OF CONSUMPTIVE IRRIGATION REQUIREMENT AND CONSUMPTIVE USE

GENERAL

The consumptive irrigation requirement (CIR) and consumptive use (CU) (same as evapotranspiration or ET) data used in this update of Department procedures are described in the publication "Estimating Consumptive Irrigation Requirements for Crops in Idaho" by R.G. Allen and C.E. Brockway, August 1983. The document, published by the University of Idaho Water and Energy Resources Research Institute, is the completion report for the research project. Allen and Brockway selected the FAO-Blaney-Criddle method for use, as it required the least adjustment to match measured values of consumptive use. The letters FAO derive from the United Nations Food and Agriculture Organization, the entity which helped develop it.

Using information in the report as well as Appendix E supplied by the authors, values of mean consumptive irrigation requirement were plotted on a map. Regions of similar irrigation requirement were delineated on the map, with boundaries generally following those of the "Climatic Areas" of U. of Idaho Bulletin 516, by Sutter and Corey. In addition to using a different method for determining consumptive use than that used in Bulletin 516, Allen and Brockway used data from a larger number of climatic stations. Consumptive use and consumptive irrigation requirement data are now available for several areas which were undefined in Bulletin 516. These areas are: Idaho City -Centerville, Anderson Dam - Prarie, and Stanley - Sawtooth Valley. Table A lists the mean or average consumptive use for alfalfa hay, the 80th percentile consumptive use, mean consumptive irrigation requirement, and 80th percentile irrigation requirement for 98 weather stations in the state. With the exception of Table A which is an attachment to this document, all references to tables and figures are to those in Allen and Brockway 1983.

Station	Mean	80th PCTL.	Mean	80th PCTL.
	ĊU .	CU	CIR	CIR
Aberdeen Exp. Sta.	37.5	40.4	33.6	38.4
American Falls ISW	38.2	40.5	33.2	37.7
Anderson Dam	33.5	35.4	29.5	33.0
Arbon 2NW	33.0	34 6	27 6	31 6
Aroo 3SW	31 6	33 8	227.0	32 0
ALCO JON	- 22 1	35.5	20.0	21 0
ASITON	33.I	50.5 57.1	20.9	31.0
Bayview Model Basin	29.4	JL.1	· 21.0	20.1
Blackfoot 255W	37.4	40.2	34.5	37.0
Bliss	41.1	43.4	38.1	42.2
Boise WSO AP	40.2	42.3	35.4	39.0
Bonners Ferry 1SW	31.5	33.4	24.3	28.6
Bruneau	39.8	42.0	36.5	40.8
Burley FAA AP	36.5	38.4	32.6	36.3
Cabinet Gorge	30.9	32.8	21.4	26.6
Caldwell	40.4	43.2	36.9	41.1
Cambridge	37.5	40.4	32.4	37.7
Cascade INW	28.6	30.3	23.1	26.7
Castleford 2N	40.6	42.5	36.4	40.4
Challis	34 7	37 1	30.7	34 4
Chilly Barton Flat	29 9	32 0	25.2	30.3
Coour d'Alono lE	30 5	34 4	21 6	20.2
Coeur u Arene in	21 1	24.4 22 E	24.0	29.0
Council	21.1	30.E	22.2	20.1
Council	3/.5	39.5	30.4	35.8
Deer Flat Dam	40.8	42.4	31.2	40.5
Driggs	28.3	30.0	22.3	27.1
Dubois Exp. Sta.	30.5	32.8	25.2	30.1
Emmett 2E	40.7	43.2	36.7	41.1
Fairfield Ranger Sta.	29.4	31.0	26.3	29.9
Fort Hall	38.2	40.4	33.3	37.8
Garden Valley RS	35.3	37.3	29.2	33.9
Glenns Ferry	38.4	40.9	35.6	39.0
Grace	34.8	37.3	28.0	33.2
Grandview 2W	40.2	42.8	37.5	42.0 /
Grangeville	30.5	33.0	20.1	27.1
Hailey Ranger Sta	29.0	31.1	25 6	30 1
Hamer 4NW	34.1	35.9	29.9	(33.5
Hazalton	38 7	41 9	35 1	39 5
Hill City	28.8	30.7	26 1	29.7
Hallistor	25.6	20 F	21 2	36.0
notitster Derig	21 2	36.5	20 6	22 0
nowe	24.3	30.0 20.1	47.0 DE 6	20.0 20.0
Idano City	30.2	34.4	20.0	50.0
IGANO FAILS ZESE	36.8	39.0	31.6	36.0
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SEASONAL	CROP WATER (Acre 1	TABLE A USE STATISTICS Inches/Acre/Sea	FOR ALFALFA son)	HAY
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TABLE A cont.

Station	Mean CU	80th PCTL. CU	Mean CIR	80th PCTL. CIR
Idaho Falle 16SF	33 7	35 5	26 9	30.9
Idano Fallo EAA AD	35 7	28.1	31 2	35.5
Idaho Falls FAA AF	32.8	35 0	28 6	32.8
Idano rails 40W	24 8	26.5	18 1	24 9
ISTANU PAIK DAM	24.0	20.5 /T Q	36.2	40.2
Vellogg	32 1	3/1	20.2	28 1
Keilogg	24 5	J4.1 25 6	17 9	20.1
Kilgore	24.0	23.0	17.0	23.5
RUOSKIA Euro DNNE	33.2	J7.J	23.3	49.J .
	41.7	20 6	20.0	41.4
Lewiston WSU AP	37.5	39.0		00.0
Lifton Pumping Station	2/.5	29.0	23.9	27.4
Mackay RS	33./	20.2	29.1	33.0 ·
Malad Malad City	35.4	3/.0	29.2 20 E	34.D
Malau City	34.4	· 30 + 3	20.0	ວວ ₊ 0 ລ⊏ ດີ
Malta 26	30.4	37.9	30.9	· 35.0
мау	20.9	31 .1	24.0	20.0
McCall		29.9		20.0
Minidoka Dam	38.5	40,0	34.0 ·	39.1
Montpeller	20.0	28.7	22.4	20.2
Moscow - U of 1	33./	36.0	25.0	30.2
Mountain Home	38.0	40.3	34.6	38.8
New Meadows RS	28.6	30.1	22.0	26.9
Nez Perce	30.6	32.3	21.1	25.3
Oakley	30.4	38.7	30.9	35.0
Ola 45	30.5	38.3	30.9	35.1
Orotino	3/.6	39.8	27.5	32.4
Palisades Dam	33.5	35.0	25.0	29.4
Parma Exp. Sta.	40.4	43.0	36./	41.6
Paul LENE	38.0	40.6	34.0	38.4
Payette	41.0	43.0	37.4	40.9
Picabo	29.9	31.9	26.8	31.2
Pocatello WSO AP	37.0	39.3	32.4	36.9
Portnill	30.2	31.7	23.1	27.8
Potlatch	32.4	35.6	23.2	28.1
Preston	34.7	3/.1	27.8	33.2
Reynolds	30.0	31./	26.2	29.7
Richfield	37.0	39.3	33.7	37.9
Riggins	39.1	41.4	30.4	35.3
Rupert	38.8	41.5	35.7	39.3
St. Anthony IWNW	29.6	31.4	25.2	28.3
Saint Maries	32.5	34.7	22.5	28.0
Salmon	32.2	33.9	27.2	30.6
Sandpoint Exp. Star	30.3	32.1	21.0	26.0
Shoshone LWNW	39.1	42.0	35.9	40.3
Stanley *	22.7	23.6	18.8	21.9
Strevell	32.8	35.4	27.6	32.7

* Values are for irrigated pasture, not alfalfa hay

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Station Mean 80th PCTL. Me	an 80th IR C	PCTL.
Swan Falls 42.3 44.4 38	3.9 42	2.5
Swan Valley 32.2 33.8 23	3.9 28	3.0
Tensed 31.1 32.7 22	2.4 27	7.0
Tetonia Exp. Sta. 28.2 29.8 23	2.3 26	5.9
Three Creek 26.5 28.3 22	2.5 26	5.6
Twin Falls 2NNE 39.1 41.4 35	5.6 39	9.8
Twin Falls 3SE 39.2 41.6 35	5.6 40).1
Weiser 39.2 41.7 35	5-8 39	.9

TABLE A cont.

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Station	/ Mean	80th PCTL.	Mean	80th PCTL.
	1		30(300-2-2-2-2)	<u> </u>
Aberdeen Exp. Sta.	37.5	40.4	33.6	38.4
American Falls 1SW	38.2	40.5	3342	37.7
Anderson Dam	33.5	35.4	29.5	33.0
Arbon 2NW	33.0	34.6	27.6	31.6
Arco 3SW	31.6	33.8	28.0	32.9
Ashton	33.1	35.5	25.9	31.0
Bayview Model Basin	29.4	31.1	21.5	26.7
Blackfoot 2SSW	37.4	40.2	32.5	37.6
Bliss	41.1	43.4	38.1	42.2
Boise WSO AP	40.2	42.3	35.4	39.0
Bonners Ferry 1SW	31.5	33.4	24.3	28.6
Bruneau	39.8	42.0	36.5	40.8
Burley FAA AP	36.5	38.4	32.6	36.3
Cabinet Gorge	30.9	32.8	21.4	26.6
Caldwell	40.4	43.2	36.9	41.1
Cambridge	37.5	40.4	32.4	37.7
Cascade 1NW	28.6	30.3	23.1	26.7
Castleford 2N	40.6	42 5	36 4	40.4
Challis	34.7	37 1	30.7	34 4
Chilly Barton Flat	29.9	32.9	25.2	30.3
Coeur d'Alene lE	32.5	34 4	24 6	20.8
Cottonwood	31.1	23.5	22.0	29.0
Council	37.5	39.5	30 4	35.8
Deer Flat Dam	40.8	42 4	37 2	40 5
Driggs	28.3	30 0	22 3	27 1
Dubois Exp. Sta.	30.5	32.8	25 2	30 1
Emmott 2E	40 7	13 2	36 7	11 1
Rairfield Panger Sta	29 4	31 0	26.3	70 Q
Fort Hall	38.2		20.3	27.9
Cardon Valley RS	35.2	27.2	20.2	22 0
Cloppe Forry	38 /	37.3	23.2	33.9
Croco	3/ 8	27 2	22.0	22.0
Grandwiew 2W	10 2	37.3	20.0	33.4
Grandoview 2w	20.5	42.0	37.5	442.0
	30.5	. 33.0	20.1	2/.1
Harrey Ranger Sta.	29.0	31.1	25.6	30.1
	34.1	33.9	29.9	33.5
	20./	41.9	35.1	39.5
	20.0	30./ 20.F	20.1	29.1
HOLLISTER	33.0	38.5	31.3	30.2
HOWE	34.5	30.0	29.6	33.9
Idano City	30.2	52.4	25.6	30.8
Idano Falls 2ESE	36.8	39.0	31.6	36.0

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SEASONAL	CROP	WATER	USE	STATISTICS	FOR	ALFALFA	НАҮ
	((Acre]	Inche	es/Acre/Seas	son)		

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TABLE A cont.

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Station Mean CU 80th PCTL. CU Mean CIR 80th PCTL. CIR Idaho Falls 16SE 33.7 35.5 26.9 30.9 Idaho Falls FAA AP 35.7 38.1 31.2 35.5 Idaho Falls 46W 32.8 35.0 28.6 32.8 Island Park Dam 24.8 26.5 18.1 24.9 Jerome 39.5 41.9 36.2 40.2 Kulogg 32.1 34.1 22.5 28.1 Kilgore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 29.5 31.3 Kuna 2NNE 41.7 44.4 37.2 9.41.4 Lewiston WSO AP 37.3 39.6 30.9 35.3 Malad 35.4 37.8 29.2 34.5 Malad City 34.473 36.5 28.5 33.6 Morcall 27.8 29.9 21.1 25.6 Montpelier 26.6 28.7 22.4 26.2 </th <th></th> <th></th> <th></th> <th></th> <th></th>					
CUCUCUCIRCIRIdaho Falls 16SE 33.7 35.5 26.9 30.9 Idaho Falls FAA AP 35.7 38.1 31.2 35.5 Idaho Falls 46W 32.8 35.0 28.6 32.8 Island Park Dam 24.8 26.5 18.1 24.9 Jerome 39.5 41.9 36.2 40.2 Kellogg 32.1 34.1 22.5 28.1 Kingore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 23.3 29.5 Kuna 2NNE 41.7 44.4 37.2 31.9 Lifton Pumping Station 27.5 29.0 23.9 27.4 Malad -35.4 37.8 29.2 34.5 Malad City 36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 34.6 38.8 New Meadows RS 28.6 30.1 22.6 22.5 Oakley 36.4 38.7 30.9 35.6 Orafino 37.6 32.2 21.1 22.5 Oakley 36.4 38.7 30.9 35.6 Oakley 36	Station	Mean	80th PCTL.	Mean	80th PCTL.
Idaho Falls 16SE 33.7 35.5 26.9 30.9 Idaho Falls FAA AP 35.7 38.1 31.2 35.5 Idaho Falls 46W 32.8 35.0 28.6 32.8 Island Park Dam 24.8 26.5 18.1 24.9 Jerome 39.5 41.9 36.2 40.2 Kellogg 32.1 34.1 22.5 28.1 Kingore 24.5 25.6 17.8 23.3 Kosskia 35.2 37.3 29.6 30.9 35.3 Lewiston WSO AP 37.3 39.6 30.9 35.3 Maltad City 35.4 37.8 29.2 34.5 Maltad Ze 36.4 37.9 30.9 35.0 May 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 35.6 25.0 3		CU	CU	CIR	CIR
Idaho Falls 16SE33.735.526.930.9Idaho Falls FAA AP35.738.131.235.5Idaho Falls FAA Dam24.835.028.632.8Island Park Dam24.826.518.124.9Jerome39.541.936.240.2Kellogg32.134.122.528.1Kilgore24.525.617.823.3Kooskia35.237.323.329.5Kuna 2NNE41.744.437.241.4Lewiston WSO AP37.339.630.935.3Lifton Pumping Station35.736.329.133.6Malad 35.4 37.829.234.5Malad 35.4 37.829.234.5Malad 35.4 37.829.234.5Malad27.829.921.125.6Malad27.829.921.125.6Mortpelier26.628.722.426.2Moscow - U of I38.736.034.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Payette41.043.037.440.9Pocatello W		[
Idaho Falls FAA AP 35.7 38.1 31.2 35.5 Idaho Falls 46W 32.8 35.0 28.6 32.8 Island Park Dam 24.8 26.5 18.1 24.9 Jerome 39.5 41.9 36.2 40.2 Kellogg 32.1 34.1 22.5 28.1 Kilgore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 23.3 29.5 Kuna 2NNE 41.7 44.4 37.2 41.4 Lewiston WSO AP 37.3 39.6 30.9 25.3 Lifton Pumping Station 37.5 29.0 23.9 27.4 Mackay RS 33.7 36.3 29.1 33.6 Malad 35.4 37.8 29.2 34.5 Malad City 34.4 36.5 28.5 33.6 Mary 28.9 31.1 24.8 28.0 Maccall 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Montpelier 26.6 23.3 21.1 25.6 Montpelier 26.6 30.1 22.6 22.6 New Meadows RS 28.6 30.1 22.6 26.9 Nez Perce 30.6 32.3 30.9 35.1 Orofino 37.6 39.8 27.5 32.4 Palisades Dam 33.5 55.6 25.0 29.4 Parama Exp. Sta. 40.4 43.0 36.7 40.9 <	Idaho Falls 16SE	33.7	35.5	26.9	30.9
Idaho Falls 46W32.835.028.632.8Island Park Dam24.826.518.124.9Jerome39.541.936.240.2Kellogg32.134.122.528.1Kilgore24.525.617.823.3Kooskia35.237.323.329.5Kuna 2NNE41.744.437.241.4Lewiston WSO AP37.339.630.935.3Lifton Pumping Station27.529.023.927.4Malad-35.437.829.234.5Malad-35.437.829.234.5Malad City34.436.528.533.6Mary28.931.124.820.0McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley35.435.625.029.4Parma Exp. Sta.40.443.036.741.6Paul IENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.723.127.8Porthill30.2 <t< td=""><td>Idaho Falls FAA AP</td><td>35.7</td><td>38.1</td><td>31.2</td><td>35.5</td></t<>	Idaho Falls FAA AP	35.7	38.1	31.2	35.5
Island Park Dam24.826.518.124.9Jerome 39.5 41.9 36.2 40.2 Kellogg 32.1 34.1 22.5 22.1 Kingore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 23.3 29.5 Kuna 2NNE 41.7 44.4 37.2 41.4 Lewiston WSO AP 37.3 39.6 30.9 35.3 Lifton Pumping Station 27.5 29.0 23.9 27.4 Mackay RS 32.7 36.3 29.1 33.6 Malad -35.4 37.9 30.9 35.0 Malta 2E 36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 22.6 Minidoka Dam 38.5 40.6 34.6 39.1 Montpelier 26.6 28.7 22.4 26.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.9 35.1 Orofino 37.6 39.8 27.5 32.4 Palisades Dam 33.5 35.6 25.0 29.4 Parma Exp. Sta. 40.4 43.0 36.7 41.6 Paul 1ENE 38.0 40.6 34.0 36.4 Payette 41.0 43.0 37.4 40.9 Porthill 30.2 31.7 32.4 35.9 Porthill 30.2 <t< td=""><td>Idaho Falls 46W</td><td>32.8</td><td>35.0</td><td>28.6</td><td>32.8</td></t<>	Idaho Falls 46W	32.8	35.0	28.6	32.8
$\begin{array}{llllllllllllllllllllllllllllllllllll$	Island Park Dam	24.8	26.5	18.1	24.9
Kellogg 32.1 34.1 22.5 28.1 Kilgore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 23.3 29.5 Kuna 2NNE 41.7 44.4 37.2 41.4 Lewiston WSO AP 37.3 39.6 30.9 35.3 Lifton Pumping Station 27.5 29.0 23.9 27.4 Malad 35.4 37.3 36.3 29.1 33.6 Malad City 36.4 37.9 30.9 35.0 Malad City 36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 25.0 30.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.1 22.6 22.6 Orofino 37.6 39.8 27.5 32.4 Palisades Dam 33.5 35.6 25.0 29.4 Parma Exp. Sta. 40.4 43.0 36.7 41.6 Paul LENE 38.0 40.6 34.0 38.4 Payette 41.0 43.0 37.4 40.9 Picabo 29.9 31.9 26.8 31.2 Porthill 30.2 31.7 27.8 32.2 <td>Jerome</td> <td>39.5</td> <td>41.9</td> <td>36.2</td> <td>40.2</td>	Jerome	39.5	41.9	36.2	40.2
Kilgore 24.5 25.6 17.8 23.3 Kooskia 35.2 37.3 23.3 29.5 Kuna 2NNE 41.7 44.4 37.2 41.4 Lewiston WSO AP 37.3 39.6 30.9 35.3 Lifton Pumping Station 27.5 29.0 23.9 27.4 Mackay RS 33.7 36.3 29.1 33.6 Malta City 34.4 36.5 28.5 33.6 Malta 2E 36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 25.0 30.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.1 22.6 26.9 Nez Perce 30.6 32.3 21.1 25.3 Ordfino 37.6 39.8 27.5 32.4 Palisades Dam 33.5 35.6 25.0 29.4 Parma Exp. Sta. 40.4 43.0 36.7 41.6 Payette 41.0 43.0 37.4 36.9 Porthill 30.2 31.7 23.1 27.8 Poctaello WSO AP 37.0 39.3 32.4 36.9 Porthill 30.2 31.7 23.1 27.8	Kellogg	32.1	34.1	22.5	28.1
Kooskia35.237.323.329.5Kuna 2NNE41.744.437.241.4Lewiston WSO AP37.339.630.935.3Lifton Pumping Station27.529.023.927.4Malad33.736.329.133.6Malad35.437.829.234.5Malad City34.436.528.533.6Malad City36.437.930.935.0May28.931.124.828.0McCall27.829.921.125.6Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Orofino37.639.827.532.4Palisades Dam33.535.625.09.4Parma Exp. Sta.40.443.036.741.6Paul 1ENE38.040.634.038.4Pocatello WSO AP37.039.332.436.9Porthill30.231.723.17.8Potatch32.435.633.737.9Riggins39.141.430.435.3Reynolds30.031.726.229.7Richield37.039.332.436.9Porthill30.23	Kilgore	24.5	25.6	17.8	23.3
Kuna 2NNE41.744.437.241.4Lewiston WSO AP37.339.630.935.3Lifton Pumping Station27.529.023.927.4Mackay RS33.736.329.133.6Malad35.437.829.234.5Malad City34.436.528.533.6Malta 2E36.437.930.935.0May28.931.124.828.0McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8Nez Perce30.632.321.125.3Oakley36.438.730.935.1Orofino37.639.827.532.4Parma Exp. Sta.40.443.036.741.6Payette41.043.036.741.6Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Riggins39.141.4<	Kooskia	35.2	37.3	23.3	29,5
Lewiston WSO AP37.339.630.935.3Lifton Pumping Station27.529.023.927.4Mackay RS33.736.329.133.6Malad35.437.829.234.5Malad City34.436.528.533.6Malta 2E36.437.930.935.0May28.931.124.828.0McCall27.829.921.125.6Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.534.722.528.0Saint Maries <td< td=""><td>Kuna 2NNE</td><td>41.7</td><td>44.4</td><td>37.2</td><td>41.4</td></td<>	Kuna 2NNE	41.7	44.4	37.2	41.4
Lifton Pumping Station27.529.023.927.4Mackay RS33.736.329.133.6Malad35.437.829.234.5Malad City34.436.528.533.6Malta 2E36.437.930.935.0May28.931.124.828.0McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Parma Exp. Sta.40.443.036.741.6Payette41.043.036.741.6Payette41.043.032.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Riggins39.141.430.435.3Rupert32.435.623.228.1Preston32.435.623.228.1Preston32.435.623.2 <t< td=""><td>Lewiston WSO AP</td><td>37.3</td><td>39.6</td><td>30.9</td><td>35.3</td></t<>	Lewiston WSO AP	37.3	39.6	30.9	35.3
Mackay RS 33.7 36.3 29.1 33.6 Malad .35.4 37.8 29.2 34.5 Malad City .34.43 36.5 28.5 33.6 Malta 2E .36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 25.6 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 25.0 30.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.1 22.6 26.6 Nez Perce 30.6 32.3 21.1 25.3 Oakley 36.4 38.7 30.9 35.6 Orofino 37.6 39.8 27.5 32.4 Parma Exp. Sta. 40.4 43.0 36.7 41.6 Paul LENE 38.0 40.6 34.0 38.4 Payette 41.0 43.0 37.4 40.9 Picabo 29.	Lifton Pumping Station	27.5	29.0	23.9	27.4
Malad 35.4 37.8 29.2 34.5 Malad City 34.4 36.5 28.5 33.6 Malta ZE 36.4 37.9 30.9 35.0 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Moccall 27.8 29.9 21.1 25.6 Montpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 25.0 30.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.1 22.6 26.9 Nez Perce 30.6 32.3 21.1 25.3 Oakley 36.4 38.7 30.9 35.6 Ola 4S 36.5 38.3 30.9 35.1 Orofino 37.6 39.8 27.5 32.4 Parma Exp. Sta. 40.4 43.0 36.7 41.6 Paul 1ENE 38.0	Mackay RS	33.7	36.3	29.1	33.6
Malad City 34.4 36.5 28.5 33.6 May 28.9 31.1 24.8 28.0 McCall 27.8 29.9 21.1 25.6 Minidoka Dam 38.5 40.6 34.6 39.1 Mortpelier 26.6 28.7 22.4 26.2 Moscow - U of I 33.7 36.0 25.0 30.2 Mountain Home 38.0 40.3 34.6 38.8 New Meadows RS 28.6 30.1 22.6 26.9 Nez Perce 30.6 32.3 21.1 25.3 Oakley 36.4 38.7 30.9 35.6 Ola 4S 36.5 38.3 30.9 35.1 Orofino 37.6 39.8 27.5 32.4 Palisades Dam 33.5 35.6 25.0 29.4 Parma Exp. Sta. 40.4 43.0 37.4 40.9 Picabo 29.9 31.9 26.8 31.2 Pocatello WSO AP 37.0 39.3 32.4 36.9 Porthill	Malad	-35.4	37.8	29.2	34.5
Malta 2E36.437.930.935.0May28.931.124.828.0McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.727.822.7Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Salmon32.233.927.230.6Salmon32.233.927.230.6Salmon32.232.723.6 <t< td=""><td>Malad City</td><td>34.4</td><td>36.5</td><td>(28.5)</td><td>33.6</td></t<>	Malad City	34.4	36.5	(28.5)	33.6
May28.931.124.828.0McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul IENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.722.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3Stant Maries32.534.722.528.0Saint Maries32.534.722.528.0Saint Maries32.233.9 <td>Malta 2E</td> <td>36.4</td> <td>37.9</td> <td>30.9</td> <td>35.0</td>	Malta 2E	36.4	37.9	30.9	35.0
McCall27.829.921.125.6Minidoka Dam38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul LENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.0Saint Maries32.534.722.528.0Sainton32.233.9 </td <td>Mav</td> <td>28.9</td> <td>31.1</td> <td>24.8</td> <td>28.0</td>	Mav	28.9	31.1	24.8	28.0
Nordal38.540.634.639.1Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Ridgins39.141.430.435.3Rupert38.841.535.739.3St. Anthony lWNW29.631.425.228.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevel L32.8	McCall	27.8	29.9	21.1	25.6
Montpelier26.628.722.426.2Moscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul 1ENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.0Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.	Minidoka Dam	38.5	40.6	34.6	39.1
NoncourtNoncourtNoncourtNoncourtNoncourtMoscow - U of I33.736.025.030.2Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul 1ENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.0Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley	Montpeljer	26.6	28.7	22.4	26.2
Notion38.040.334.638.8Mountain Home38.040.334.638.8New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.	Moscow - II of I	33.7	36.0	25.0	30.2
New Meadows RS28.630.122.626.9Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.618.821.9Strevel 132.835.427.632.7	Mountain Home	38.0	40.3	34.6	38.8
Nez Perce30.632.321.125.3Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul 1ENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevel 132.835.427.632.7	New Meadows RS	28.6	30.1	22.6	26.9
Oakley36.438.730.935.6Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.233.927.230.6Salmon32.233.927.230.6Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevel 132.835.427.632.7	Nez Perce	30.6	32.3	21.1	25.3
Ola 4S36.538.330.935.1Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevel132.835.427.632.7	Oaklev	36.4	38.7	30.9	35.6
Orofino37.639.827.532.4Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony lWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Ola 4S	36.5	38.3	30.9	35.1
Palisades Dam33.535.625.029.4Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony lWNW29.631.425.228.3Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Orofino	37.6	39.8	27.5	32.4
Parma Exp. Sta.40.443.036.741.6Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony lWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Palisades Dam	33.5	35.6	25.0	29.4
Paul lENE38.040.634.038.4Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.233.927.230.6Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Stanley *22.723.618.821.9Strevell32.835.427.632.7	Parma Exp. Sta.	40.4	43.0	36.7	41.6
Payette41.043.037.440.9Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Paul lENE	38.0	40.6	34.0	38.4
Picabo29.931.926.831.2Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Pavette	41.0	43.0	37.4	40.9
Pocatello WSO AP37.039.332.436.9Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.233.927.230.6Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Picabo	29.9	31.9	26.8	31.2
Porthill30.231.723.127.8Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Pocatello WSO AP	37.0	39.3	32.4	36.9
Potlatch32.435.623.228.1Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Porthill	30.2	31.7	23.1	27.8
Preston34.737.127.833.2Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Potlatch	32.4	35.6	23.2	28.1
Reynolds30.031.726.229.7Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony lWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Preston	34.7	37.1	27.8	33.2
Richfield37.039.333.737.9Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony IWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone IWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Revnolds	30.0	31.7	26.2	29.7
Riggins39.141.430.435.3Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Richfield	37.0	39.3	33.7	37.9
Rupert38.841.535.739.3St. Anthony 1WNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone 1WNW39.142.035.940.3Stanley *22.723.618.821.9Strevel132.835.427.632.7	Riggins	39_1	41.4	30.4	35.3
St. Anthony lWNW29.631.425.228.3Saint Maries32.534.722.528.0Salmon32.233.927.230.6Sandpoint Exp. Sta.30.332.121.026.0Shoshone lWNW39.142.035.940.3Stanley *22.723.618.821.9Strevell32.835.427.632.7	Runert	38.8	41.5	35.7	39.3
Saint Maries 32.5 34.7 22.5 28.0 Salmon 32.2 33.9 27.2 30.6 Sandpoint Exp. Sta. 30.3 32.1 21.0 26.0 Shoshone 1WNW 39.1 42.0 35.9 40.3 Stanley * 22.7 23.6 18.8 21.9 Strevell 32.8 35.4 27.6 32.7	St. Anthony IWNW	29.6	31.4	25.2	28.3
Salmon 32.2 33.9 27.2 30.6 Sandpoint Exp. Sta. 30.3 32.1 21.0 26.0 Shoshone 1WNW 39.1 42.0 35.9 40.3 Stanley * 22.7 23.6 18.8 21.9 Strevell 32.8 35.4 27.6 32.7	Saint Maries	32.5	34.7	22.5	28.0
Salmon 32.2 33.9 27.2 30.0 Sandpoint Exp. Sta. 30.3 32.1 21.0 26.0 Shoshone 1WNW 39.1 42.0 35.9 40.3 Stanley * 22.7 23.6 18.8 21.9 Strevel1 32.8 35.4 27.6 32.7	Salmon	32.5	37 G	27.2	30.6
Sanapointe hkp. bta. 30.1 32.1 21.0 20.0 Shoshone lWNW 39.1 42.0 35.9 40.3 Stanley * 22.7 23.6 18.8 21.9 Strevell 32.8 35.4 27.6 32.7	Sandnaint Evn Sta	30 3	32.1	21 0	26.0
Stanley * 22.7 23.6 18.8 21.9 Strevel1 32.8 35.4 27.6 32.7	Shochong WNW	30 1	12 N	35 0	40.3
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Stanlov *	22.1	77 K	18 8	20.5
	Strevel1	32.8	35.4	27.6	32.7

* Values are for irrigated pasture, not alfalfa hay

-2-

TABLE A cont.

Station	Mean CU	80th PCTL. CU	Mean CIR	80th PCTL. CIR
Swan Falls	42.3	44.4	38.9	42.5
Swan Valley	32.2	33.8	23.9	28.0
Tensed	31.1	32.7	22.4	27.0
Tetonia Exp. Sta.	28.2	29.8	22.3	26.9
Three Creek	26.5	28.3	22.5	26.6
Twin Falls 2NNE	39.1	41.4	35.6	39.8
Twin Falls 3SE	39.2	41.6	35.6	40.1
Weiser	39.2	41.7	35.8	39.9

3-

ADMINISTRATOR'S MEMORANDUM

TO: Regional Offices and Water Allocation Section

FROM: Norman C. Young

s NOT

Transfer Processing No. 7

DATE: September 24, 1982

RE: Sample Calculations for Change in Nature of Use.

The intent of these sample calculations is to provide general guidelines for regional and state office staffs for quantitative evaluation of requested changes in nature of use. To comply with the intent of Section 42-222, <u>Idaho Code</u>, Department personnel must insure that a transfer of a water right does not result in an expansion of use.

An expansion could occur if any one of the following three parameters is increased under the new use: (1) rate of flow, (2) volume or (3) consumptive use. Each of the three parameters must be computed and checked since depending on the specific situation any one of the parameters might be "controlling". The "controlling" parameter determines how much water may be transferred without injury to other rights. The sample situation below demonstrates that depending on the situation any one of the three parameters can be "controlling".

The methodology shown makes many assumptions, and is intended to be used when the portion of the water right to be changed was previously applied to 640 acres or less. For larger acreages the applicant will be required to provide an evaluation by a qualified professional. Note also that the methodology does not take into account possible injury due to change in season of use. This factor must be evaluated on a case by case basis.

Sample Situation:

A wateruser desires to change the nature of use of part of a water right from irrigation to industrial for use in an ethanol production plant. The water is currently licensed for irrigation near Mackay. The water user desires to maintain irrigation with any water not needed for industrial use. The rates of flow needed for the industrial use are 0.10 cfs for washing machinery and 0.20 cfs for the mash. The total is 0.30 cfs, since occassionally both rates of flow must be satisfied simultaneously. Assume a seven day per week operation. The volume needed for the industrial use is computed as follows:

Volume: Washing: .10 cfs X
$$\frac{1.98 \text{ AF}}{\text{CFS DAY}}$$
 X $\frac{4 \text{ HRS.}}{\text{DAY}}$ X $\frac{1 \text{ DAY}}{24 \text{ HRS.}}$ X $\frac{365 \text{ DAYS}}{\text{YEAR}} = \frac{12.0 \text{ AF}}{\text{YEAR}}$

Mash: .20 CFS X $\frac{1.98 \text{ AF}}{\text{CFS DAY}}$ X $\frac{6 \text{ HRS.}}{\text{DAY}}$ X $\frac{1 \text{ DAY}}{24 \text{ HRS.}}$ X $\frac{365 \text{ DAYS}}{\text{YEAR}} = \frac{36.1 \text{ AF}}{\text{YEAR}}$

Total: 12.0 + 36.1 = $48.1 \frac{\text{AF}}{\text{YEAR}}$

(1)

The consumptive use for the industrial purposes is computed as follows:

Consumptive Use:

Washing: 1.2 AF/YEAR (assume that 10% is consumptively used) Mash: 36.1 AF/YEAR (assume that all is consumptively used) Total: 37.3 AF/YEAR

Case 1:

Given:

- Rate of Flow Controlling
- Irrigation right is licensed at 0.80 cfs for 80 acres. - Volume diverted for irrigation purposes is 3.5 AF/acre (From Water User's Handbook, IDWR p. 11. This assumes alfalfa* and 60% irrigation efficiency.)
- Number of days in the irrigation season is 215. (From Water User's Handbook, IDWR, p. 17.)
- Irrigation consumptive use is 16.3 inches = 1.4 AF/acre (From Sutter, R. J. and G. L. Corey, "Consumptive Irrigation Requirements of Crops in Idaho", University of Idaho Bulletin 516, July 1970 Table 6, page 8, copy attached. This is the average seasonal consumptive irrigation requirement for alfalfa near Mackay. Note that the attached map of Idaho shows the climatic areas.

Find:

Rate of flow, volume and consumptive use for irrigation use and industrial use after change.

Analysis:		Total	rate					0.80	cfs			
	-	Total	volume	diver	cted			3.5	(80)	=	280	AF/YEAR
	-	Total	consum	tive	use	(C.	U.)	1.4	(80)	=	112	AF/YEAR

Solution: a. New use check

RATE	VOLUME	С. U.
0.80 cfs	280.0 AF	112.0 AF
-0.30 cfs	-48.1 AF	-37.3 AF
0.50 cfs	231.9 AF	74.7 AF

All values are positive. Therefore, the original right is large enough to provide for the new use.

b. Number of acres calculation.

- 1. Rate parameter check $\frac{0.30}{0.80}$ (80) = 30 acres out 2. Volume parameter check
 - $\frac{48.1}{3.5}$ = 13.7 acres out
- 3. C. U. parameter check $\frac{37.3}{1.4} = 26.6$ acres out

*An "alfalfa standard" will be used for any consumptive use computation for irrigation. This means that regardless of the historical crop uses, the crop used in the water requirement computations is alfalfa.

c. Graphical representation of the solution:







d. Evaluation of water right after the change. As demonstrated above, the original irrigation right is large enough to provide for the requirements of the industrial use and to provide for continued irrigation of a portion of the lands. The computation of the number of acres that can be irrigated after the change is based on maximum utilization of remaining water supplies. In this case, the rate of flow appears to limit the irrigated acreage to 50 acres, so rate of flow appears to be the "controlling" parameter.

However, when rate of flow is initially found to be "controlling" one further check should be made. If the remaining irrigation rate of flow (0.50 cfs) can provide enough water to irrigate more than the proportionate number of acres (50), then the acreage irrigated for the rate of flow parameter can be increased.

Generally, the minimum rate of flow per acre is based on the maximum irrigation demand. Since the demand is based on a number of factors including soil type, soil depth and irrigation system in addition to the factors already mentioned, this computation must be made by a qualified irrigation expert (e.g. Verl King). After the maximum number of acres is found for rate of flow when it is the controlling factor the other parameters should be checked to make sure they are not exceeded by the new maximum.

As an example, assume that the maximum number of acres that can be irrigated by 0.50 cfs is computed by an expert to be 52.0 acres. Then the right after the change would be as follows:

		Rig	ht after ch	ange		
USE Irr. Ind.	ACRES 52 N.A.	<u>RATE</u> 0.50 <u>0.30</u> 0.80 cfs	<u>VOLUME</u> 52 X 3.5	= 182 <u>48.1</u> <u>230.1</u> AF	$\frac{\text{C. U.}}{52 \times 1.4} = 72.8$ $\frac{37.3}{110.1} \text{ AF}$	
<u>Case 2</u> :	Volume Co - Irrigat - Volume - Consump - Water u is cons	ntrolling ion right i diverted fo tive use fo sed to wash umptively u	s licensed or irrigatio or irrigatio machinery used.	at 0.80 cfs f n purposes is n is 1.4 AF/a is used 24 ho	for 80 acres. s 3.5 AF/ acre. acre. purs/day and only 1.67	%
Find:	Rate of f trial use	low, volume after char	and consum	ptive use for	r irrigation and indus	-
Analysis:	- Total r - Total v - Total C - Volume	ate 0.80 olume 3.5 .U. 1.4 for industr	cfs (80) = 280 (80) = 112 ial use rec	AF/YEAR AF/YEAR alculated as	follows:	
	Washing:	.10 cfs X	1.98 $\frac{\text{AF}}{\text{cfs DA}}$	$\frac{1}{Y} \times \frac{24 \text{ HRS}}{\text{DAY}} \Sigma$	$X = \frac{1}{24} \frac{\text{DAY}}{\text{HRS}} X$	
		$\frac{365 \text{ DAYS}}{\text{YEAR}} =$	$=$ 72.3 $\frac{\text{AF}}{\text{YR}}$.			
	Mash:	No change	(36.1 AF/YE	AR)		
	Total Vol	. = 72.3 +	36.1 = 108.	4 AF/YEAR		
	- C. U. f Washing: Mash: Total C.	or industri 1.67% 36.1 A U.: 1.2 +	al use reca of 72.3 = F/YEAR - 36.1 = 37.	lculated as 1 1.2 AF/YEAR 3 AF/YEAR (no	follows: o change)	
Solution:	a. New us	e check				
RATE 0.8 -0.3 0.5	0 0 0 cfs		VOLUME 280.0 -108.4 171.6 A	F	<u>C. U.</u> 112.0 <u>-37.3</u> 74.7 AF	
All value provide f	s are posi or the new	tive. Ther use.	efore, the	original righ	nt is large enough to	
	b. Numbe 1. Rate <u>0.30</u> 0.80	r of acres parameter o (80) = 30 a	calculation heck acres out	L.		•
	2. Volum	e parameter	check			

- 2. Volume parameter check $\frac{108.4}{3.5} = 31 \text{ acres out}$ 3. C. U. parameter check $\frac{37.3}{1.4} = 26.6 \text{ acres out}$

(4)

c. Graphical Solution



d. Evaluation of water right after the change. As shown in the graphical solution, volume is the "controlling" parameter, which limits irrigation after the change to 49 acres.

Right	after	change

USEACRESIrr.49Ind.N.A.	$\frac{\text{RATE}}{0.50}$ $\frac{0.30}{0.80} \text{ cfs}$	VOLUME 171.6 108.4 280.0 AF	$\frac{C \cdot U}{49 (1.4)} = 68.6$ $\frac{37.3}{105.9}$
------------------------	--	--------------------------------------	--

Consumptive Use Controlling Case 3: - Irrigation right is licensed for 1.60 cfs for 80 acres. Given: - Volume diverted for irrigation purposes is 3.5 AFA/acre. - Consumptive use for irrigation is 1.4 AF/acre. Rate of flow, volume and consumptive use for irrigation use and Find: industrial use after change. 1.60 cfs Analysis: Total rate AF/YR. 3.5(80) = 280Total volume AF/YR. 1.4 (80) = 112 Total C. U. Volume for industrial use = 48.1 AF/YR. 37.3 AF/YR. C. U. for industrial use =

(5)

Solution: a. New use check

RATE	VOLUME	C. U.
1.60	280.0	112.0
-0.30	48.1	-37.3
1.3 cfs	231.9 AF	74.7 AF

All values are positive. Therefore, the original right is large enough to provide for the new use.

- b. Number of acres calculation.
- 1. Rate parameter check $\frac{0.30}{1.60}$ (80) = 15 acres out
- 2. Volume parameter check $\frac{48.1}{3.5} = 13.7$ acres out
- 3. C. U. parameter check $\frac{37.3}{1.4} = 26.6 \text{ acres out}$



d. Evaluation of water right after the change. As shown in the graphical solution, consumptive use is the "controlling" parameter, which limits irrigation after the change to 53.4 acres.

Right after change

USE	ACRES	RATE	VOLUME	C. U.
Irr.	53.4	1.3	$\overline{53.4}$ (3.5) = 186.9	74.7
Ind.	N.A.	.3	48.1	37.3
	۰.	1.6	235.0 AF	112.0 AF

When the supplemental information sheet for change in nature of use is received by the regional office, the computations of the three parameters should be completed and placed in the file. These computations will be reviewed by state office personnel during the review process.

REPLACED by Table A in attached amendment.

Table 6. Average annual consumptive irrigation requirement by crop for Idaho (inches).

Area	Station	Sugar beets	Dry beans	Corn silage	Field corn	Spring grain	Pota- toes	Small veg.	Winter grain	Al- falfa	Pas- ture	Or- chards	
$\mathbf{U}_{1.}$	Aberdeen	18.1	14.0	14.4	15.5	13.5	17.7	9.5	18.4	19.6	15.7		· ".
2.	Ashton 1S	.12.1		9.6		10.0	12.3		13.7	13.5	10.1		
3.	Bonners Ferry 1SW			11.8		13.0	15.1	*****	15.1	16.7	12.0		
4.	Caldwell	24.4	16.9	18.8	19.8	13.7	23.4	10.7	19.9	26 1	20.3	21.4	
5.	Cascade 1NW			9.9		10.3	11.4		13.8	13.7	10.3		
6.	Challis			13.6		15.2	15.3	*****	16.3	19.3	14.7		
7.	Coeur d'Alene RS			13.5		13.9	17.2		16.1	19.1	13.5		
8.	Council	20.4		16.2	·	13.4	20.3		17.1	22.5	16.5		
9.	Driggs			9.4		9.2	11.5		13.5	12.7	9.5		
10.	Dubois Exp. Sta.	16.5		12.4	·	12.6	16.1		16.0	17.5	13.5		
11.	Fairfield			11.9		12.3	14.4		15.6	15.6	12.1		
12.	Grace	12.8		10.2	·	10.5	12.4		14.2	14.4	-10.6		
13.	Grandview	18.7	18.8	22.6	22.9	16.2	26.9	13.0	21.1	31.6	24.2	26.1	
14.	Grangeville			9.5		6.4	12.7		11.5	14.1	85		
15	Hailey RS			12.7		13.1	14.9	· · · · ·	16.3	17.5	13.7		
16.	Hollister	18.5	13.3	14.0	15.2	11.8	18.3	8 1	17.1	20.4	15.2		
17.	Idaho Falls AP	18.6		13.9		12.9	17.9		17.1	19.4	15.5		
18.	Idaho Falls 46W	15.6		12.9		13.5	16.6		16.2	17.3	13.5	· • • • • • •	
19	Island Park Dam			5.6		4.6	7.0		93	82	5.7		
20.	Kooskia	·		13.4		11.0	17.4		14.6	19.2	12.0		
21.	Lewiston			18.2		14.8	21.4	5.1	14.4	25.8	18.2	20.7	
22.	Mackay RS			11.5		13.3	13.2		15.7	16.3	12.8		
23.	Malad	19.1		14.8		15.0	18.4		16.6	20.8	15.5		
24.	Montpelier RS			10.8		11 1	13.3		15.1	14.5	. 11.2		
-25	Moscow U of I			12.8	,	11.0	16.2	7.7	15.0	18.2	12.6		
5.	Mountain Home	25.1	17.0	19.1	20.7	16.6	24.1	11.9	21.5	26.7	21.1	22.1	.2
27.	Ola 4S	18.9		15.1		10.0	19.4	7.6	17.6	21.2	15.7	17.1	
28,	Owvhee, Nevada			12.6		13.0	15.5		16.5	17.3	13.1		
29.	Pocatello WB AP	21.3	14.3	16.2		12.8	20.2	9.6	17.3	22.6	17.5		
30.	Preston 2SE	18.3		14.3	·	14.8	18.0		16.8	20.1	14.8		
31.	Riggins RS			18.5		14.6	22.2		14.6	26.5	17.2		1.4
32.	Rupert	23.3	16.2	18.1	19.2	12.7	21.9	10.2	19.1	24.9	19.5	20.5	
33.	St. Maries			12.8		13.1	16.0	8.4	15.9	17.9	12.8		
.34.	Salmon			12.2		13.0	16.5		16.4	17.0	13.3		
35	Sandpoint Exp. Sta.			10.2		11.6	13.4		14.4	14.6	10.2		
36.	Savlor Creek	26.9	17.5	20.5	21.9	17.8	25.3	12.1	19.3	28.7	22.2	23 7	
37.	Sheaville, Oregon			13.9		13.7	17.0		17.5	18.0	14.3		
38.	Shoshone 1WNW	21.9	16. Ï	17.2	17.8	12.8	21.6	10.2	20.6	23.6	18.8		
39.	Strevell	16.2		13.0		13.5	16.6		16.5	18.0	13.6		1997) 1997 - 1997
40.	Three Creek	· •••••		7.5		7.5	11.5		12.1	11.3	8.7		
41.	Twin Falls 2NNE	21.9	15.6	16.8	17.4	13.2	21.3	97	19.2	23.2	18.3	18.9	
42.	Weiser	25.6	17.9	19.3	21.2	14.5	23.7	7.3	21.4	26.8	21.2	22:0	
										2010	/	32.0	
	State Average	20.0	16.1	13.9	19.2	12.6	17.3	9.4	16.3	19.3	14.5	21.4	

8



NGTE: Figure in Parenthesis is 80 Percentile Seasonal Alfalta Consumptive Use From U of 1 Builetin 516

Transfer No._____

Water Right No.

Supplement to Form No. 222 2/82

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

Application For Transfer of Water Right Supplemental Information for CHANGE IN NATURE OF USE

1. Fully complete Form 222. Type or print in ink "CHANGE IN NATURE OF USE" at the top of page 1. If no change in point of diversion or place of use is desired, so note under items C.2 and/or C.3 C.

2. Describe fully the new use to which the water is intended to be applied:

a. Nature of use:

b. Rate of flow:_____

c. Hours per day and days per year that the flow will be diverted:_____

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d. Season of use:

e. Return flows from the use: (quantity and quality of return flows, and location of discharge):

3. Describe positive and negative effects on other waterusers predicted to result from the proposed change in nature of use._____

