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MEMORANDUM

TO: Idaho Technical Committee on Hydrology (ITCH)  
FROM: Bob Sutter, IDWR  
DATE: March 9, 1995  
SUBJECT: Tributary Valley Information

At Chairman Brockway's request I am sending the Snake Plain Aquifer Tributary Valley information which we have assembled. Along with a brief explanation and a summary table for the overall effort, we have included for each of the 20 tributaries 1) a descriptive table, 2) list of references, 3) ground water right history, 4) map, and 5) a representative well hydrograph.

The summary table includes a tentative study priority ranking of high, medium, or low. As discussed with Dr. Brockway, we would like to have a work session as the final item for the March 16 ITCH meeting to 1) review/revise these rankings, 2) discuss potential study methods, and 3) discuss time and costs associated with such studies.

BS:cjk

## SNAKE PLAIN AQUIFER TRIBUTARY VALLEY INFORMATION

Twenty basins tributary to the eastern Snake River Plain have been briefly reviewed. Only the areas lying outside the boundary of the eastern Snake River Plain ground water model or the Henrys Fork model were included in the analysis. It was assumed that areas lying within the model where ground water development has taken place are already accounted for.

Information for the basins was acquired from previous studies, the water rights data base, land use data, well driller's logs, and water-level data. Selected physical and hydrologic data were compiled for each of the basins and are presented in the following tables. Water rights and land use data were used to assess the level of ground water development in the basins. Plots showing annual and cumulative totals of the number of ground water rights and their diversion rates are included. Plots of the agricultural lands in each of the tributary basins are shown on the attached maps. These plots were developed from 1986 Landsat classification data. Water-level hydrographs from observation wells that are representative of the basin's ground water trends are also included.

Due to the large number of basins and limited resources available, a priority system was developed as to their need and degree of further study. The system is based on the level of historic and current ground water activity in a basin. Water rights and land use data were the primary sources of data used to develop the ranking. When available, long-term ground water trends assisted in the ranking decisions. From on these data sets, each of the basins were ranked according to their relative level of impact on the plain. Three levels of priority were identified: high, medium, and low. The criteria used to determine each of the levels is presented below.

### **High Priority**

Cumulative Ground Water Diversion Rate exceeds 500 cfs, and  
1986 Irrigated Lands exceeds 50,000 acres, and  
Based on historical data (water rights, land use, and water levels) indicate a high growth rate.

### **Medium Priority**

Cumulative Ground Water Diversion Rate exceeds 100 cfs, and  
1986 Irrigated Lands exceeds 10,000 acres, and  
Based on historical data (water rights, land use, and water levels) indicate a medium growth rate

### **Low Priority**

Cumulative Ground Water Diversion Rate less than 100 cfs, and  
Based on historical data (water rights, land use, and water levels) indicate a low growth rate

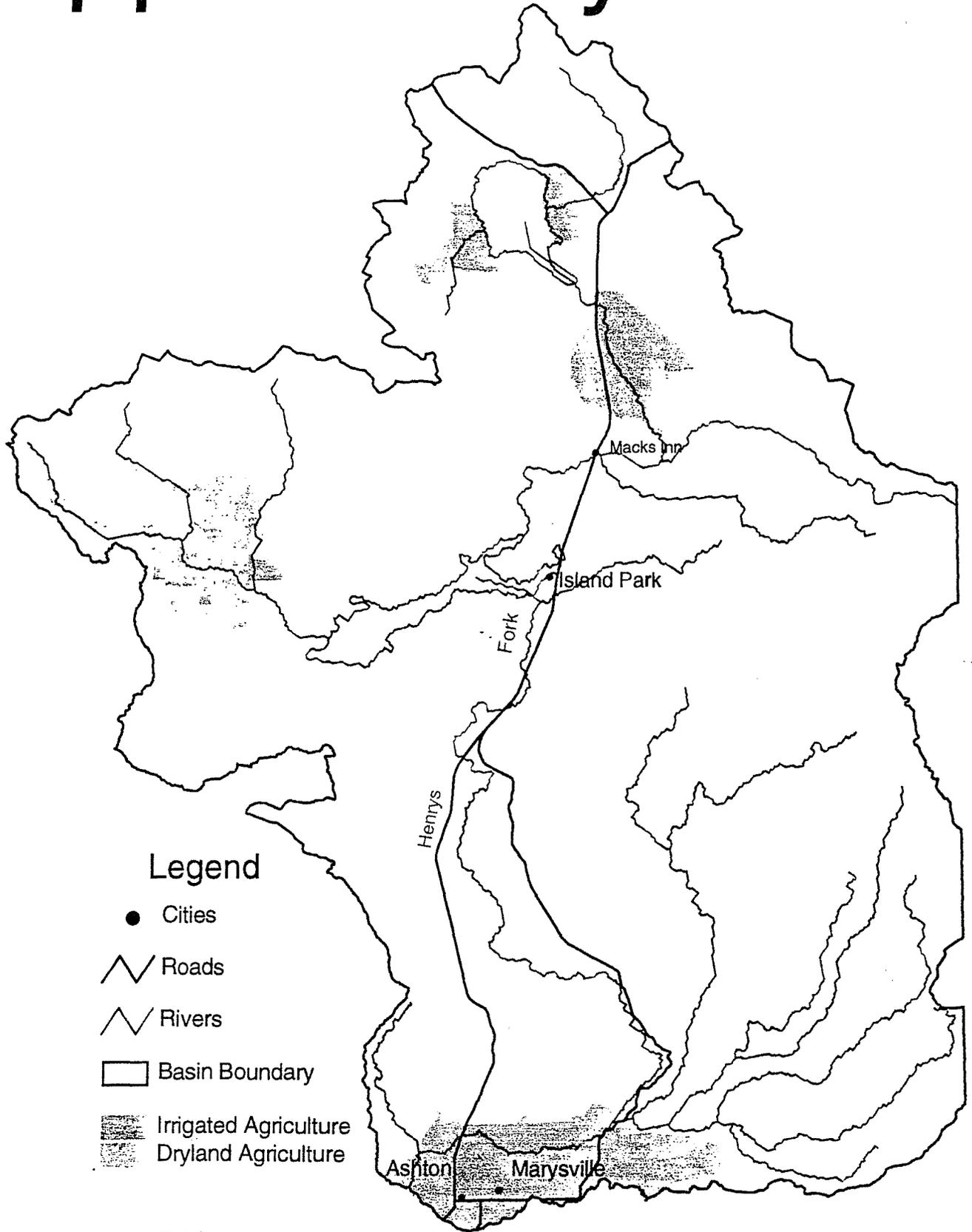
The selected priority for each tributary basin along with key support data are presented in the hydrologic summary table on the following page. This ranking is only tentative and is subject to review.

### HYDROLOGIC SUMMARY OF TRIBUTARY BASINS

Priority	Tributary Basin	Drainage Area (mi <sup>2</sup> )	Authorized Ground Water Diversion Rate (cfs)	Total Irrigated Land: 1986 Est. (ac)	Precipitation (1000 ac-ft/yr)	Basin Outflow (1000 ac-ft/yr)	
						Surface Water	Ground Water
Low	Upper Henrys Fork	1,060	10	33,500	1,487 - 1,978	1,088	0
Low	Falls River/Conant Creek	520	13	41,200	971	579	0
<del>Medium</del> <sup>High</sup>	Teton River	890	355	143,200	1,058	597	0
High	Rexburg Bench	165	925	58,500	141 - 174	10	0 - 19
Low	South Fork of Snake River	5,750	24	25,300	10,216	5,022	0
Low	Willow Creek	650	25	5,200	534	100	0 - 29
Low	Blackfoot River	930	18	9,600	987	267	0 - 25
High	Portneuf River	1,290	550	90,700	1,128	202	49 - 63
Medium	Bannock Creek	410	365	45,600	393	28	22 - 30
Low	Rockland	430	58	19,800	295	17	51
High	Raft River	1,510	1825	104,800	1,248	0	84
High <sup>evrg mod.</sup>	Oakley Fan	1,630	2220	171,200	1,347	210	215
Medium <sup>evrg mod.</sup>	Camas/Beaver Creeks	830	195	14,700	872	37	267
<del>Medium</del> <sup>Low</sup>	Medicine Lodge Creek	830	285	9,700	872	41	20 - 30
Low	Birch Creek	600	5	1,400	749	0	57 - 78
Medium	Little Lost River	840	120	11,500	1,147	52	100

Priority	Tributary Basin	Drainage Area (mi <sup>2</sup> )	Authorized Ground Water Diversion Rate (cfs)	Total Irrigated Land: 1986 Est. (1000 ac)	Precipitation (1000 ac-ft/yr)	Basin Outflow (1000 ac-ft/yr)	
						Surface Water	Ground Water
High <sup>EXIST</sup>	Big Lost River	1440	510	69,800	1,206 - 1,551	74	142 - 308
Low	Little Wood River	480	36	26,800	566	124	13 - 24
Medium <sup>Support.</sup>	Big Wood River/Silver Creek	1180	345	27,000	1,492	330	38
Medium	Camas Prairie	680	155	110,300	638	128	20

# Upper Henrys Fork



## Legend

● Cities

∩ Roads

∩ Rivers

□ Basin Boundary

▨ Irrigated Agriculture

▩ Dryland Agriculture

Totals  
Irrigated Agriculture 33,491 Acres  
Dryland Agriculture 2,122 Acres  
Total Area 1,060 Square Miles

Scale 1:356,771

0 4.9 9.8 14.7 Miles

UPPER HENRY'S FORK BASIN		
Drainage Area (mi <sup>2</sup> )	1,060	
Elevation (ft)	5,200 - >10,000, 6,710 mean	
Principal Drainage	Henry's Fork	
Towns/Population	Island Park 159, Ashton 1,114	
Ground Water Diversion Rate (cfs)		
Water Rights	10	
Total Irrigated Land (ac)		
Previous Estimates	1986	33,500
Water Budget (ac-ft/yr)		
Precipitation	1,487,000 - 1,978,000	
Basin Outflow	Surface Water	1,088,000
	Ground Water	Negligible
Evapotranspiration	399,000 - 890,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	200 - 23,000	
Storage Coefficient	0.1 - 0.3	
Hydrologic Data Available		
Continuous Stream Gages	Henry's Lake (039000) Henry's Fork near Lake (039500) Island Park Reservoir (042000) Henry's Fork nr Island Park (042500) Henry's Fork nr Ashton (046000)	
Observation Wells	4 USGS wells	
Mass WL Measurements	1974-75	
Diversion Records	Good	

UPPER HENRY'S FORK BASIN

List of References

Brockway, C.E., and Grover, K.P., 1977, Water management and groundwater in the Henry's Fork - upper Snake River basin of Idaho: Moscow, University of Idaho, Idaho Water Resources Research Institute, 43p.

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

Kjelstrom, L.C., 1986, Flow characteristics of the Snake River and water budgets for the Snake River Plain, Idaho and eastern Oregon: U.S. Geological Survey Hydrologic Investigations Atlas HA-680.

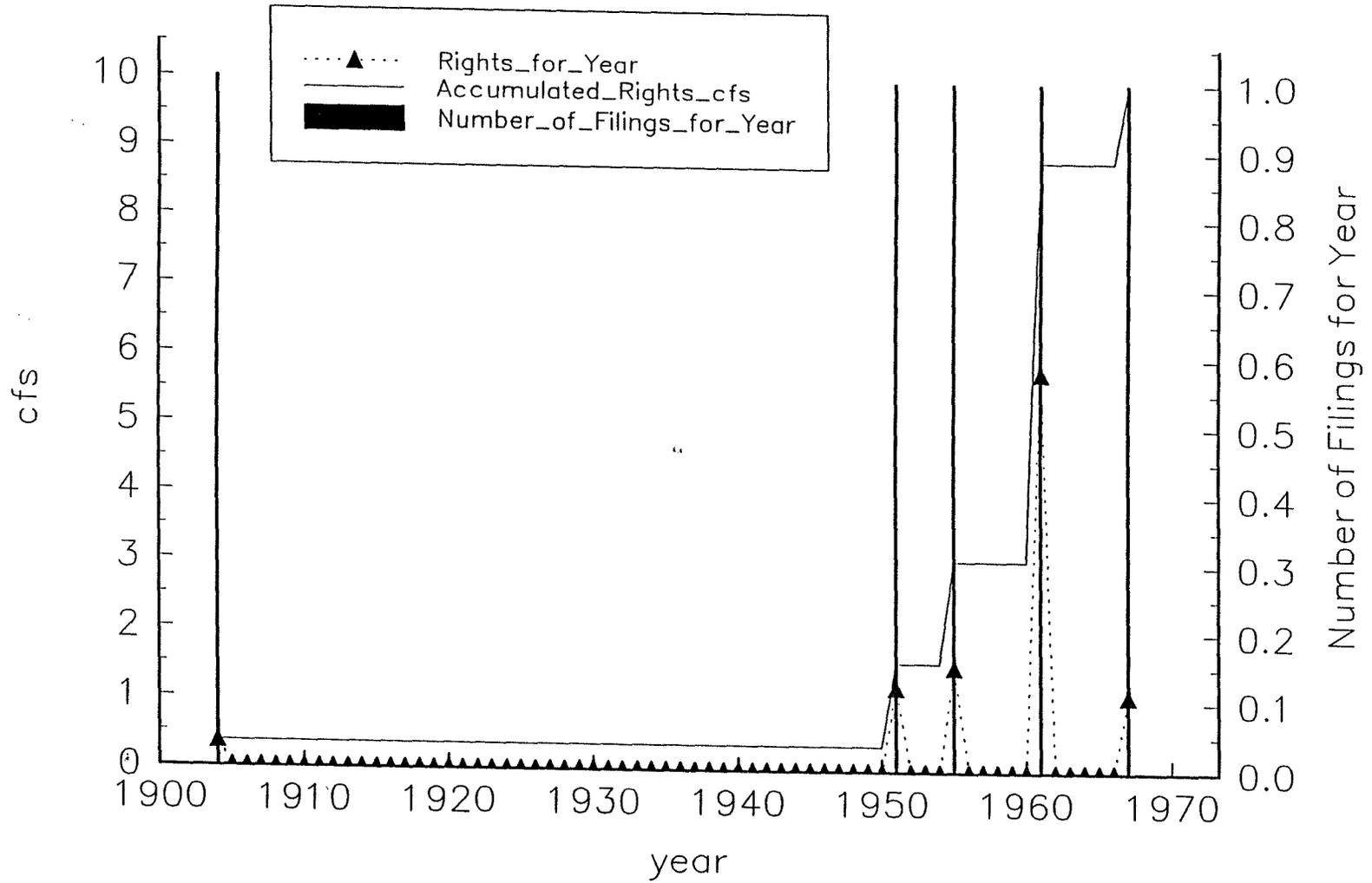
Stearns, H.T., Bryan, L.L., and Crandall, L., 1939, Geology and water resources of the Mud Lake region, Idaho including the Island Park area: U.S. Geological Survey Water-Supply Paper 818, 125p.

Whitehead, R.L., 1978, Water resources of the upper Henrys Fork basin in eastern Idaho: Idaho Department of Water Resources Water Information Bulletin 46, 91p.

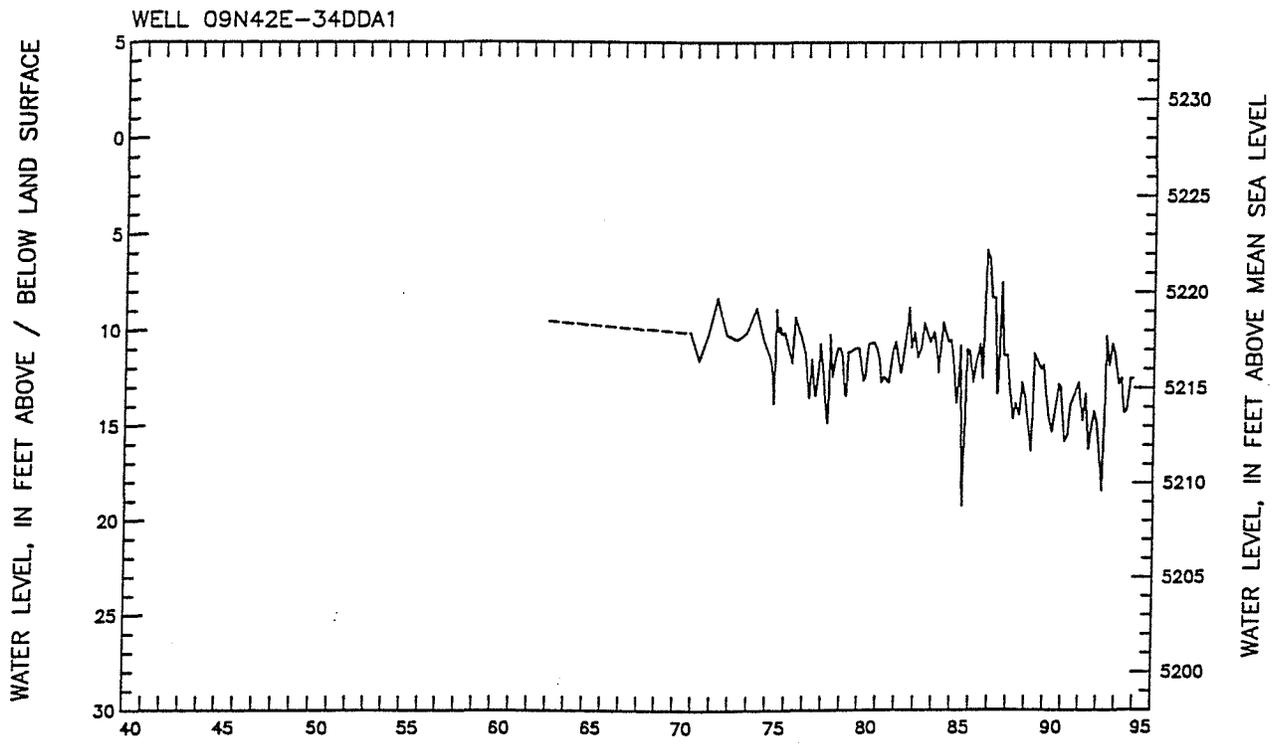
Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

Wytzes, J., 1980, Development of a groundwater model for the Henrys Fork and Rigby fan area, upper Snake River basin: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 205p.

### Water Rights Upper Henrys Fork Groundwater



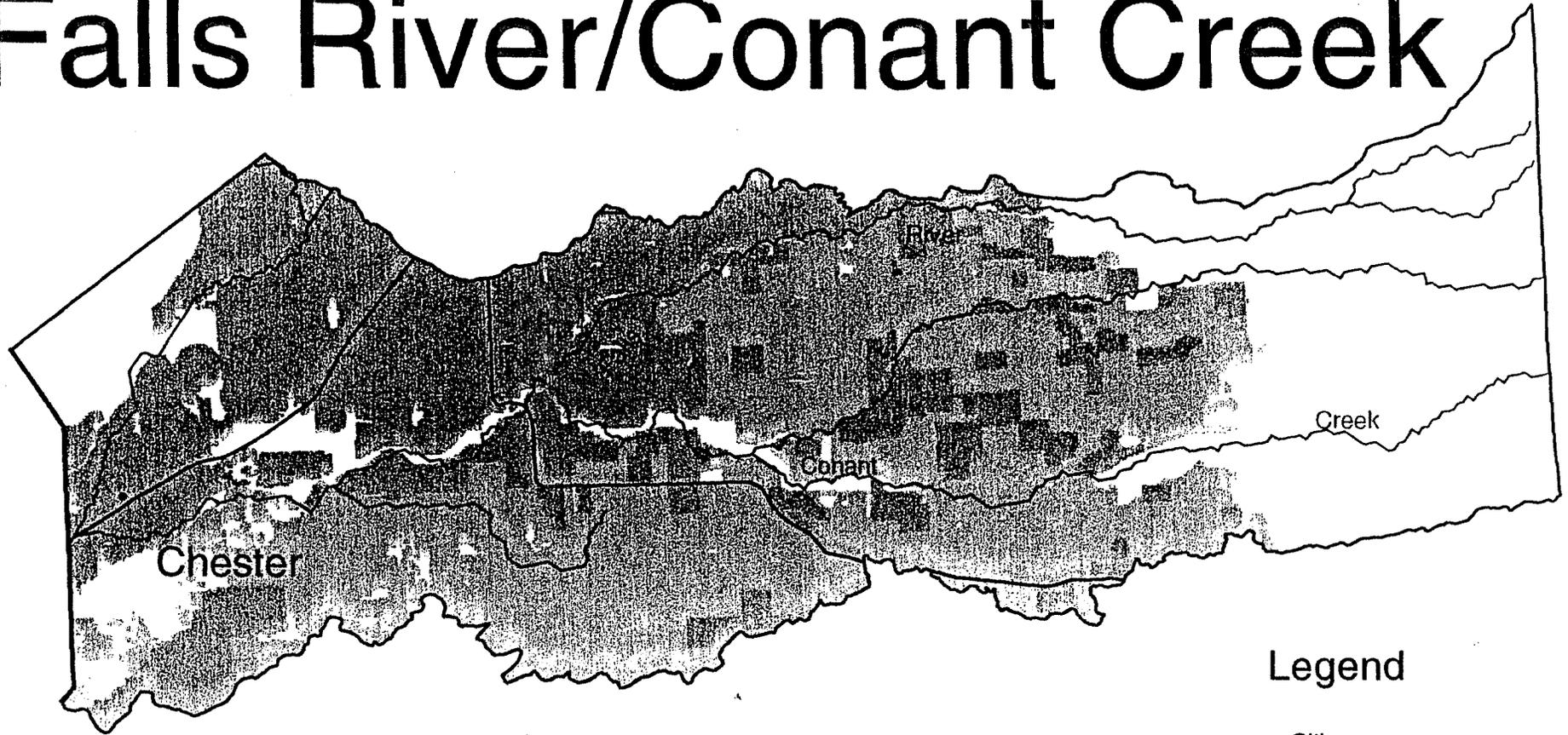
HENRYS FORK



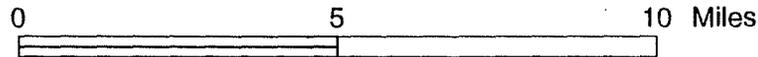
HYDROGRAPH OF WELL 09N42E-34DDA1

FALLS RIVER AND CONANT CREEK BASINS		
Drainage Area (mi <sup>2</sup> )	520	
Elevation (ft)	6,970 mean	
Principal Drainage	Falls River and Conant Creek	
Towns/Population	Drummond 37	
Ground Water Diversion Rate (cfs)		
Water Rights	13	
Total Irrigated Land (ac)		
Previous Estimates	1986	41,200
Water Budget (ac-ft/yr)		
Precipitation	971,000	
Basin Outflow	Surface Water	579,000
	Ground Water	Negligible
Evapotranspiration	392,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	N/A	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Falls R nr Squirrel (047500) Falls R nr Chester (049500)	
Observation Wells	2 USGS wells	
Mass WL Measurements	N/A	
Diversion Records	Good	

# Falls River/Conant Creek



Scale 1:191,418



## Legend

- Cities
- Wytzes Model Boundary
- Roads
- Rivers
- Basin Boundary
- Irrigated Agriculture
- Dryland Agriculture

### Totals

Irrigated Agriculture	41,200 Acres
Dryland Agriculture	46,050 Acres
Total Area (Idaho)	210 Square Miles

FALLS RIVER AND CONANT CREEK BASINS

List of References

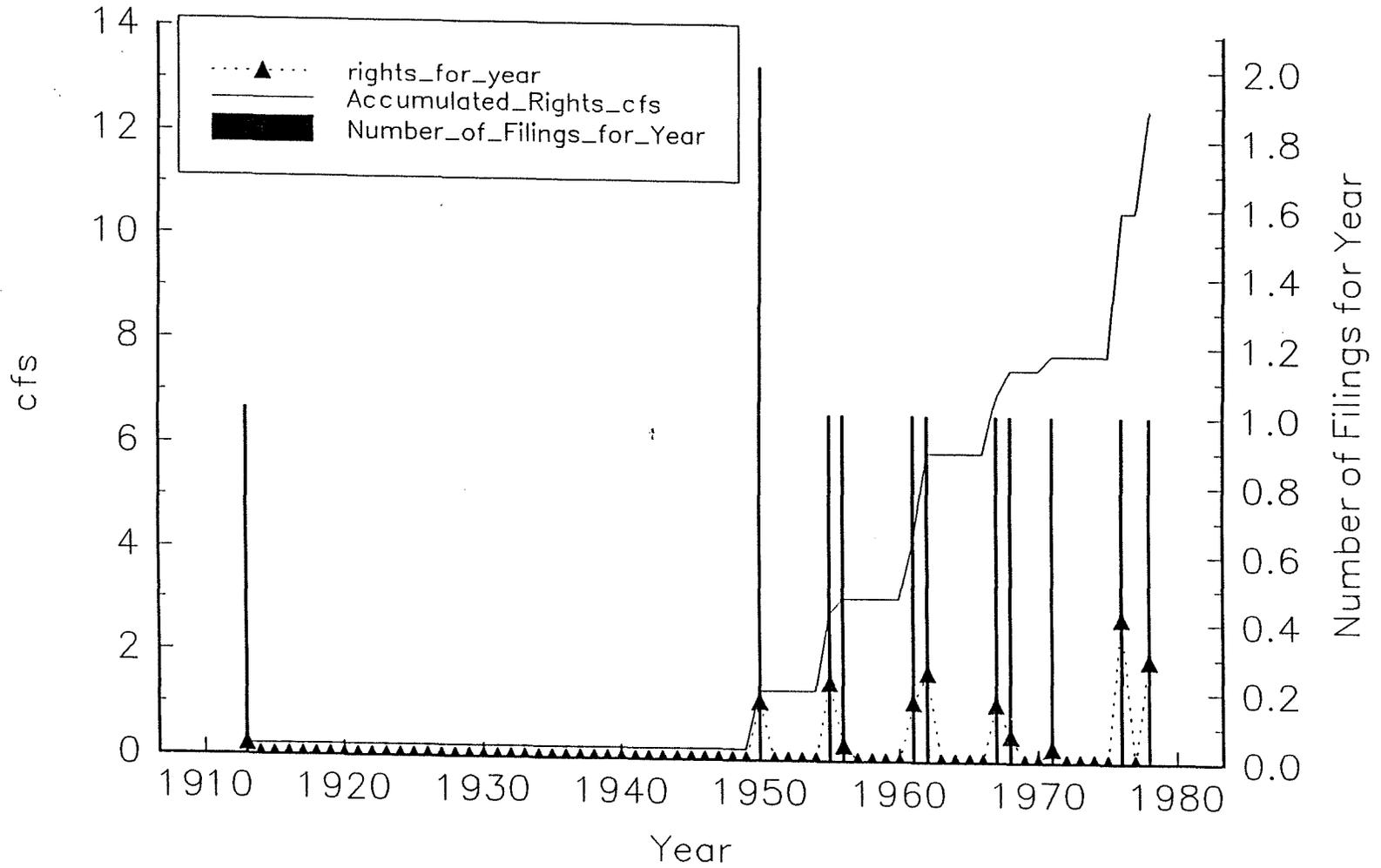
Crosthwaite, E.G., Mundorff, M.J., and Walker, E.H., 1970, Ground-water aspects of the lower Henrys Fork region, eastern Idaho: U.S. Geological Survey Water-Supply Paper 1879-C, 22p.

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

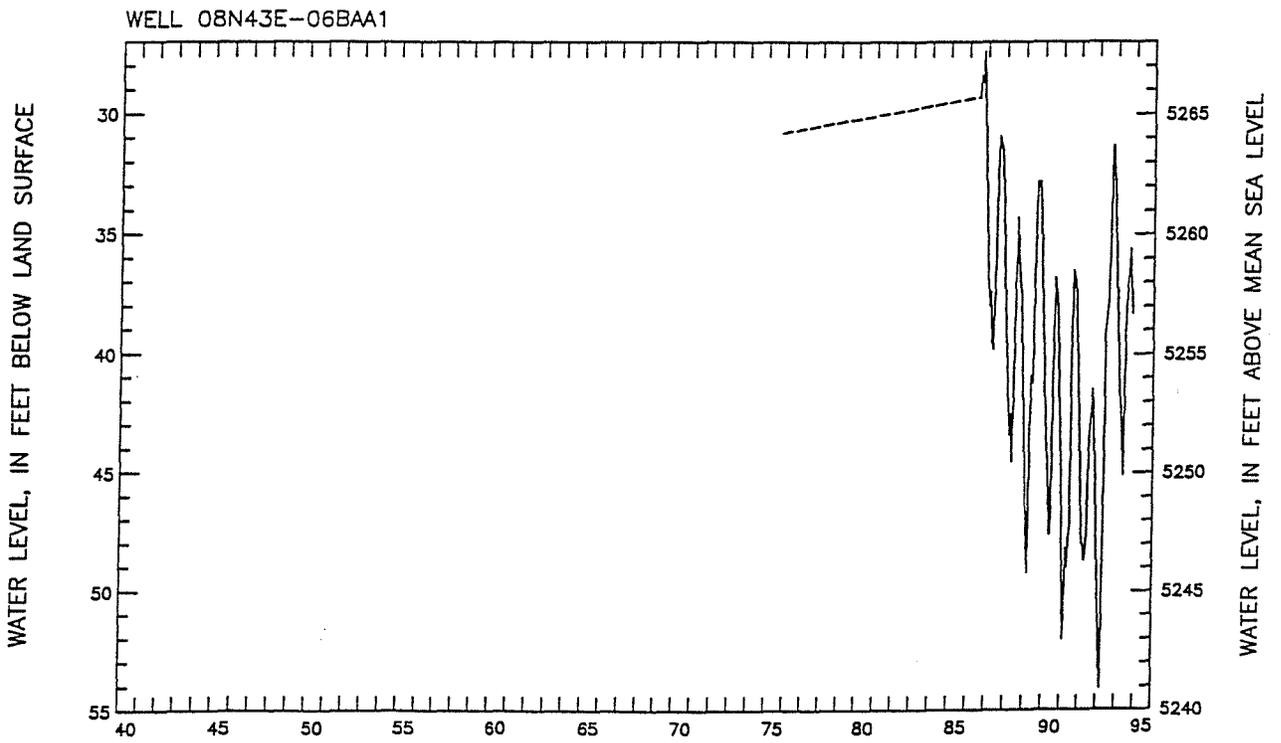
Kjelstrom, L.C., 1986, Flow characteristics of the Snake River and water budgets for the Snake River Plain, Idaho and eastern Oregon: U.S. Geological Survey Hydrologic Investigations Atlas HA-680.

Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

# Water Rights for Falls River/Conant Creek Groundwater



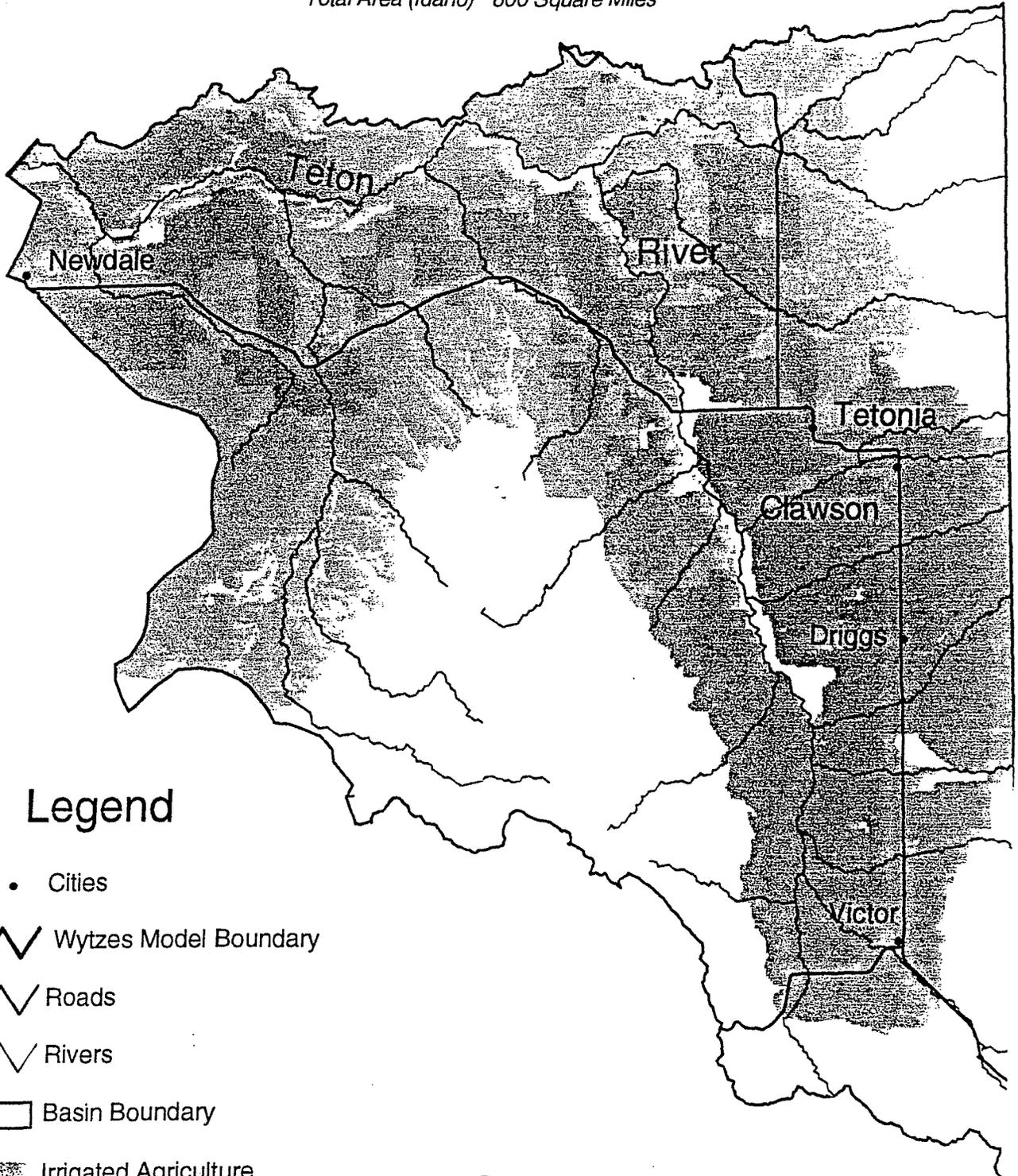
FALLS RIVER



HYDROGRAPH OF WELL 08N43E-06BAA1

# Teton River

Totals  
Irrigated Agriculture 143,200 Acres  
Dryland Agriculture 81,000 Acres  
Total Area (Idaho) 600 Square Miles



## Legend

- Cities
- ∩ Wytzes Model Boundary
- ∩ Roads
- ∩ Rivers
- Basin Boundary
- ▨ Irrigated Agriculture
- ▧ Dryland Agriculture

Scale 1:254,573

0 5 10 15 Miles

TETON BASIN	
Drainage Area (mi <sup>2</sup> )	890
Elevation (ft)	5,000 - >8,500
Principal Drainage	Teton River and Bitch Creek
Towns/Population	Victor 292, Driggs 846, Tetonia 132
Ground Water Diversion Rate (cfs)	
Water Rights	355
Total Irrigated Land (ac)	
Previous Estimates	1986 143,200
Water Budget (ac-ft/yr)	
Precipitation	1,058,000
Basin Outflow	Surface Water 597,000
	Ground Water Negligible
Evapotranspiration	461,000
Aquifer Properties	
Transmissivity (ft <sup>2</sup> /d)	13,400 - 66,800
Storage Coefficient	N/A
Hydrologic Data Available	
Continuous Stream Gages	Teton R nr St. Anthony (055000) Teton R ab S Leigh Cr (052200)
Observation Wells	7 USGS wells
Mass WL Measurements	Spring 1959
Diversion Records	Good

TETON BASIN

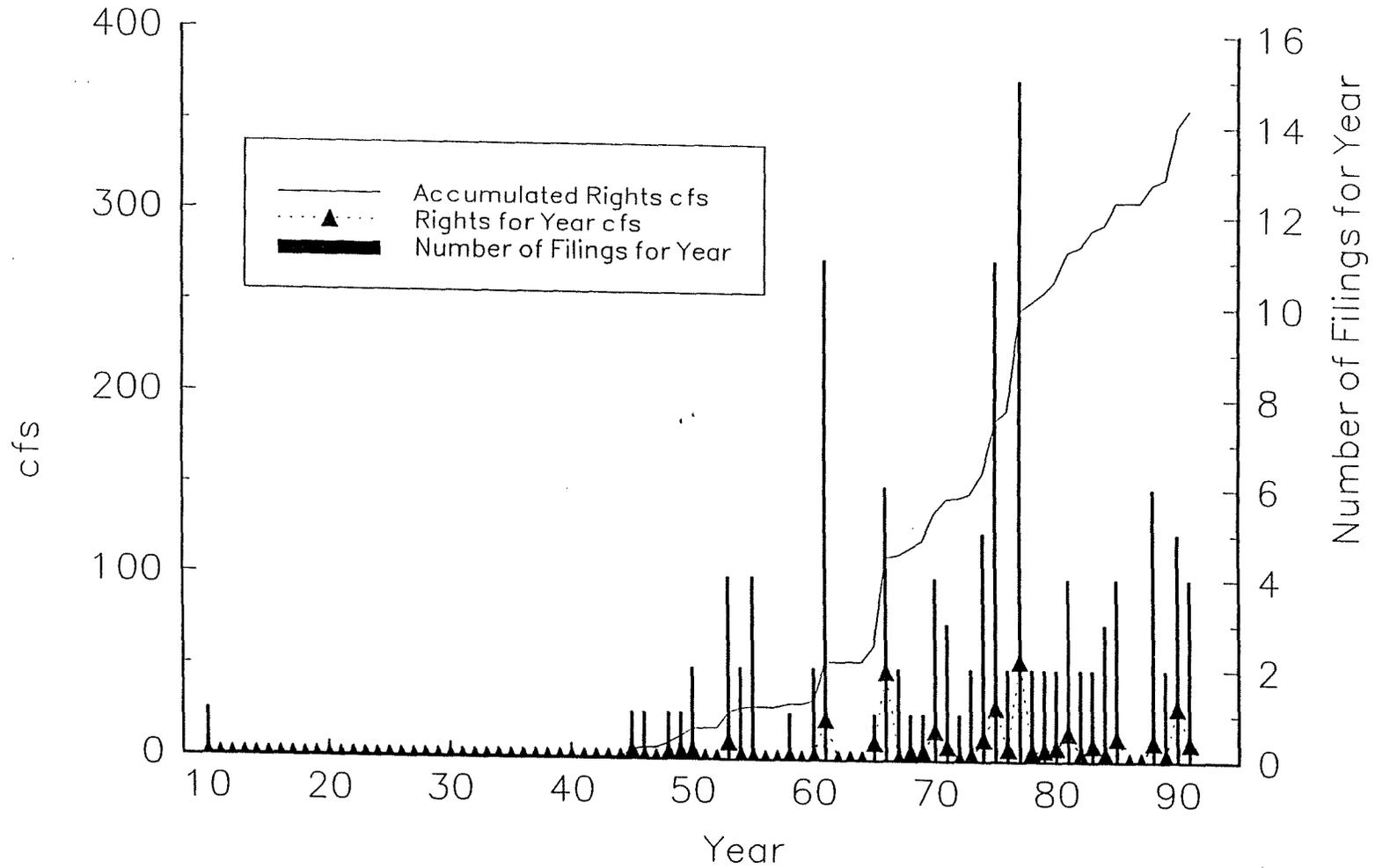
List of References

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

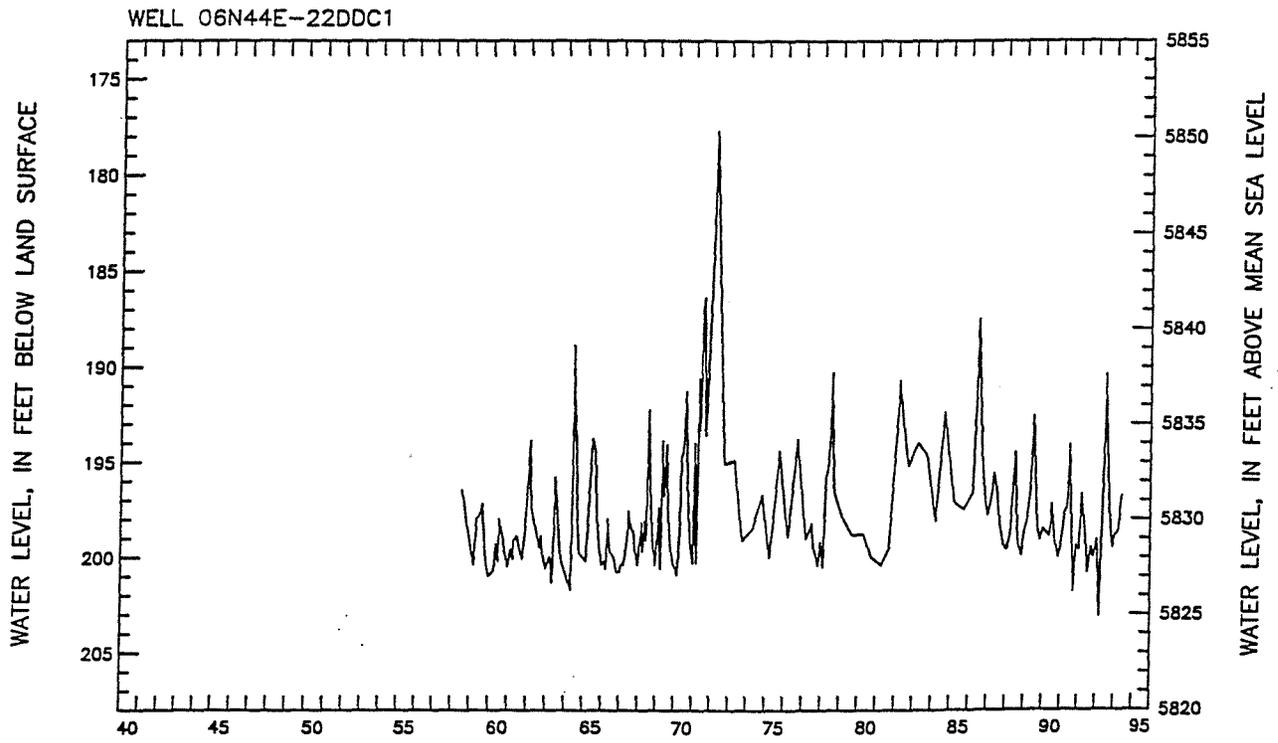
Kilburn, C., 1964, Ground water in the upper part of the Teton valley, Teton Counties, Idaho and Wyoming: U.S. Geological Survey Water-Supply Paper 1789, 60p.

Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

# Water Rights for Upper Teton Basin Groundwater

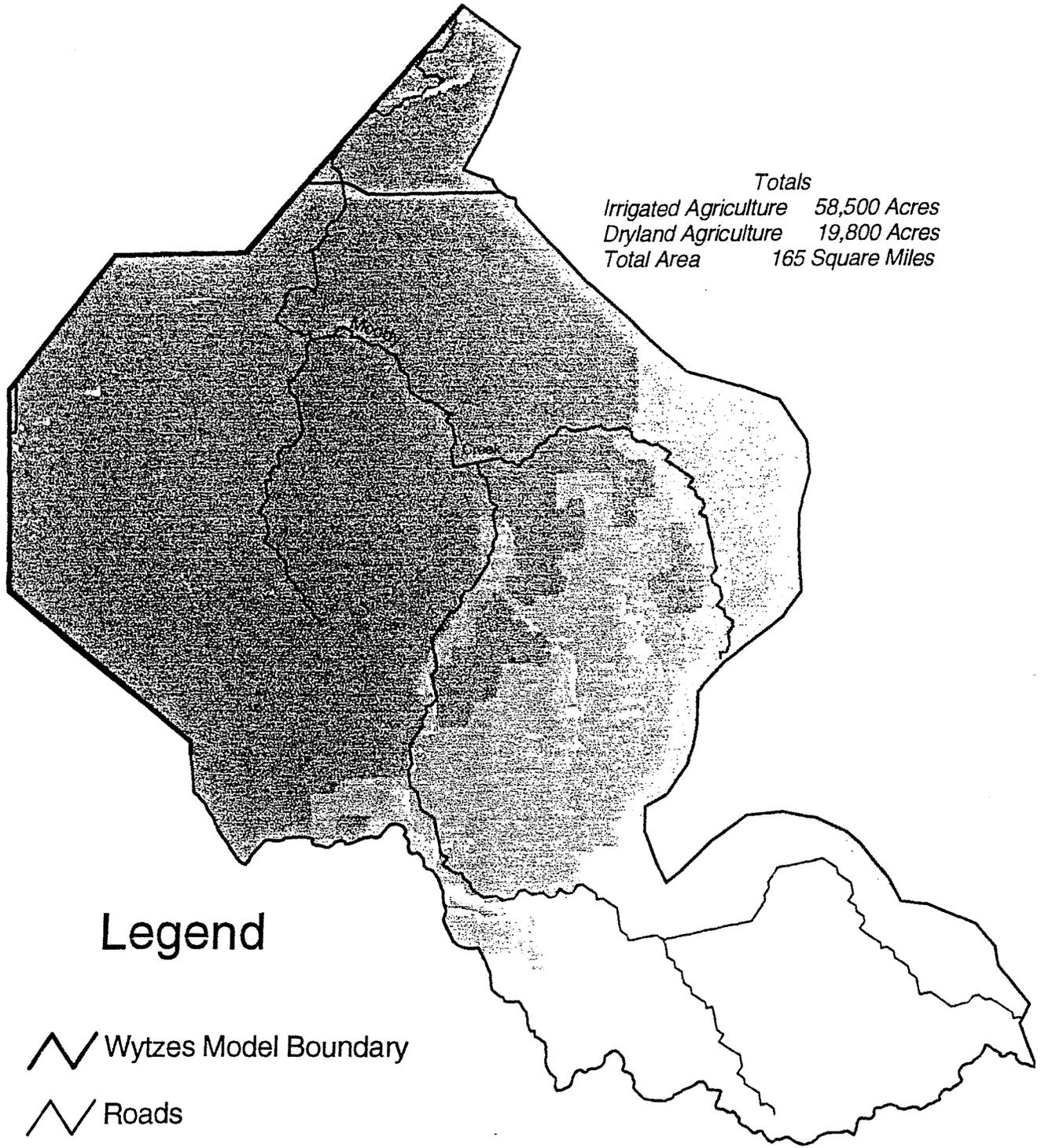


TETON



HYDROGRAPH OF WELL 06N44E-22DDC1

# Rexburg Bench



## Legend

 Wytzes Model Boundary

 Roads

 Rivers

 Basin Boundary

 Irrigated Agriculture

 Dryland Agriculture

Scale 1:168,949

0 5 10 Miles

REXBURG BENCH		
Drainage Area (mi <sup>2</sup> )	165	
Elevation (ft)	5,000 - 6,500	
Principal Drainage	Moody Creek	
Towns/Population	Rexburg 14,298	
Ground Water Diversion Rate (cfs)		
Water Rights	925	
Total Irrigated Land (ac)		
Previous Estimates	1968	(ground water) 9,000
	1986	58,500
Water Budget (ac-ft/yr)		
Precipitation	141,000 - 174,000	
Basin Outflow	Surface Water	10,000
	Ground Water	0 - 19,000
Evapotranspiration	112,000 - 164,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	13,400 - 53,500	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Moody Cr nr Rexburg (055319) - discon	
Observation Wells	4 USGS wells	
Mass WL Measurements	N/A	
Diversion Records	Good	

REXBURG BENCH

List of References

Crosthwaite, E.G., Mundorff, M.J., and Walker, E.H., 1970, Ground-water aspects of the lower Henrys Fork region, eastern Idaho: U.S. Geological Survey Water-Supply Paper 1879-C, 22p.

Garabedian, S.P., 1992, Hydrology and digital simulation of the regional aquifer system, eastern Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 1408-F, 102p.

Kjelstrom, L.C., 1986, Flow characteristics of the Snake River and water budgets for the Snake River Plain, Idaho and eastern Oregon: U.S. Geological Survey Hydrologic Investigations Atlas HA-680.

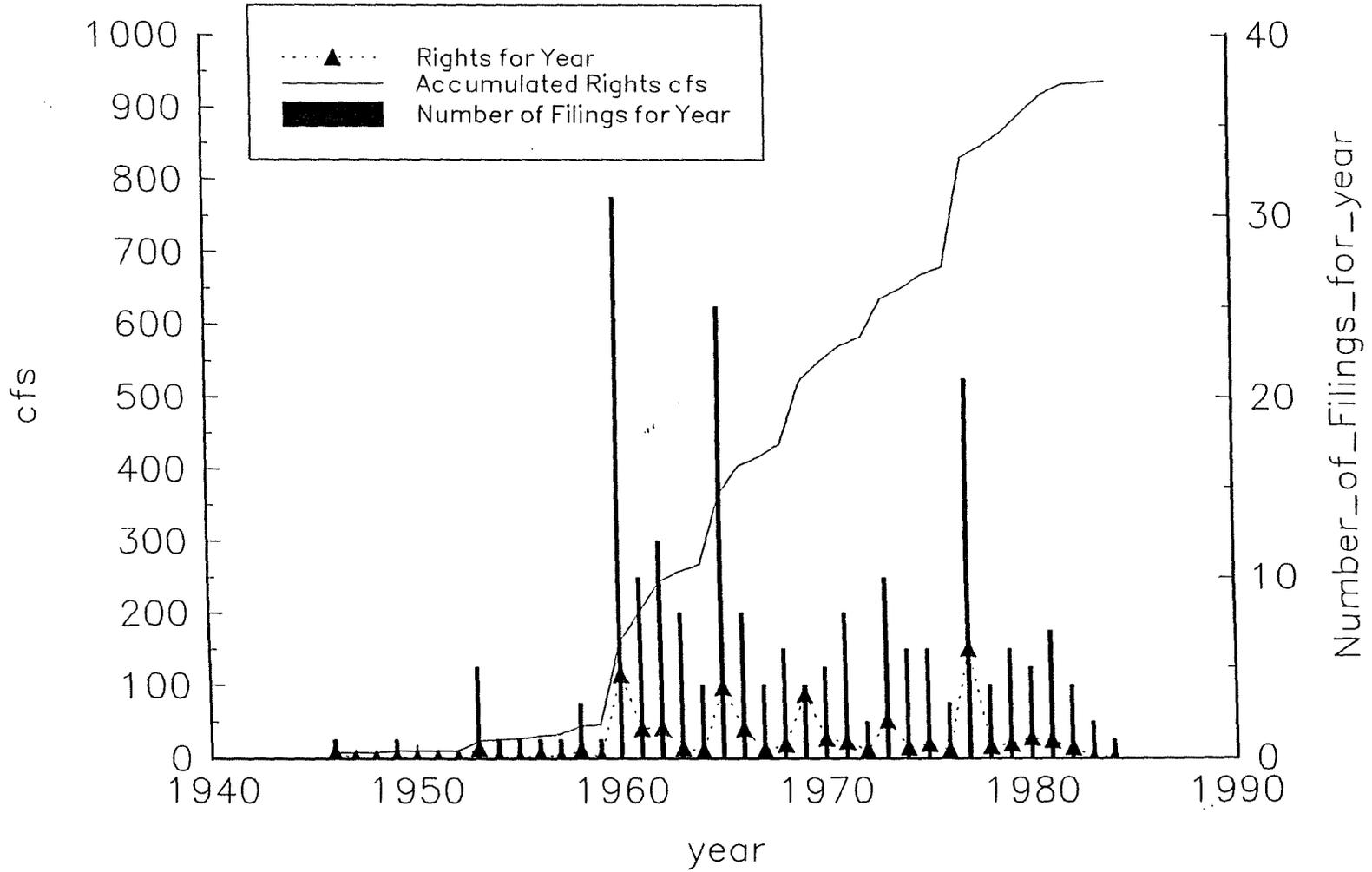
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Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

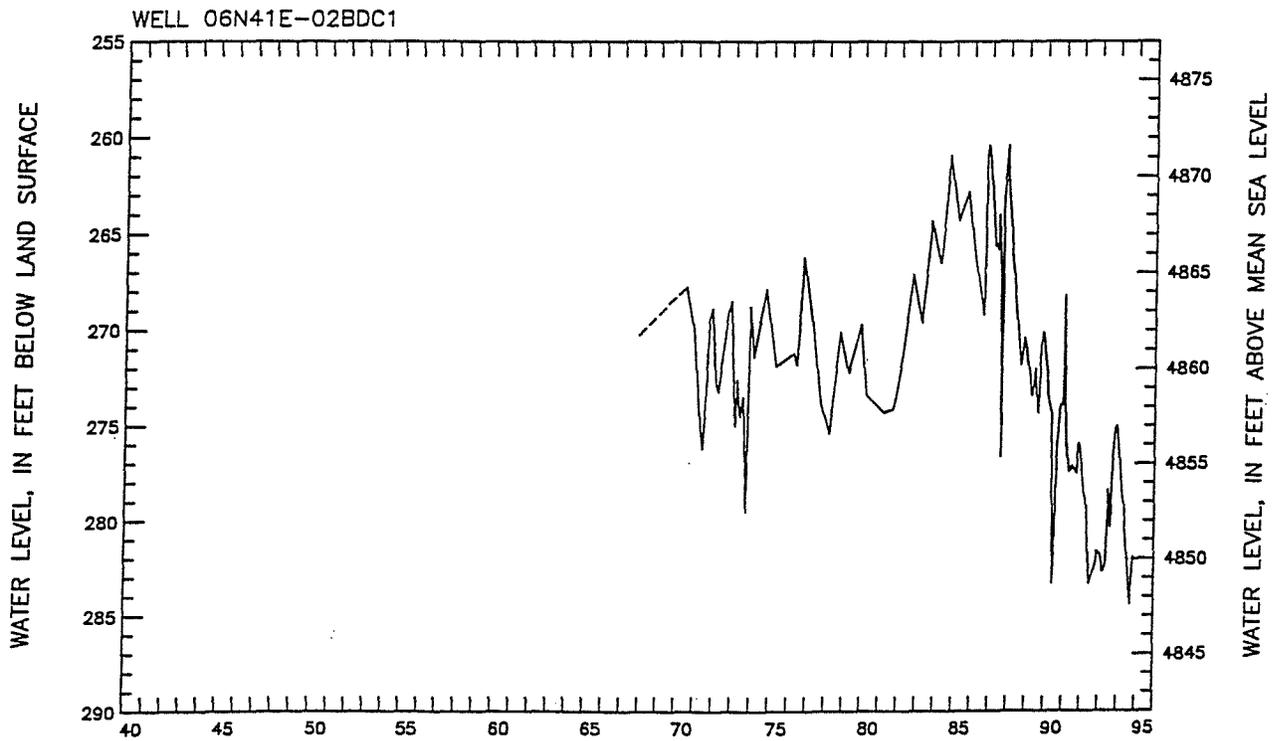
Hasket. Gordon

Rexburg Bench,

### Water Rights for Rexburg Bench Groundwater



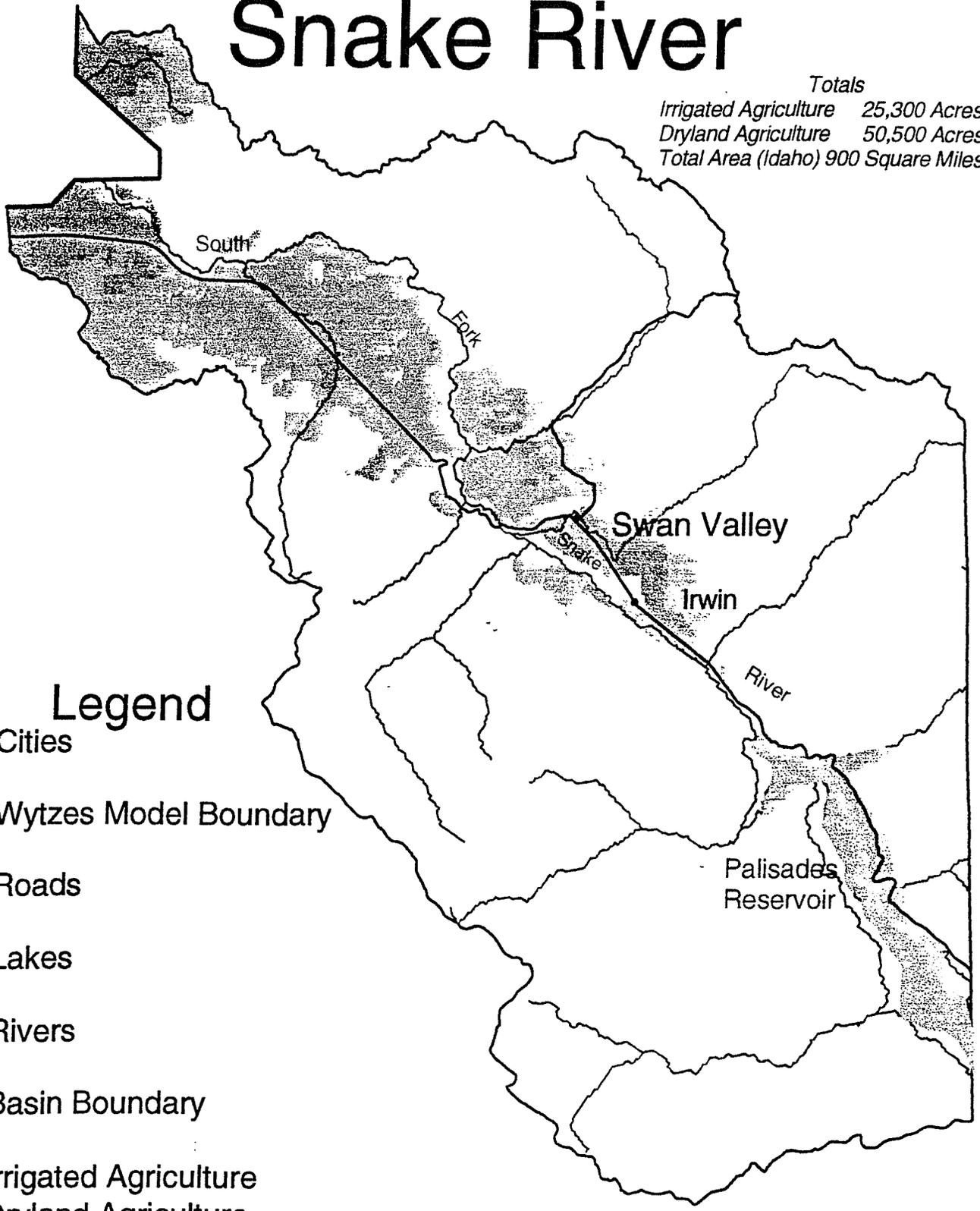
REXBURG BENCH



HYDROGRAPH OF WELL 06N41E-02BDC1

# South Fork of the Snake River

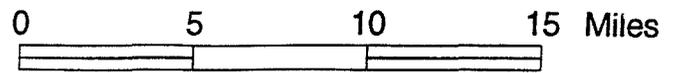
Totals  
 Irrigated Agriculture 25,300 Acres  
 Dryland Agriculture 50,500 Acres  
 Total Area (Idaho) 900 Square Miles



## Legend

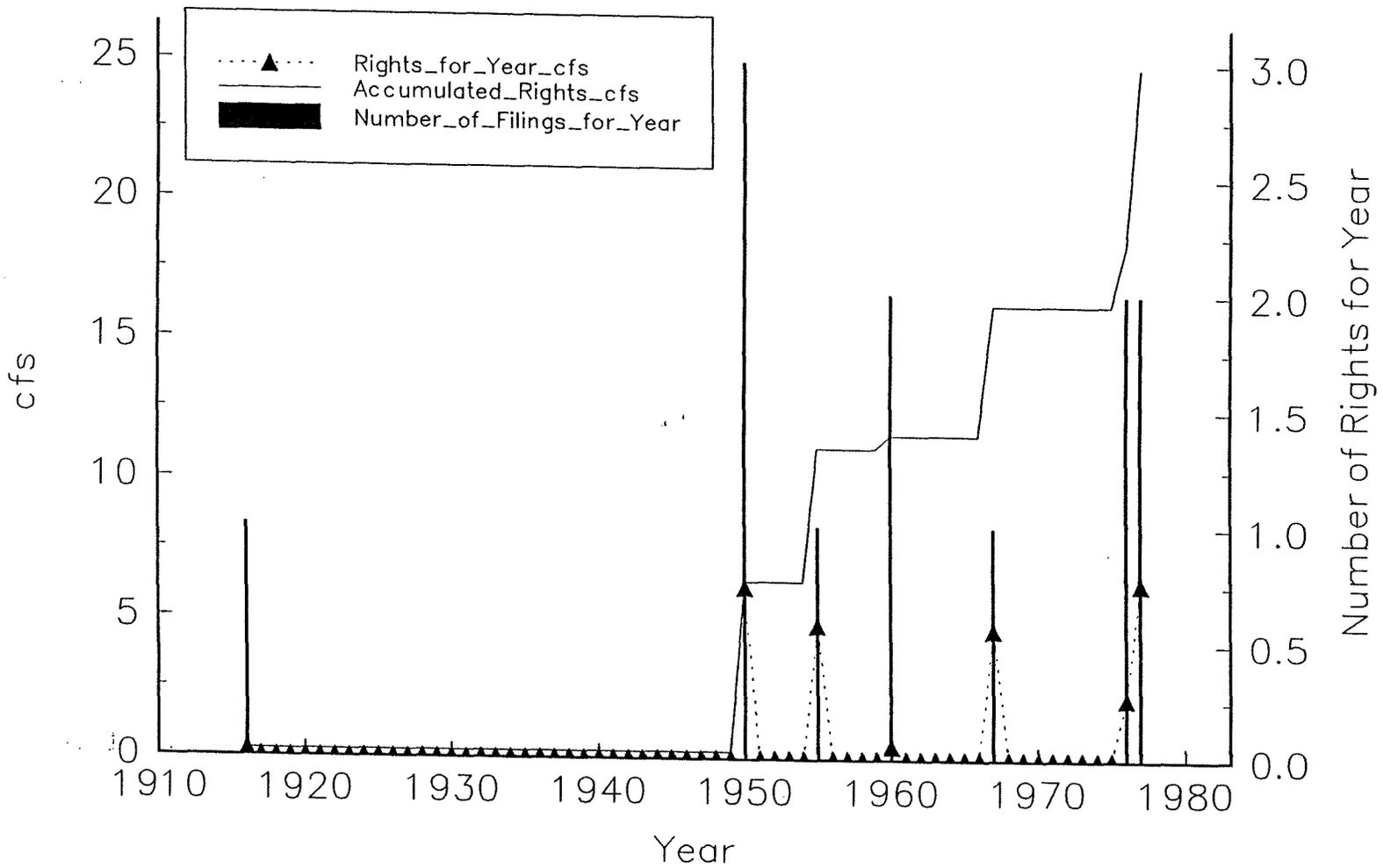
- Cities
- Wytzes Model Boundary
- Roads
- ▒ Lakes
- Rivers
- Basin Boundary
- ▒ Irrigated Agriculture
- ▒ Dryland Agriculture

Scale 1:348,232

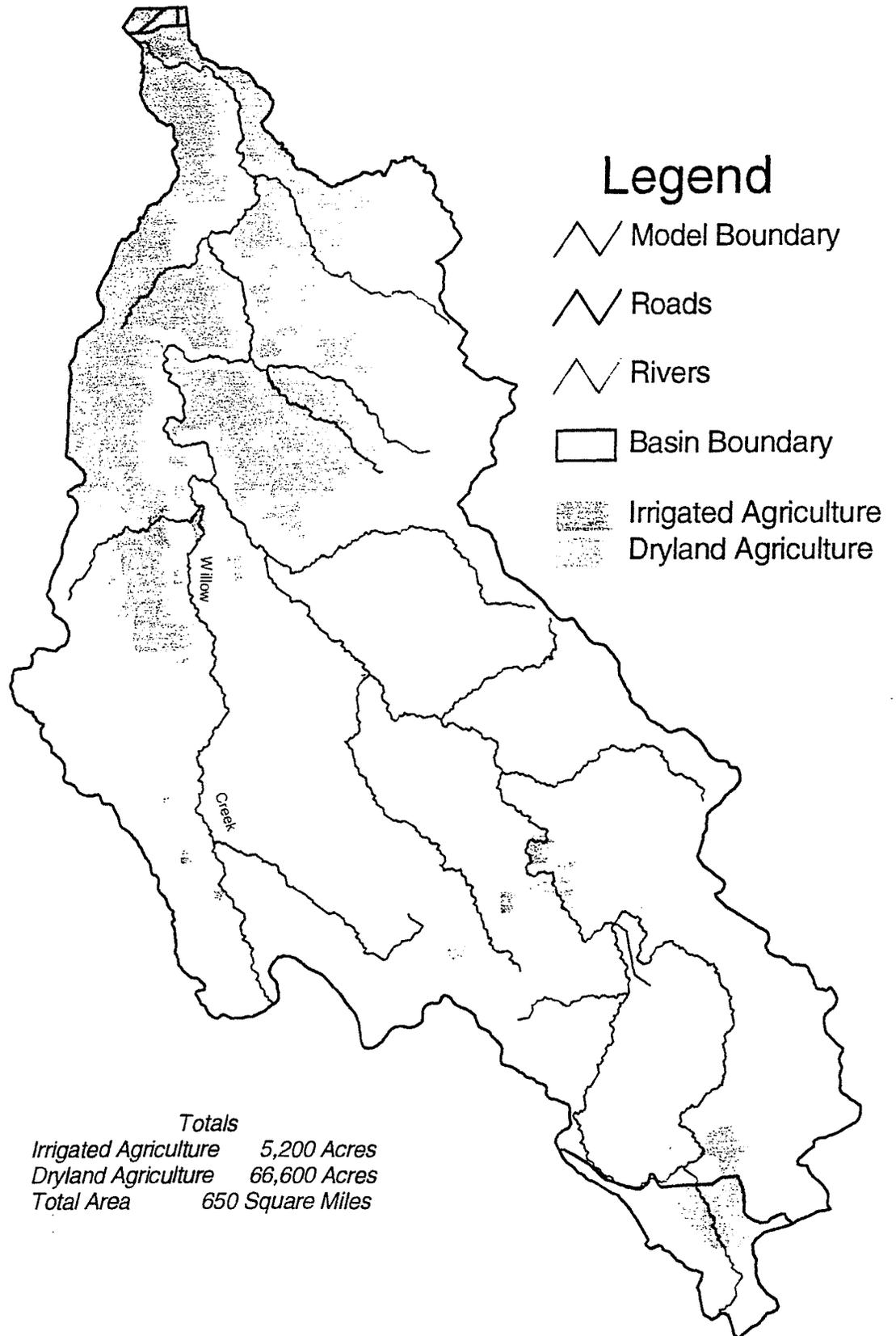


SOUTH FORK OF SNAKE RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	5,750	
Elevation (ft)	7,770 mean	
Principal Drainage	South Fork of Snake River	
Towns/Population	Irwin 108, Swan Valley 141	
Ground Water Diversion Rate (cfs)		
Water Rights	24	
Total Irrigated Land (ac)		
Previous Estimates	1986	25,300
Water Budget (ac-ft/yr)		
Precipitation	10,216,000	
Basin Outflow	Surface Water	5,022,000
	Ground Water	Negligible
Evapotranspiration	5,194,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	N/A	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Palisades Reservoir nr Irwin (032450) Snake R nr Irwin (032500) Snake R nr Heise (037500)	
Observation Wells	N/A	
Mass WL Measurements	N/A	
Diversion Records	Good	
List of References		
Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.		
Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.		

### Water Rights for South Fork Groundwater



# Willow Creek

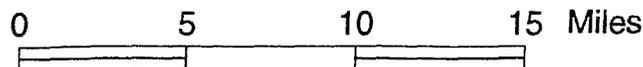


## Legend

- Model Boundary
- Roads
- Rivers
- Basin Boundary
- Irrigated Agriculture
- Dryland Agriculture

*Totals*  
Irrigated Agriculture 5,200 Acres  
Dryland Agriculture 66,600 Acres  
Total Area 650 Square Miles

Scale 1:359,902



WILLOW CREEK BASIN	
Drainage Area (mi <sup>2</sup> )	650
Elevation (ft)	5,000 - >7,000
Principal Drainage	Willow Creek
Towns/Population	Ririe 596
Ground Water Diversion Rate (cfs)	
Water Rights	25
Total Irrigated Land (ac)	
Previous Estimates	1986 5,200
Water Budget (ac-ft/yr)	
Precipitation	534,000
Basin Outflow	Surface Water 100,000
	Ground Water 0 - 29,000
Evapotranspiration	405,000 - 434,000
Aquifer Properties	
Transmissivity (ft <sup>2</sup> /d)	N/A
Storage Coefficient	N/A
Hydrologic Data Available	
Continuous Stream Gages	Willow Cr below Tex Cr (057940) Ririe Lake nr Ririe (057950) Willow Cr nr Ririe (058000)
Observation Wells	1 USGS well
Mass WL Measurements	N/A
Diversion Records	Good

WILLOW CREEK BASIN

List of References

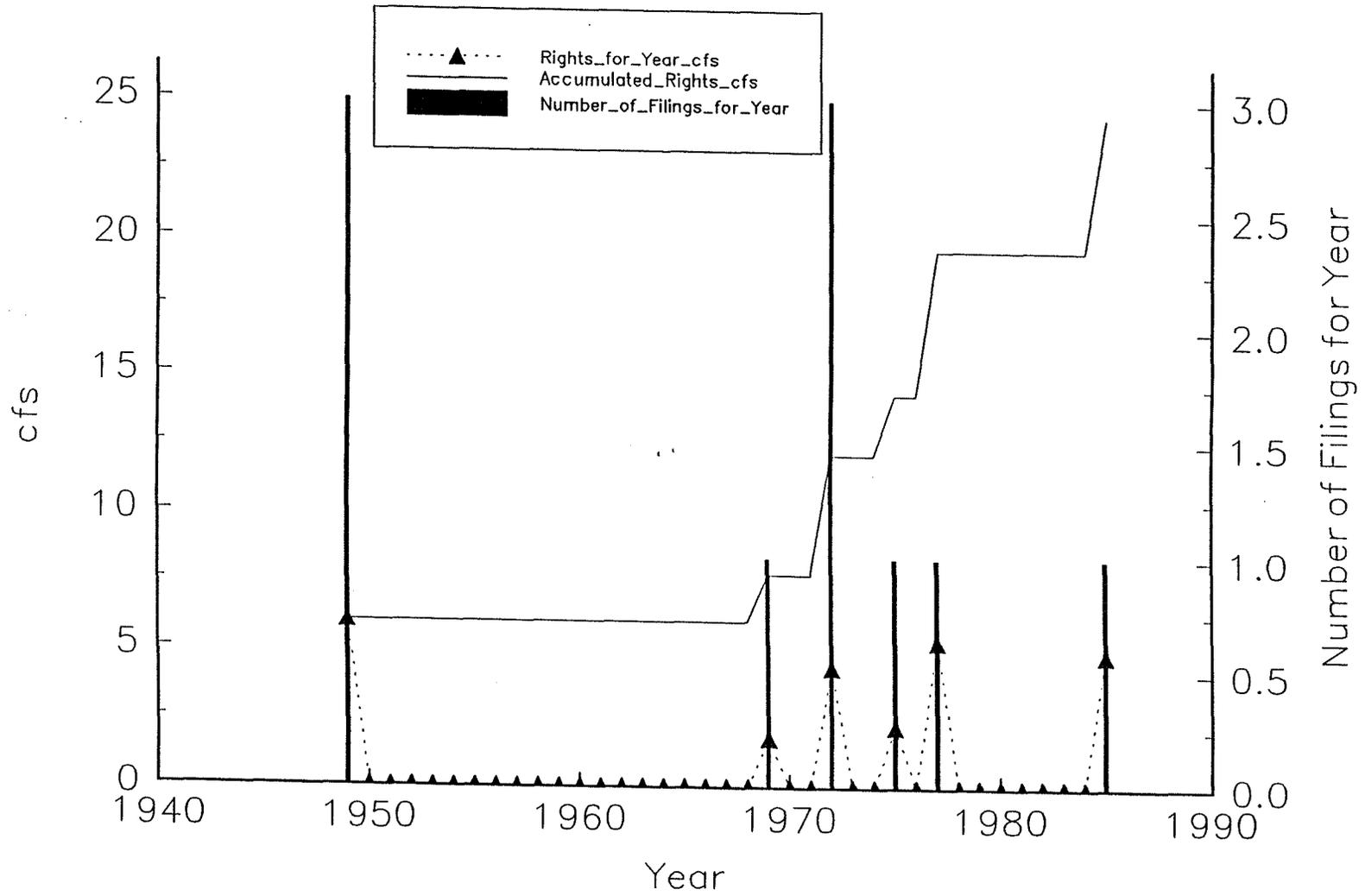
Garabedian, S.P., 1992, Hydrology and digital simulation of the regional aquifer system, eastern Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 1408-F, 102p.

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

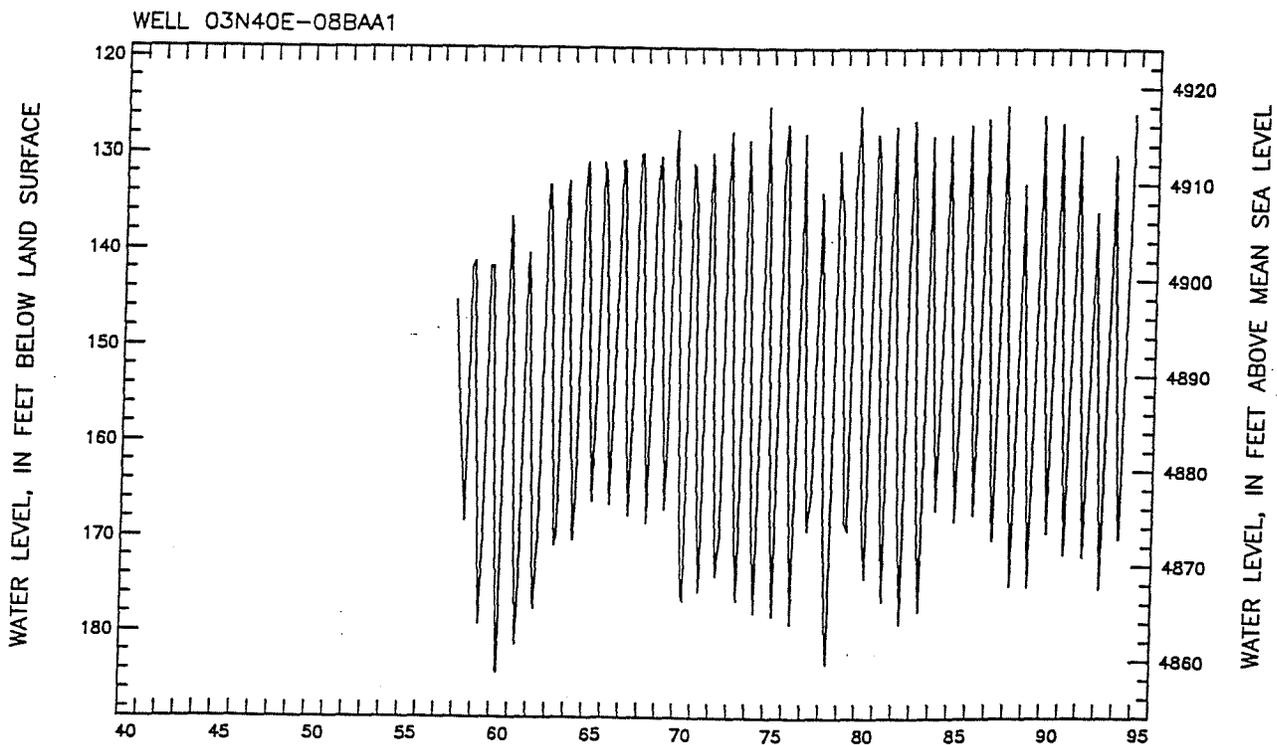
Kjelstrom, L.C., 1986, Flow characteristics of the Snake River and water budgets for the Snake River Plain, Idaho and eastern Oregon: U.S. Geological Survey Hydrologic Investigations Atlas HA-680.

Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

### Water Rights for Willow Creek Groundwater



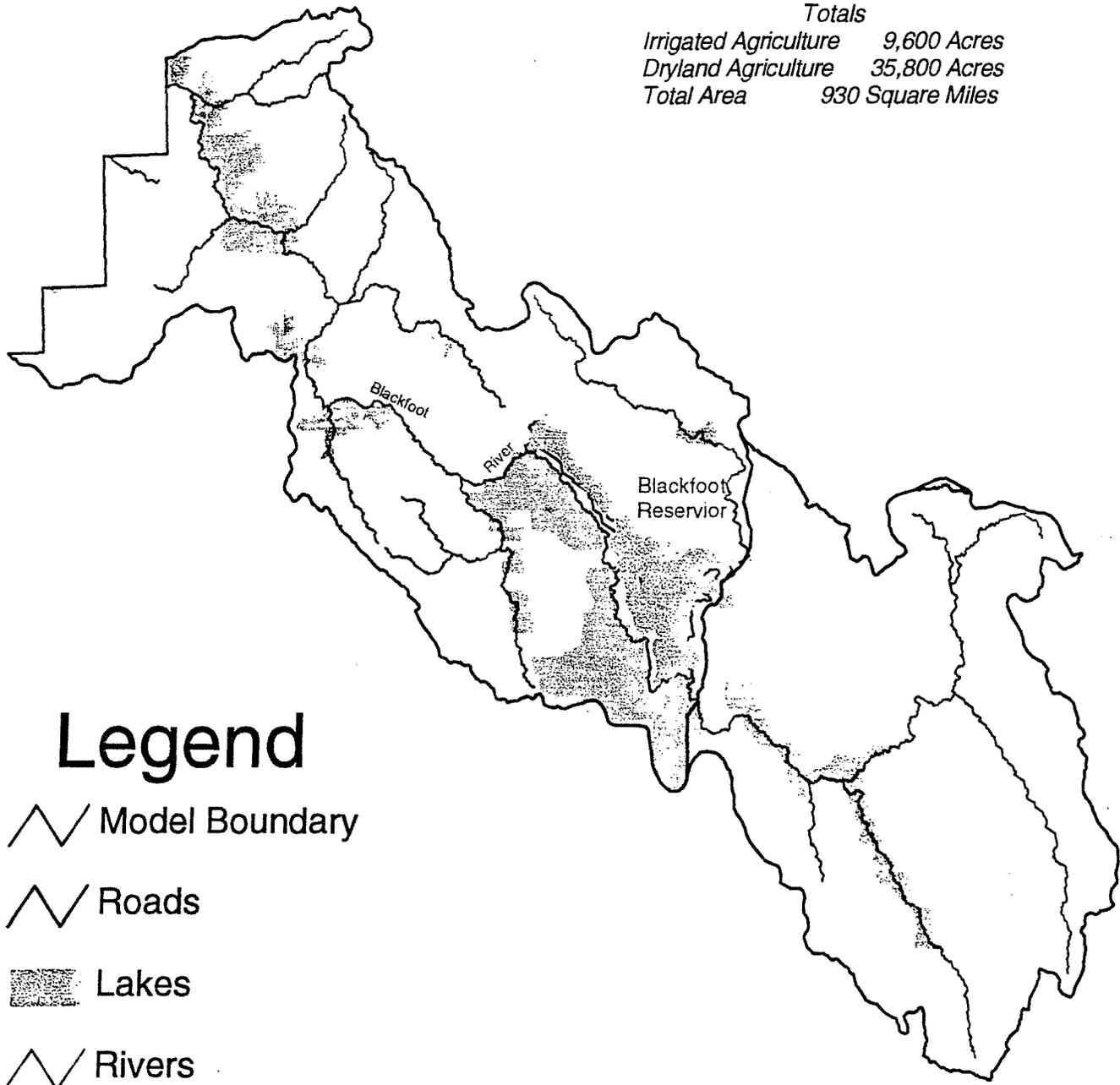
WILLOW CREEK



HYDROGRAPH OF WELL 03N40E-08BAA1

# Blackfoot River

Totals	
Irrigated Agriculture	9,600 Acres
Dryland Agriculture	35,800 Acres
Total Area	930 Square Miles



## Legend

Model Boundary

Roads

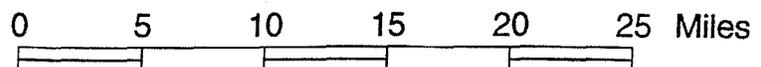
Lakes

Rivers

Basin Boundary

Irrigated Agriculture  
Dryland Agriculture

Scale 1:496,869



BLACKFOOT RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	930	
Elevation (ft)	4,600 - >7,000	
Principal Drainage	Blackfoot River	
Towns/Population	None	
Ground Water Diversion Rate (cfs)		
Water Rights	18	
Total Irrigated Land (ac)		
Previous Estimates	1986	9,600
Water Budget (ac-ft/yr)		
Precipitation	987,000	
Basin Outflow	Surface Water	267,000
	Ground Water	0 - 25,000
Evapotranspiration	695,000 - 720,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	N/A	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Blackfoot R nr Shelley (066000)	
Observation Wells	1 USGS well	
Mass WL Measurements	N/A	
Diversion Records	Fair	

BLACKFOOT RIVER BASIN

List of References

deSonneville, J.L.J., 1974, Development of a digital groundwater model with application to aquifers in Idaho: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, M.S. Thesis, 243p.

Dion, N.P., 1974, An estimate of leakage from Blackfoot Reservoir to Bear River basin, southeastern Idaho: Idaho Department of Water Administration Water Information Bulletin 34.

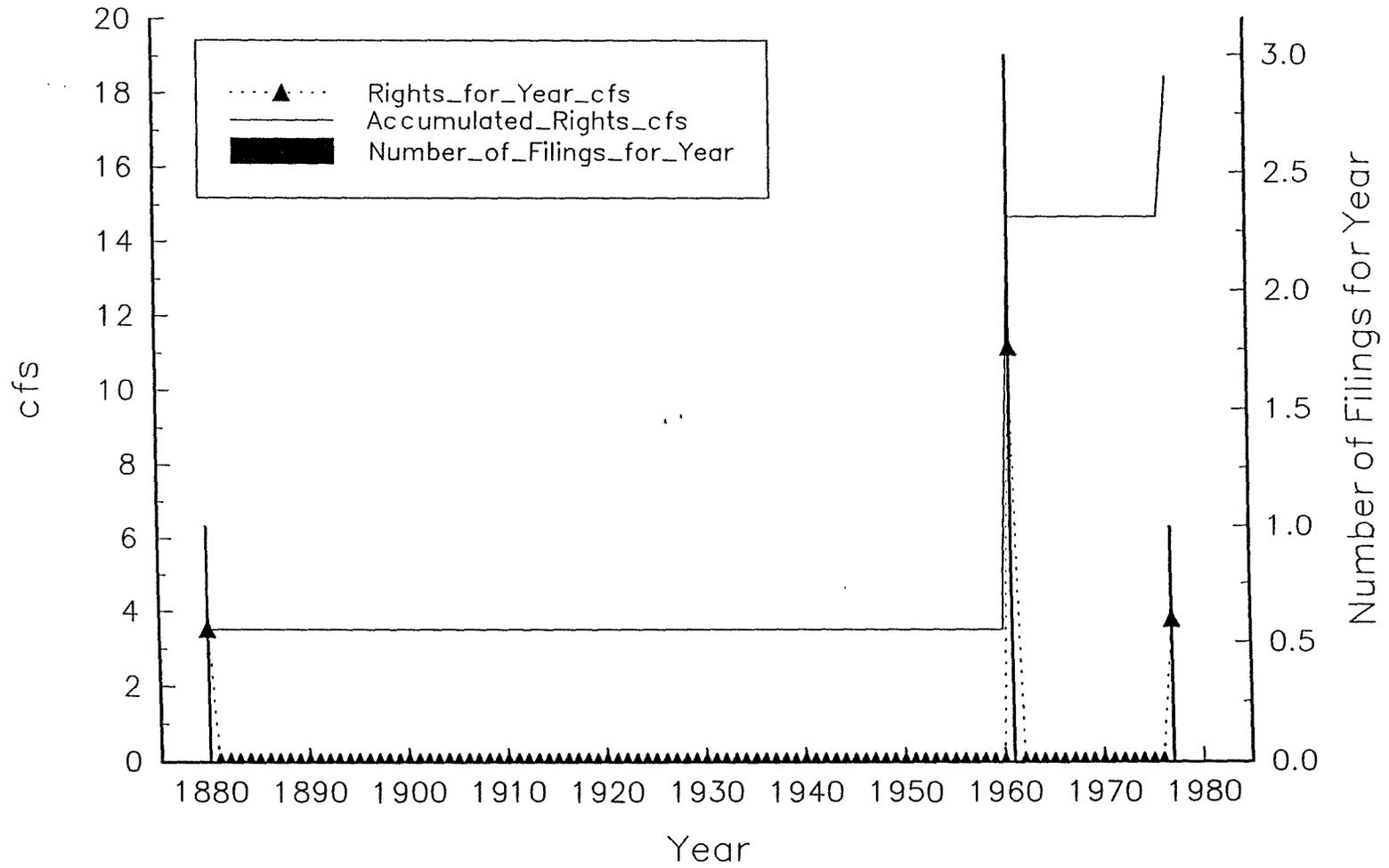
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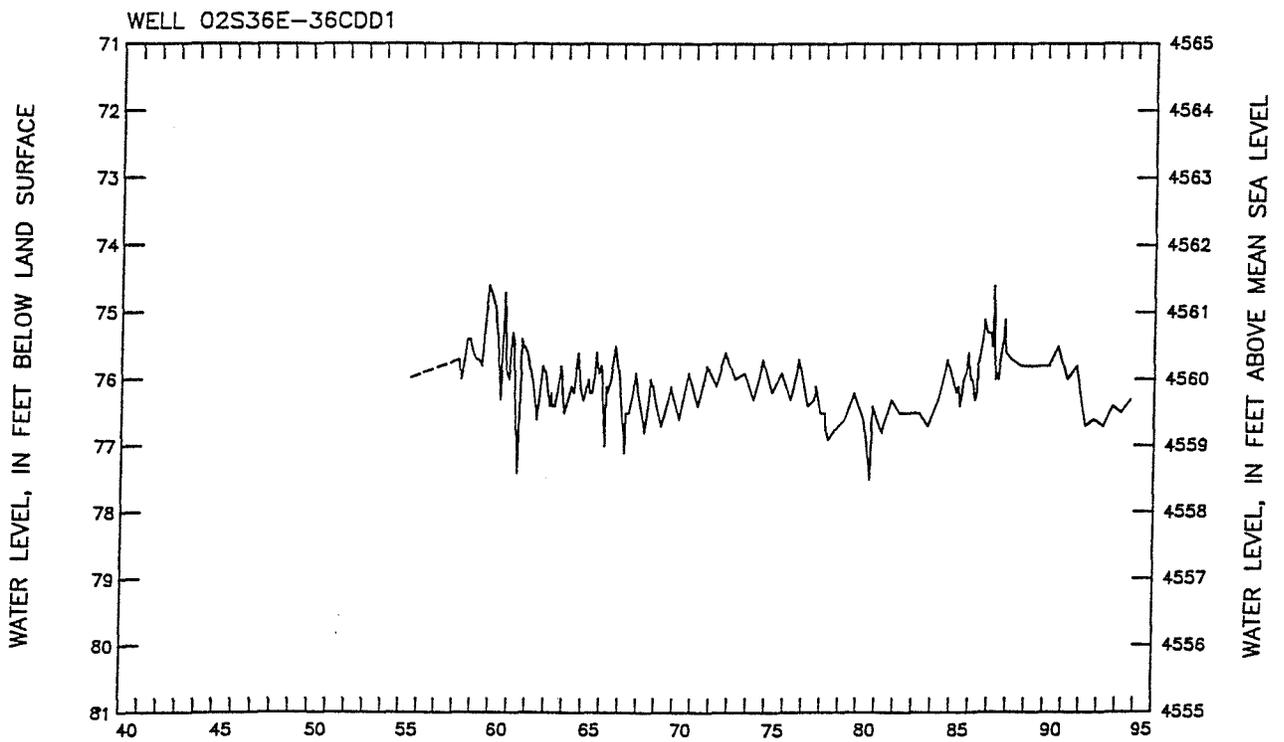
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### Water Rights for Blackfoot River Groundwater



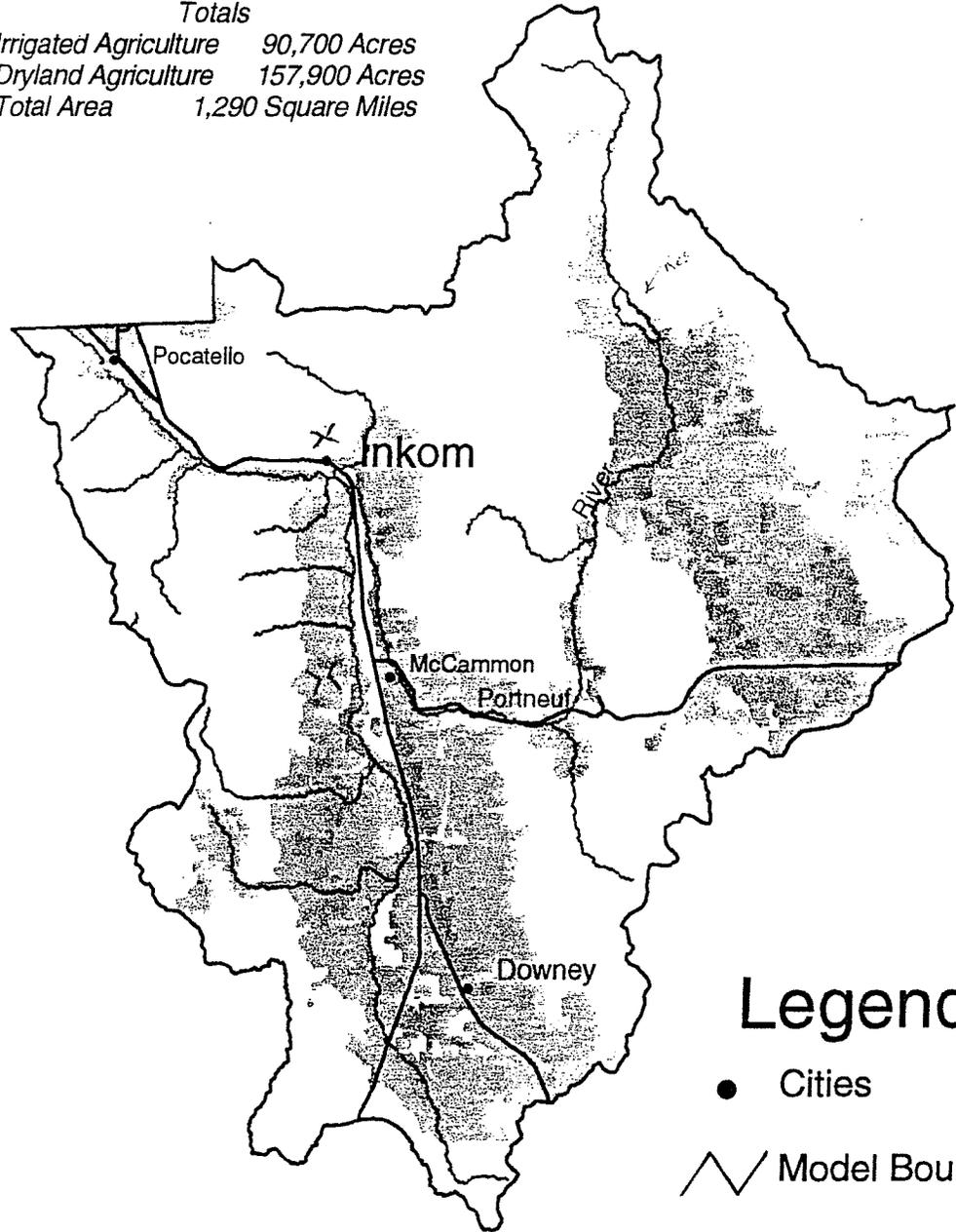
BLACKFOOT RIVER



HYDROGRAPH OF WELL 02S36E-36CDD1

# Portneuf River

Totals  
Irrigated Agriculture 90,700 Acres  
Dryland Agriculture 157,900 Acres  
Total Area 1,290 Square Miles



## Legend

● Cities

— Model Boundary

— Roads

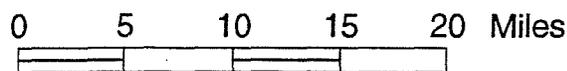
— Rivers

□ Basin Boundary

■ Irrigated Agriculture

■ Dryland Agriculture

Scale 1:563,902



PORTNEUF RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	1,290	
Elevation (ft)	4,400 - >9,000, 5,850 mean	
Principal Drainage	Portneuf River	
Towns/Population	McCammon 1,946, Inkom 769, Pocatello 46,117, Chubbuck 7,794	
Ground Water Diversion Rate (cfs)		
Water Rights	550	
Total Irrigated Land (ac)		
Previous Estimates	1970	33,500
	1986	90,700
Water Budget (ac-ft/yr)		
Precipitation	1,128,000	
Basin Outflow	Surface Water	202,000
	Ground Water	49,000 - 63,000
Evapotranspiration	863,000 - 877,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	400,000	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Portneuf R at Topaz (073000) Marsh Cr nr McCammon (075000) Portneuf R at Pocatello (075500)	
Observation Wells	7 USGS wells	
Mass WL Measurements	Summer 1968-69	
Diversion Records	None - Fair	

PORTNEUF RIVER BASIN

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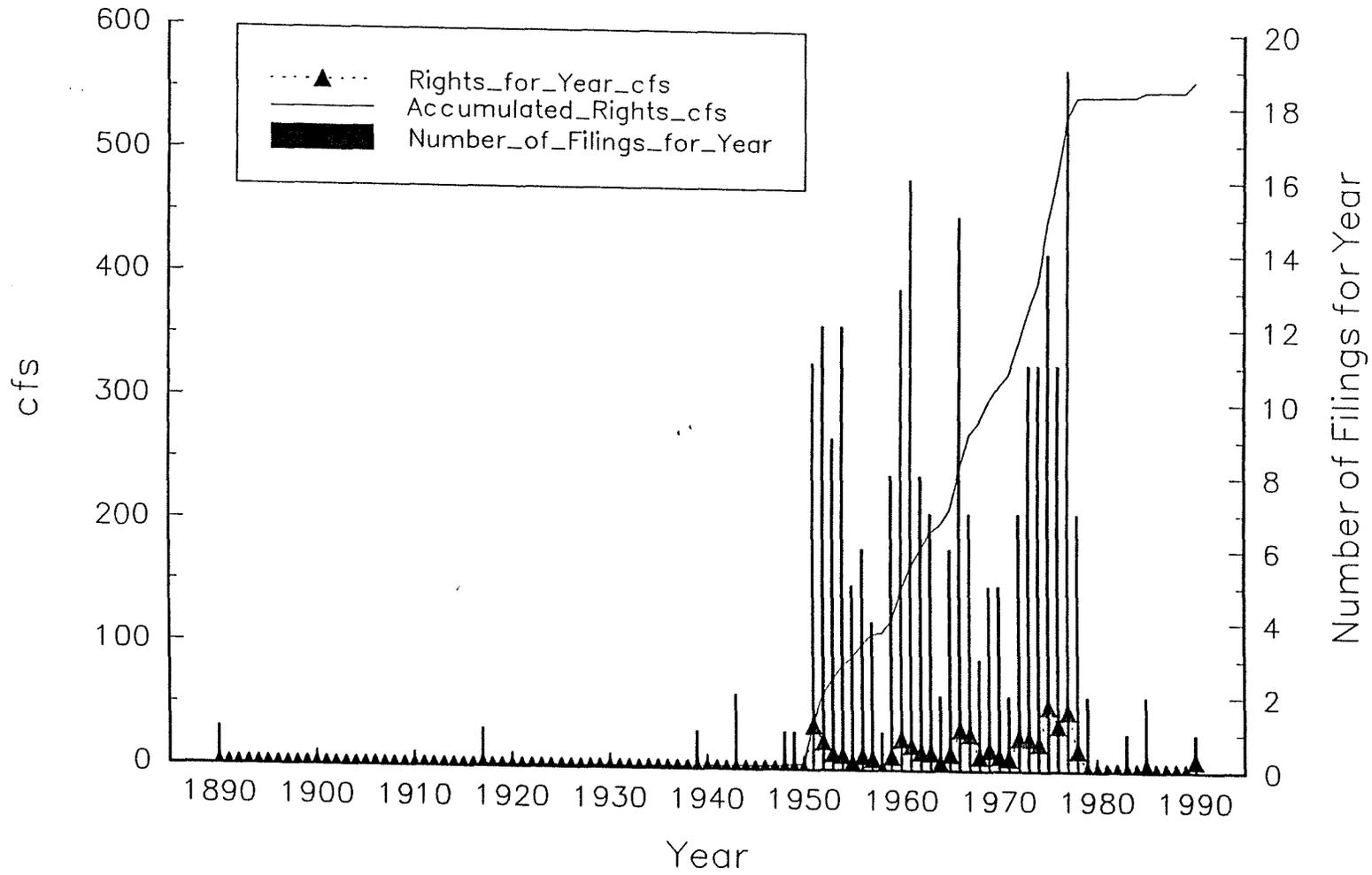
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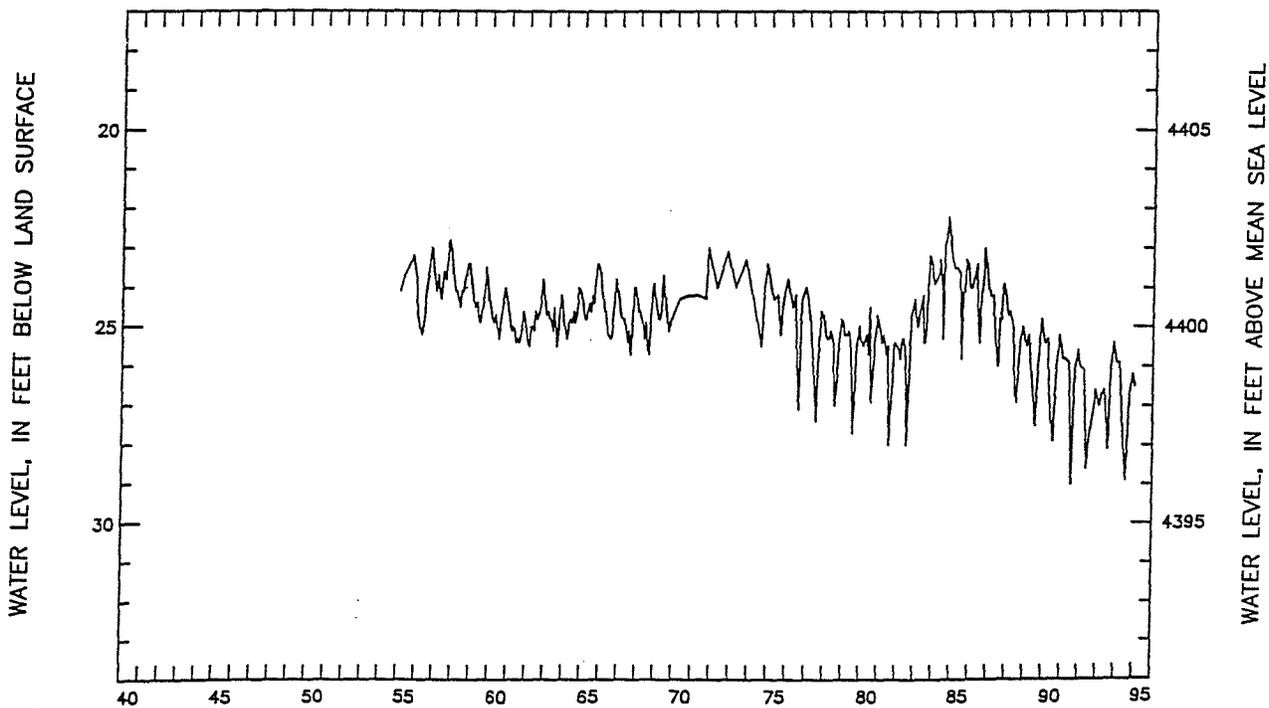
Warnick, C.C., Heitz, L.F., Kirkland, L.A., and Burke, G.G., 1981, User guide for Idaho hydrologic maps: Moscow, University of Idaho, Idaho Water and Energy Resources Research Institute, 46p.

# Water Rights Portneuf River Groundwater



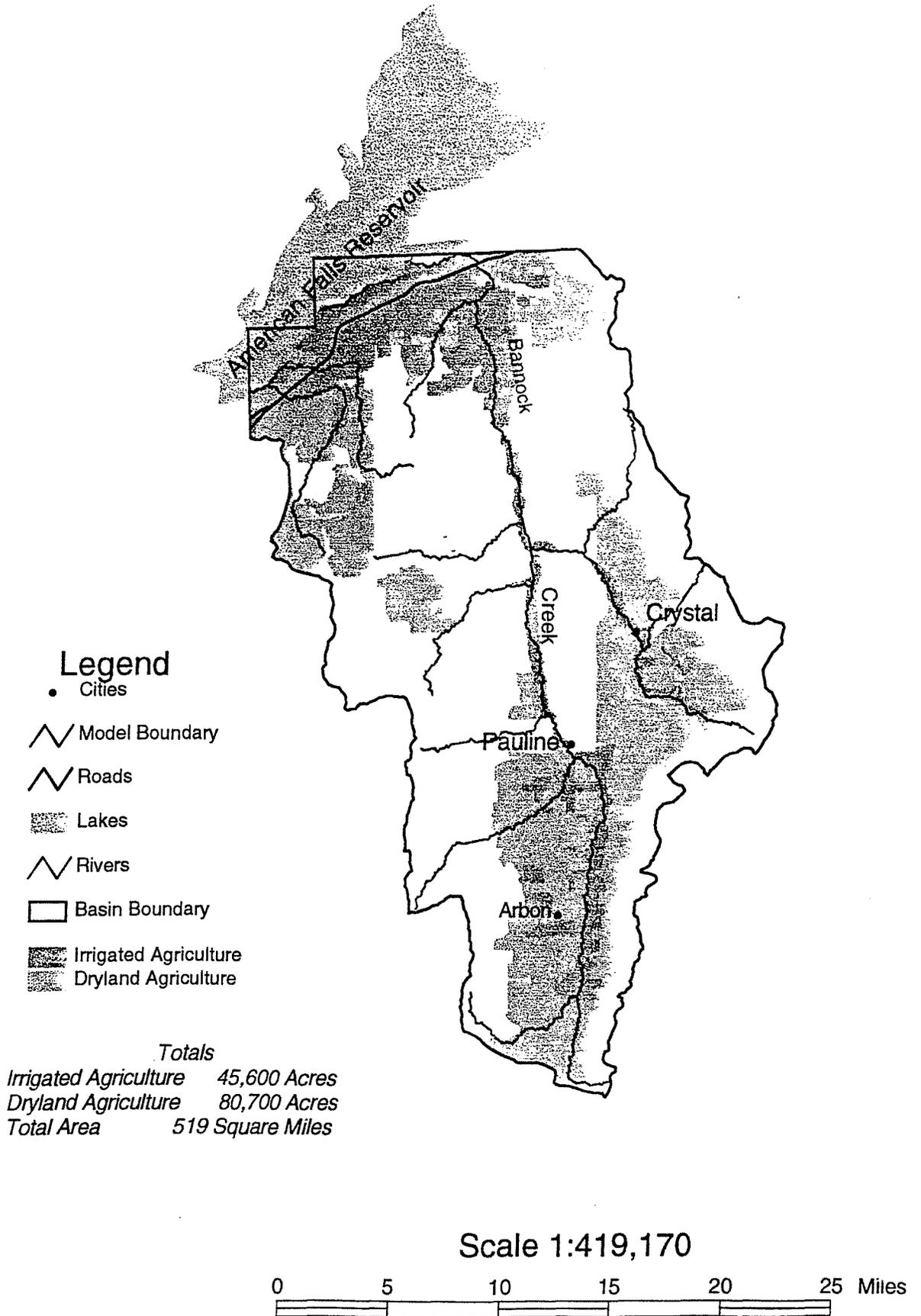
PORTNEUF

WELL 05S33E-35CDC1



HYDROGRAPH OF WELL 05S33E-35CDC1

# Bannock Creek



## Legend

- Cities
- ∩ Model Boundary
- ∩ Roads
- ▨ Lakes
- ∩ Rivers
- Basin Boundary
- ▨ Irrigated Agriculture
- ▨ Dryland Agriculture

### Totals

<i>Irrigated Agriculture</i>	<i>45,600 Acres</i>
<i>Dryland Agriculture</i>	<i>80,700 Acres</i>
<i>Total Area</i>	<i>519 Square Miles</i>

Scale 1:419,170

0 5 10 15 20 25 Miles

BANNOCK CREEK BASIN		
Drainage Area (mi <sup>2</sup> )	410	
Elevation (ft)	4,400 - >8,000	
Principal Drainage	Bannock Creek	
Towns/Population	Arbon 10	
Ground Water Diversion Rate (cfs)		
Water Rights	365	
Total Irrigated Land (ac)		
Previous Estimates	1986	45,600
Water Budget (ac-ft/yr)		
Precipitation	393,000	
Basin Outflow	Surface Water	28,000
	Ground Water	22,000 - 30,000
Evapotranspiration	335,000 - 343,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	N/A	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Bannock Cr nr Pocatello (076200)	
Observation Wells	7 USGS wells	
Mass WL Measurements	N/A	
Diversion Records	None	

Water budget  
S. Spina 12

BANNOCK CREEK BASIN

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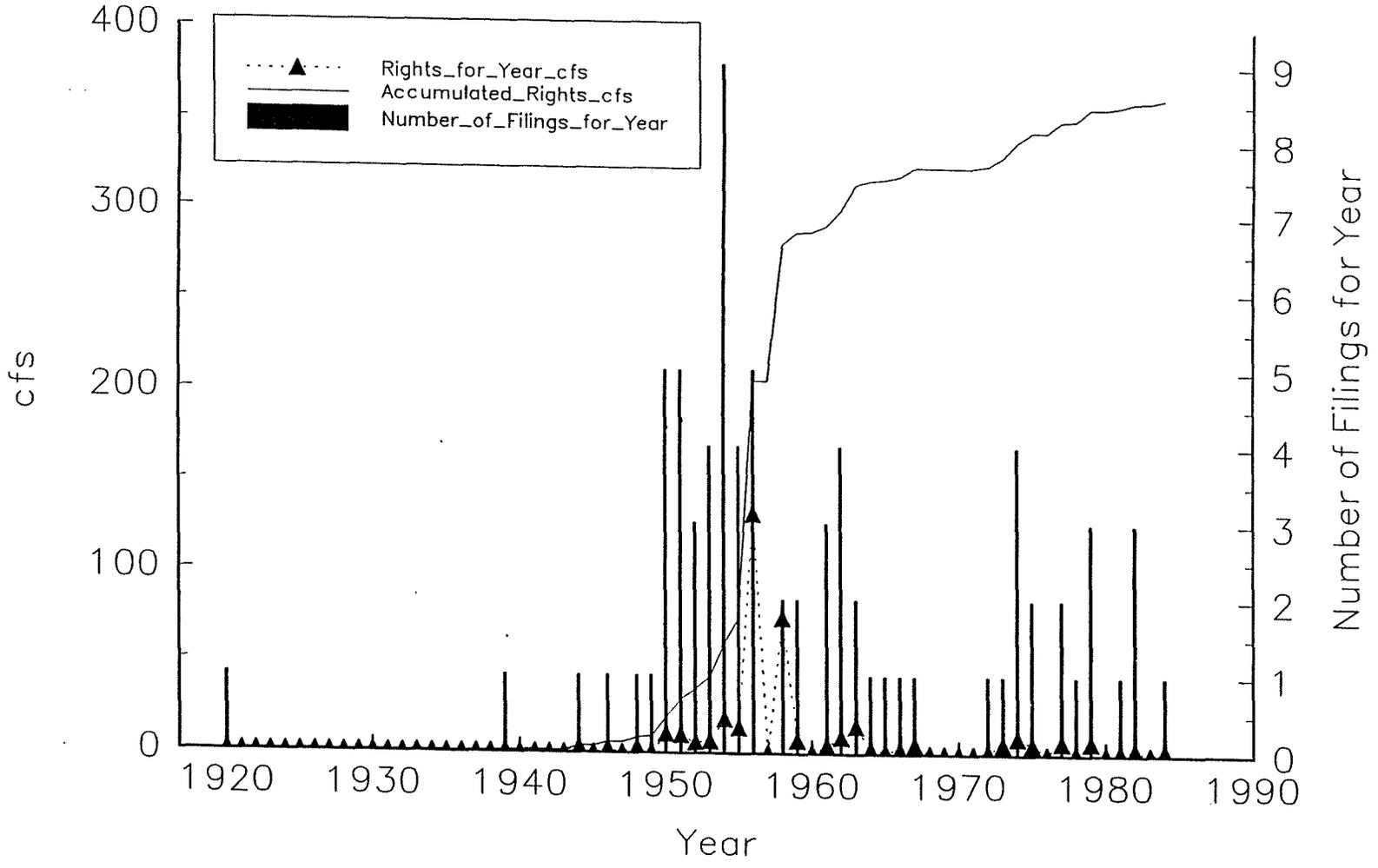
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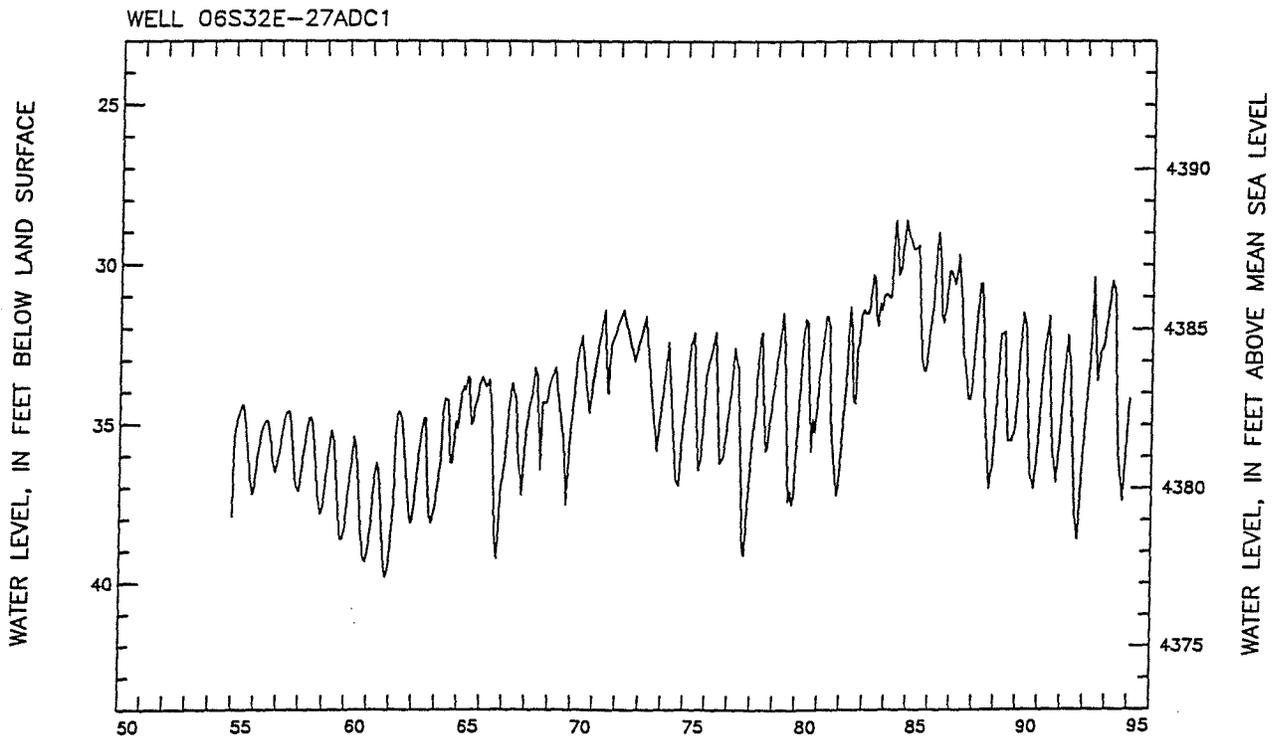
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# Water Rights for Bannock Creek Groundwater

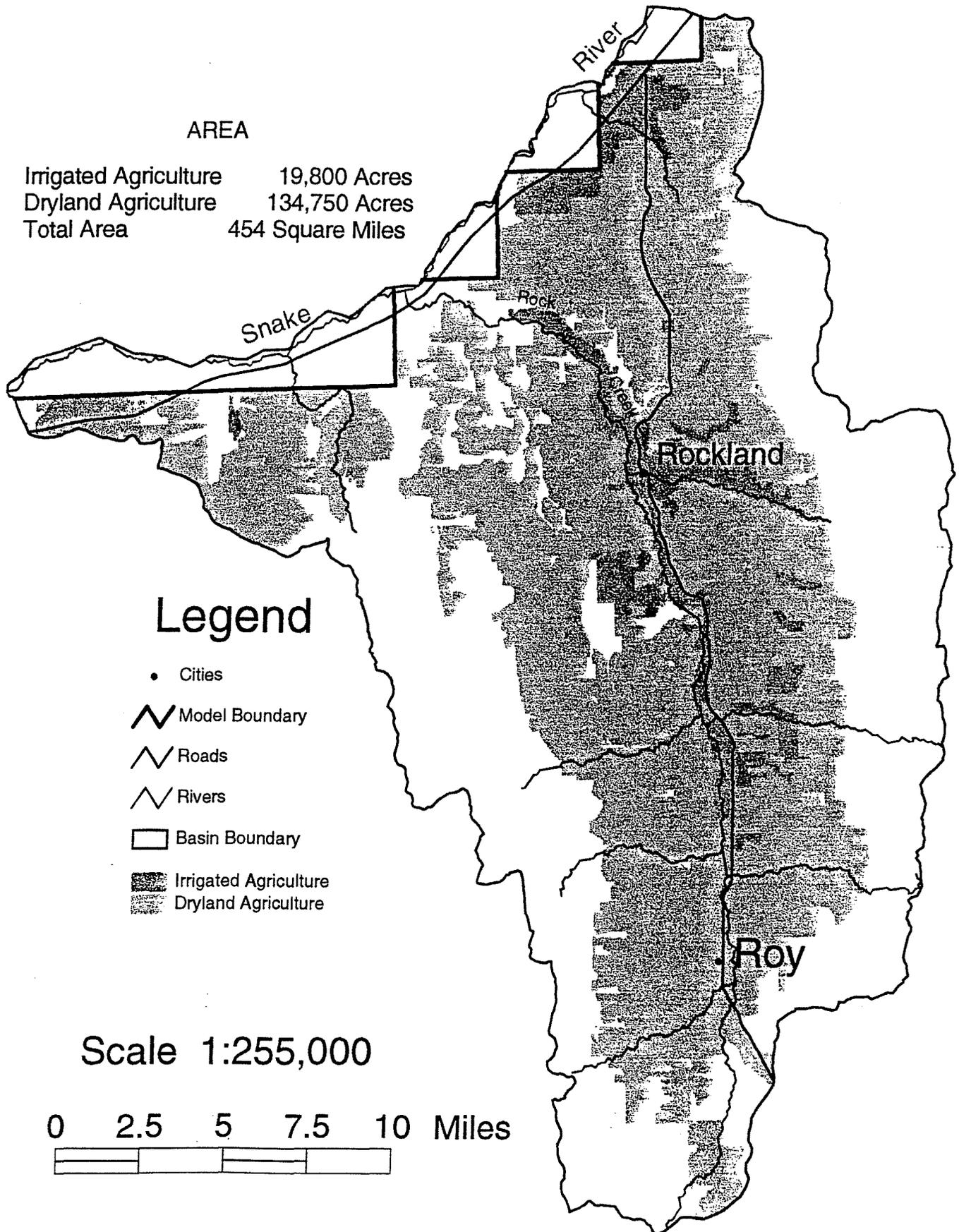


BANNOCK CREEK (ARBON VALLEY)



HYDROGRAPH OF WELL 06S32E-27ADC1

# Rockland



ROCKLAND BASIN		
Drainage Area (mi <sup>2</sup> )	430	
Elevation (ft)	4200 - 8700, 5700 mean	
Principal Drainage	Rock Creek	
Towns/Population	Rockland 264	
Ground Water Diversion Rate (cfs)		
Water Rights	58	
Total Irrigated Land (ac)		
Previous Estimates	1986	19,800
Water Budget (ac-ft/yr)		
Precipitation	295,000	
Basin Outflow	Surface Water	17,000
	Ground Water	51,000
Evapotranspiration	227,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	3,900 - 48,000, 20,000 mean	
Storage Coefficient	0.1 - 0.3, 0.2 mean	
Hydrologic Data Available		
Continuous Stream Gages	Rock Cr nr American Falls (077650) East Fork Rock Cr (077600)	
Observation Wells	2 USGS wells	
Mass WL Measurements	Spring 1979	
Diversion Records	Poor	

ROCKLAND BASIN

List of References

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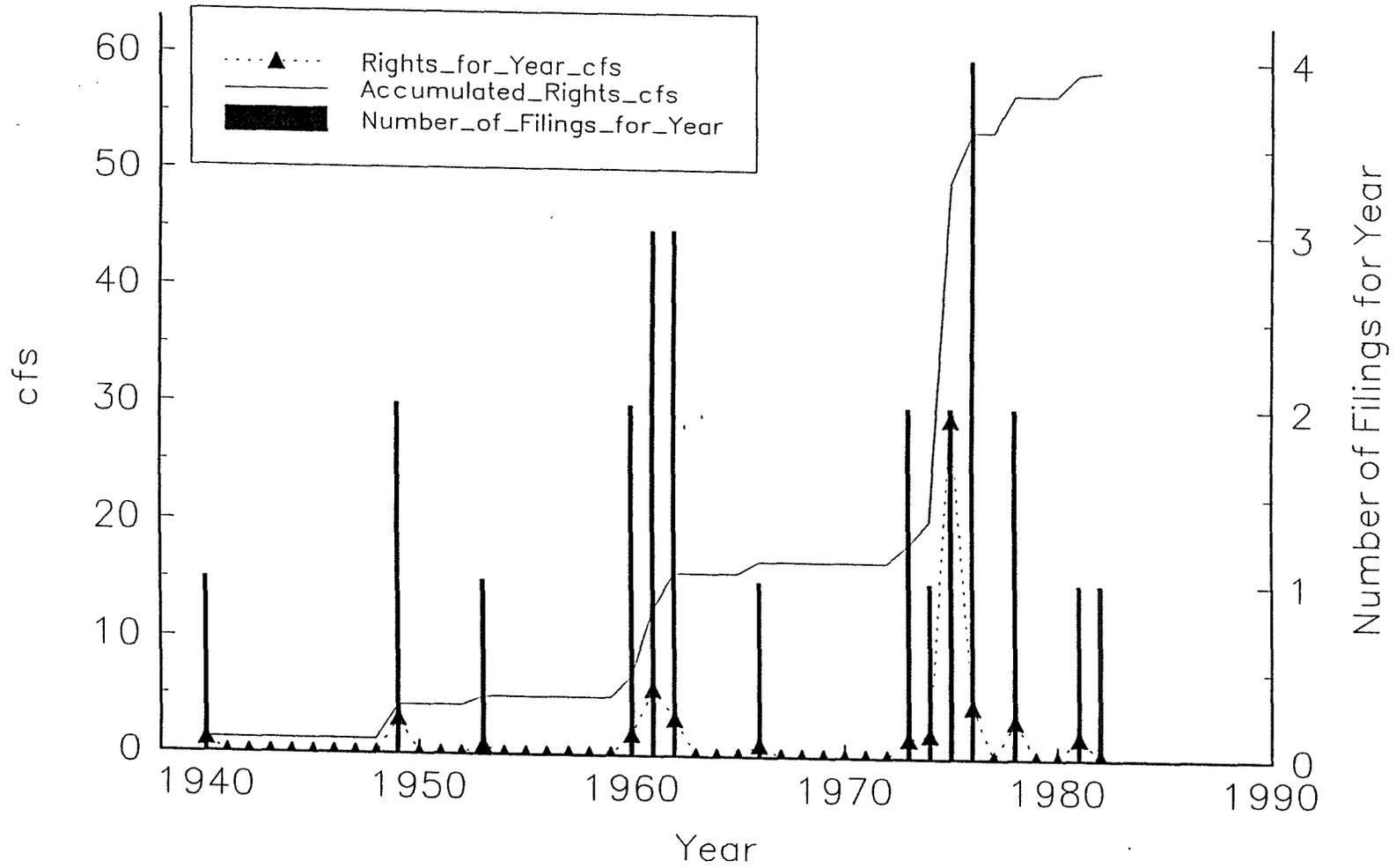
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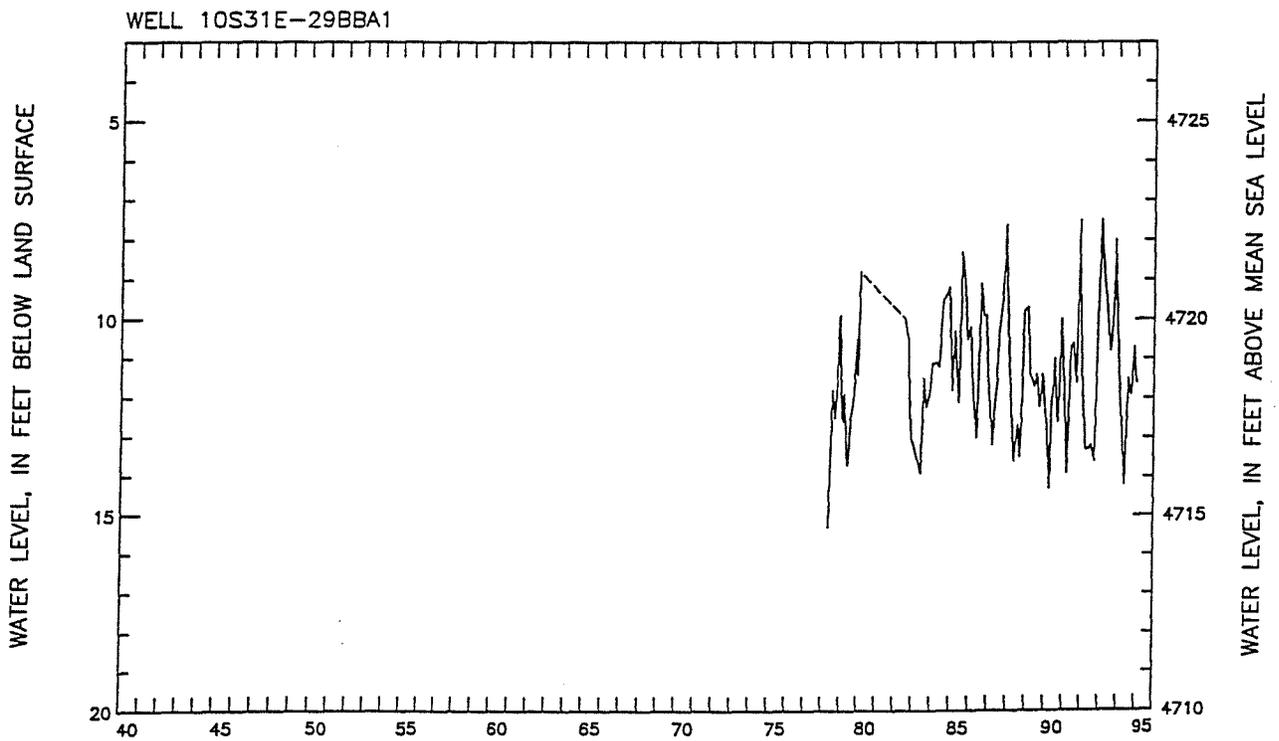
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# Water Rights for Rockland Groundwater

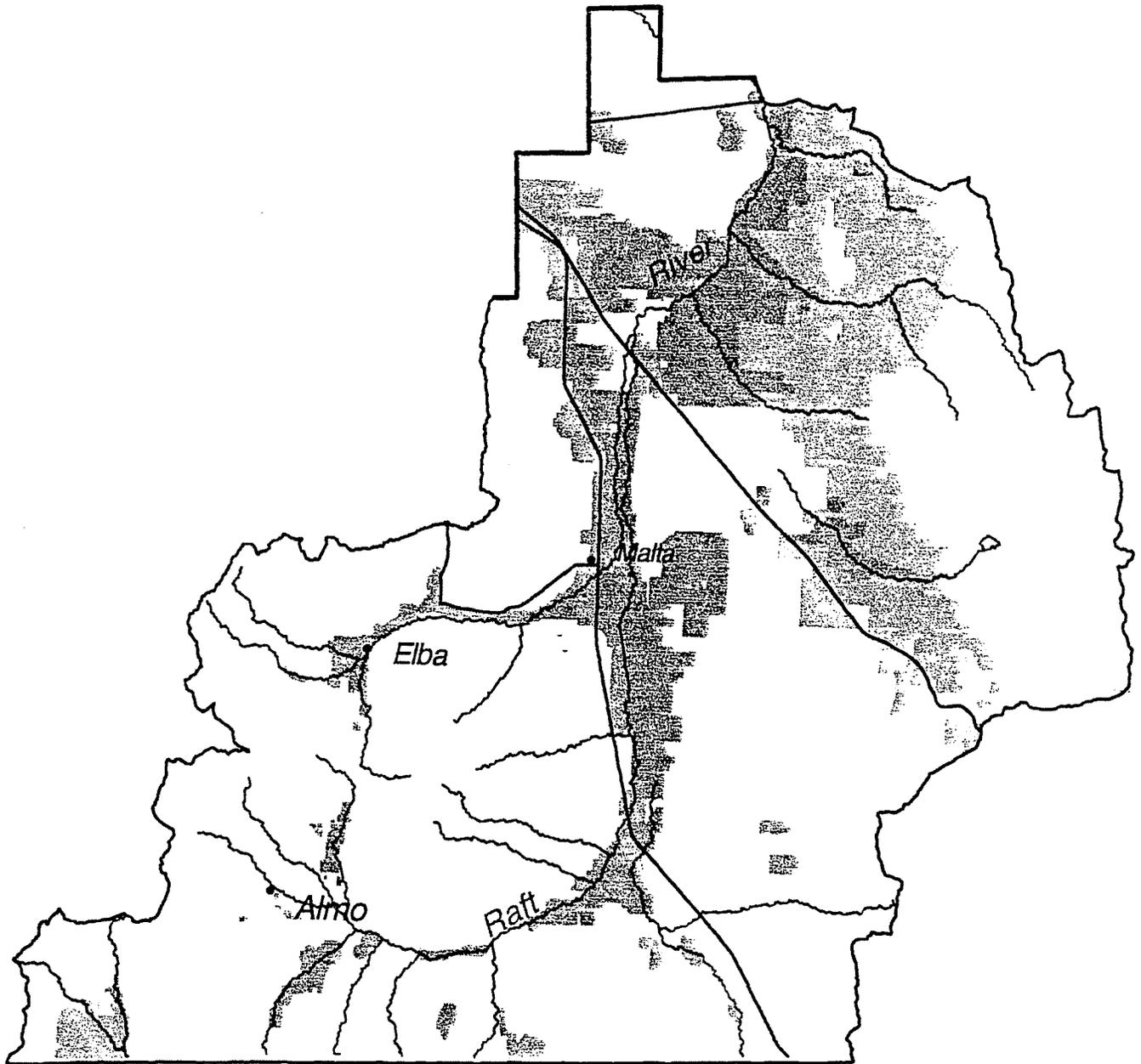


ROCKLAND



HYDROGRAPH OF WELL 10S31E-29BBA1

# *Raft River*

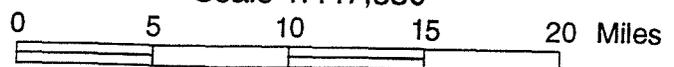


## Legend

- Cities
- Model Boundary
- Roads
- Rivers
- Basin Boundary
- Irrigated Agriculture
- ▨ Dryland Agriculture

Totals  
Irrigated Agriculture 104,800 Acres  
Dryland Agriculture 78,500 Acres  
Total Area (Idaho) 1,240 Square Miles

Scale 1:447,330



RAFT RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	1,510	
Elevation (ft)	4,200 - >8,000	
Principal Drainage	Raft River	
Towns/Population	Malta	
Ground Water Diversion Rate (cfs)		
Water Rights	1825	
Total Irrigated Land (ac)		
Previous Estimates	1927	9,000
	1954	43,000
	1960	87,000
	1986	104,800
Water Budget (ac-ft/yr)		
Precipitation	1,248,000	
Basin Outflow	Surface Water	Negligible
	Ground Water	84,000
Evapotranspiration	1,164,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	20,600 - 24,600	
Storage Coefficient	0.026 - 0.16	
Hydrologic Data Available		
Continuous Stream Gages	Raft R nr Malta (078000)	
	Raft R nr mouth (079901)	
Observation Wells	8 USGS Wells and 22 IDWR Wells	
Mass WL Measurements	Spring/Fall 1952, Spring 1966	
Diversion Records	None - Poor	

RAFT RIVER BASIN

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Fader, S.W., 1952, Records of wells and ground-water withdrawals for irrigation in Raft River valley, Cassia County, Idaho: U.S. Geological Survey Open-File Report 52-42, 134p.

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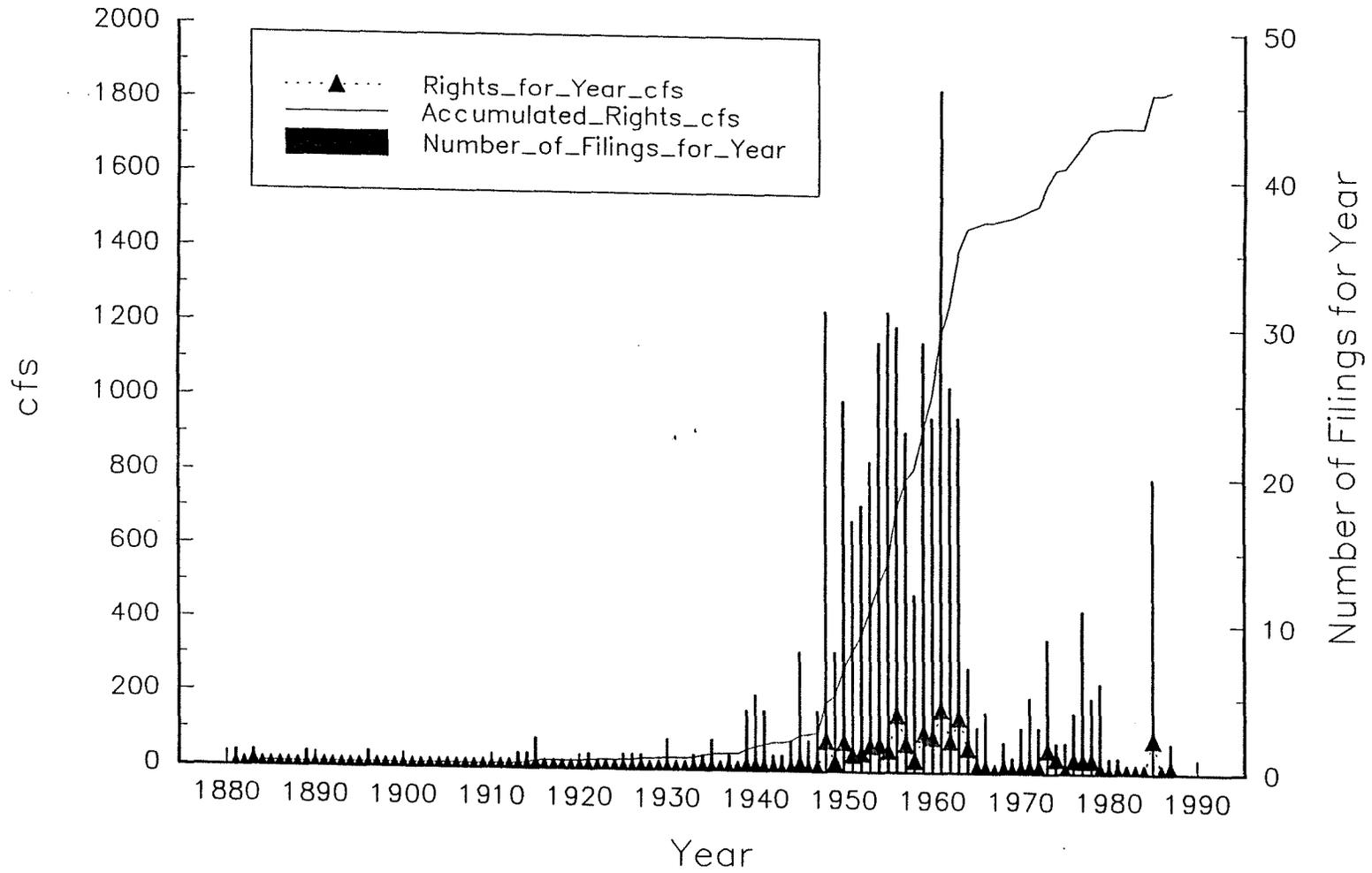
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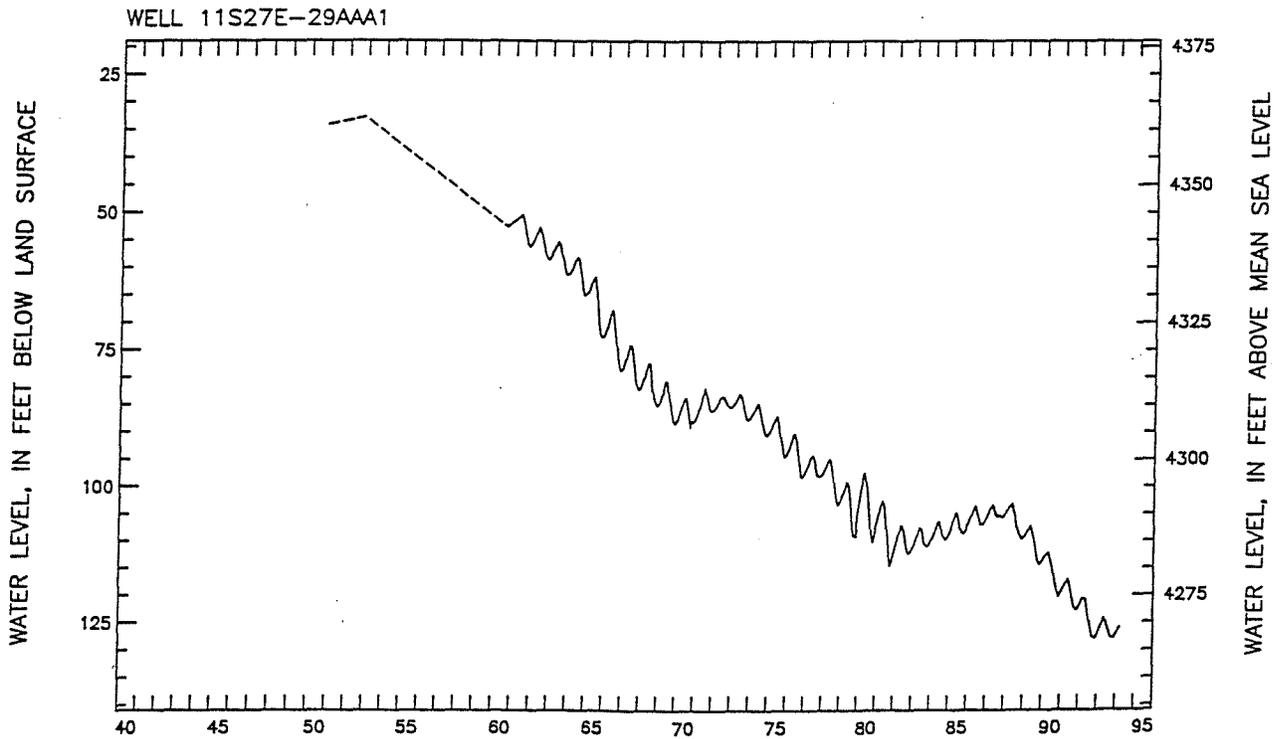
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Walker, E.H., Dutcher, L.C., Decker, S.O., and Dyer, K.L., 1970, The Raft River basin, Idaho-Utah, as of 1966 - a reappraisal of the water resources and effects of ground-water development: Idaho Department of Water Resources Water Information Bulletin 19, 95p.

# Water Rights for Raft River Groundwater

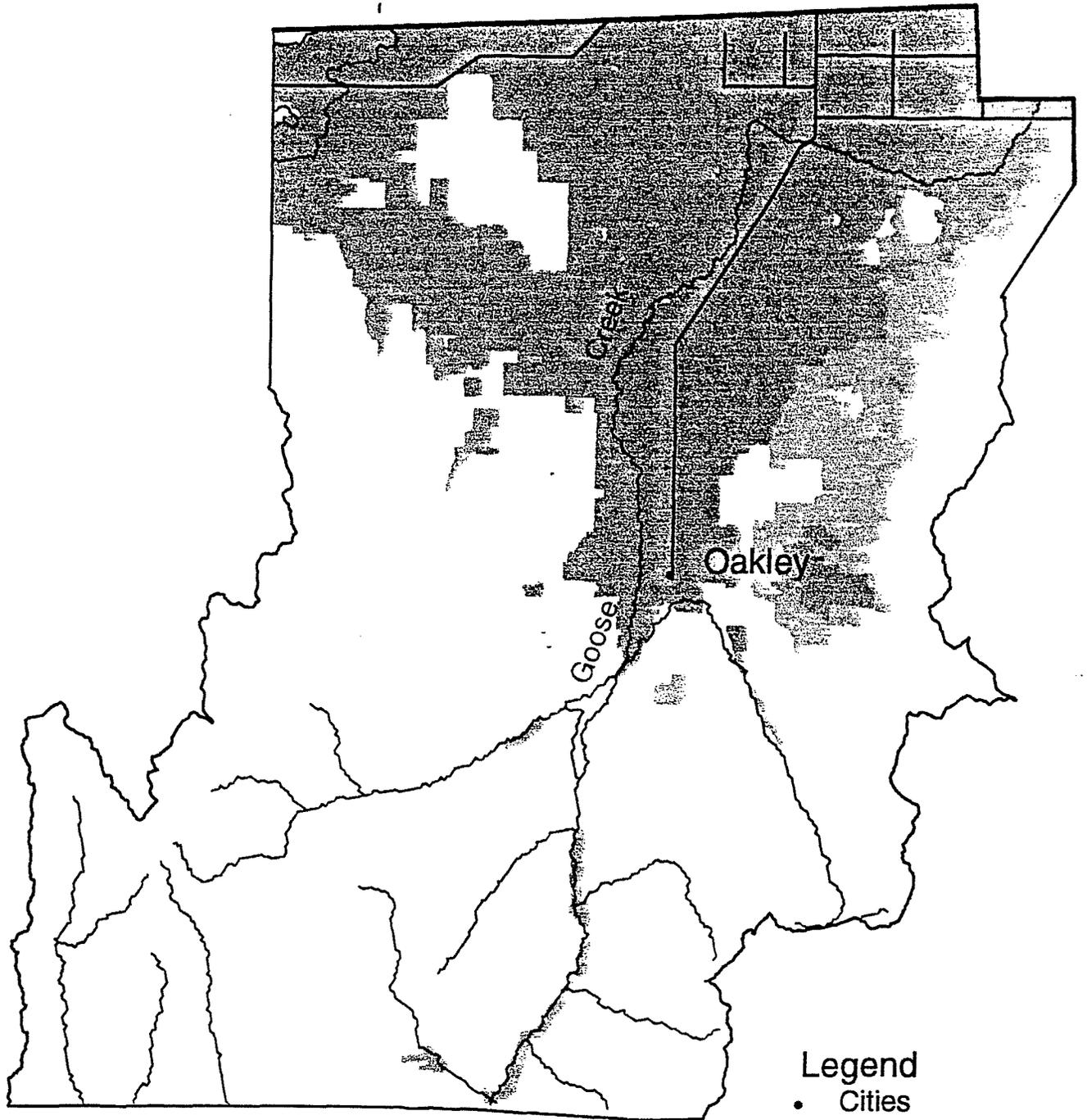


RAFT RIVER



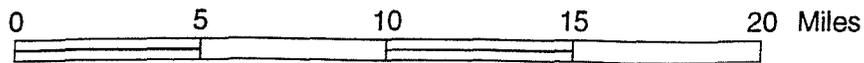
HYDROGRAPH OF WELL 11S27E-29AAA1

# Oakley Fan



Totals  
 Irrigated Agriculture 171,200 Acres  
 Dryland Agriculture 20,000 Acres  
 Total Area (Idaho) 870 Square Miles

Scale 1:324,967



- Legend
- Cities
  - Model Boundary
  - Roads
  - Rivers
  - Basin Boundary
  - Irrigated Agriculture
  - Dryland Agriculture

OAKLEY FAN		
Drainage Area (mi <sup>2</sup> )	1,630	
Elevation (ft)	4,150 - >10,000	
Principal Drainage	Goose Creek	
Towns/Population	Oakley 635, Burley 8,702	
Ground Water Diversion Rate (cfs)		
Water Rights	2220	
Total Irrigated Land (ac)		
Previous Estimate	1969	153,000
	1986	171,200
Water Budget (ac-ft/yr)		
Precipitation	1,347,000	
Recharge: Snake River	345,000	
Basin Outflow	Surface Water	210,000
	Ground Water	215,000
Evapotranspiration	1,267,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	1,700 - 3,100,000	
Storage Coefficient	0.001 - 0.07	
Hydrologic Data Available		
Continuous Stream Gages	Goose Cr nr Oakley (082500) Trapper Cr nr Oakley (083000) Oakley Reservoir nr Oakley (083500)	
Observation Wells	14 USGS wells and 14 IDWR wells	
Mass WL Measurements	Spring 1966, Spring/Fall 1984	
Diversion Records	Good	

OAKLEY FAN

List of References

Crosthwaite, E.G., 1969, Water resources of the Goose Creek - Rock Creek area, Idaho, Utah, and Nevada: Idaho Department of Reclamation, Water Information Bulletin 8, 73p.

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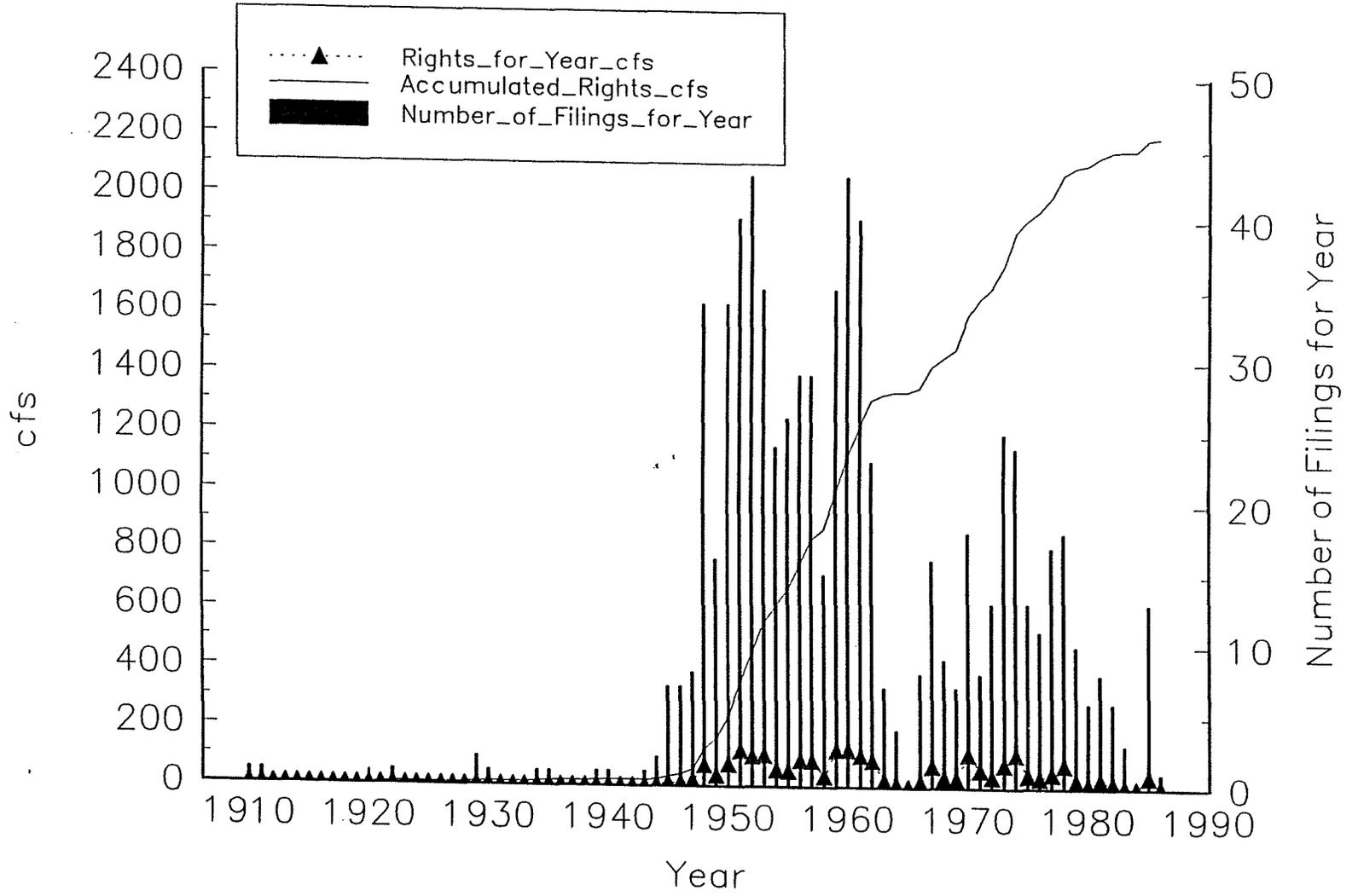
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Williams, R.P., and Young, H.W., 1982, Water resources of Rockland basin, southeastern Idaho: U.S. Geological Survey Open-File Report 82-755, 68p.

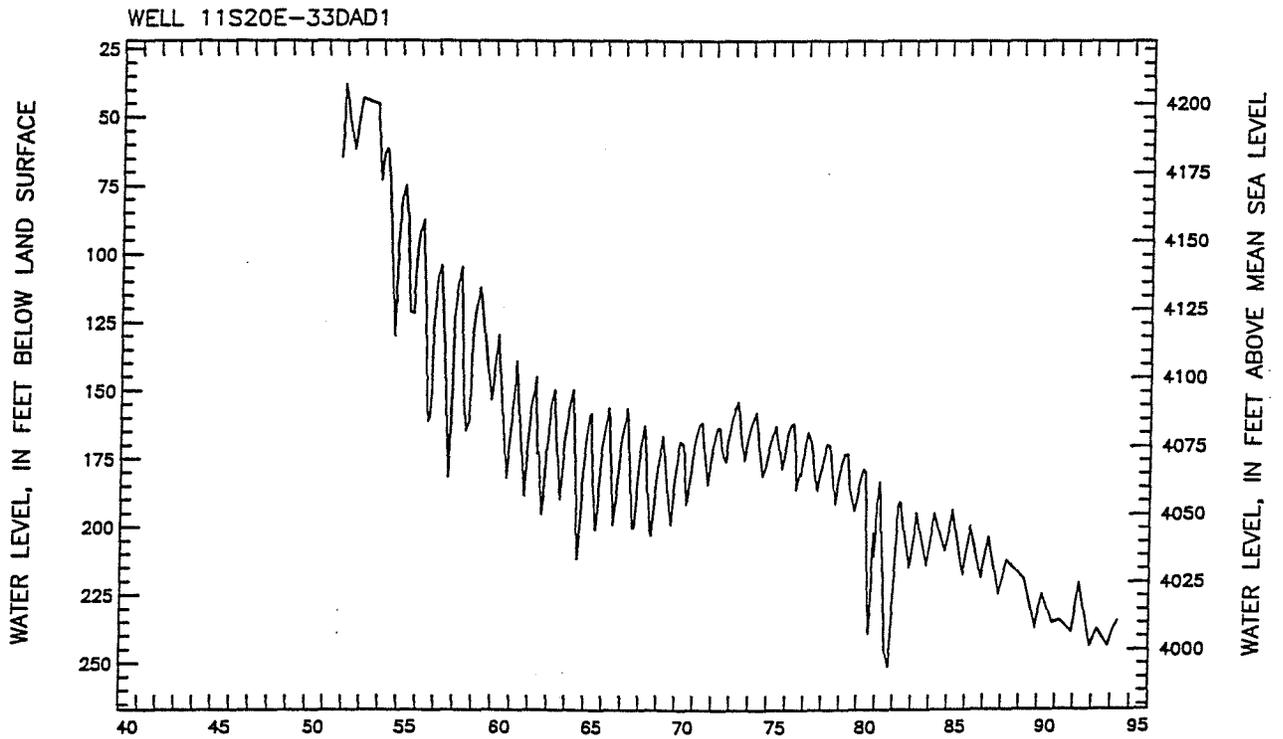
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### Water Rights for Oakley Fan Groundwater

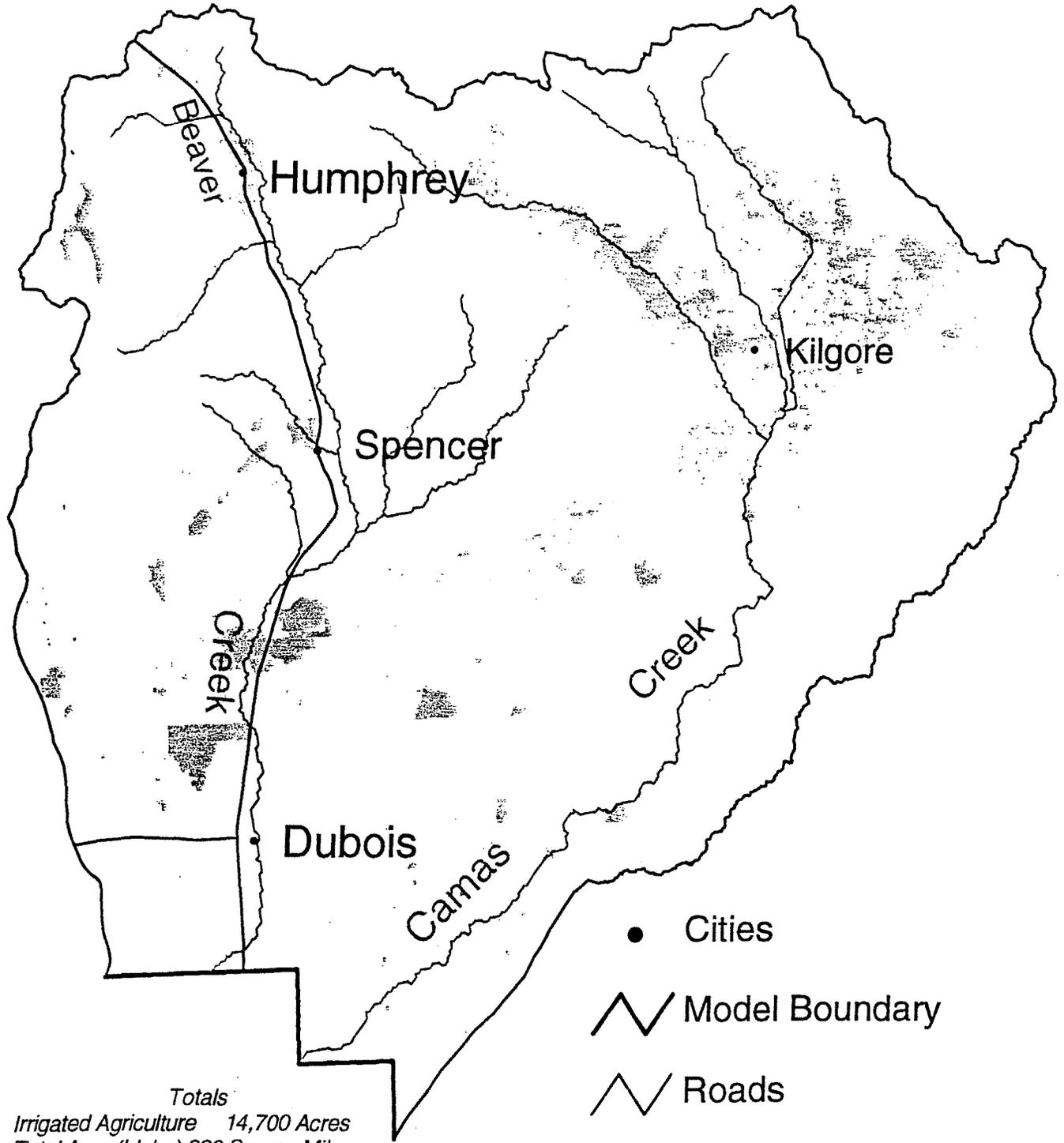


OAKLEY FAN



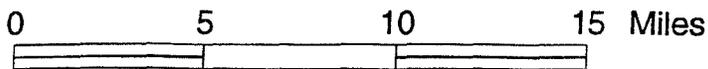
HYDROGRAPH OF WELL 11S20E-33DAD1

# Beaver and Camas Creeks



Totals  
Irrigated Agriculture 14,700 Acres  
Total Area (Idaho) 830 Square Miles

Scale 1:316,361



- Cities
- Model Boundary
- Roads
- Rivers
- Basin Boundary
- Irrigated Agriculture

CAMAS AND BEAVER CREEK BASINS		
Drainage Area (mi <sup>2</sup> )	830	
Elevation (ft)	6,400 - 10,000	
Principal Drainage	Camas and Beaver Creeks	
Towns/Population	Spencer 189, Dubois 420, Hamer 79	
Ground Water Diversion Rate (cfs)		
Water Rights	195	
Total Irrigated Land (ac)		
Previous Estimates	1927	20,400
	1986	14,700
Water Budget (ac-ft/yr)		
Precipitation	872,000	
Basin Outflow	Surface Water	37,000
	Ground Water	267,000
Evapotranspiration	568,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	200 - 20,000	
Storage Coefficient	0.20	
Hydrologic Data Available		
Continuous Stream Gages	Camas Cr nr Kilgore (108900) Camas Cr at Camas (112000) Beaver Cr at Spencer (113000) Beaver Cr at Dubois (113500)	
Observation Wells	3 USGS wells	
Mass WL Measurements	Spring 1980	
Diversion Records	Good	

CAMAS AND BEAVER CREEK BASINS

List of References

Garabedian, S.P., 1992, Hydrology and digital simulation of the regional aquifer system, eastern Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 1408-F, 102p.

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

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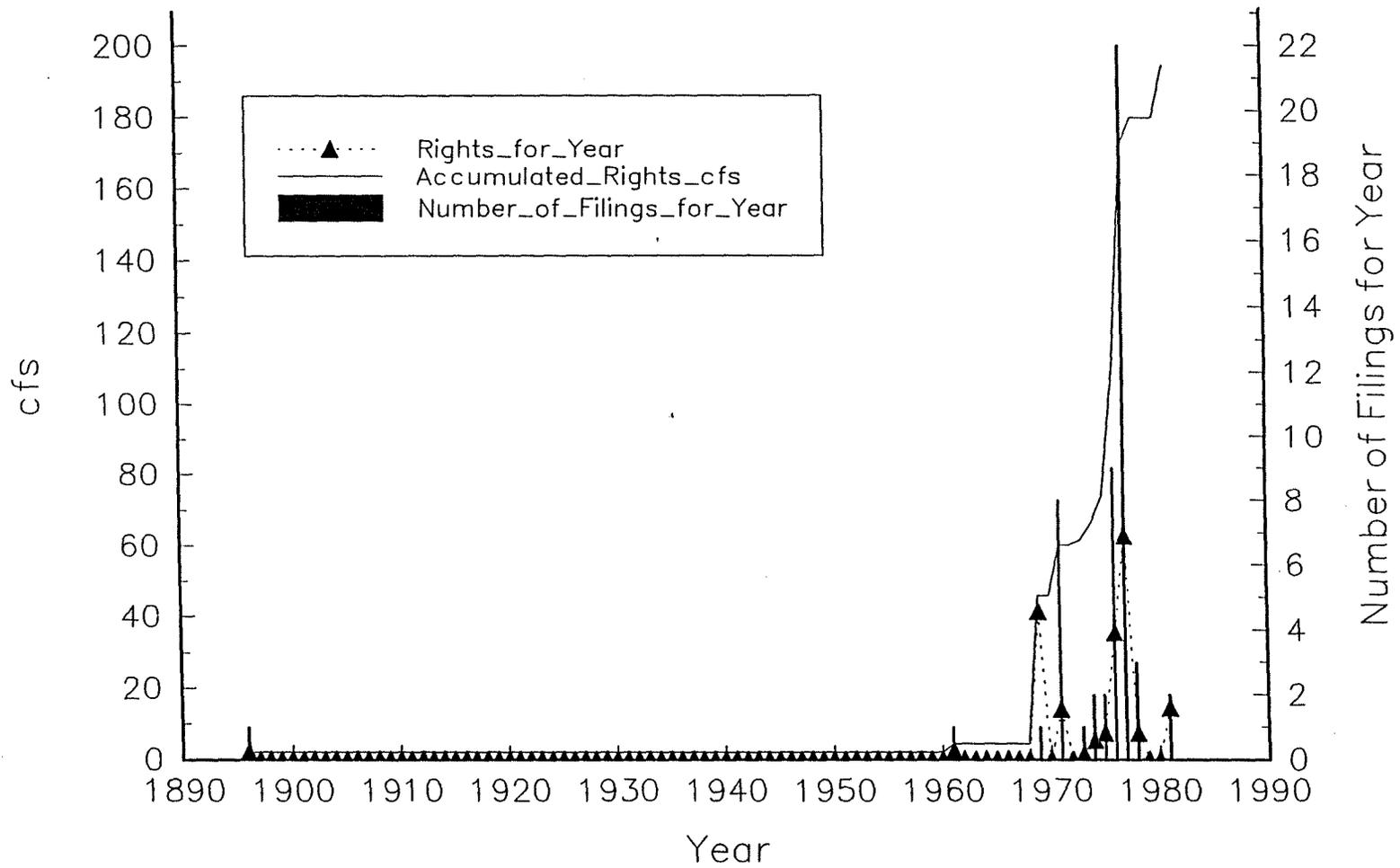
Mundorff, M.J., Crosthwaite, E.G., and Kilburn, C., 1964, Ground water for irrigation in the Snake River basin in Idaho: U.S. Geological Survey Water-Supply Paper 1654, 224p.

Spinazola, J.M., 1994, Geohydrology and simulation of flow and water levels in the aquifer system in the Mud Lake area of the eastern Snake River Plain, eastern Idaho: U.S. Geological Survey Water-Resources Investigations Report 93-4227, 78p.

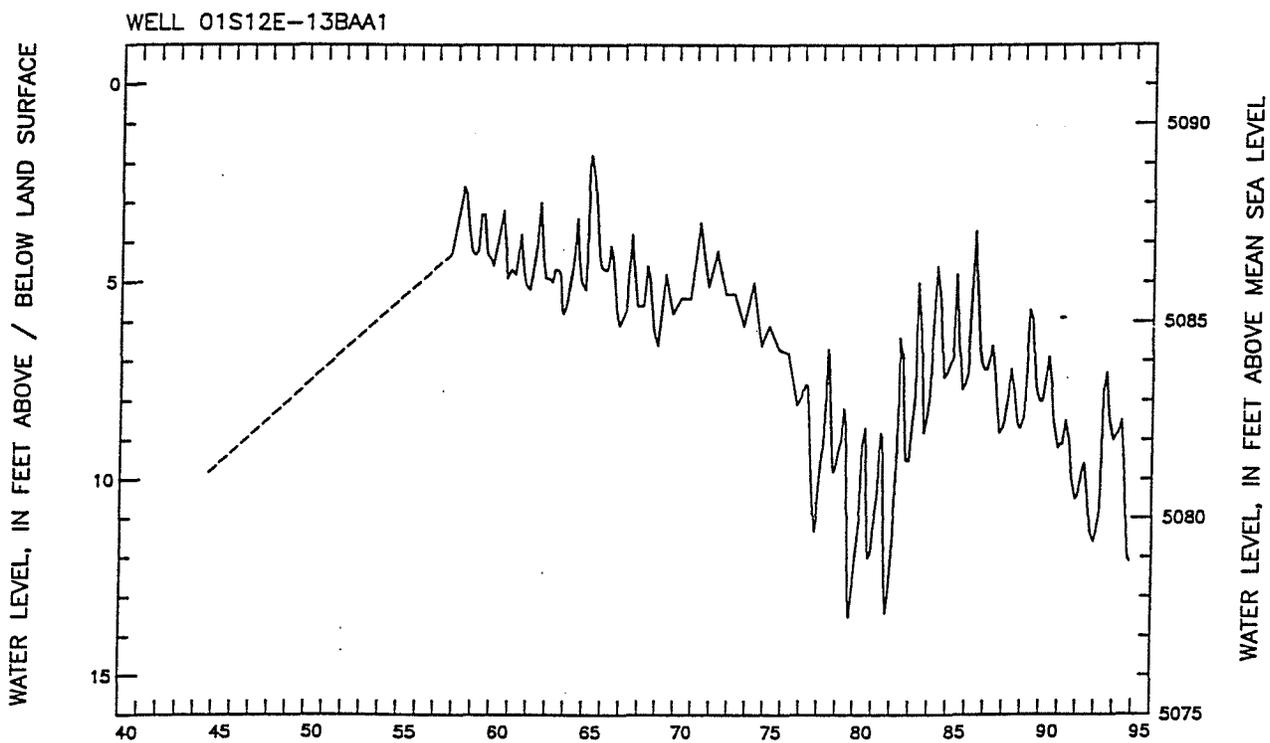
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### Water Rights Beaver/Camas Creeks Groundwater

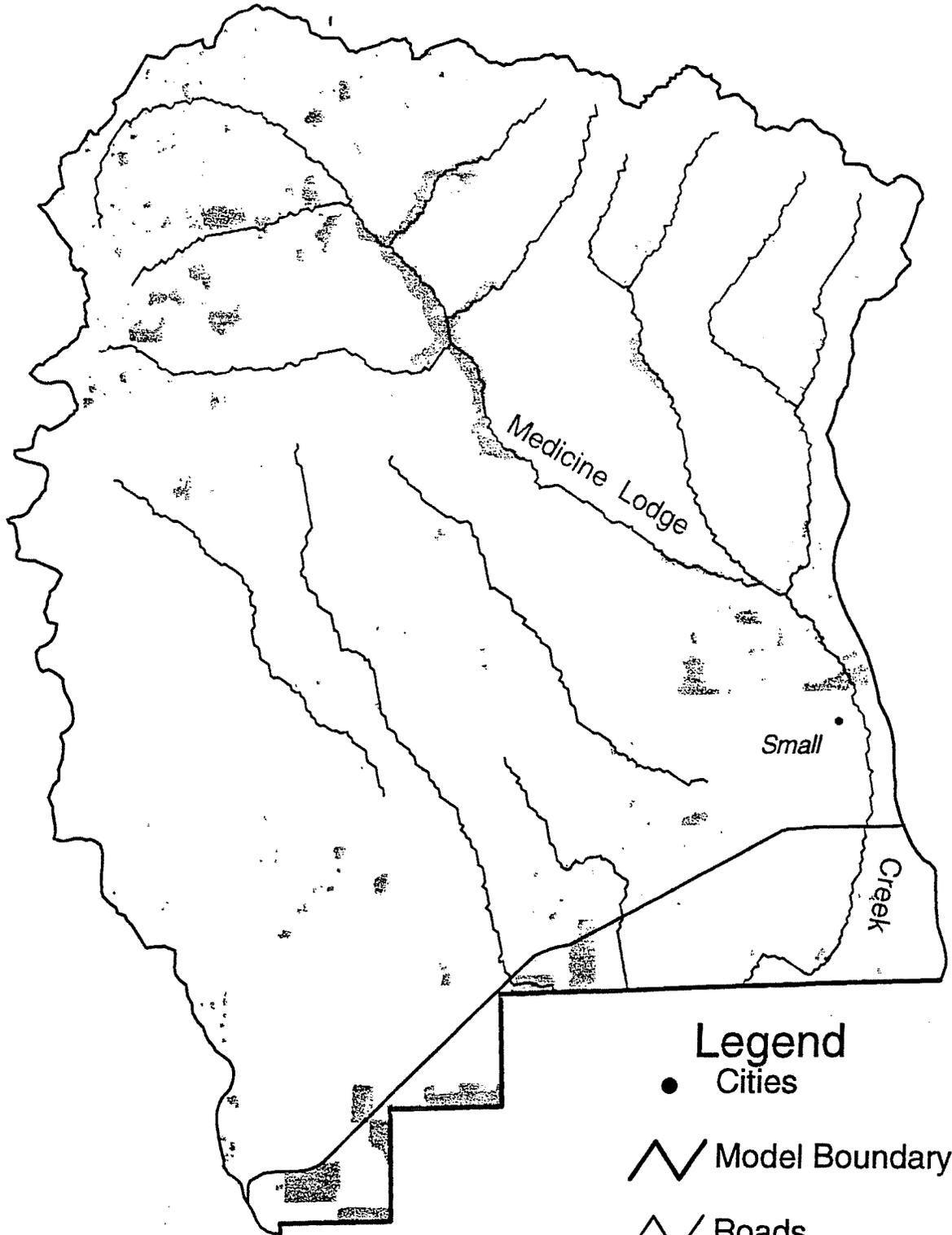


BEAVER CAMAS CREEK



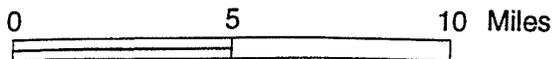
HYDROGRAPH OF WELL 01S12E-13BAA1

# Medicine Lodge Creek



Totals  
Irrigated Agriculture 9,653 Acres  
Total Area 833 Square Miles

Scale 1:275,177



- Legend**
- Cities
  - Model Boundary
  - Roads
  - Rivers
  - Basin Boundary
  - Irrigated Agriculture

MEDICINE LODGE CREEK BASIN		
Drainage Area (mi <sup>2</sup> )	830	
Elevation (ft)	5,440 - >9,000	
Principal Drainage	Medicine Lodge, Warm Spring, Deep, and Blue Creeks	
Towns/Population	Small	
Ground Water Diversion Rate (cfs)		
Water Rights	285	
Total Irrigated Land (ac)		
Previous Estimates	1927	6,000
	1986	9,700
Water Budget (ac-ft/yr)		
Precipitation	872,000	
Basin Outflow	Surface Water	41,000
	Ground Water	20,000 - 30,000
Evapotranspiration	801,000 - 811,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	200 - 20,000	
Storage Coefficient	0.20	
Hydrologic Data Available		
Continuous Stream Gages	Medicine Lodge Cr nr Small (116500)	
Observation Wells	2 USGS wells	
Mass WL Measurements	Spring 1980	
Diversion Records	Good	

MEDICINE LODGE CREEK BASIN

List of References

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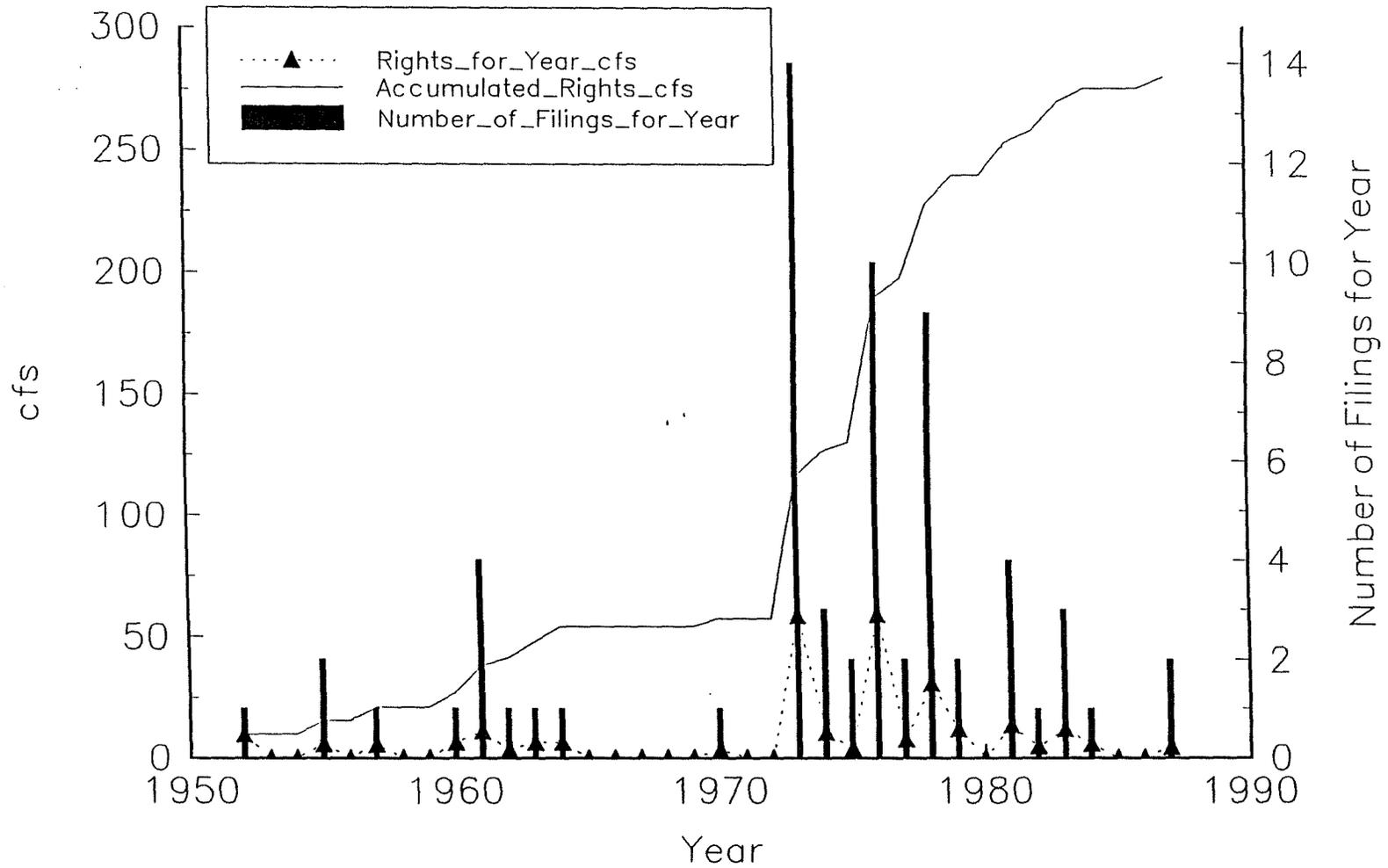
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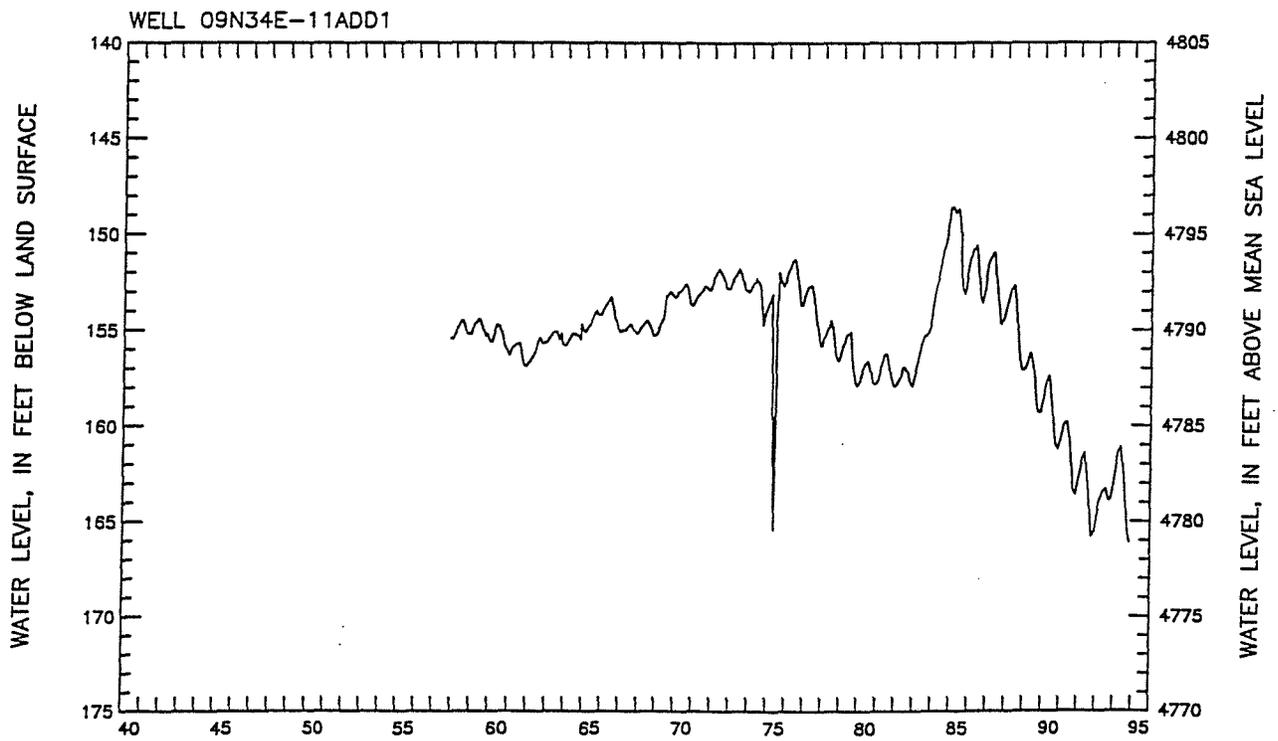
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### Water Rights for Medicine Lodge Creek Groundwater

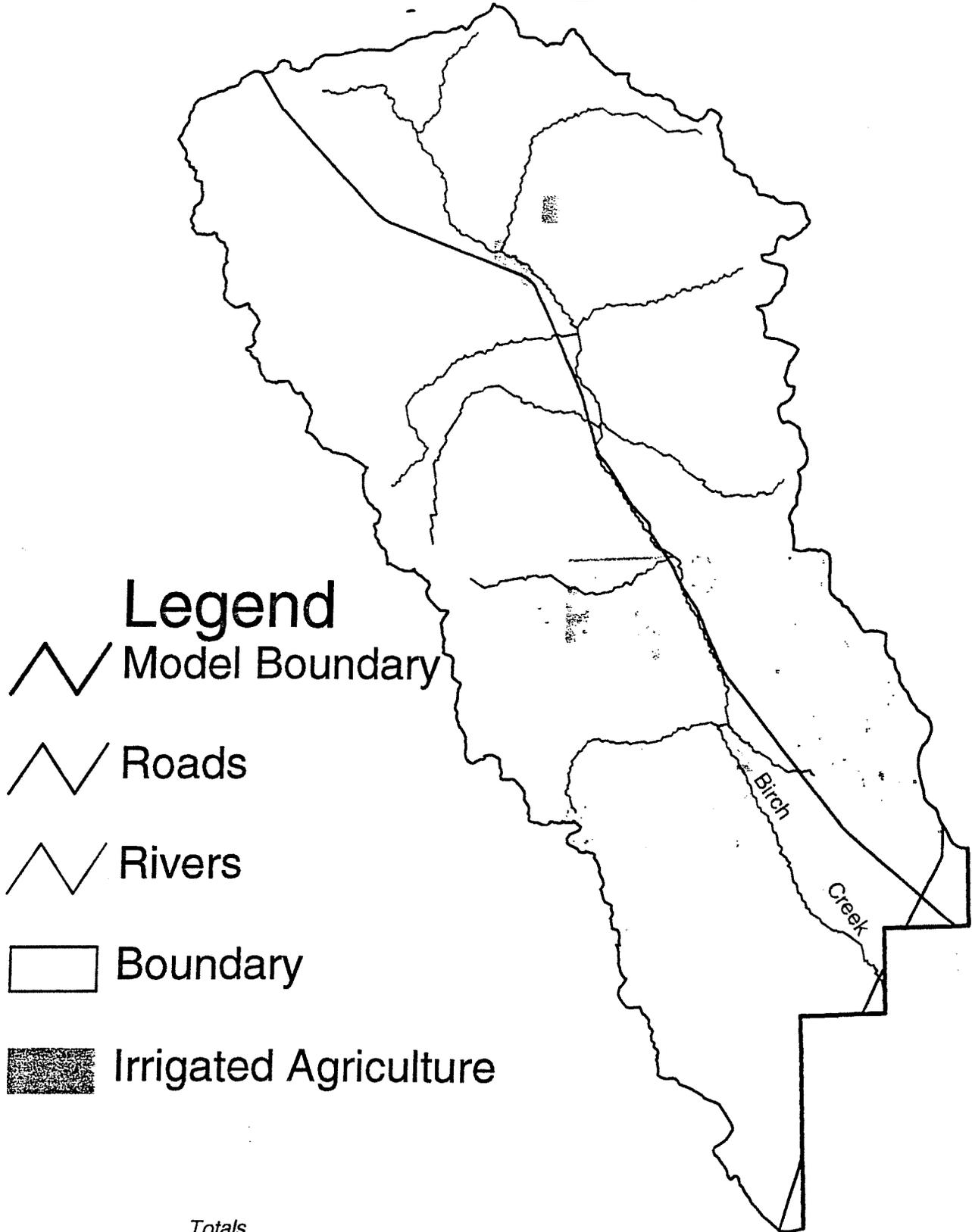


MEDICINE LODGE

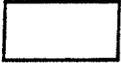


HYDROGRAPH OF WELL 09N34E-11ADD1

# Birch Creek

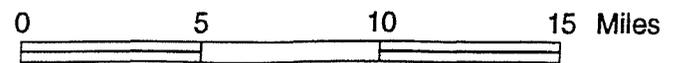


## Legend

-  Model Boundary
-  Roads
-  Rivers
-  Boundary
-  Irrigated Agriculture

Totals  
Irrigated Agriculture 1,400 Acres  
Total Area 600 Square Miles

Scale 1:337,630



BIRCH CREEK BASIN		
Drainage Area (mi <sup>2</sup> )	600	
Elevation (ft)	5,000 - >10,000	
Principal Drainage	Birch Creek	
Towns/Population	Reno	
Ground Water Diversion Rate (cfs)		
Water Rights	5	
Total Irrigated Land (ac)		
Previous Estimates	1927	1,200
	1986	1,400
Water Budget (ac-ft/yr)		
Precipitation	749,000	
Basin Outflow	Surface Water	0
	Ground Water	57,000 - 78,000
Evapotranspiration	671,000 - 692,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	N/A	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	N/A	
Observation Wells	N/A	
Mass WL Measurements	N/A	
Diversion Records	Good	

BIRCH CREEK BASIN

List of References

Garabedian, S.P., 1992, Hydrology and digital simulation of the regional aquifer system, eastern Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 1408-F, 102p.

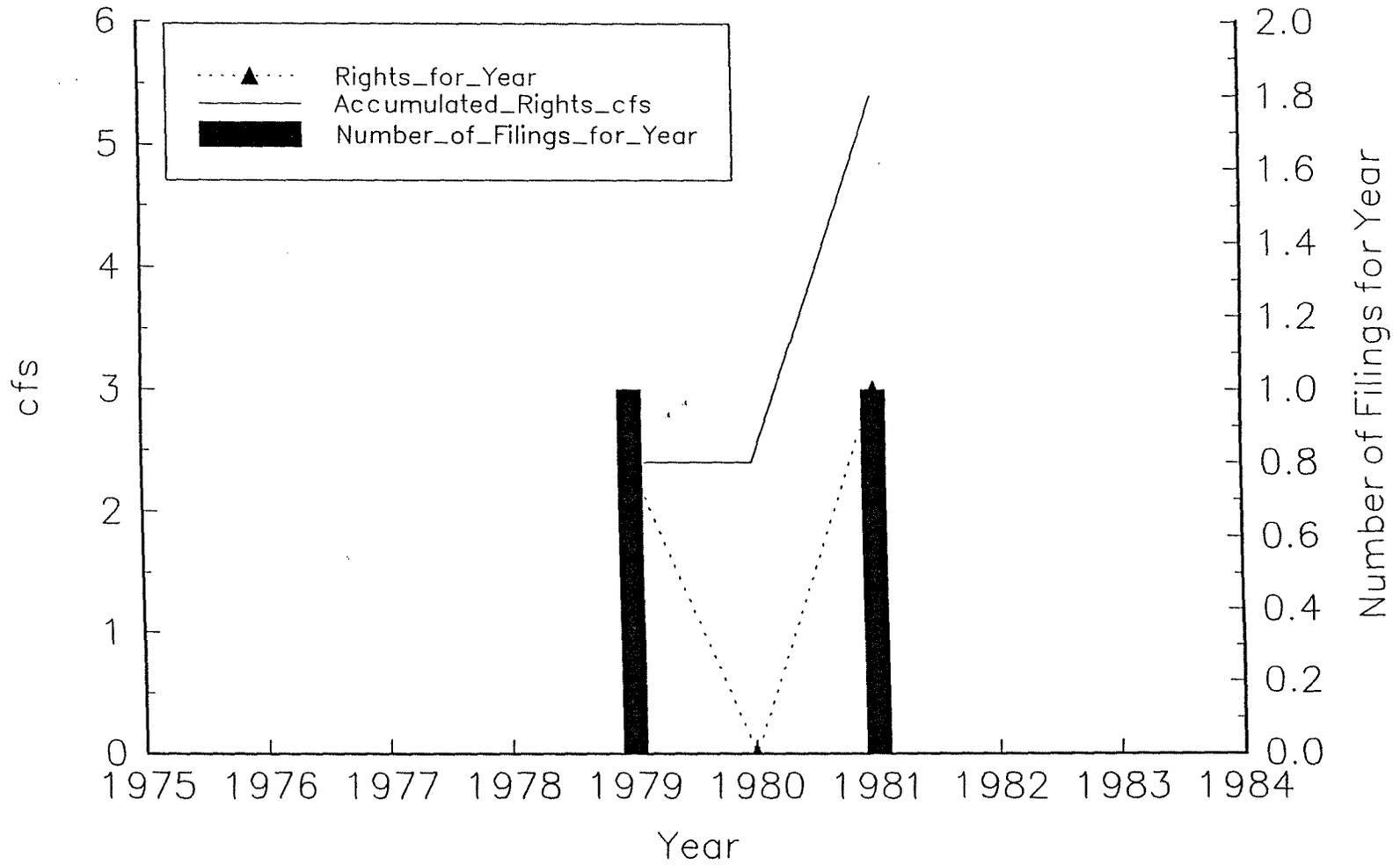
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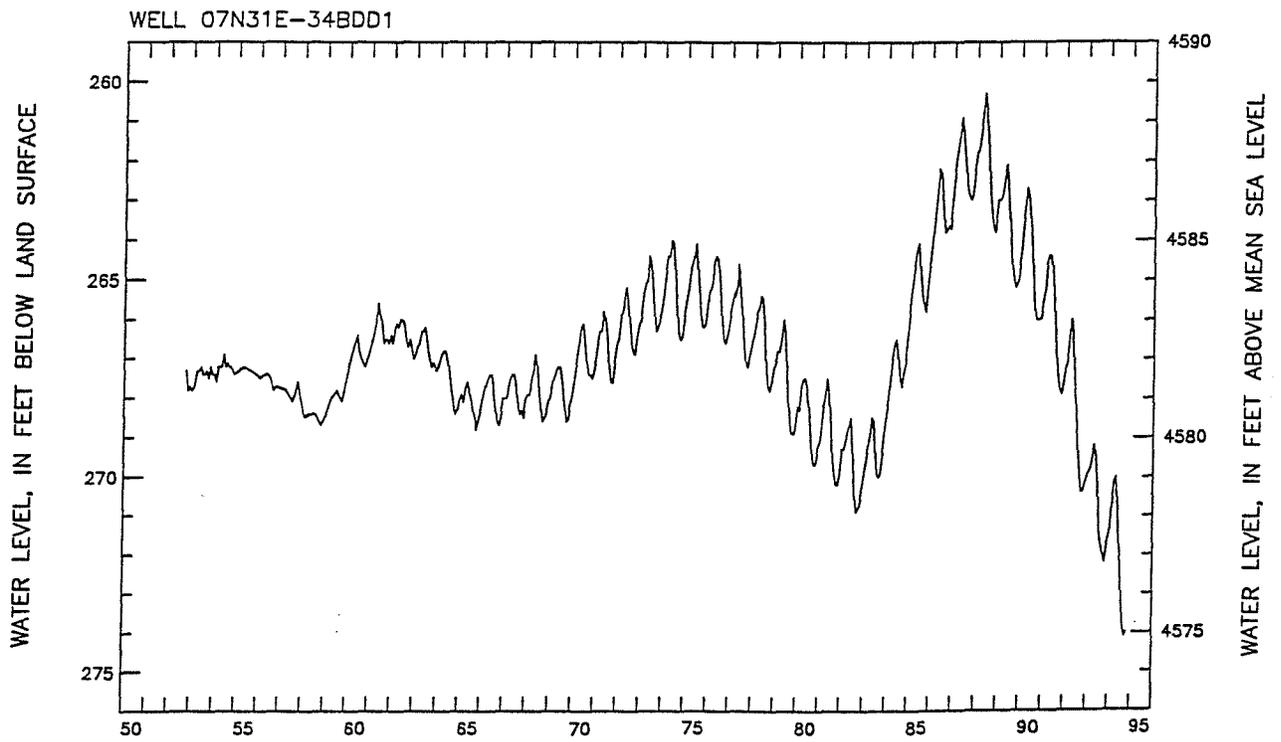
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### Water Rights for Birch Creek Groundwater

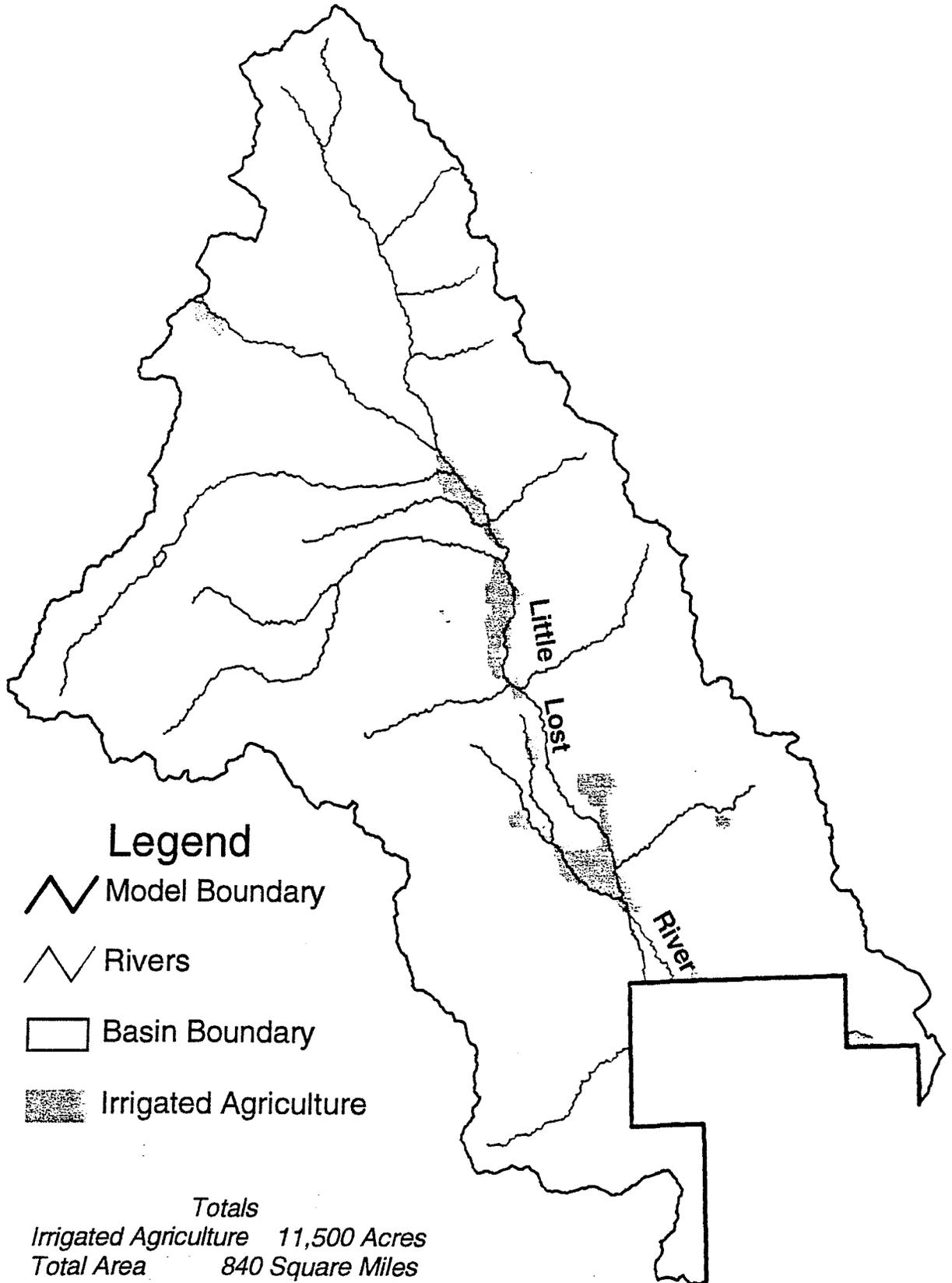


BIRCH CREEK



HYDROGRAPH OF WELL 07N31E-34BDD1

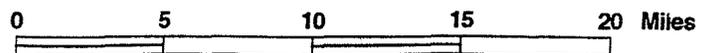
# Little Lost River



- Legend**
-  Model Boundary
  -  Rivers
  -  Basin Boundary
  -  Irrigated Agriculture

*Totals*  
*Irrigated Agriculture 11,500 Acres*  
*Total Area 840 Square Miles*

**Scale 1:409,323**



LITTLE LOST RIVER BASIN	
Drainage Area (mi <sup>2</sup> )	840
Elevation (ft)	4,800 - 12,000
Principal Drainage	Little Lost River
Towns/Population	Howe 20
Ground Water Diversion Rate (cfs)	
Water Rights	120
Total Irrigated Land (ac)	
Previous Estimates	1986 11,500
Water Budget (ac-ft/yr)	
Precipitation	1,147,000
Basin Outflow	Surface Water 52,000
	Ground Water 100,000
Evapotranspiration	995,000
Aquifer Properties	
Transmissivity (ft <sup>2</sup> /d)	29,000 - 66,000
Storage Coefficient	0.15 - 0.20
Hydrologic Data Available	
Continuous Stream Gages	Little Lost R below Wet Cr (118700)
Observation Wells	4 USGS wells
Mass WL Measurements	Spring 1966, 1970's
Diversion Records	Fair

## LITTLE LOST RIVER BASIN

### List of References

Clebsch, A., Jr., Waite, H.A., and Decker, S.O., 1974, The availability of water in the Little Lost River basin, Idaho: Idaho Department of Water Resources Water Information Bulletin 37, 60p.

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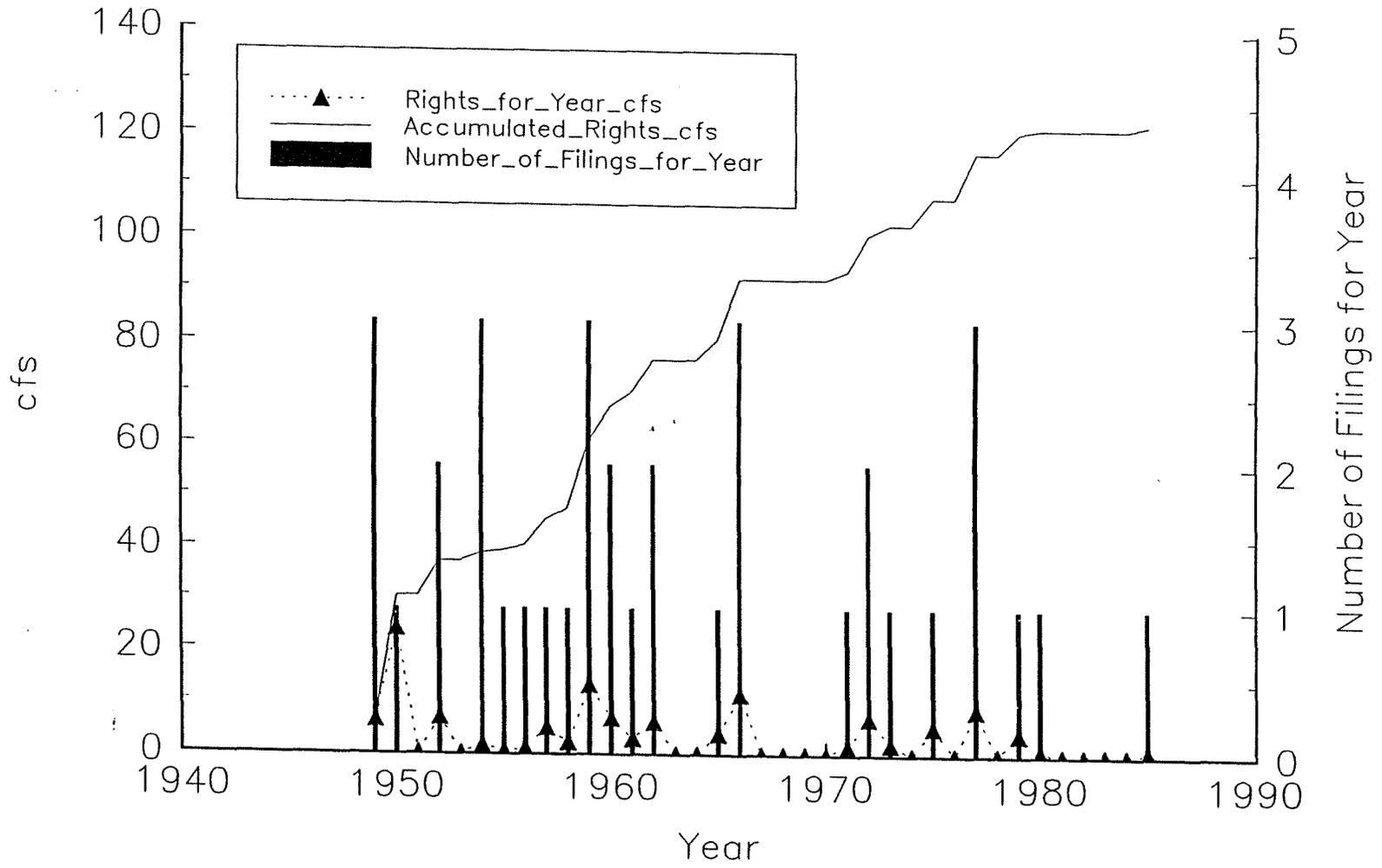
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Stearns, H.T., Crandall, L., and Steward, W.G., 1938, Geology and ground-water resources of the Snake River Plain in southeastern Idaho: U.S. Geological Survey Water-Supply Paper 774, 268p.

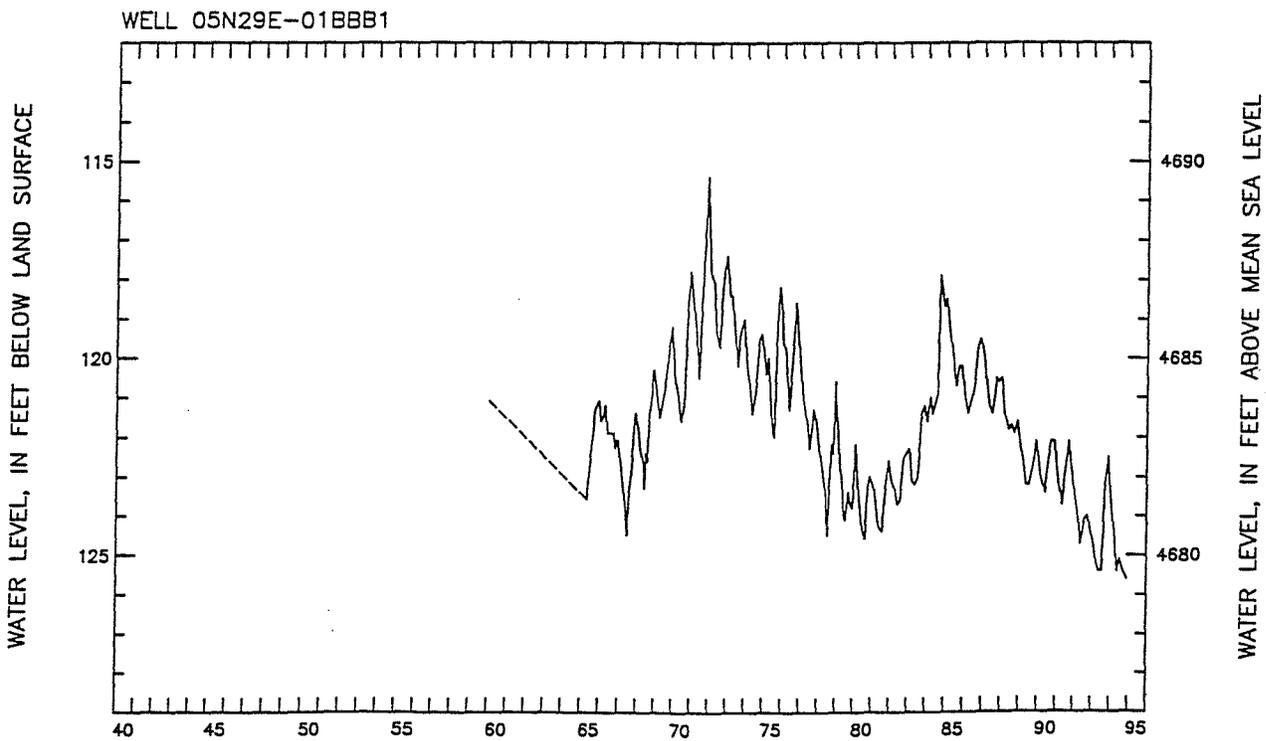
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### Water rights for Little Lost River Groundwater

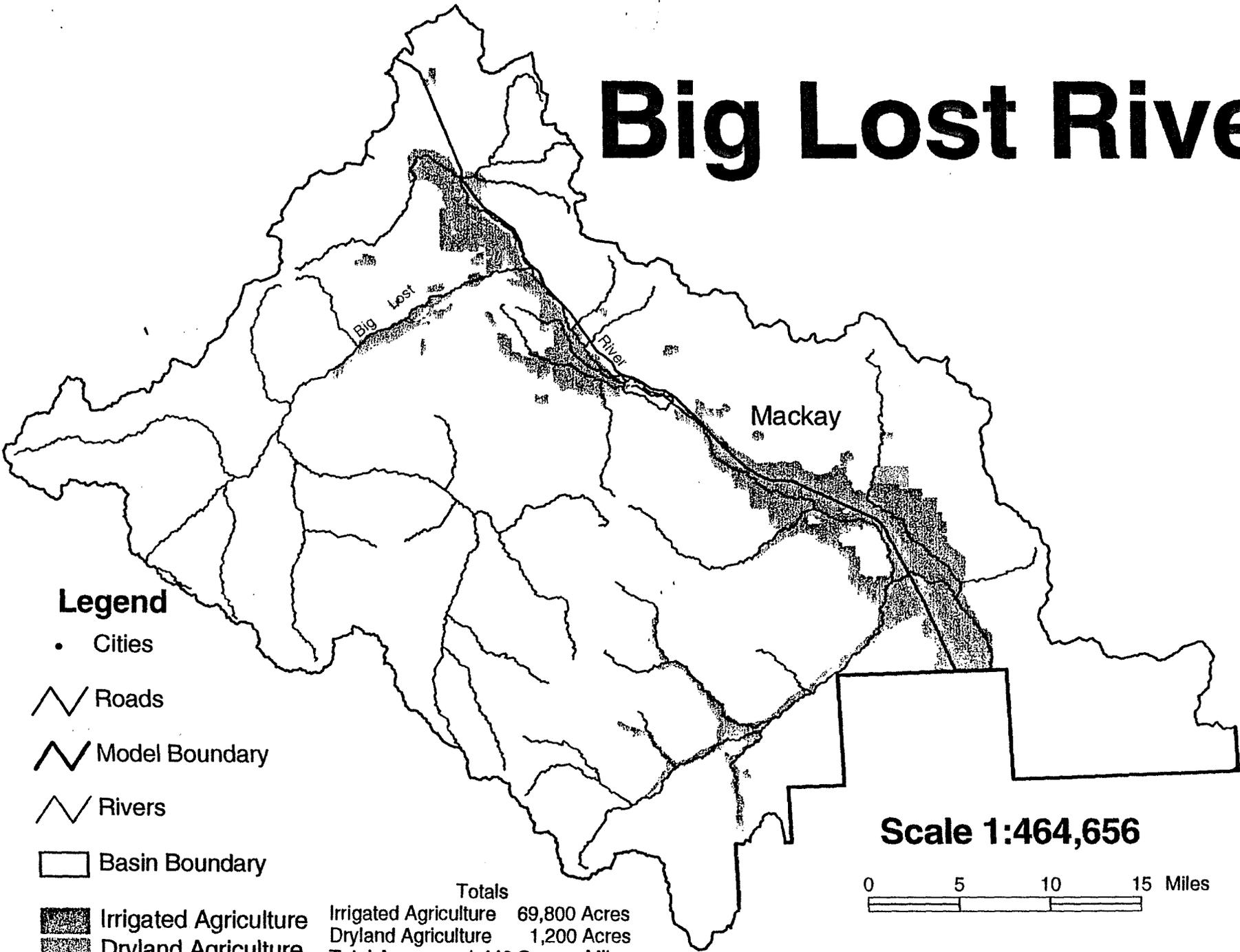


LITTLE LOST



HYDROGRAPH OF WELL 05N29E-01BBB1

# Big Lost River



## Legend

• Cities

∧ Roads

∧ Model Boundary

∧ Rivers

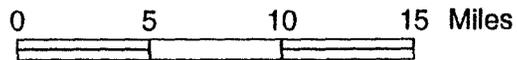
□ Basin Boundary

■ Irrigated Agriculture

■ Dryland Agriculture

Totals	
Irrigated Agriculture	69,800 Acres
Dryland Agriculture	1,200 Acres
Total Area	1,440 Square Miles

Scale 1:464,656



BIG LOST RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	1,440	
Elevation (ft)	5,300 - >10,000	
Principal Drainage	Big Lost River	
Towns/Population	Mackay 171, Moore 190, Arco 1,016	
Ground Water Diversion Rate (cfs)		
Water Rights	510	
Total Irrigated Land (ac)		
Previous Estimates	1927	50,000
	1970	75,500
	1986	69,800
Water Budget (ac-ft/yr)		
Precipitation	1,206,000 - 1,551,000	
Basin Outflow	Surface Water	74,000
	Ground Water	142,000 - 308,000
Evapotranspiration	824,000 - 1,335,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	130,000 - 200,000	
Storage Coefficient	0.001	
Hydrologic Data Available		
Continuous Stream Gages	N. Fork Big Lost R at Wild Horse (120000) Big Lost R at Howell Ranch (120500) Mackay Reservoir nr Mackay (126000) Big Lost R below Mackay Res (127000) Big Lost R nr Arco (132500)	
Observation Wells	7 USGS wells	
Mass WL Measurements	Fall 1967-68 Spring 1991	
Diversion Records	Good	

## BIG LOST RIVER BASIN

### List of References

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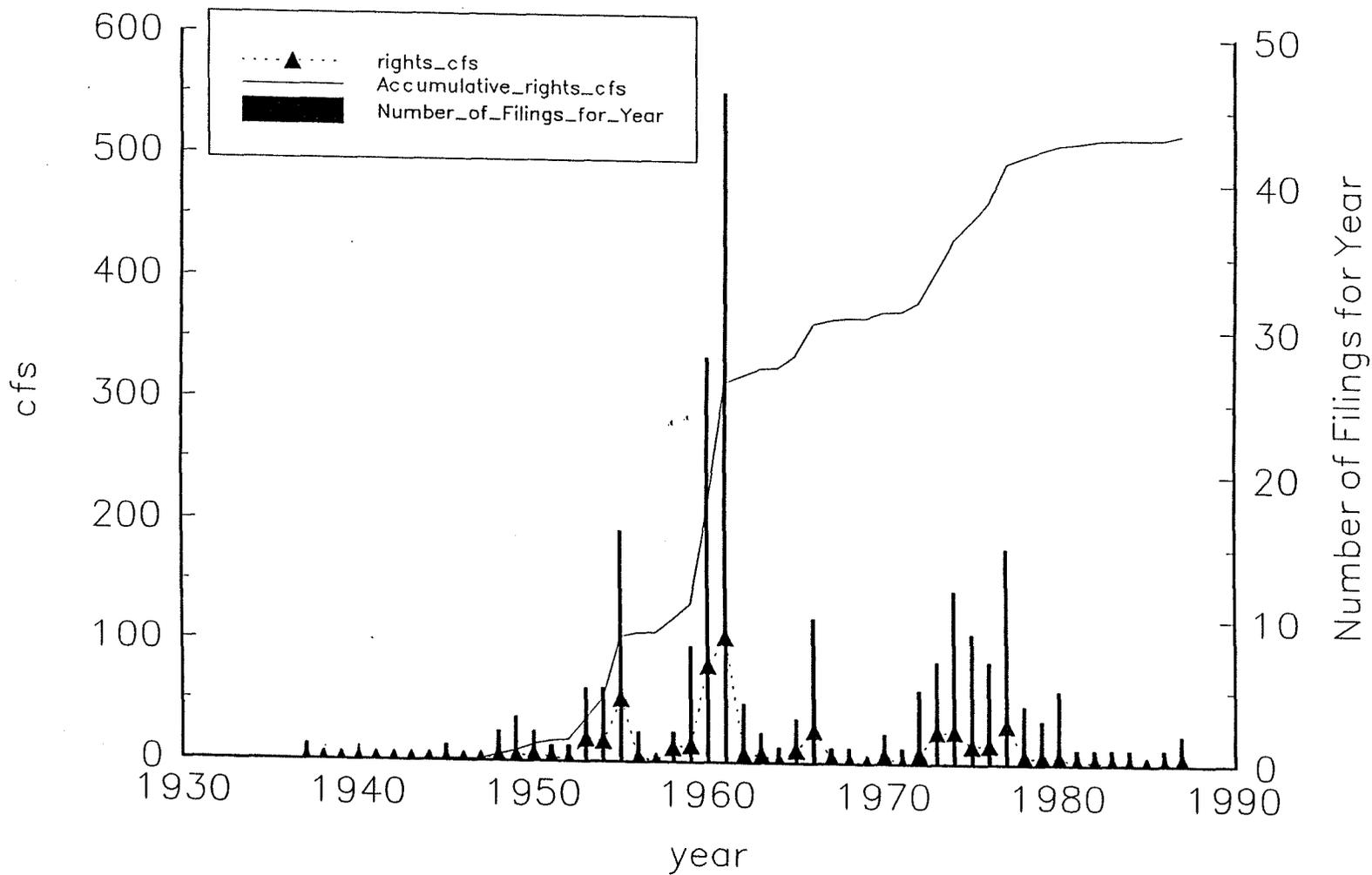
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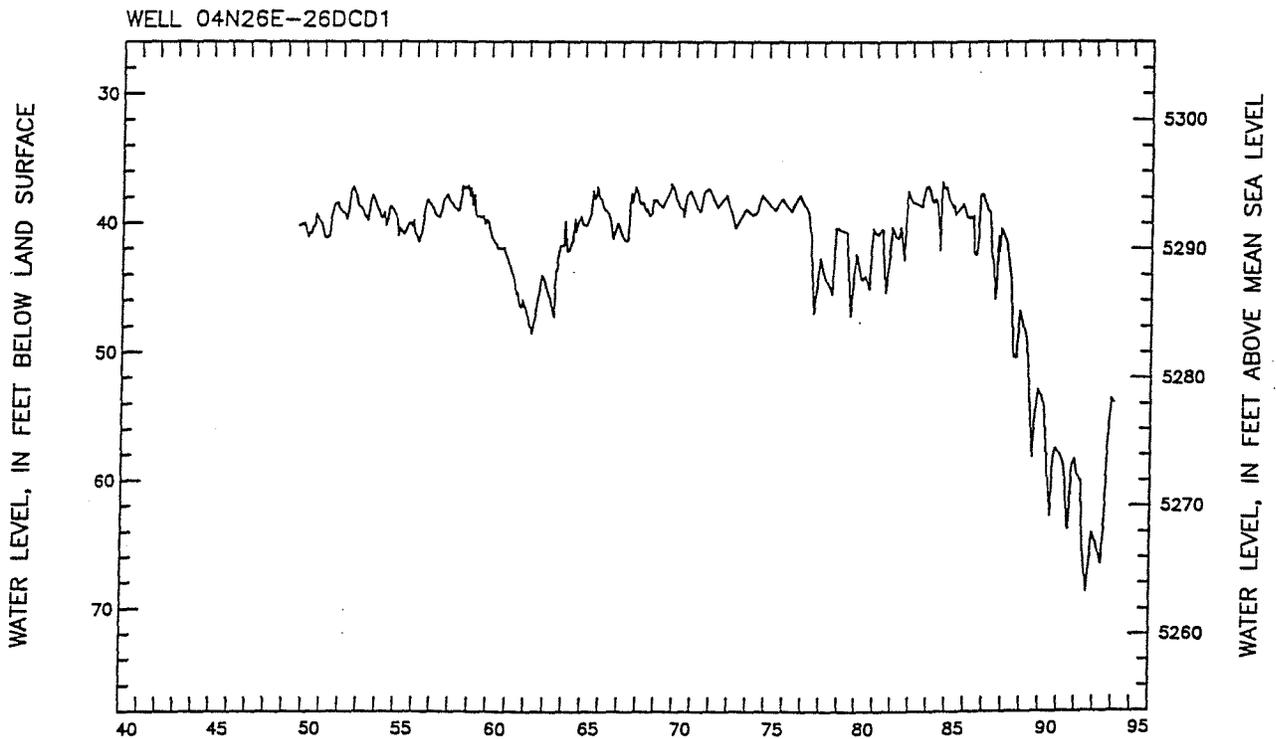
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# Water Rights for Big Lost River Groundwater

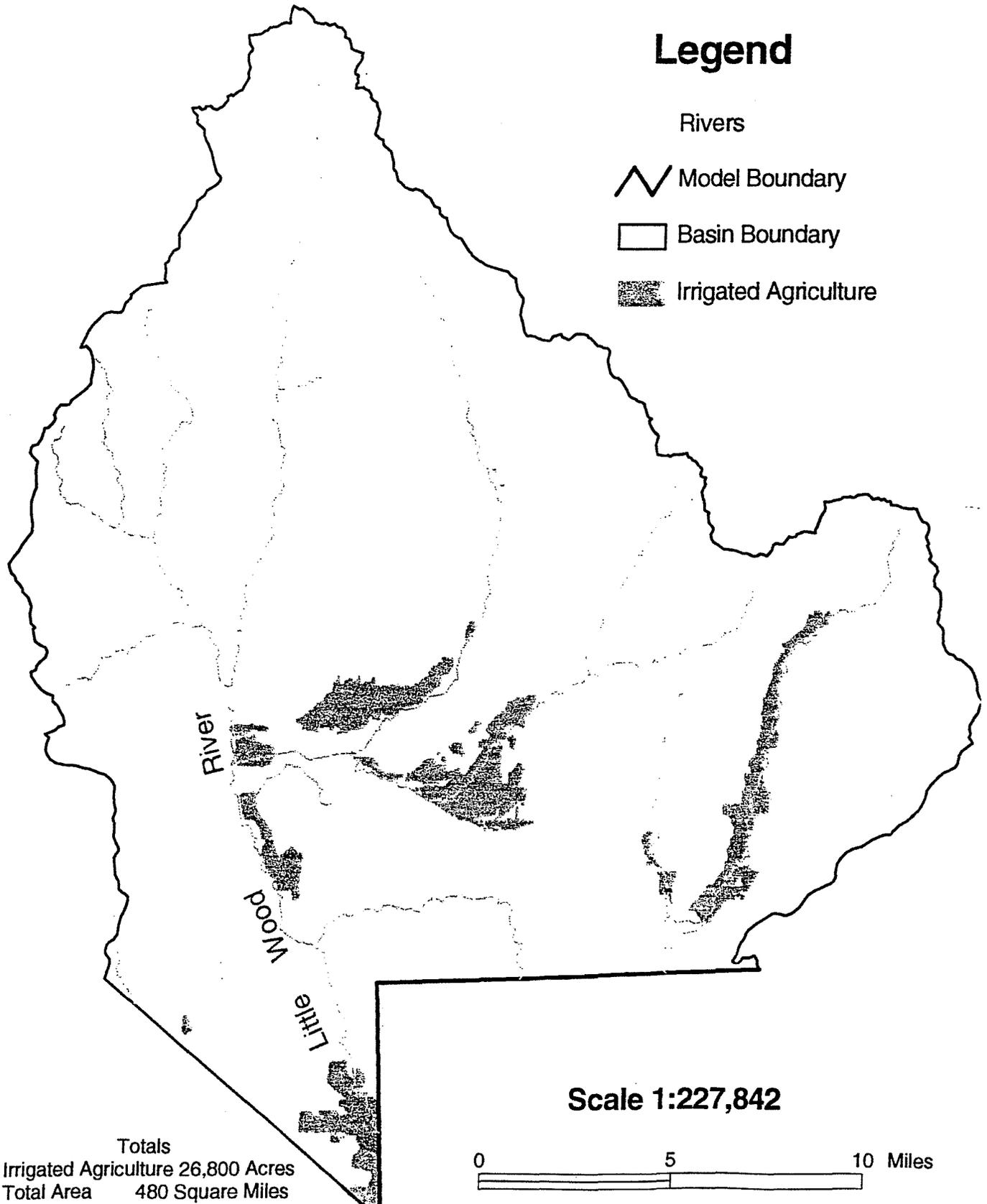


BIG LOST



HYDROGRAPH OF WELL 04N26E-26DCD1

# Little Wood River



LITTLE WOOD RIVER BASIN	
Drainage Area (mi <sup>2</sup> )	480
Elevation (ft)	4,800 - 11,000
Principal Drainage	Little Wood River and Fish Creek
Towns/Population	Carey 300
Ground Water Diversion Rate (cfs)	
Water Rights	36
Total Irrigated Land (ac)	
Previous Estimates	1986 26,800
Water Budget (ac-ft/yr)	
Precipitation	566,000
Basin Outflow	Surface Water 124,000
	Ground Water 13,000 - 24,000
Evapotranspiration	418,000 - 429,000
Aquifer Properties	
Transmissivity (ft <sup>2</sup> /d)	N/A
Storage Coefficient	N/A
Hydrologic Data Available	
Continuous Stream Gages	Little Wood R @ High Five Cr (147900) Little Wood Reservoir (148200) Little Wood R nr Carey (148500)
Observation Wells	2 USGS wells
Mass WL Measurements	Fall 1952
Diversion Records	Good

LITTLE WOOD RIVER BASIN

List of References

Garabedian, S.P., 1992, Hydrology and digital simulation of the regional aquifer system, eastern Snake River Plain, Idaho: U.S. Geological Survey Professional Paper 1408-F, 102p.

Harenberg, W.A., Jones, M.L., O'Dell, I., Brennan, T.S., Lehmann, A.K., and Tungate, A.M., 1993, Water resources data, Idaho, water year 1993: U.S. Geological Survey Water-Data Report ID-93-1.

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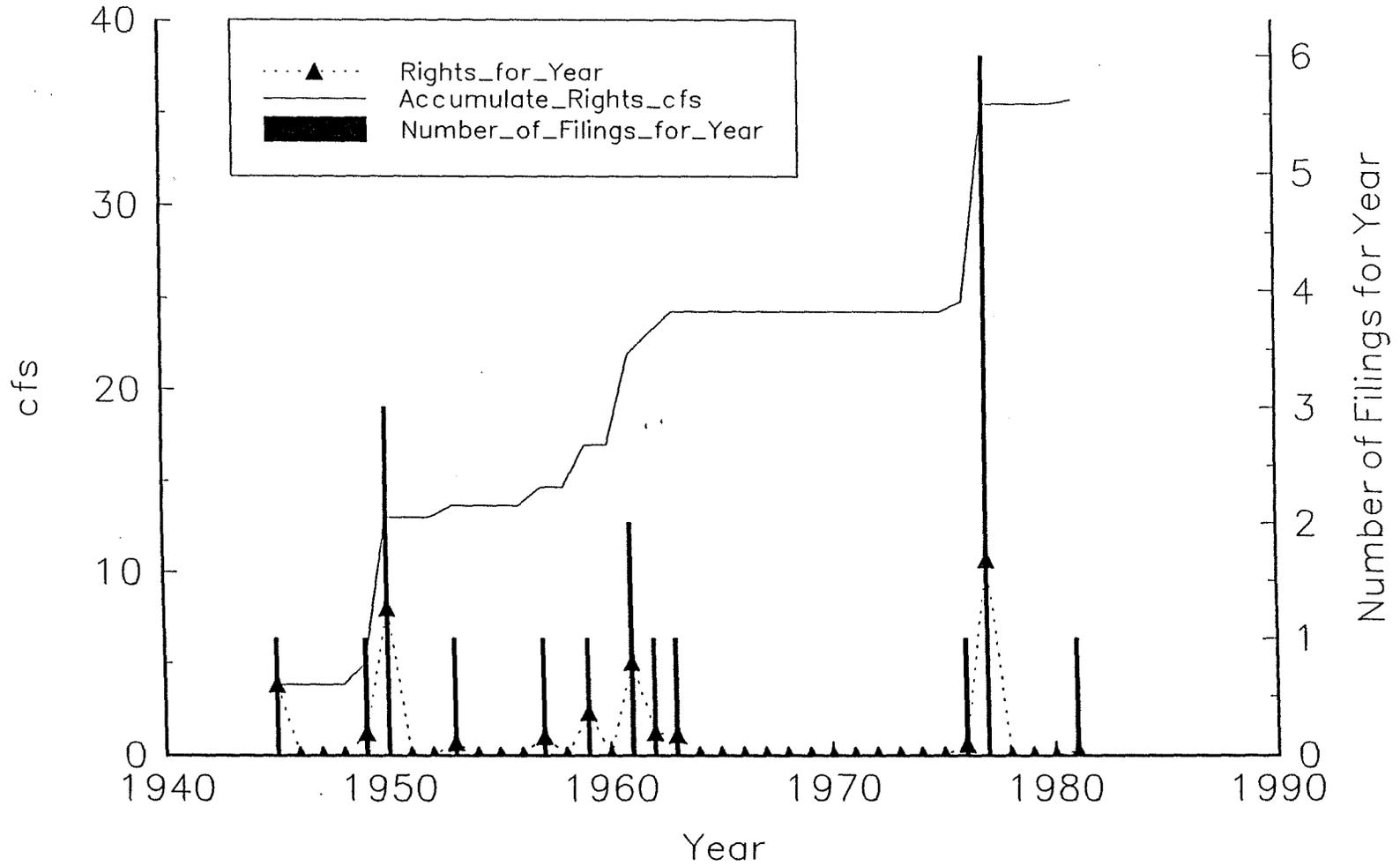
Mundorff, M.J., Crosthwaite, E.G., and Kilburn, C., 1964, Ground water for irrigation in the Snake River basin in Idaho: U.S. Geological Survey Water-Supply Paper 1654, 224p.

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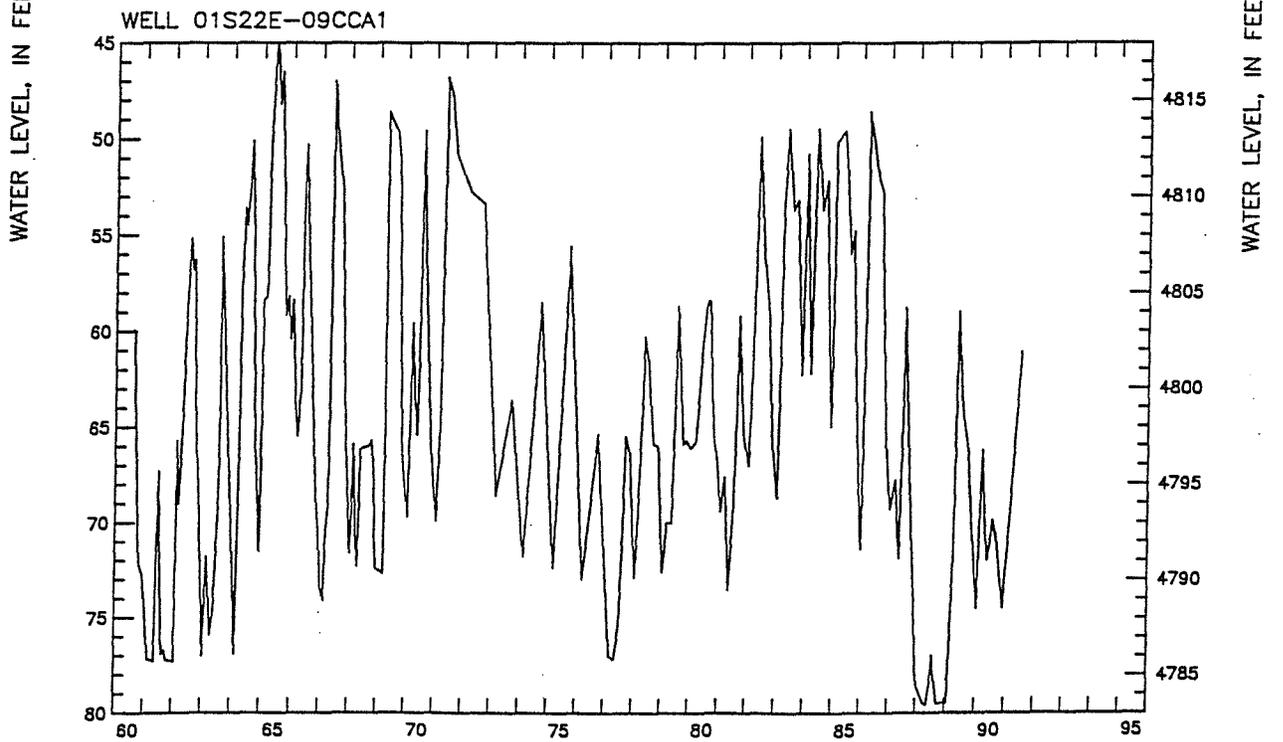
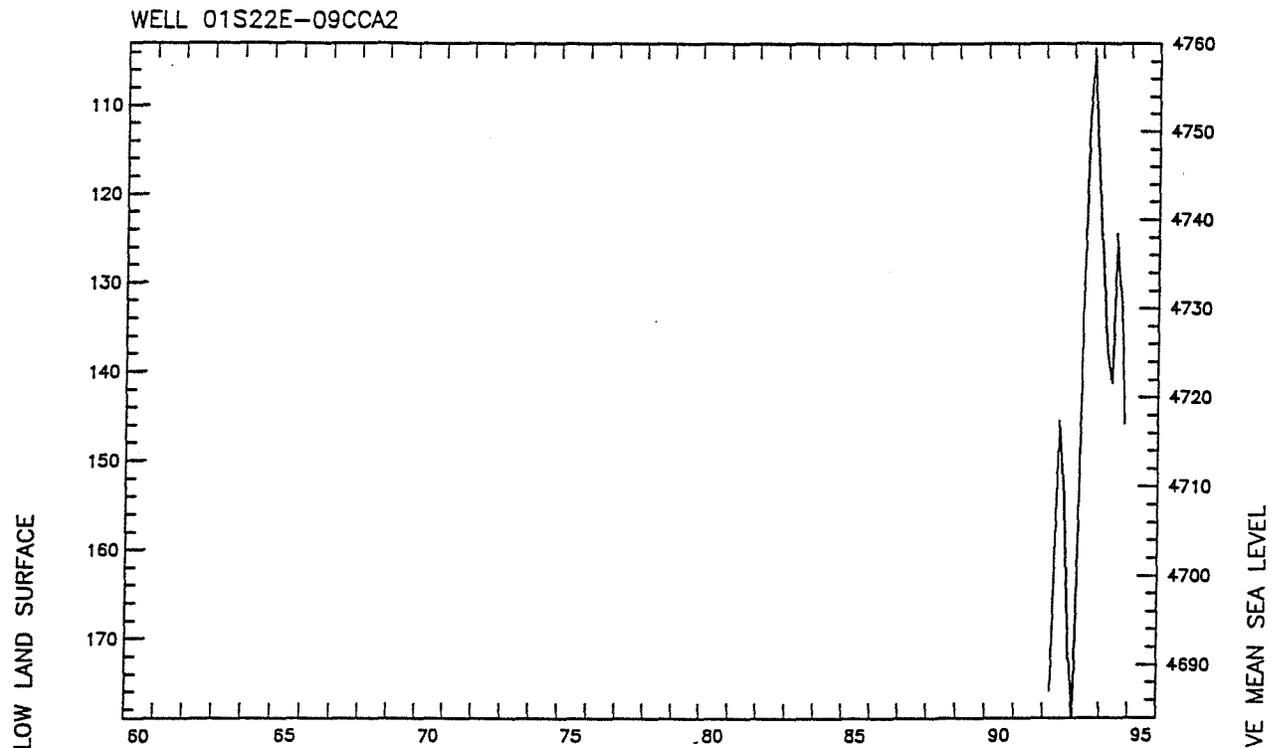
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# Water Rights for Little Wood River Groundwater

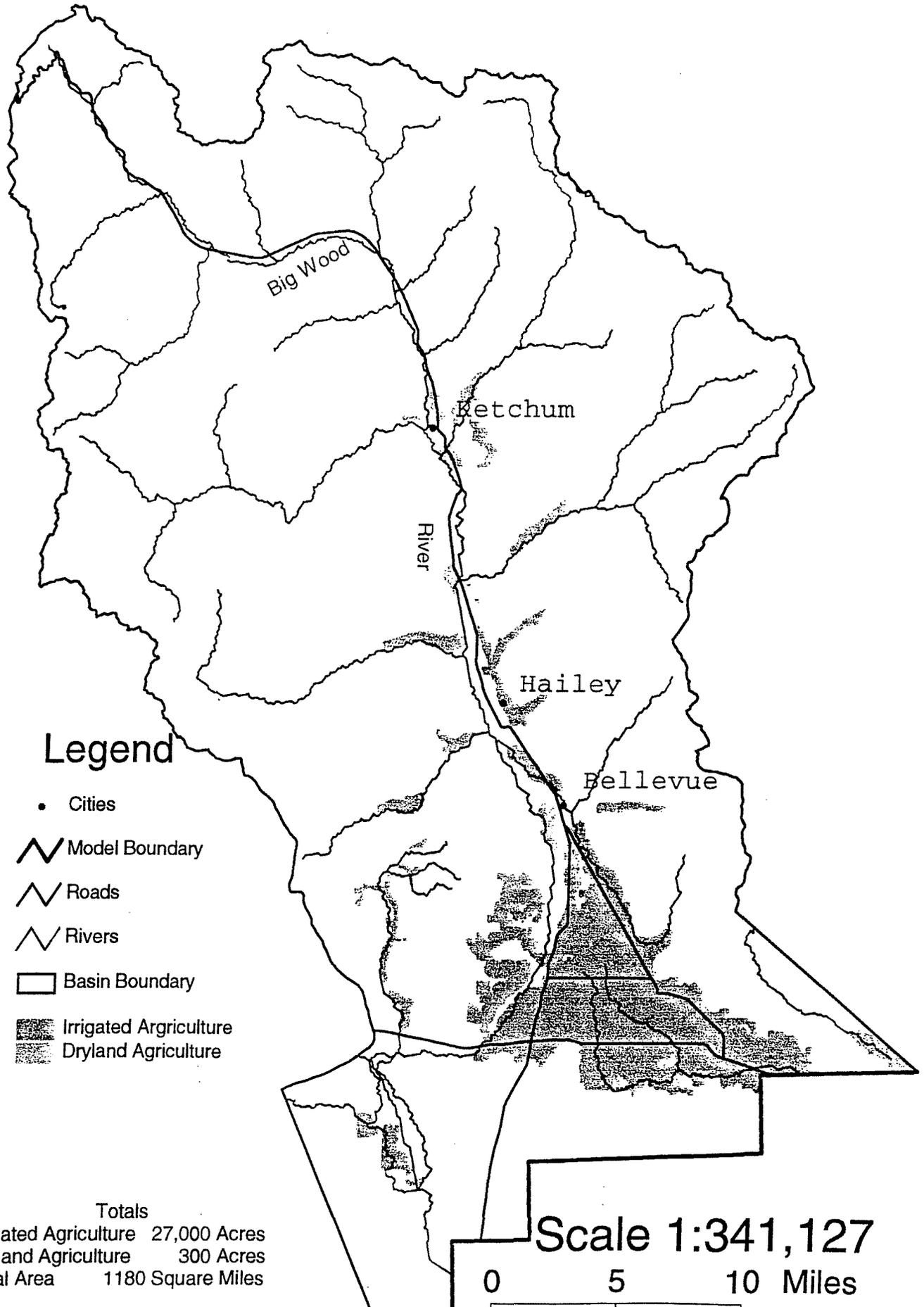


LITTLE WOOD



HYDROGRAPHS OF WELLS 01S22E-09CCA2 AND 01S22E-09CCA1

# Big Wood River



BIG WOOD RIVER BASIN		
Drainage Area (mi <sup>2</sup> )	1180	
Elevation (ft)	4,800 - >10,000	
Principal Drainage	Big Wood River and Silver Creek	
Towns/Population	Ketchum 2,523, Hailey 3,575, Bellevue 1,275	
Ground Water Diversion Rate (cfs)		
Water Rights	345	
Total Irrigated Land (ac)		
Previous Estimates	1959	20,600
	1972	23,000
	1986	27,000
Water Budget (ac-ft/yr)		
Precipitation	1,492,000	
Basin Outflow	Surface Water	330,000
	Ground Water	38,000
Evapotranspiration	1,124,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	100,000 - 300,000	
Storage Coefficient	N/A	
Hydrologic Data Available		
Continuous Stream Gages	Big Wood R at Hailey (139500) Big Wood R nr Bellevue (141000) Silver Cr - Sportsman Access (150430)	
Observation Wells	7 USGS Wells	
Mass WL Measurements	Fall 1952, Summer 1954, Spring-Fall 1970, Summer 1975-76	
Diversion Records	Good	

BIG WOOD RIVER BASIN

List of References

Castelin, P.M., and Chapman, S.L., 1972, Water resources of the Big Wood River - Silver Creek area, Blaine County, Idaho: Idaho Department of Water Resources Water Information Bulletin 28, 44p.

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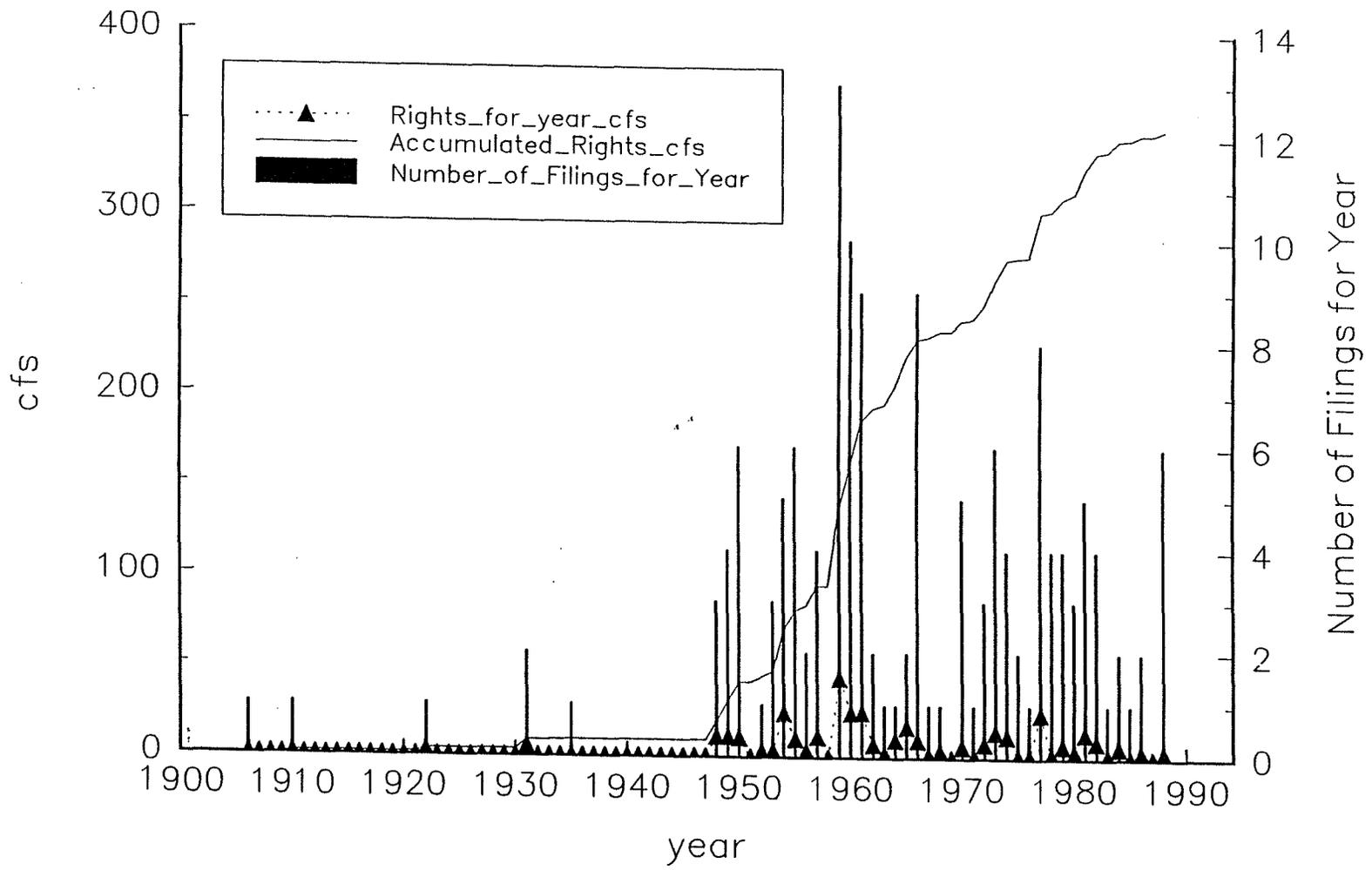
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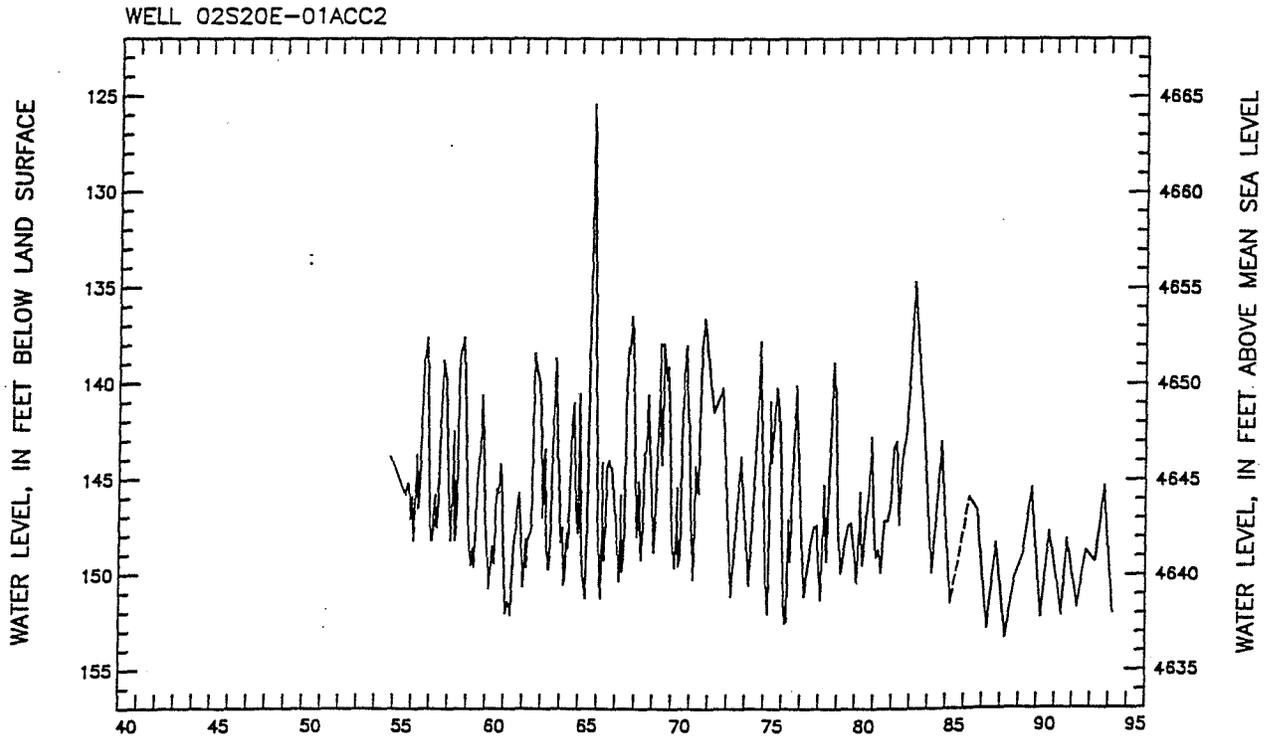
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### Water Rights for Big Wood River Groundwater

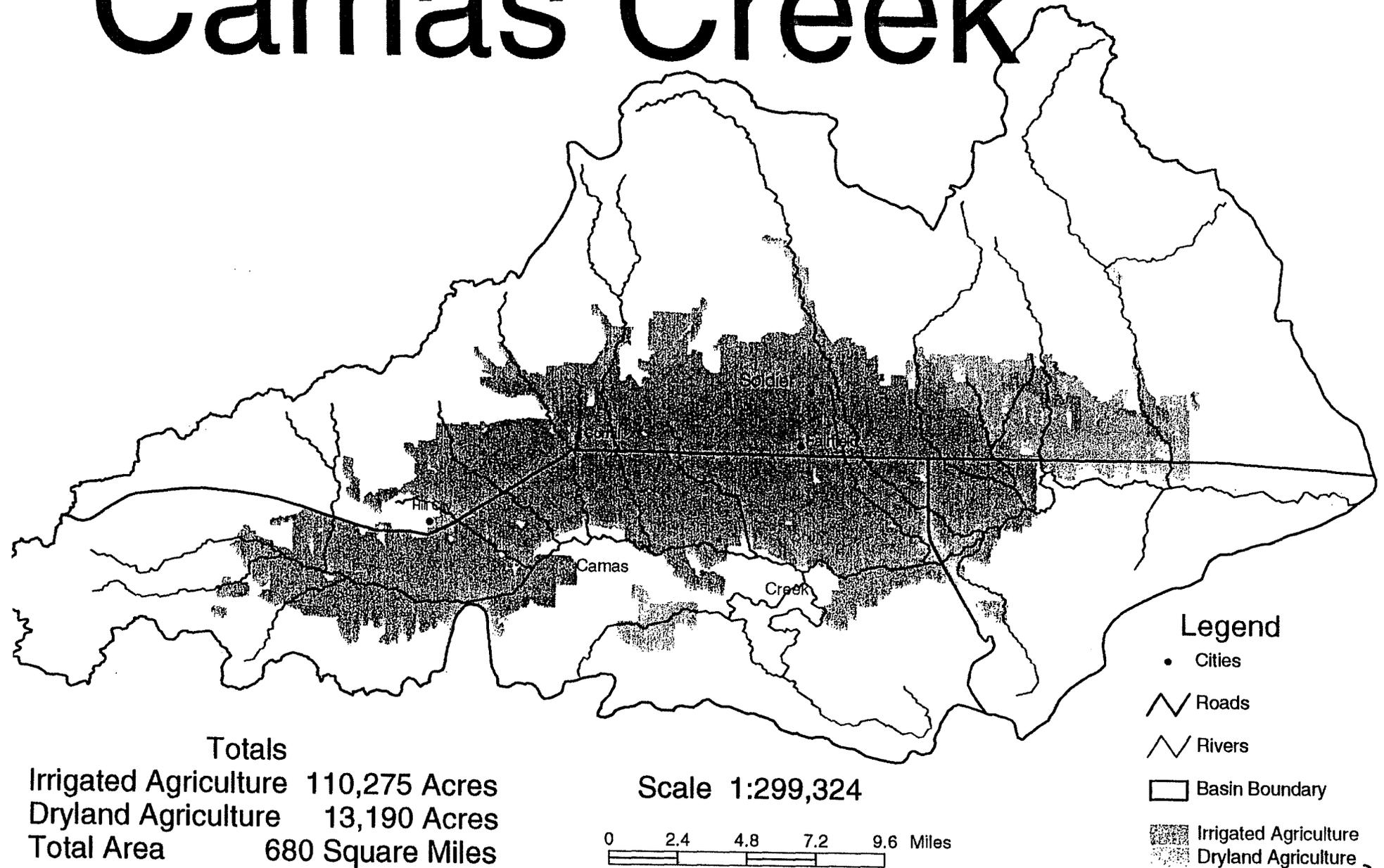


BIG WOOD



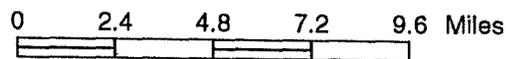
HYDROGRAPH OF WELL 02S20E-01ACC2

# Camas Creek



Totals  
Irrigated Agriculture 110,275 Acres  
Dryland Agriculture 13,190 Acres  
Total Area 680 Square Miles

Scale 1:299,324



- Legend**
- Cities
  - Roads
  - - - Rivers
  - Basin Boundary
  - ▒ Irrigated Agriculture
  - ░ Dryland Agriculture

CAMAS CREEK BASIN		
Drainage Area (mi <sup>2</sup> )	680	
Elevation (ft)	4,900 - 10,000, 5,600 mean	
Principal Drainage	Camas Creek	
Towns/Population	Fairfield 371	
Ground Water Diversion Rate (cfs)		
Water Rights	155	
Total Irrigated Land (ac)		
Previous Estimates	1960	10,300
	1986	110,300
Water Budget (ac-ft/yr)		
Precipitation	638,000	
Basin Outflow	Surface Water	128,000
	Ground Water	20,000
Evapotranspiration	490,000	
Aquifer Properties		
Transmissivity (ft <sup>2</sup> /d)	9,400 - 26,700	
Storage Coefficient	0.001	
Hydrologic Data Available		
Continuous Stream Gages	Camas Cr nr Blaine (141500)	
Observation Wells	8 USGS Wells	
Mass WL Measurements	Fall 1957, Spring/Fall 1977	
Diversion Records	None	

CAMAS CREEK BASIN

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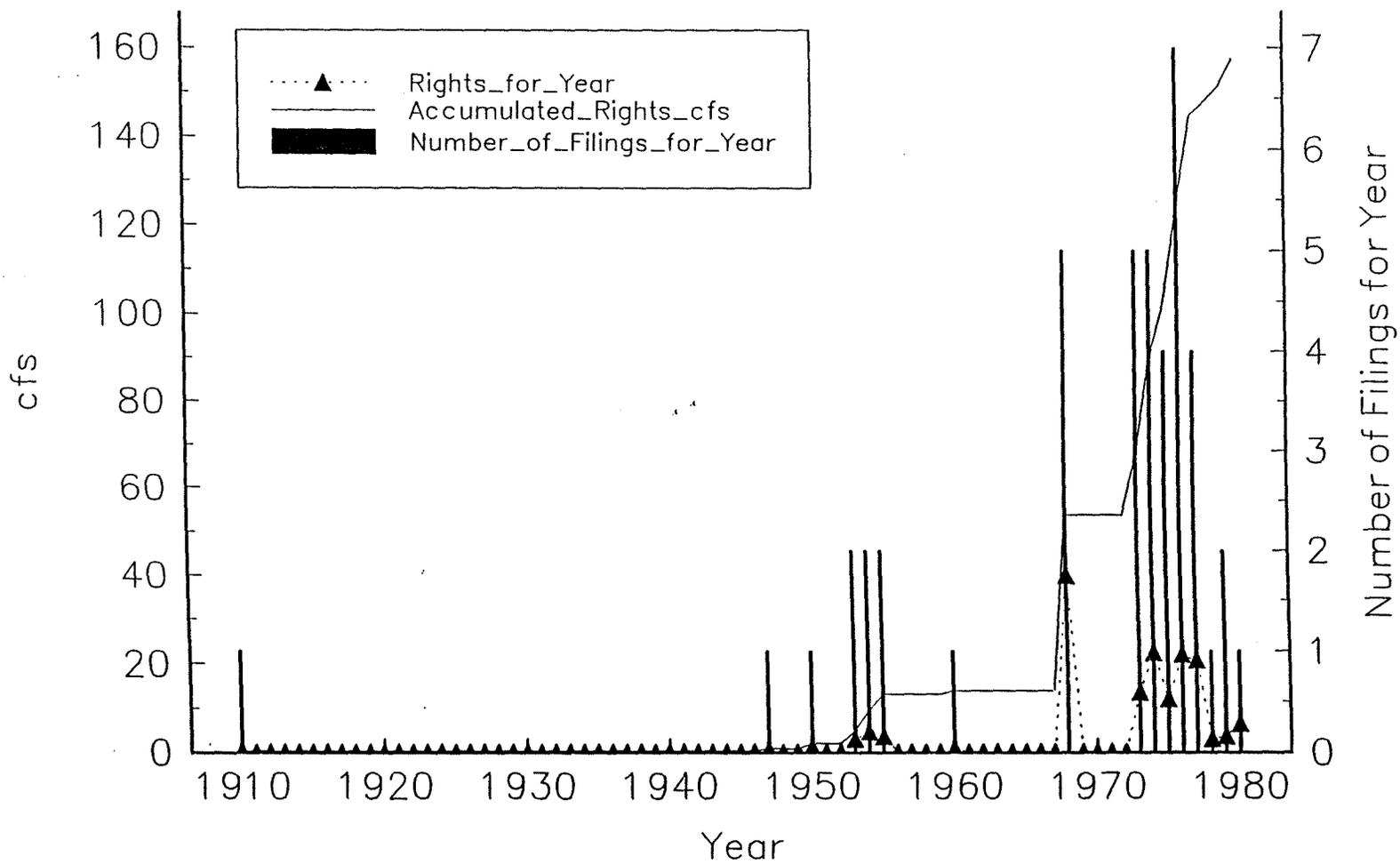
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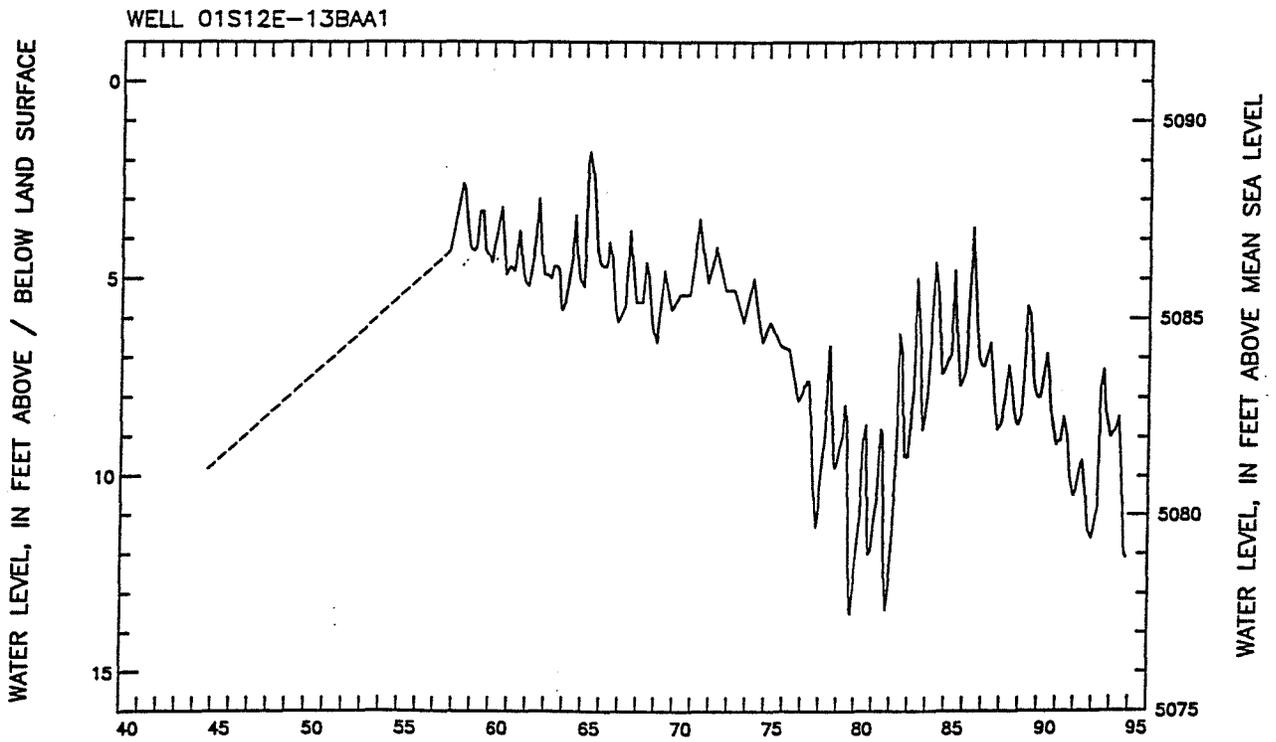
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# Water Rights Camas Basin Groundwater



CAMAS PRAIRIE



HYDROGRAPH OF WELL 01S12E-13BAA1