SECOND ANNUAL REPORT
SOUTH PLATTE DITCH RECHARGE DEMONSTRATION

A COOPERATIVE VENTURE BY:

SOUTH PLATTE DITCH COMPANY
COLORADO DIVISION OF WATER RESOURCES
COLORADO STATE UNIVERSITY
GROUNDWATER APPROPRIATORS OF THE SOUTH PLATTE

NOVEMBER 1977

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

Acknowledgments

This recharge demonstration project received financial support from each of the cooperating agencies. The Colorado Division of Water Resources provided funds toward construction and maintenance and provided staff time and expense for surface water data collection and analysis. Instrumentation was provided by the Colorado State University through the "Groundwater Management Experiment Station Project" on a loan basis and staff time and expense for ground water data collection and analysis were also provided. The South Platte Ditch Company operated and maintained the canal and paid for a portion of the construction and maintenance costs. The Groundwater Appropriators of the South Platte (GASP) provided some financial support toward the operation and maintenance of the project.

The cooperation provided by the South Platte Ditch Company, Groundwater Appropriators of the South Platte, the land owners in the project area and all other individuals is gratefully acknowledged. A limited amount of space prohibits acknowledgment of each of them separately.

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INTRODUCTION

With the inclusion of wells into the long established priority system under the Water Rights Determination and Administration Act of 1969, as amended, it is imperative that a management plan be developed to relieve well owners from the curtailment of pumping when a call is placed on the river by senior appropriators. One such plan would be to store surplus surface water in the alluvial groundwater aquifer by means of artificial recharge, and withdrawing such water later on during the irrigation season. The technique of artificial recharge has been successfully employed in Colorado on the Arikaree River near Cope and in Prospect Valley as well as in other places.

In an effort to store the excess water of the South Platte River, a cooperative venture by the South Platte Ditch Company (SPD Co.), the Colorado Division of Water Resources (DWR), Colorado State University (CSU), and Groundwater Appropriators of the South Platte (GASP) was initiated on March 19, 1974 to demonstrate the feasibility of artificial recharge. This report is a continuation of the first annual report published in 1975 which described the earlier stages of the South Platte Ditch recharge demonstration project and covered the period from the Spring of 1974 through the Spring of 1975. This report covers a period of two years from the Fall of 1975 through the Spring of 1977 summarizing the project activities and data collected during this period, and emphasizing the importance, feasbility, and benefits of such a recharge program.

OBJECTIVES

The objectives of the project are:

1) To demonstrate the feasibility of artifically recharging the excess flows of the South Platte River in the underlying alluvial aquifer.

2) To gain experience in the type and amount of surface and groundwater data needed to determine flow direction, rate of groundwater movement, infiltration rate and return flows to the river to evaluate project benefits, and to ensure project safety by preventing damage to individual farms due to flooding by rising water table and icing problems.

3) To encourage groundwater users in the area to develop their own recharge program.

DESCRIPTION OF THE STUDY AREA

The study area is located within the alluvium of the South Platte River in the northeastern part of Colorado near the Town of Merino and within the service area of the South Platte Ditch Company. The South Platte Ditch headgate is located in the SW¼ of Section 8, Township 4 North, Range 54 West. The Sand Hill Lateral (Figure 1) diverts its water from the South Platte Ditch (Figure 2) at a point 5.4 miles downstream of the headgate. The availability of surplus water in this reach of the river, an abandoned leaky Sand Hill Lateral of the SPD Co., and the company's desire to participate in the project were the prime considerations in selecting the recharge site.

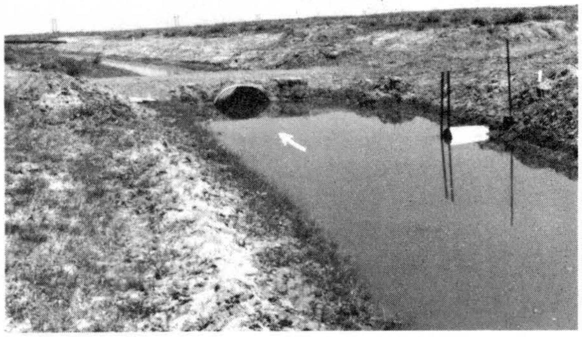


Figure 1. Sand Hill Lateral with Culvert and 12-inch PVC pipe.

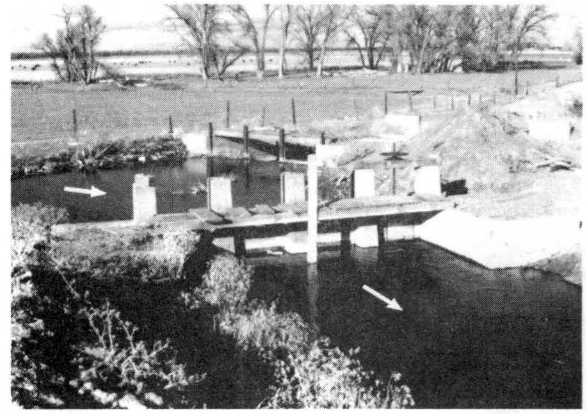


Figure 2. Sand Hill Lateral Diverting Water from South Platte Ditch.

Figure 3 shows the project area along with the existing observation well network and stream gaging stations. Three gaging stations (G-1, G-2, and G-3) were installed on the Sand Hill Lateral to obtain flow data at three different locations. The upstream and downstream stations (G-3 and G-1) have a wooden weir as a control section and the middle station (G-2) has a galvanized steel trapezoidal flume as the control section. A fourth gaging station was installed on the Prewitt Drain to monitor seepage outflows. All gaging stations are equipped with automatic water level recorders. Thirty observation wells were drilled, four of them were equipped with automatic recorders. Additionally, thirty-one irrigation and stock wells were also used to monitor water table fluctuations. At the downstream end of the lateral there are a series of natural depressions, one of which was equipped with a staff gage and used for terminal discharge from the Sand Hill Lateral.

Approximately 5,774 acres of land are irrigated under the South Platte Ditch supplemented by thirty-two privately owned large capacity wells. Eight of these wells are located between the South Platte Ditch and the Sand Hill Lateral.

RESPONSIBILITIES OF AGENCIES AND REHABILITATION OF PROJECT AREA

The South Platte Ditch Company agreed to obtain the necessary local easements to rehabilitate the lateral and to release and control water into the Sand Hill Lateral. Colorado State University provided instrumentation during the demonstration period, staff time for surveying, the drilling of the observation wells, and collection of groundwater data. The Division of Water Resources provided staff time and funds to install and operate the gaging stations, surveying, and to collect and analyze surface water data. CSU and DWR both provided staff time for the preparation of the reports. The major role of GASP has been to provide financial support towards operation and maintenance of the project during the demonstration period.

Rehabilitation of the Sand Hill Lateral included cleaning of the lateral to remove weeds and impervious clay, extensive earth work to raise the banks to increase the lateral capacity, installation of culverts for cattle crossings, etc. A detailed description of the project area and project activities prior to the Fall of 1975 can be found in the first annual report of the project.

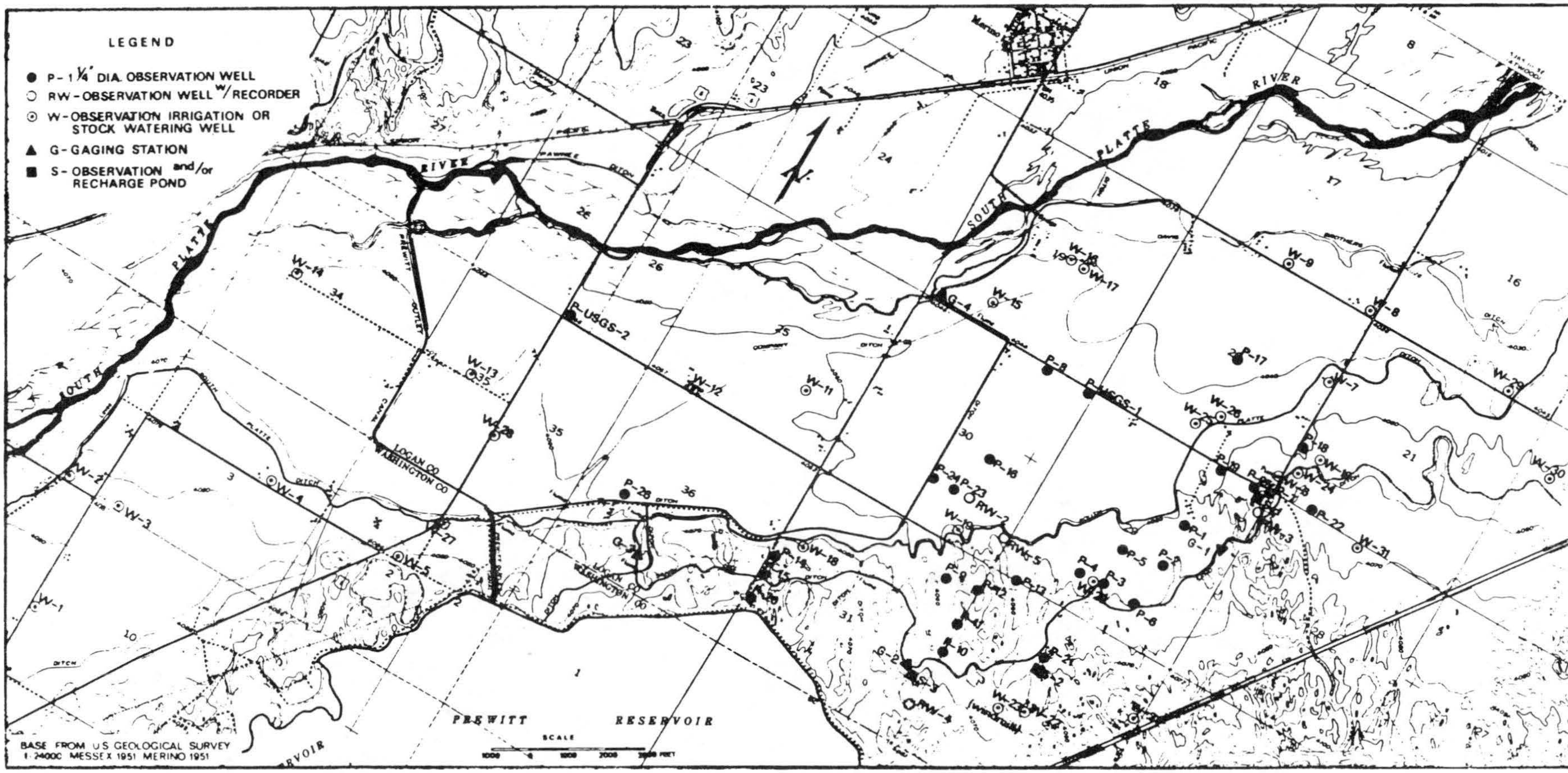


Figure 3. Project Area Map

The waste ponds were surveyed during the month of September, 1975, by DWR personnel to determine the storage capacity of the ponds. The storage volume at an elevation of 4057.11 feet (msl) was determined to be 58.8 acre-feet. During the Fall of 1975, the middle gaging station (G-2) was upgraded by installing a new galvanized steel trapezoidal flume approximately 350 feet upstream of the culvert located in the SE¼ of Section 31, Township 6 North, Range 53 West. Cost of the flume was provided by GASP. To increase accuracy, the lower gaging station (G-1) was relocated and moved to an old wooden flume located in the NE¼ of Section 29, Township 6 North, Range 53 West.

During the Fall of 1975 the lateral bank was washed out upstream of the culvert in the SE¼ of Section 31, Township 6 North, Range 53 West and was repaired later on by the SPD Company. A new staff gage was installed in the waste pond in the month of February 1976, to observe the water surface elevation in the pond. Major earth work was undertaken in the month of September, 1976 by the SPD Company to remove clay from the bottom of the waste pond in an effort to increase its storage capacity and infiltration rate.

DATA COLLECTION

Surface Water

Daily recorded flows passing each of the three gaging stations (G-1, G-2, and G-3) are presented in Appendix A. The quantity of water diverted for recharge is computed from the gage heights at the upstream gaging station (G-3) and the rating curve which relates stage to discharge. The middle gaging station (G-2) is used as an index station to determine the amount of water that remains in aquifer storage for withdrawal during the irrigation season and which can be credited to the SPD Company. A portion of the water passing the downstream gage (G-1) that does not seep into the ground is discharged into the waste pond where it ultimately infiltrates into the ground. Waste pond gage height was monitored to prevent any flooding in the neighboring lands by over filling of the pond.

For the purpose of development of a digital ground water simulation model of the project area, DWR personnel collected data on ground surface and bedrock elevations and aquifer properties from U. S. Geological Survey maps and hydrologic maps. Well withdrawal was computed from power records obtained from the Fort Morgan REA office and the Public Service Company of Colorado. Climatological data were obtained from the U. S. Weather Service reports and surface diversion records were obtained from the State Engineer's Office.

Ground Water

Ground water levels were monitored in the observation wells on a bi-weekly basis. Depth to water table measurements were also taken at some selected irrigation and stock wells. Daily variations of water table elevations can be obtained from the four observation wells equipped with automatic water level recorders (Figure 4). Water table elevations (msl) are presented in Appendix B.

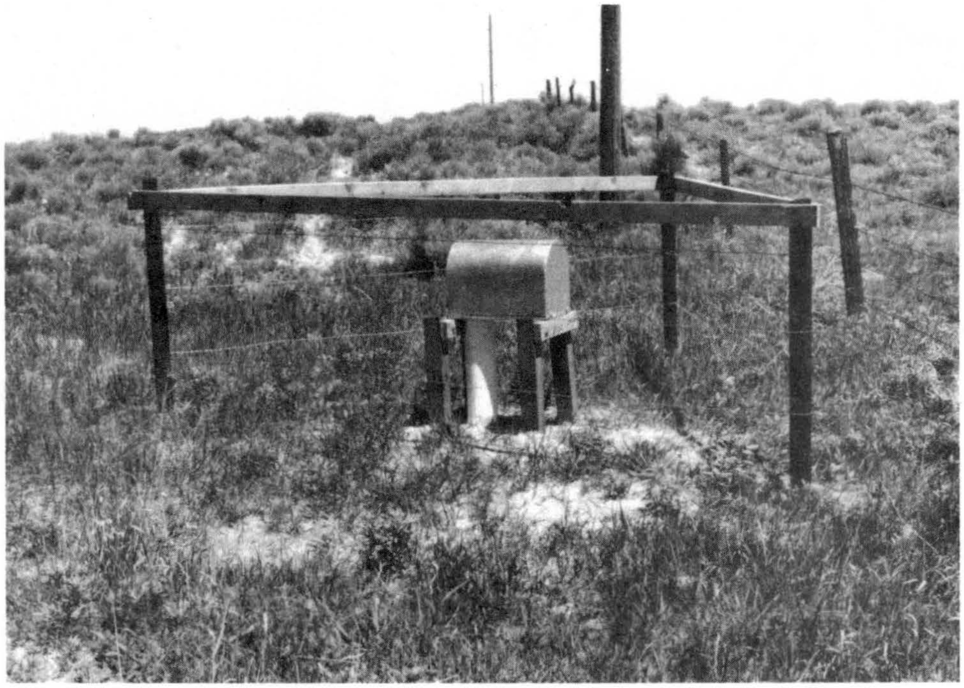


Figure 4. Observation Well with Recorder.

ANALYSES

Surface Water

The quantities of water diverted for the purpose of recharge, as measured at the three gaging stations (G-1, G-2, and G-3), during the reporting period are as follows:

	Upstream Station G-3		Middle Station G-2		Downstream Station G-1	
	Ac-Ft	Avg. cfs	Ac-Ft	Avg. cfs	Ac-Ft	Avg. cfs
Fall 1975	1636.36	12.50	1398.00	10.68	875.44	6.69
Spring 1976	595.27	17.65	463.25	13.74	194.55	5.77
Fall 1976	621.30	14.24	462.53	10.60	172.18	3.95
Spring 1977	1815.18	14.08	1543.90	11.97	1136.05	8.81

The volume of flow passing the middle gaging station (G-2) is used to determine the amount of water stored in the aquifer which is available for withdrawal during the irrigation season and is creditable to the SPD Co. The daily rates of flow passing each of the gaging stations for the period Fall of 1975 through Spring of 1977 are shown in Figures 5 through 8. From the figures it is apparent that the volume and time distribution of recharge varies from season to season depending upon the availability of water and prevailing weather conditions. During the two year period, the maximum amount of water was diverted during the Spring of 1977 with the next highest amount during the Fall of 1975.

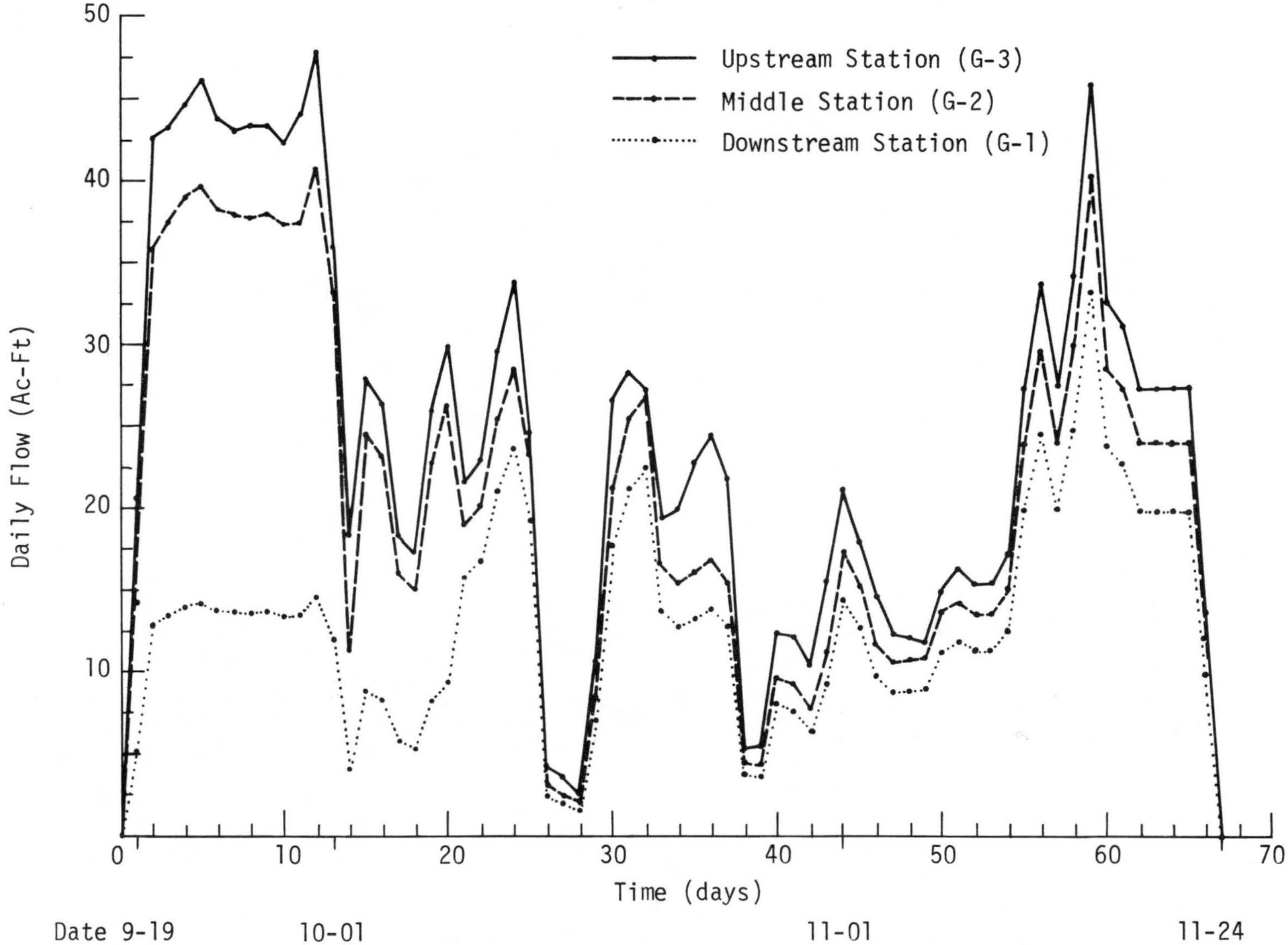


Figure 5. Sand Hill Lateral Hydrographs for Fall 1975

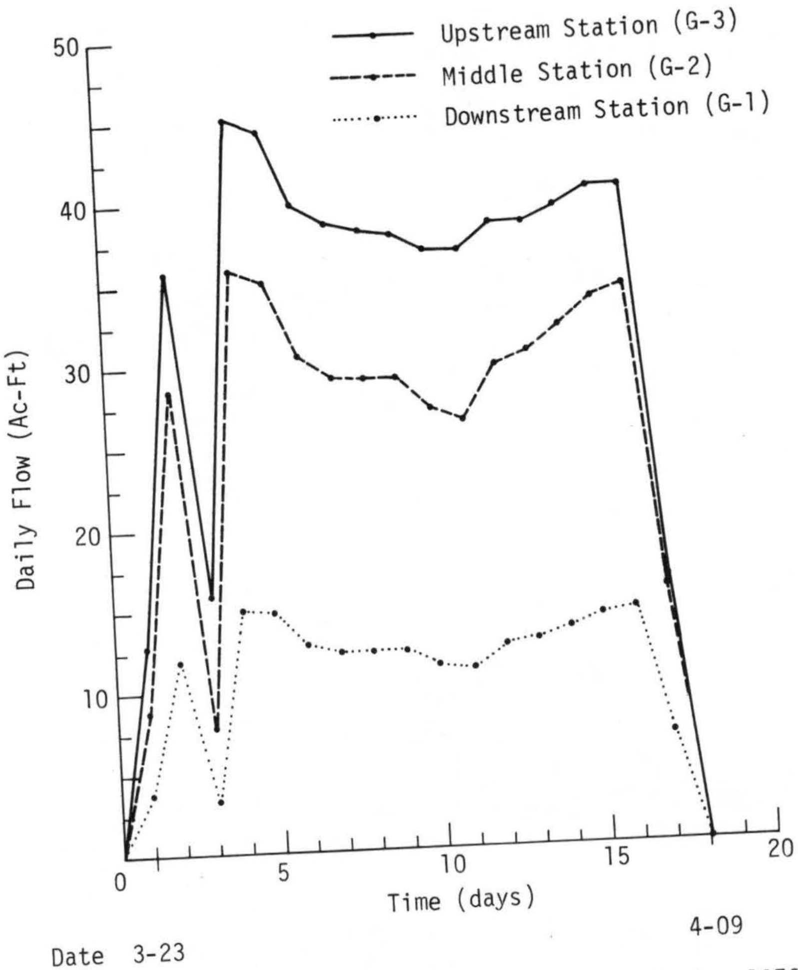


Figure 6. Sand Hill Lateral Hydrographs for Spring 1976

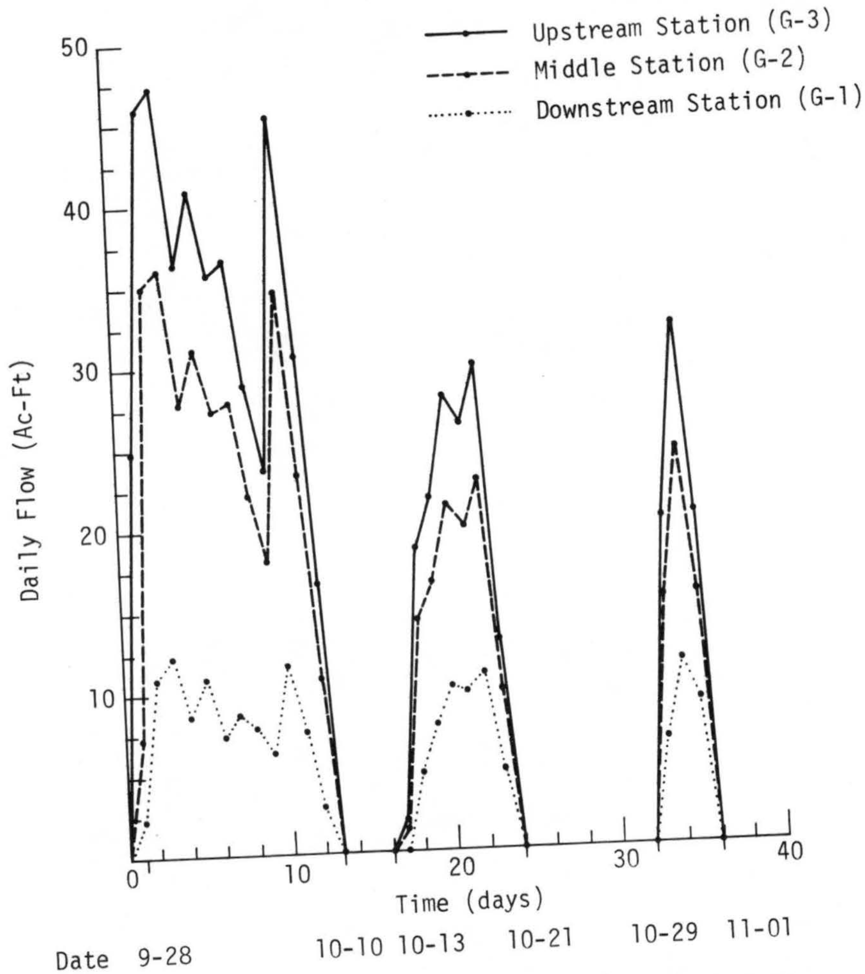


Figure 7. Sand Hill Lateral Hydrographs for Fall 1976

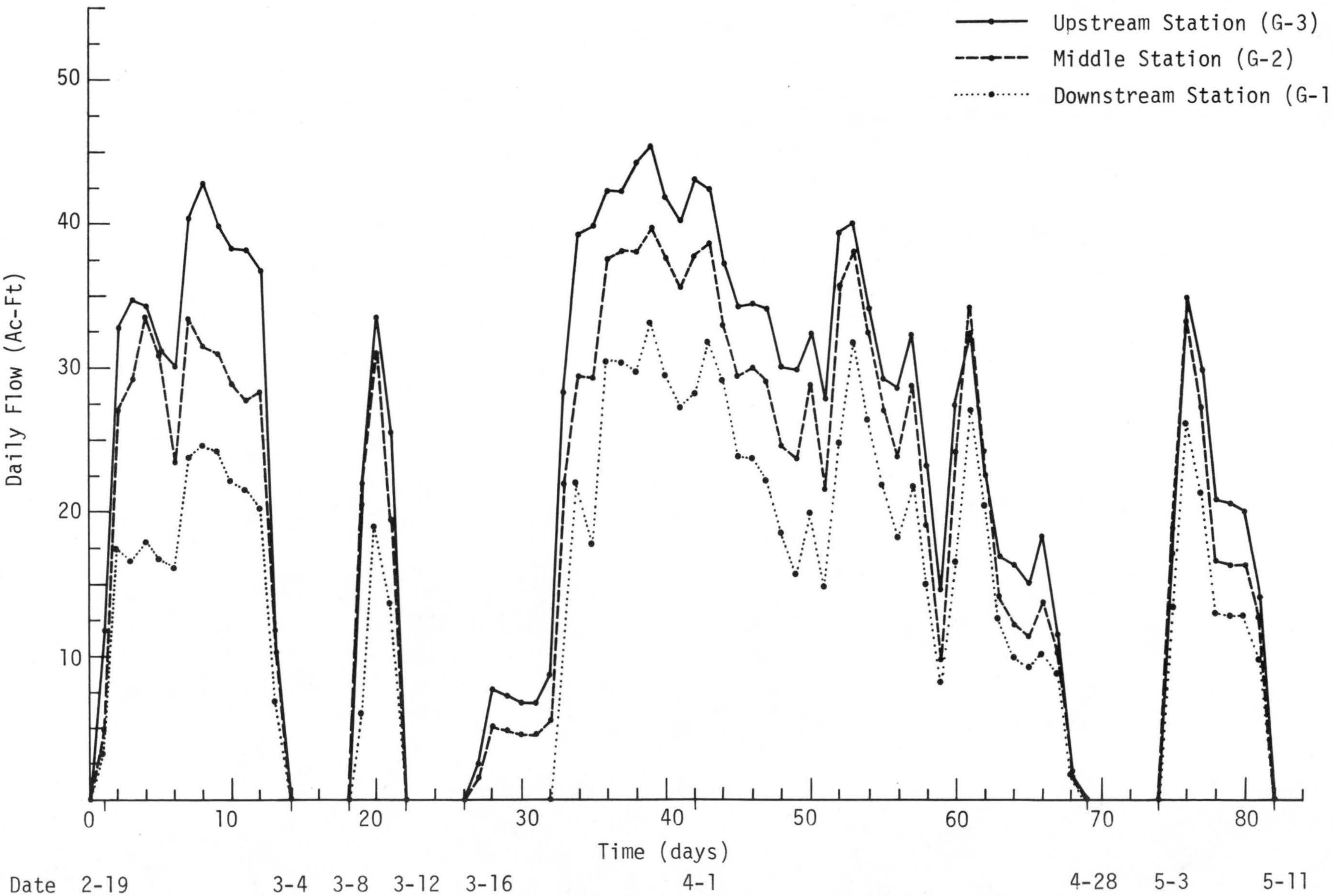


Figure 8. Sand Hill Lateral Hydrographs for Spring 1977

Ground Water

Water table hydrographs for selected observation wells are shown in Figures 9 and 10 and are continuations of information in Figure 5 of the First Annual Report. Generally, water tables have not changed significantly to justify drawing a new water table contour map to replace Figure 4 in the First Annual Report. General direction of ground water movement is toward the north; however, during recharge periods a mound builds up beneath recharge ponds which has a gradient away from the ponds in all directions. Localized effect of the recharge pond is dampened within a one mile radius and cannot be observed in the limited number of observation wells outside that circle.

Periods and amount of recharge are also noted on the hydrograph figures. The water table rises during periods of recharge and the resulting mound flattens when recharge is terminated due to drainage of the water to lower elevations. Withdrawal of water by nearby pumps during the spring and summer may accelerate mound decay near recharge facilities. Certainly the higher water tables will benefit nearby pumpers providing larger pump discharges at lower operating costs. This would be especially true for wells W-20, W-6, W-24, W-10, and W-7 shown in Figure 3. Benefits might also be expected at W-25 and W-26; however, lack of an access hole has prevented collection of data for these two wells. Wells closest to Sand Hill Lateral or recharge ponds will receive the most benefit.

Analyses of data for observation wells P-10, P-11 and P-12 (see Figure 9) indicate that response to recharge from the canal occurs very rapidly at P-10 and there is an increasing lag time before response is noted at wells P-11 and later at P-12. The magnitude of fluctuation is also greatest for P-10 and successively less for P-11 and P-12 which are further away.

There was continuous recharge during the Fall of 1975 for 66 days and nearly continuous recharge for 80 days during the Spring of 1977. Checking water table response in P-10 during these two periods, it is noted that the water table rises during the early part of the recharge period but then begins to decline prior to the time recharge is terminated. This suggests that recharge rate decreases with time which might be caused by canal sealing. Periodic cleaning of the canal to maintain high seepage rates is recommended.

Data for both RW-3, a continuous float driven recorder well, and P-7 are plotted on Figure 10. Unfortunately, the bottom of RW-3 is at elevation 4033.4 and when the water table drops below that elevation the record is lost. Water in recharge ponds nearly surrounds RW-3 which is located on a small hill while P-7 is located approximately 50 feet from high water level northeast of the recharge ponds.

Water level in RW-3 and its corresponding rise or fall is closely correlated with stage height of water in the ponds. This substantiates that recharge rate is correlated with pond area and gage height. Periodic cleaning of the pond may be necessary to maintain percolation rates. Analyses of data indicate that during major recharge periods, such as the Fall of 1975 and the Spring of 1977, water levels in RW-3 rose above the bottom of the pond. This resulted in fully saturated flow beneath the pond with a resultant decrease in gradient and recharge rate. These conditions seem to have developed on April 2, 1977 when the

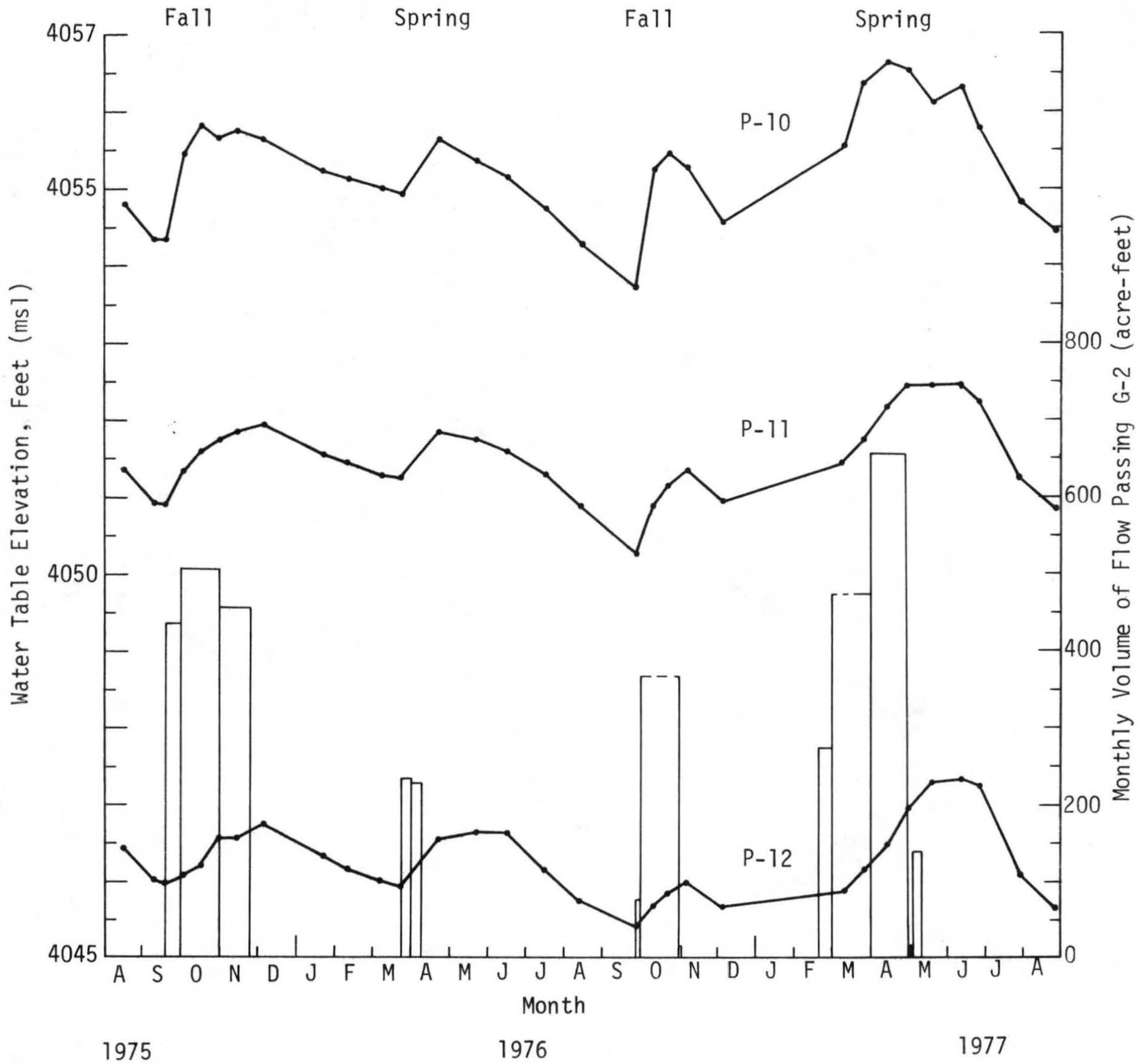


Figure 9. Water Table Hydrographs for Selected Observation Wells With Bar Graphs of Recharge Flows

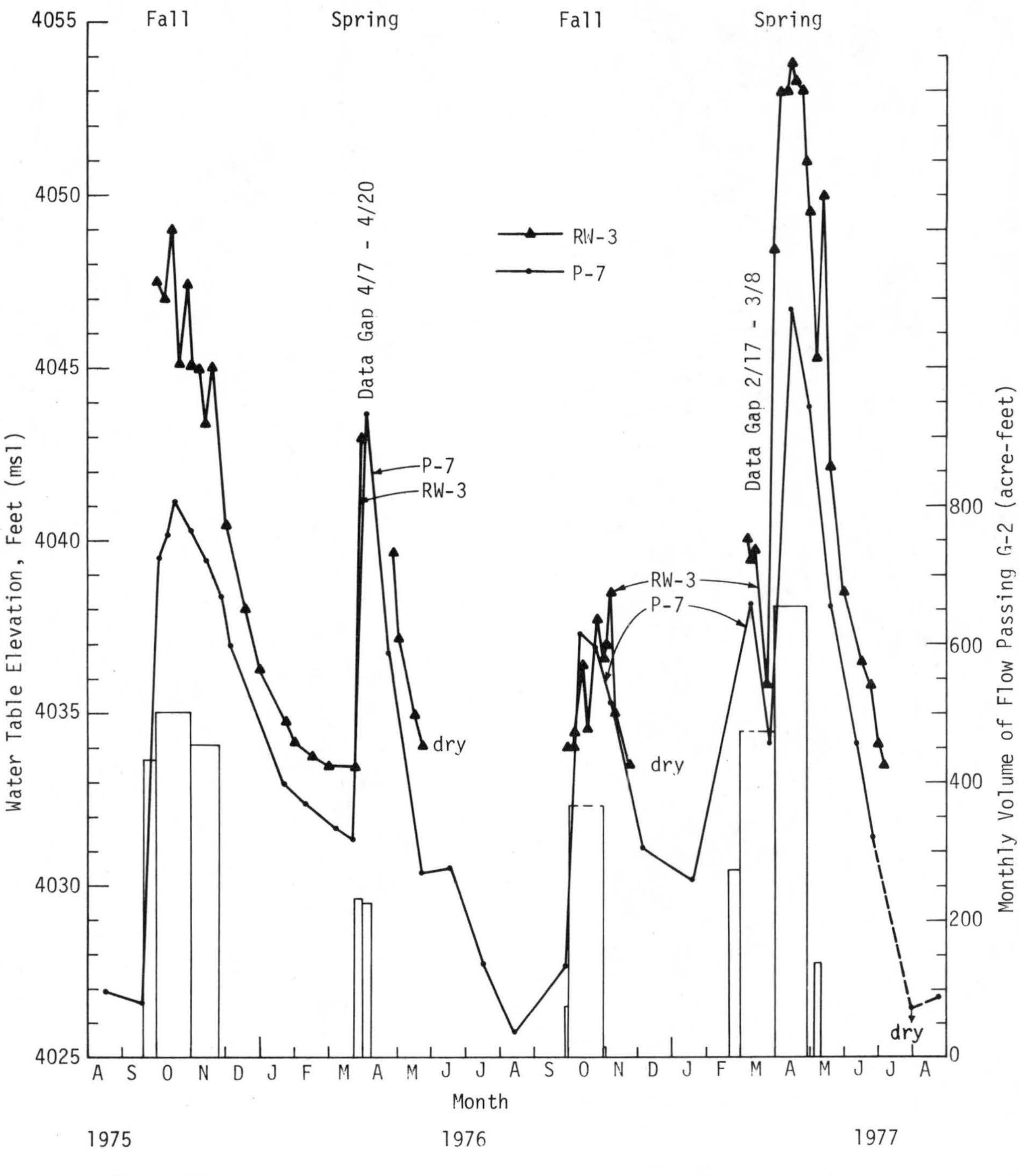


Figure 10. Water Table Hydrographs for Observation Wells P-7 and RW-3 With Bar Graphs of Recharge Flows

waste ponds started spilling. At that time, the rate of flows at G-3, G-2 and G-1 were respectively 42.42, 38.65 and 31.93 acre-feet per day. The flow was subsequently reduced to 30 acre-feet per day at G-3, the corresponding flows at G-2 and G-1 were 23.6 and 15.7 acre-feet per day. This suggests that when the ponds are full, the flow rate at G-2, corresponding to the optimum infiltration rates, should not exceed 23.6 acre-feet per day (12 cfs).

Water table rises in excess of 2.8 feet per day were observed in RW-3 on March 28, 1977 which happened to coincide with peak rate of inflow to the ponds and maximum stage height in the ponds. The water table was approaching the bottom of the pond at that time. The shape of the decline curve for dissipation of the recharge mound is quite similar for all of the recharge periods. Decline rates of over one foot per day were observed within two days following the time when inflow to the pond ceased on May 10, 1977. Generally, the decay curve has an exponential shape and during the Spring and Summer of 1977 it took approximately one and a half months to drop 17 feet. Records from RW-3 suggest that the cone of influence from a nearby well reached RW-3 about June 20, 1977.

Colorado State University used the Glover equations for flow to a drain to analyze the amount of recharge water returning to the drain ditch for a cross-section through P-14 and P-15. Calibration of the equations was made using P-10, P-11 and P-15, but a match for P-14 could not be made, suggesting an effect of the nearby drain. Figure 11 shows the computed normalized flow q/Q where q is the flow into the drain per foot of length and Q is the recharge rate per foot of length from the Sand Hill Lateral. The drain is located about 1150 feet north of the Sand Hill Lateral in the vicinity of P-14 and P-15. For the Fall of 1975 recharge period, the analyses indicate that approximately 80 percent of the recharge flow rate would be entering the drain within 15 days and that by the end of the recharge period 65 days later, the rate of flow into the drain would be equal to the recharge rate from the canal. Following termination of recharge on November 23, 1975, the recharge water continued to enter the drain and by late February almost all of the water recharged above G-2 had flowed into the drain. This supports the DWR position that credit be given for only a portion of water which passes the middle gaging station G-2 and is retained in the aquifer at the end of the spring recharge period.

Three observation wells and a recorder well were placed in the southeast quarter of Section 30, Township 6 North, Range 53 West to monitor water level fluctuations. Analyses of three years of record show that major fluctuations are correlated with flow periods in the South Platte Canal, periods of pumping by well W-19 and rainfall events. Water level rises of as much as 0.8 feet were observed at RW-2 when the first flows were turned into the South Platte Canal in 1975. It has not been possible to determine any effect on the water table in that area due to recharge from the Sand Hill Lateral. The slope of the water table is very flat in that area and sometimes the direction of flow is from the drain toward P-23 and RW-2. This suggests that lowering of the water level in the drain ditch by cleaning the drain could provide better drainage to the area.

Model Study

A digital computer model was developed by the Colorado Division of Water Resources for the recharge project area in order to simulate surface water

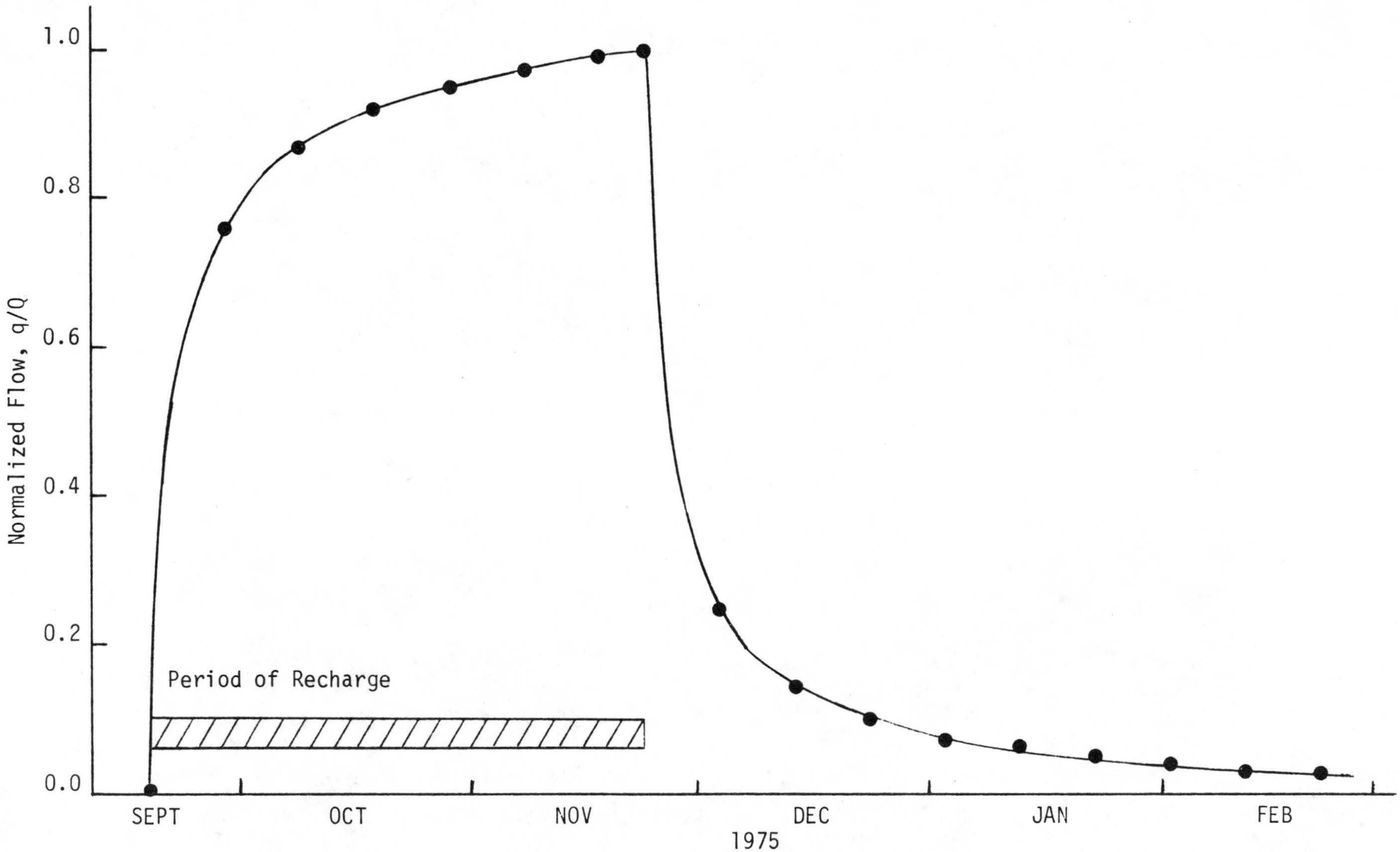


Figure 11. Normalized Flow into Drainage Ditch as a Function of Time for Cross-section through P-14 and P-15.

ground water interaction and to determine the effect of recharge on return flows from project area to the South Platte River. A grid system consisting of 600 cells with an average width and breadth of a cell equal to a quarter of a mile was constructed. This grid system was overlaid on geological and hydrological maps of the project area (extending well beyond the boundaries of the project area) to determine the physical and hydrological characteristics of each cell. A computer program based on implicit finite difference techniques was used to solve the flow equations for each cell using the well withdrawals, recharge, surface diversions, and precipitation data for the period April 1974 through January 1975. The model was calibrated by comparing the computed and measured water table elevations as of January 1975. Some of the physical parameters were adjusted until standard deviations of differences between the measured and computed heads were within $\pm$ 2 feet. After the model was calibrated, two more computer runs were made; one with no recharge, and the second with recharge data for the period of September 1974 through June 1975. The difference in the return flows resulting from these last two runs was considered to be the return flow to the river due to recharge only. This difference was found to be 23% of the recharge flows at the middle gaging station (G-2). It was, therefore, concluded that for the given time distribution of recharge, approximately 77% of the volume of flow passing G-2 during the previous fall and spring was available at the end of the month of June for withdrawal and could be credited to the SPD Company.

In addition to the DWR model study, the CSU staff constructed and calibrated both a finite difference and finite element model of the recharge pond area. These models can be used to evaluate recharge operation policies to minimize the danger of causing drainage problems and to evaluate beneficiaries from the recharge project. Further refinement of these techniques is needed.

Consumptive Use

The average net consumptive use for various crops under the project area, as determined by the Blaney-Criddle method, was found to be 6810 acre-feet per year. The average annual diversion by the South Platte Ditch (1966-76) has been 9811 acre-feet. Assuming 50 percent irrigation efficiency, the consumptive use of surface water would be 4905 acre-feet. The remaining 1904 acre-feet is the consumptive use of the ground water. This amount would vary from year to year; however, it is an indication of the augmentation water needs of the wells under the South Platte Ditch.

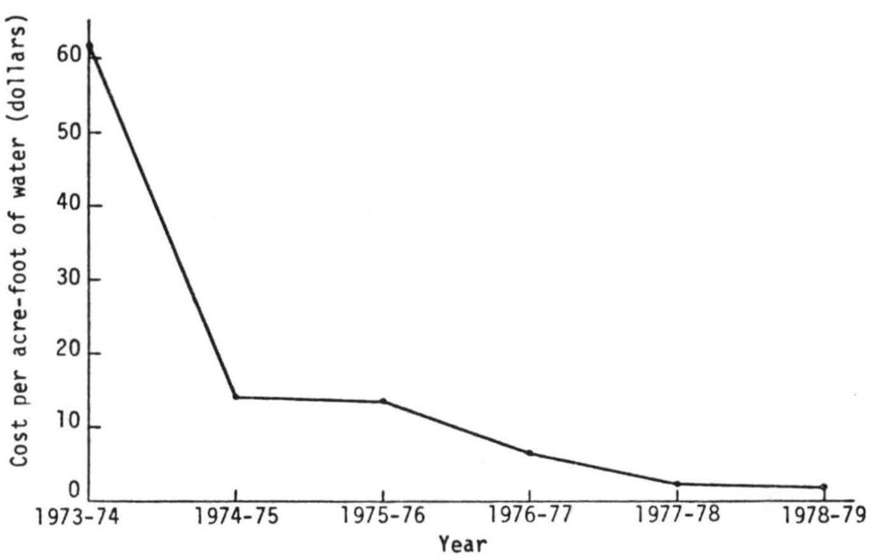
PROJECT COSTS AND BENEFITS

The following table presents the expenditure incurred annually by each of the co-operating agencies since the initiation of the recharge project. It can be noted from this table that initial costs were very high during the earlier years because of the rehabilitation of the Sand Hill Ditch, surveying of the area, earth work, and installation of culverts and observation wells. Engineering cost included personnel time spent in the field and office for data collection and analysis. During the first two years, most time was spent in the field in an attempt to collect field data. This cost increased during the third year due to the time spent on the development of a computer groundwater model.

	Fiscal Year			
	1973-74	1974-75	1975-76	1976-77
South Platte Ditch Company				
materials and/labor		$ 2,836	$ 951	$ 541
Division of Water Resources				
materials and/labor	$3,398	1,990	6	9
engineering	3,823	5,275	13,632	6,986
Colorado State University				
engineering	1,500	4,725	4,195	2,530
Groundwater Appropriators of the South Platte				
materials and/labor			579	
TOTAL COST	$8,721	$14,826	$19,363	$10,066
Volumes of flow passing G-2 (ac-ft)	185	1368	1861	2006
77% of G-2 flow (ac-ft)	142	1053	1433	1545
Cost of water $/ac-ft	$61.4	$14	$13.5	$6.5

Material cost during the year 1977-78 would be slightly higher compared to the year 1976-77 due to expected cost of purchasing gaging station recorders (approximately $450 per recorder); however, engineering cost would decrease considerably and material cost would also be negligible after 1977-78. Annual cost of insurance, cleaning and Ditch Rider is estimated to be approximately $1466. The cost of operating a gaging station is estimated to be approximately $10 per day of recharge and approximately $135/year for monitoring 9 observation wells. Assuming the quantity of water recharged in 1977-78 to be 1545 acre-feet in 87 days (same as in 1976-77), the annual cost for the year 1977-78 is estimated to be approximately $3321 which would be reduced to $2871 in subsequent years.

The annual cost per acre-foot of water is presented in the following figure.



The cost per acre-foot is estimated to be $2.2 in the year 1977-78 and $1.9 per ac-ft in the year 1978-79. From the projected cost of water it is evident that water can be stored very economically in the alluvial aquifer.

CONCLUSIONS

1. The first three years of successful operation of the recharge project demonstrated that surplus water, when available, can be inexpensively stored in the alluvial aquifer.

2. The total amounts of water recorded (acre-feet) at the three gaging stations for recharge during the two year period are as follow:

Period	Station G-3	Station G-2	Station G-1
Fall 1975 - Spring 1976	2231.6	1861.2	1069.9
Fall 1976 - Spring 1977	2436.4	2006.4	1308.2

3. Digital model results indicate that approximately 77% of the volume of water passing the middle gaging station during the previous fall and spring would be available at the end of the month of June for withdrawal from the aquifer.

4. The cost benefit analysis shows that water can be stored underground in the project area for less than $2.00 per acre-foot.

RECOMMENDATIONS

1. Artificial recharge is very inexpensive and is an efficient way of capturing excess surface water for use at a more beneificial time and place. Canal officials should consider recharging at times other than fall and spring when water becomes available due to rainfall.

2. It is recommended that two stream gaging stations (G-2 and G-1) be maintained on the Sand Hill Lateral for future recharge operations. The middle gaging station (G-2) may be considered as a bare minimum requirement for the continuation of the project. The ditch company should consider relocating the lower (G-1) gaging station near the inlet of the pond and equip it with an automatic recorder. Gaging station G-2 should also be equipped with an automatic recorder.

3. The lateral and the waste ponds should be cleaned prior to initiating recharge for the fall and spring periods in order to remove the silt deposits and maintain high infiltration rates.

4. It is strongly recommended that the trapezoidal flume at gaging station number two be upgraded by raising the flume, providing a concrete base to prevent settlement and a cutoff wall on the upstream side to prevent underflow.

5. It is recommended that when all the waste ponds become full the rate of flow in the Sand Hill Lateral be restricted to 15 cfs at the upstream gaging station (G-3) or 12 cfs at (G-2) in order to avoid any damages to adjacent property.

6. If the recharge is continued, a minimal groundwater observation network must be monitored. Measurements of observation wells P-1, P-7, P-18, P-19, P-25, and RW-3 should be made prior to every major recharge event and at two week intervals during recharge. Supplemental data from W-6, W-7 and W-10 would be desirable. Analysis of this data would be necessary to prevent water logging or drainage problems.

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APPENDIX A

Table A-1. Flow Volumes Recorded at Sand Hill Lateral Gaging Stations, Fall 1975

Date	Upstream Station G-3 (ac-ft)		Middle Station G-2 (ac-ft)		Downstream Station G-1 (ac-ft)	
	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
09-19-75	20.58	20.58	14.2	14.2	5.11	5.11
09-20-75	42.69	63.27	35.9	50.1	12.92	18.03
09-21-75	43.27	106.54	37.5	87.6	13.50	31.53
09-22-75	44.67	151.21	39.0	126.6	14.04	45.57
09-23-75	46.04	197.25	39.7	166.3	14.29	59.86
09-24-75	43.76	241.01	38.3	204.6	13.79	73.65
09-25-75	43.04	284.05	38.0	242.6	13.68	87.33
09-26-75	43.40	327.45	37.7	280.3	13.57	100.90
09-27-75	43.42	370.87	38.0	318.3	13.68	114.58
09-28-75	42.23	413.10	37.4	355.7	13.46	128.04
09-29-75	44.05	457.15	37.5	393.2	13.50	141.54
09-30-75	47.89	505.04	40.7	433.9	14.65	156.19
10-01-75	35.92	540.96	33.2	467.1	11.95	168.14
10-02-75	18.37	559.33	11.3	478.4	4.07	172.21
10-03-75	27.93	587.26	24.5	502.9	8.82	181.03
10-04-75	26.45	613.71	23.2	526.1	8.35	189.38
10-05-75	18.24	631.95	16.0	542.1	5.76	195.14
10-06-75	17.21	649.16	15.1	557.2	5.44	200.58
10-07-75	25.99	675.15	22.8	580.0	8.21	208.79
10-08-75	29.87	705.02	26.2	606.2	9.43	218.22
10-09-75	21.66	726.68	19.0	625.2	15.77	233.99
10-10-75	22.91	749.59	20.1	645.3	16.88	250.67
10-11-75	29.63	779.22	25.4	670.7	21.08	271.75
10-12-75	33.79	813.01	28.5	699.2	23.66	295.41
10-13-75	24.57	837.58	23.2	722.4	19.26	314.67
10-14-75	4.29	841.87	3.0	725.4	2.49	317.16
10-15-75	3.58	845.45	2.4	727.8	1.99	319.15
10-16-75	2.66	848.11	2.0	729.8	1.66	320.81
10-17-75	11.68	859.79	8.5	738.3	7.06	327.87
10-18-75	26.52	886.31	21.2	759.5	17.60	345.47
10-19-75	28.22	914.53	25.5	785.0	21.17	366.64
10-20-75	27.26	941.79	27.1	812.1	22.49	389.13
10-21-75	19.42	961.21	16.6	828.7	13.78	402.91
10-22-75	19.97	981.18	15.4	844.1	12.78	415.69
10-23-75	22.70	1003.88	16.1	860.2	13.36	429.05
10-24-75	24.38	1028.26	16.8	877.0	13.94	442.99
10-25-75	21.82	1050.08	15.5	892.5	12.87	455.86
10-26-75	5.39	1055.47	4.6	897.1	3.82	459.68
10-27-75	5.50	1060.97	4.3	901.4	3.57	463.25
10-28-75	12.35	1073.32	9.7	911.1	8.05	471.30
10-29-75	12.20	1085.52	9.2	920.3	7.64	478.94
10-30-75	10.45	1095.97	7.8	928.1	6.47	485.41
10-31-75	15.52	1111.49	11.2	939.3	9.30	494.71
11-01-75	21.13	1132.62	17.4	956.7	14.44	509.15
11-02-75	17.97	1150.59	15.3	972.0	12.70	521.85
11-03-75	14.58	1165.17	11.7	983.7	9.71	531.56
11-04-75	12.34	1177.51	10.6	994.3	8.80	540.36
11-05-75	12.13	1189.64	10.8	1005.1	8.96	549.32
11-06-75	11.86	1201.50	10.9	1016.0	9.05	558.37
11-07-75	15.02	1216.52	13.7	1029.7	11.37	569.74
11-08-75	16.30	1232.82	14.3	1044.0	11.87	581.61
11-09-75	15.39	1248.21	13.5	1057.5	11.21	592.82
11-10-75	15.50	1263.71	13.6	1071.1	11.29	604.11
11-11-75	17.21	1280.92	15.1	1086.2	12.53	616.14
11-12-75	27.36	1308.28	24.0	1110.2	19.92	636.56
11-13-75	33.74	1342.02	29.6	1139.8	24.57	661.13
11-14-75	27.47	1369.49	24.1	1163.9	20.00	681.13
11-15-75	34.20	1403.69	30.0	1193.9	24.90	706.03
11-16-75	45.83	1449.52	40.2	1234.1	33.37	739.40
11-17-75	32.60	1482.12	28.6	1262.7	23.74	763.14
11-18-75	31.12	1513.24	27.3	1290.0	22.66	785.80
11-19-75	27.36	1540.60	24.0	1314.0	19.92	805.72
11-20-75	27.36	1567.96	24.0	1338.0	19.92	825.64
11-21-75	27.36	1595.32	24.0	1362.0	19.92	845.56
11-22-75	27.36	1622.68	24.0	1386.0	19.92	865.48
11-23-75	13.68	1636.36	12.0	1398.0	9.96	875.44

Table A-2. Flow Volumes Recorded at Sand Hill Lateral Gaging Stations

Date	Upstream Station G-3 (ac-ft) Daily	Cumulative	Middle Station G-2 (ac-ft) Daily	Cumulative	Downstream Station G-1 (ac-ft) Daily	Cumulative
			Spring 1976			
03-23-76	12.93	12.93	8.93	8.93	3.75	3.75
03-24-76	35.78	48.71	28.55	37.48	11.99	15.74
03-25-76	15.91	64.62	7.95	45.43	3.34	19.08
03-26-76	45.12	109.74	35.93	81.36	15.09	34.17
03-27-76	44.35	154.09	35.16	116.52	14.77	48.94
03-28-76	39.80	193.89	30.58	147.10	12.84	61.78
03-29-76	38.57	232.46	29.14	176.24	12.24	74.02
03-30-76	38.17	270.63	29.05	205.29	12.20	86.22
03-31-76	37.81	308.44	29.05	234.34	12.20	98.42
04-01-76	36.81	345.25	27.01	261.35	11.34	109.76
04-02-76	36.74	381.99	26.31	287.66	11.05	120.81
04-03-76	38.42	420.41	29.67	317.33	12.46	133.27
04-04-76	38.39	458.80	30.45	347.78	12.79	146.06
04-05-76	39.30	498.10	31.98	379.76	13.43	159.49
04-06-76	40.47	538.57	33.53	413.29	14.08	173.57
04-07-76	40.48	579.05	34.32	447.61	14.41	187.98
04-08-76	16.22	595.27	15.64	463.25	6.57	194.55
			Fall 1976			
09-28-76	24.89	24.89	7.26	7.26	2.28	2.28
09-29-76	45.95	70.84	35.08	42.34	10.96	13.24
09-30-76	47.23	118.07	36.05	78.39	12.28	25.52
10-01-76	36.42	154.49	27.80	106.19	8.64	34.16
10-02-76	40.83	195.32	31.17	137.36	10.95	45.11
10-03-76	35.75	231.07	27.29	164.65	7.26	52.37
10-04-76	36.54	267.61	27.89	192.54	8.66	61.03
10-05-76	28.90	296.51	22.06	214.60	7.88	68.91
10-06-76	23.61	320.12	18.02	232.62	6.24	75.15
10-07-76	45.30	365.42	34.58	267.20	11.56	86.71
10-08-76	30.60	396.02	23.36	290.56	7.58	94.29
10-09-76	14.08	410.10	10.75	301.31	2.85	97.14
			NO RECHARGE			
10-14-76	1.93	412.03	1.47	302.78	0.0	97.14
10-15-76	18.63	430.66	14.22	317.00	4.84	101.98
10-16-76	21.62	452.28	16.50	333.50	7.78	109.76
10-17-76	27.94	480.22	21.33	354.83	10.12	119.88
10-18-76	26.11	506.33	19.93	374.76	9.79	129.67
10-19-76	29.85	536.18	22.79	397.55	10.90	140.57
10-20-76	12.90	549.08	9.85	407.40	4.96	145.53
			NO RECHARGE			
10-30-76	20.03	569.11	15.29	422.69	6.52	152.05
10-31-76	31.87	600.98	24.33	447.02	11.31	163.36
11-01-76	20.32	621.30	15.51	462.53	8.82	172.18

Table A-3. Flow Volumes Recorded at Sand Hill Lateral Gaging Stations, Spring 1977

Date	Upstream Station G-3 (ac-ft)		Middle Station G-2 (ac-ft)		Downstream Station G-1 (ac-ft)	
	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
02-19-77	11.78	11.78	4.92	4.92	3.20	3.20
02-20-77	32.73	44.51	27.09	32.01	17.59	20.79
02-21-77	34.69	79.20	29.27	61.28	16.62	37.41
02-22-77	34.35	113.55	33.66	94.94	18.02	55.43
02-23-77	31.28	144.83	30.87	125.81	16.86	72.29
02-24-77	30.16	174.99	23.48	149.29	16.11	88.40
02-25-77	40.48	215.47	33.46	182.75	23.91	112.31
02-26-77	42.81	258.28	31.50	214.25	24.66	136.97
02-27-77	39.89	298.17	30.99	245.24	24.36	161.33
02-28-77	38.32	336.49	28.95	274.19	22.25	183.58
03-01-77	38.15	374.64	27.77	301.96	21.56	205.14
03-02-77	36.67	411.31	28.39	330.35	20.32	225.46
03-03-77	10.30	421.61	11.83	342.18	6.94	232.40
NO RECHARGE						
03-09-77	22.02	443.63	20.53	362.71	6.05	238.45
03-10-77	33.62	477.25	31.03	393.74	19.15	257.60
03-11-77	25.63	502.88	19.50	413.24	13.75	271.35
NO RECHARGE						
03-17-77	2.50	505.38	1.59	414.83	0.00	271.35
03-18-77	7.65	513.03	5.05	419.88	0.00	271.35
03-19-77	7.21	520.24	4.86	424.74	0.00	271.35
03-20-77	6.71	526.95	4.61	429.35	0.00	271.35
03-21-77	6.71	533.66	4.61	433.96	0.00	271.35
03-22-77	8.61	542.27	5.54	439.50	0.00	271.35
03-23-77	28.32	570.59	21.89	461.39	17.56	288.91
03-24-77	39.34	609.93	29.48	490.87	22.07	310.98
03-25-77	39.88	649.81	29.22	520.09	17.88	328.86
03-26-77	42.47	692.28	37.64	557.73	30.57	359.43
03-27-77	42.25	734.53	38.03	595.76	30.44	389.87
03-28-77	44.11	778.64	38.17	633.93	29.85	419.72
03-29-77	45.42	824.06	39.77	673.70	33.24	452.96
03-30-77	41.85	865.91	37.63	711.33	29.56	482.52
03-31-77	40.22	906.13	35.66	746.99	27.37	509.89
04-01-77	43.08	949.21	37.76	784.75	28.38	538.27
04-02-77	42.42	991.63	38.65	823.40	31.93	570.20
04-03-77	37.21	1028.84	32.98	856.38	29.19	599.39
04-04-77	34.28	1063.12	29.48	885.86	23.95	623.34
04-05-77	34.44	1097.56	30.00	915.86	23.84	647.18
04-06-77	34.07	1131.63	29.04	944.90	22.23	669.41
04-07-77	30.02	1161.65	24.59	969.49	18.63	688.04
04-08-77	29.90	1191.55	23.69	933.18	15.77	703.81
04-09-77	32.49	1224.04	28.84	1022.02	20.05	723.86
04-10-77	27.92	1251.96	21.56	1043.58	14.89	738.75
04-11-77	39.46	1291.42	35.66	1079.24	24.99	763.74
04-12-77	40.03	1331.45	38.12	1117.36	31.86	795.60
04-13-77	34.12	1365.57	32.49	1149.85	26.47	822.07
04-14-77	29.32	1394.89	27.02	1176.87	22.08	844.15
04-15-77	28.54	1423.43	23.92	1200.79	18.21	862.36
04-16-77	32.23	1455.66	28.69	1229.48	21.82	884.18
04-17-77	23.13	1478.79	19.07	1248.55	15.07	899.25
04-18-77	14.60	1493.39	9.76	1258.31	8.41	907.66
04-19-77	27.46	1520.85	24.18	1282.49	16.61	924.27
04-20-77	32.37	1553.22	34.34	1316.83	27.28	951.55
04-21-77	22.60	1575.82	24.26	1341.09	20.67	972.22
04-22-77	16.92	1592.74	14.06	1355.15	12.75	984.97
04-23-77	16.39	1609.13	12.14	1367.29	10.01	994.98
04-24-77	15.01	1624.14	11.46	1378.46	9.42	1004.40
04-25-77	18.28	1642.42	13.71	1392.46	10.27	1014.67
04-26-77	11.54	1653.96	10.11	1402.57	8.96	1023.63
04-27-77	2.05	1656.01	1.79	1404.36	2.20	1025.83
NO RECHARGE						
05-04-77	18.81	1674.82	17.12	1421.48	13.52	1039.35
05-05-77	34.87	1709.69	33.23	1454.71	26.25	1065.60
05-06-77	29.88	1739.57	27.22	1481.93	21.50	1087.10
05-07-77	20.82	1760.39	16.58	1498.51	13.10	1100.20
05-08-77	20.65	1781.04	16.38	1514.89	12.94	1113.14
05-09-77	20.08	1801.12	16.36	1531.25	12.92	1126.06
05-10-77	14.06	1815.18	12.65	1543.90	9.99	1136.05

Appendix B

Table B-1. Water Table Elevations at Selected Observation Wells, Feet (msl)

Date	P-1* 4058.53 4.2	P-2 4059.93 1.5	P-3 4059.58 0.5	P-4 4062.50 3.7	P-5 4053.15 3.0	P-6 4062.13 1.2	P-7 4058.75 1.1	P-USGS#1 4042.81 2.0	P-8 4043.22 1.8	P-9 4055.84 2.2	P-10 4063.93 2.35	P-11 4064.88 2.0	P-12 4059.77 0.8	P-13 4055.97 1.9	P-14 4060.85 2.5	P-15 4066.29 0.7
08-15-75	37.58	40.97	40.90	42.01	40.29	43.25	26.93	33.76	33.67	47.04	54.80	51.36	46.42		50.79	53.53
09-10-75	36.74	40.18	36.69	41.97	39.71	42.78		33.23	33.62	46.79	54.35	50.93	46.02	44.27	50.47	53.10
09-18-75	36.43	39.95	38.30	41.54	39.35	42.65	26.61	33.00	33.42	46.74	54.34	50.92	45.99	44.33	50.51	53.09
10-02-75	37.47	40.84	43.28	41.89	39.15	44.08	39.47	33.03	33.60	46.95	55.47	51.32	46.09	44.40	50.71	53.79
10-09-75							40.17									
10-16-75	39.14	41.48	43.78	42.52	39.74	44.56	41.13	33.35	33.74	47.16	55.80	51.60	46.21	44.48	51.10	54.20
10-30-75	40.02	41.96	44.00	42.72	40.02	44.79	40.26	33.00	33.08	47.24	55.65	51.75	46.54	44.97	50.83	53.85
11-13-75	40.29	42.25	43.97	42.76	40.13	44.85	39.41	32.81	32.84	47.22	55.75	51.88	46.57	45.00	50.69	53.69
11-26-75							38.37									
12-04-75	40.03	42.49					36.97	32.65	32.64	47.30	55.66	51.97	46.72		50.37	53.21
01-20-76	38.03	41.24	43.27	42.42	39.38	44.22	32.97	32.45	32.64	46.92	55.23	51.55	46.31	44.76	50.33	53.19
02-09-76	37.45	40.79	43.00	42.20	39.02	43.94	32.39	32.25	32.44	46.82	55.14	51.44	46.17	44.59	50.27	53.09
03-06-76	36.78	40.27	42.61	41.89	38.59	43.58	31.63	32.00	32.25	44.69	55.01	51.29	46.00	44.37	50.21	52.99
03-22-76	36.52	40.00	42.45	41.75	38.38	43.38	31.35	32.01	32.30	46.64	54.96	51.24	45.93	44.27	50.22	53.03
04-03-76	37.05	40.67	48.06	42.19	38.63	45.13	43.71	32.11	32.20					44.47		
04-21-76	38.78	41.36	43.56	42.58	39.61	44.45	36.75	32.86	33.36	47.26	55.65	51.87	46.56	44.97	50.71	53.58
05-21-76	38.05	40.97	41.18	42.36	39.99	43.88	30.40	33.46	33.93	47.24	55.39	51.76	46.67	45.02	50.33	53.19
06-15-76	37.53	40.63	38.70	43.86	39.89	43.60	30.51	33.13	33.17	47.25	55.18	51.60	46.65	45.12	50.65	52.47
07-15-76	36.68	40.17	37.69	42.22	38.97	43.12	27.73	33.04	33.89	46.79	54.76	51.30	46.18	44.56	50.29	53.19
08-13-76	35.52	39.35	41.50	41.05	38.55	42.60	25.75	32.25	33.33	46.41	54.29	50.90	45.73	44.09	49.97	
09-26-76	34.78	38.45	41.30	41.17	37.71	41.99	27.65	32.77	33.29	46.16	53.73	50.28	45.41	43.79	49.86	51.49
10-09-76	35.24	39.36	43.64	41.60	37.89	43.68	37.30	32.23	32.70	46.52	55.27	50.90	45.69	44.05	50.46	53.99
10-22-76	35.97	39.60	44.00	41.82	38.20	43.66	36.88	31.97	32.60	46.52	55.48	51.15	45.84	44.20	50.33	53.90
11-06-76	36.58	40.00	43.35	42.02	38.43	43.70	35.32	31.86	32.12	46.66	55.30	51.36	45.99	44.40	50.13	53.02
12-04-76	36.10	39.46	42.22	41.50	38.03	42.95	31.11	31.64	31.97	46.34	54.58	50.94	45.68	44.04	49.83	52.37
01-17-77							30.20	31.44	31.84						50.19	52.95
03-08-77	36.24	39.59	43.27	41.71	38.00	43.38	38.17	31.71	31.99	46.78	55.54	51.43	45.89		50.91	54.40
03-24-77	36.70	39.78	43.23	41.85	38.32	43.27	34.18	31.95	32.32	47.05	56.38	51.77	46.16	44.41	51.01	54.61
04-12-77	38.55	41.39	44.87	42.52	39.09	45.87	46.73	32.39	32.56	47.36	56.63	52.18	46.49	44.83	51.12	54.85
04-28-77	40.16	42.33	44.60	43.07	40.01	45.88	43.90	32.41	32.39	37.76	56.55	52.43	46.95	45.37	51.07	54.49
05-18-77	40.86	42.93	39.17	43.11	40.80	44.97	38.11	34.19	34.16	47.96	56.14	52.46	47.30	45.71	51.08	54.20
06-11-77	39.61	42.10	42.65	43.56	40.78	44.43	34.17	34.80	34.81	48.07	56.33	52.45	47.32	46.19	51.01	53.86
06-25-77	39.02	41.78	43.00	43.27	40.43	44.36	31.43	33.43	33.54	47.91	55.80	52.25	47.24	45.68	51.15	54.06
07-27-77	36.76	40.88	37.11	41.10	39.15	43.24	dry	31.71	32.22	46.86	54.81	51.26	46.10	44.29	50.87	53.67
08-25-77	35.70	39.61	37.75	40.82	38.48	42.63	26.80	31.94	32.53	46.47	54.47	50.83	45.65	43.88	50.52	53.54

Note: All readings fall within 4,000 to 4,100 feet (msl). Add 40 in front of the number for a full reading.
M.P. - measuring point

*Key: P-1 observation well number
4058.53 elevation of M.P. (msl)
4.2 M.P. to land surface

Table B-1. (Cont.) Water Table Elevations at Selected Observation Wells, Feet (msl)

Date	P-16 4044.72 1.3	P-17 4041.33	P-18 4050.10	P-19 4053.34	P-20 4068.75	P-21 4070.35	P-22 4070.97	P-23 4046.73	P-24 4047.32	P-25 4062.23	P-USGS#2 4057.44	P-26 4061.25	RW-2 4045.49 0.6	RW-3 4066.06	RW-4 4068.25	RW-5 4054.15
08-15-75	39.68	25.65	22.09	30.01	56.69		28.10	41.71	41.79	28.10			42.63		62.51	42.81
09-10-75	39.39	25.74	20.93	29.43	56.15	51.97	28.60	41.70	41.86	26.96	49.33	53.50	42.44	dry	62.01	42.26
09-18-75	39.08	25.45	21.38	29.74	55.97	51.77	28.78	41.48	41.50	27.79		53.36	42.32	dry	61.94	42.98
10-02-75	38.84	25.76	26.01	34.02	56.40	56.50	31.23	41.33	41.43	38.90		53.44	41.29	47.56	62.25	42.05
10-09-75			28.35	35.46			32.74			39.96						
10-16-75	38.98	25.50	29.71	36.53	56.75		34.09	41.50	41.58	40.78		53.52	41.50	47.64	62.51	42.37
10-30-75	38.63	26.58	30.38	36.71	56.91	56.75	35.23	41.14	41.12	39.89		53.33	41.17	45.52	62.70	42.32
11-13-75	38.27	26.57	30.71	36.42	56.70	57.52	35.53	40.90	40.95	39.08	48.49	53.24	41.00	43.97	62.84	42.23
11-26-75			30.90	36.12			35.66			38.09						
12-04-75	38.07	26.43	30.80	35.45	56.38	56.14				36.74		53.07		39.86	63.05	42.53
01-20-76	37.87	26.14	30.68	32.94	56.43	53.72	33.05	40.66	40.65	33.06		53.10	40.73	34.83	63.03	41.97
02-09-76	37.76	26.05	29.31	32.41	56.28	53.40	32.58	40.56	40.55	32.49		53.07	40.61	34.03	63.03	41.76
03-06-76	37.57	25.60	28.93	31.80	56.15	53.07	31.97	40.42	40.50	31.74			40.43	dry	62.91	41.53
03-22-76	37.70	25.66	28.68	31.55	56.21	52.91	31.73	40.41	40.44	31.52			40.42	dry	62.94	41.45
04-03-76		25.86								41.99				47.76		41.63
04-21-76		26.67	30.22	35.16	56.80	55.60	34.55	41.08	41.09	36.52	48.70		41.09	39.68	63.20	42.41
05-21-76			28.78	31.37	56.50		31.49	41.68	41.59	30.93			41.86	dry	63.04	43.45
06-15-76	38.63	26.48	28.50	32.45	56.78		31.46	41.25	41.22	31.08			41.35	dry	63.73	43.13
07-15-76	37.83	24.25	27.47	29.60	56.37			41.38	41.56	28.37			41.28	dry	62.35	42.37
08-13-76		23.68	25.60	27.52				41.18	41.12	25.92			41.24	dry	61.83	42.07
09-26-76	38.55		24.78	29.36	54.72	51.57		41.25	41.42	27.36			41.06	dry	61.23	41.52
10-09-76	38.28	25.09	24.84	32.05	56.09	55.55		40.81	40.90	35.68			40.72	36.06	61.45	41.44
10-22-76	37.87	25.17	25.10	32.78	56.08			40.53	40.57	35.80			40.51	37.62	61.77	41.44
11-06-76	37.63	25.12	25.26	32.93	55.73	56.17		40.45	40.47	35.00			40.44	37.53	61.94	41.53
12-04-76	37.34	25.01	25.64	31.29	55.17			40.30	40.31	31.28			40.23	dry	61.84	41.27
01-17-77			25.92	30.44	56.23					31.23						
03-08-77	37.22	25.33	26.37	33.86	57.44			40.51	40.48	37.08	48.69		40.34	40.91	62.67	
03-24-77	37.44	25.37	26.66	32.64	57.48			40.78	40.76	33.59			40.61	35.86	62.90	41.55
04-12-77	37.81	26.07	27.30	37.43	57.61	57.49		40.90	40.84	45.39	48.92		40.79	53.46	63.15	41.85
04-28-77	37.83	26.36	28.10	37.77	57.57			41.35	41.21	42.95	48.94		41.35	50.92	63.34	42.83
05-18-77	38.68	27.05	28.60	36.26	57.50			41.66	41.48	38.45	49.09		41.69	43.63	63.24	43.25
06-11-77		27.39	28.54	34.23	57.22			42.41	42.25	34.41	49.01		42.57	36.79	63.65	
06-25-77	39.02	26.14	28.50	33.51	57.50			41.73	41.60	32.15	48.89		41.75	35.49	63.12	43.21
07-27-77	38.13	23.49	26.06	27.39	57.25			40.91	40.82	26.62	49.16		40.89	dry	62.39	42.11
08-25-77	38.30	24.16	24.70	29.03	57.01			41.08	41.04	27.73	49.17		40.95	dry	62.11	41.62

Table B-2. Water Table Elevations at Selected Irrigation and Stock Wells, Feet (msl)

Date	W-1* 4093.21	W-2 4086.07	W-3 4087.38	W-4 4077.17	W-5 4086.00	W-6 4057.18	W-7 4048.59	W-8 4036.08	W-9 4035.59	W-10 4058.50	W-11 4056.33	W-12 4065.33	W-13 4063.06	W-14 4066.75	W-15 4046.34	W-16 4040.52
08-15-75						23.61	20.79			18.87						ppg
09-10-75						22.71	22.41	17.58		20.04						
09-18-75						23.95	22.59	17.94		20.72						28.64
10-02-75						31.16	23.46	18.00		26.51						28.52
10-09-75						33.55	24.11									
10-16-75						34.76	24.57	18.45		29.73						28.41
10-30-75						35.18	25.15	18.82		30.68						28.20
11-13-75			72.05		69.93	34.97	25.23	18.93		30.94			53.55			28.04
12-04-75						33.88	25.30	19.12								28.04
01-20-76					70.24	31.44	24.82									
02-09-76						31.08	24.86	20.30								
03-06-76						30.29	24.40	19.90								
03-22-76						30.13	24.37			28.40						
04-03-76						34.66										
04-21-76					69.42	33.75	25.30	19.57		30.36	41.51	52.34				28.20
05-21-76						27.30										
06-15-76							24.74									
07-15-76																
08-13-76																
09-26-76						26.67	22.03									
10-09-76						30.48	22.74	18.48		26.35						
10-22-76						31.15	23.19									
11-06-76						30.96	23.15									
12-04-76						29.31	23.31									
01-17-77																
03-08-77						32.92	23.82									
03-24-77						31.03	23.81									
04-12-77			72.48		71.02	36.43	24.50	18.49		30.28	42.15	51.14				26.51
04-28-77						36.39	25.21									
05-18-77						32.73	25.28									
06-11-77						31.32	24.76									
06-25-77						ppg	ppg									
07-27-77						22.47	20.75									
08-25-77					68.17	24.74	21.11	16.44		22.12		52.26				

Note: All readings fall within 4,000 to 4,100 feet (msl). Add 40 in front of the number for a full reading.
M.P. - measuring point

*Key: W-1 observation well number
4093.21 elevation of M.P. (msl)

Table B-2. (Cont.) Water Table Elevations at Selected Irrigation and Stock Wells, Feet (msl)

Date	W-17 4040.53	W-18 4059.39	W-19 4053.51	W-20 4059.10	W-21 4087.27	W-22 4067.50	W-23 4067.45	W-24	W-25	W-26	W-27 4071.47	W-28 4064.67	W-29 4041.42	W-30 4058.03	W-31
08-15-75	ppg			41.56									ppg	17.82	45.85
09-10-75		47.45	43.85										14.86	ppg	44.09
09-18-75		47.74	43.75	ppg	55.43								ppg	17.95	43.31
10-02-75		47.61	43.50	43.09	55.63								15.83	21.07	42.00
10-09-75															
10-16-75			43.80	43.74									16.76	20.93	41.02
10-30-75		47.61	43.67	43.95									17.29	21.33	42.24
11-13-75			44.04	44.02	55.99						62.59	55.17	17.53	21.51	39.41
11-26-75															
12-04-75															
01-20-76		47.18		43.44	56.04	59.65					62.44				40.67
02-09-76				43.22											dry
03-06-76				42.87											dry
03-22-76															
04-03-76															
04-21-76				43.69							62.37	56.42	17.55		dry
05-21-76				41.68											dry
06-15-76		47.51													dry
07-15-76															dry
08-13-76															
09-26-76				41.51											41.54
10-09-76					55.43										40.71
10-22-76															
11-06-76															
12-04-76															
01-17-77															
03-08-77															
03-24-77															
04-12-77							56.97						16.92		
04-28-77															
05-18-77															
06-11-77															
06-25-77															
07-27-77															
08-25-77											62.65		12.42		