DEMONSTRATION OF IRRIGATION RETURN FLOW WATER QUALITY IN THE MESILLA VALLEY, NEW MEXICO

by

Theodore W. Sammis

New Mexico Water Resources Research Institute
New Mexico State University
Las Cruces, New Mexico 88003

in cooperation with

Department of Agricultural Engineering
and
New Mexico Agricultural Experiment Station
New Mexico State University
Las Cruces, New Mexico 88003

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Project Officer

Arthur G. Hornsby
Source Management Branch
Robert S. Kerr Environmental Research Laboratory
Ada, Oklahoma 74820

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ABSTRACT

The general objective of this project was to demonstrate the feasibility of alternative water management practices on the quality of drainage return flow and soil salinity in the Mesilla Valley, New Mexico. The project consisted of a 450-acre demonstration farm having a combination of present day irrigation technology used to show how, through modern water management, the return flow quality and quantity can be improved.

The results of this study indicated that by using irrigation scheduling, farm irrigation efficiency can be increased 13 to 23 percent. However, field irrigation efficiency was found to vary from 80 percent down to 35 percent regardless of type of crop or field size. Trickle irrigation on a 1.3 hectare pecan orchard resulted in irrigation efficiencies near 100 percent with apparent above average yields.

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SECTION 1

INTRODUCTION

The quality of irrigation return flow represents a major problem in the western United States. The water of the Upper Rio Grande has been reported as a classic example of water quality degradation. Mineral pollution is the most serious problem in the Upper Rio Grande Basin. The problem is serious because the basin is approaching or has approached conditions of full development and utilization of the available water resources. There is a progressive increase in the concentration of total dissolved solids and percent sodium from the upper to the lower sampling stations in the Upper Rio Grande Basin. The relatively large increase in dissolved solids in the river along the irrigated areas is, to a large extent, due to the concentrating effect of irrigation.

Nearly all of the valley land in the Upper Rio Grande Basin has a high water table. Where irrigation exists, drainage canals divert water from the "near-surface aquifers" into the Rio Grande. In the Mesilla Valley, as in many other areas, high equilibrium salinity concentrations are known to exist in the near surface aquifer. The key to achieving a reduction in salt loading is to lower the groundwater levels. The most effective means for lowering groundwater levels is to reduce the source of groundwater flows, which can be accomplished by reducing seepage losses through lining canals and laterals, or by reducing deep percolation losses resulting from excessive irrigation by improved on-farm water management practices.

A U.S. Senate Select Committee (1961) and a U.S. Water Resources Council Study (1968) report estimated that the Upper Rio Grande and Pecos basins were the shortest of water in relation to projected future demands of any basin in the continental United States. The Water Resources Council study identified the major problems as water deficiencies, groundwater storage depletion, and poor water quality because of mineral pollution. The past 15-year average inflow to Elephant Butte Reservoir is only about 65 to 70 percent of the long-term average inflow. Thus, a program for reduction of mineral pollution loading is urgently needed in order to protect existing water uses from mineral quality degradation during low-flow periods, and to prevent the serious restriction of future basin-wide economic development.

The general purpose of this portion of the study was to demonstrate the effect of alternate water management practices on the quantity and quality of irrigation drainage return flow and to determine any determinable effects these management practices would have on the soil salinity of the irrigated land. To accomplish this broad objective a 182-hectare farm, located in central Mesilla Valley, was selected for the demonstration site (Figure 1). The specific objectives were:

1. To demonstrate the effects of salinity-control technologies, including canal lining, irrigation scheduling, and trickle irrigation, on the quantity and quality of return flow.
2. To measure the water flow and quality in the drain passing through the Demonstration Farm to determine the effect of water-management practice on irrigation return flow.

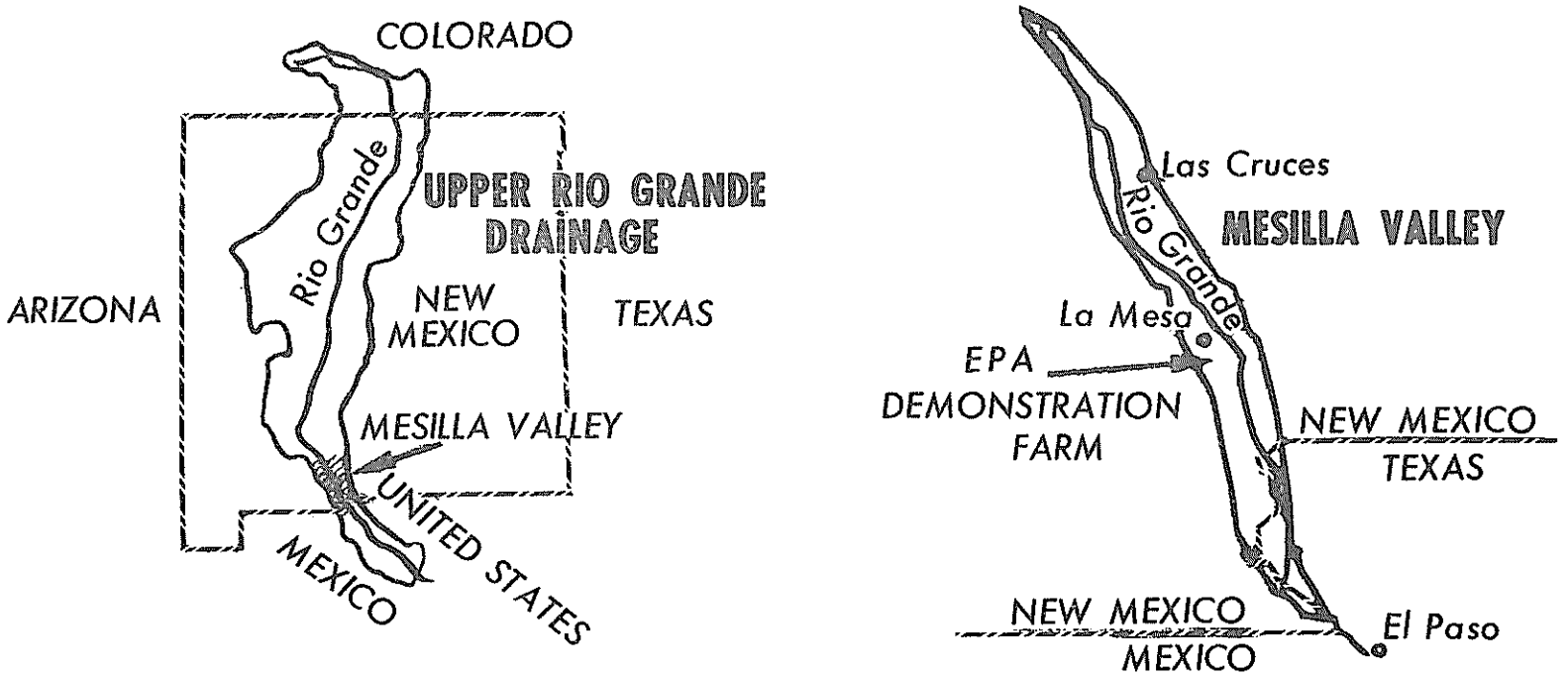


Figure 1. Location of the Mesilla Valley within the Upper Rio Grande Drainage Basin

SECTION 2

PHYSICAL DESCRIPTION OF THE MESILLA VALLEY

The Mesilla Valley is located in Dona Ana County in southern New Mexico. It extends from Selden Canyon north of Radium Springs, New Mexico, southeasterly to the New Mexico-Texas border. The Rio Grande enters the Mesilla Valley at the junction of Selden Canyon and flows southeast past Las Cruces and Anthony to El Paso Canyon. The Valley is approximately 96 kilometers long and about 10 kilometers wide at the widest point just south of Las Cruces (Figure 1).

The irrigated cropland is located predominantly in the valley floor along the Rio Grande. A small amount of the cropland is located on the mesa on either side of the valley. The major flood plains of the valley converge in the vicinity of Las Cruces and drain into the Rio Grande.

Topography

The Mesilla Valley is bounded from north to south on the east side by the San Andres, Organ, and Franklin Mountain ranges and on the west side by mesa highlands. The valley has a relatively smooth alluvial floor and is bordered by steep bluffs of about 15 to 30 meters high, composed of loosely cemented sand, silt, clay, and gravel. From the bluffs, sloping plains extend away from the river to the mountains.

The drainage into the valley is primarily from arroyos in the mesa highlands toward the river. Drainage is from northwest to southeast. The valley floor varies in altitude from about 1,250 meters at Selden Canyon to 1,130 meters in El Paso Canyon. This elevation change represents a gradient of approximately .13 percent.

The Mesilla Valley has a recent valley fill less than 45 meters thick, underlain by the Santa Fe Formation, a mixture of sand and gravel interspersed by numerous clay layers. The valley fill is a relatively fast backfill of an earlier river cut. The backfill and valley floor were completed about 10,000 years ago. The upper fill is fine ground sands and silts while the lower part of the fill is mainly gravel. All groundwater developed within the Mesilla Valley is within the valley fill.

Climate

The Mesilla Valley climate is semi-arid. It is characterized by low annual precipitation, low humidity, high temperatures, and persistent wind movements, particularly in the spring. The summer months are, in general, the wettest ones when tropical air masses from the Gulf of Mexico predominate over the area and cause thundershowers. These thundershowers are occasionally accompanied by hail which may cause severe crop damage. The high temperatures and low relative humidity result in rainfall being evaporated or transpired rapidly.

The mean annual temperature in the valley is about 15 degrees Centigrade. The winters are usually mild and dry, and temperatures above 38 Centigrade are not uncommon in the summer months. The frost-free season in the valley usually begins in mid-April and lasts about 200 days until late October.

Soils

The soils of the Mesilla Valley fall into two distinct divisions--the alluvial section, or the Rio Grande Valley fill, and the narrow margin of upland area of the piedmont slopes. Most of the soil material in the valley floor is alluvial deposit laid

down by the Rio Grande. A large portion of this fill has been transported great distances. With no perennial streams and numerous drainage ways, little material from the valley slopes is transported to the valley floor in any one year.

The soils of the Rio Grande flood plain in the Mesilla Valley are of the Glendale-Harkey-Brazito associations (USDA, SCS, 1977). These soils are brownish-gray to pale brown and are underlain by alluvial sediments ranging in texture from coarse sandy to stratified loams. The principal soil classes are Glendale clay loam, Harkey loam, and the Anthony-Vinton loam (Table 1). Harkey brown loam and Anthony-Vinton loam are characterized as slight to moderately stratified, with thin layers of heavy-textured materials in the subsoil. These soils have very slow to rapid moisture penetration rates and some accumulations of alkali. They occupy the nearly level to gently sloping areas throughout the Mesilla Valley. The Glendale clay loam soils are the most extensive of this association in the valley, occurring in large areas along the river channel in the northern part of the valley and in narrow belts in the southern portion of the valley.

The soils of the highland areas above the valley floor are of the Bluepoint-Calizo-Yturbide associations. The surface layer is generally sandy loam to gravelly loam underlain by sand and gravelly sand loam. The principal soil type occurring in these areas is the Bluepoint loamy sand (Maker et al. 1971). This soil forms a belt along the slopes adjacent to the valley floor. It is characterized by very rapid permeability, low fertility, and low water-holding capacity.

Water Conveyance System

The irrigation water conveyance system of the Mesilla Valley

TABLE 1. SOILS OF THE MESILLA VALLEY, NEW MEXICO

Soil Class	Estimated Acres[1] in Soil Survey (hectares)	Estimated Percent in Mesilla Valley (percent)
Agua loam	3,367	6.87
Agua clay loam	264	0.54
Agua variant soils, moderately wet	251	0.51
Agua variant and Belen variant soils	754	1.54
Anapra silt loam	243	0.51
Anapra clay loam	2,886	5.89
Anthony-Vinton fine sandy loam	2,342	4.78
Anthony-Vinton loam	2,717	5.55
Anthony-Vinton clay loam	833	1.70
Armijo loam	81	0.16
Armijo clay loam	1,443	2.94
Armijo clay	1,371	2.80
Belen loam	86	0.18
Belen clay loam	963	1.96
Belen clay	3,379	6.90
Belen variant soils	150	0.30
Brazito loamy fine sand	2,720	5.55
Brazito very fine sandy loam, thick surface	2,702	5.52
Glendale loam	3,165	6.46
Glendale clay loam	8,092	16.52
Glendale clay loam, alkali	241	0.49
Harkey fine sandy loam	237	0.48
Harkey loam	7,564	15.44
Harkey loam, saline and alkali	120	0.24
Harkey clay loam	3,020	6.16

[1]Acreages include Rincon Valley (1,738 hectares) portion of Elephant Butte Irrigation District.

Source: U.S.D.A., Soil Conservation Service, "Soil Survey of Dona Ana County, New Mexico", Advance copy, April 1977.

consists of an intricate network of primary canals branching into numerous primary and secondary laterals (Figures 2a and 2b). The primary canals are the Leasburg canal which originates at the Leasburg dam and the East Side and West Side canals which originate at the Mesilla dam. The Leasburg canal branches into three primary laterals--the Picacho which crosses the river to serve the west side between Leasburg and Mesilla dams before emptying in the river channel, and the Las Cruces and Mesilla laterals that branch into numerous secondary laterals to serve the east side before either emptying into the river channel or the East Side canal.

The East Side canal branches into two primary laterals which empty in the river channel below Anthony, New Mexico-Texas. The primary laterals of the East Side canal are the Anthony and the Three Saints laterals which branch into numerous secondary laterals to serve the lands on the east side of the river channel between the Mesilla dam and LaTuna Detention Farm. The West Side canal branches into two primary laterals, the La Union East and the La Union West. These three, the main canal and two primary laterals, break into numerous secondary canals supplying the area on the west side of the river between Mesilla dam and El Paso dam with surface irrigation water. A portion of the La Union East lateral crosses the river channel at Borderland to serve lands on the east side of the river.

A portion of the water released is diverted to the Rincon division at Percha dam with the remainder flowing down the river channel through the Rincon Valley to be diverted later in the Mesilla and El Paso divisions. A portion of the water diverted for the Rincon and Mesilla divisions is returned by drains and waste-ways to continue its flow into the El Paso division of the Rio Grande project.

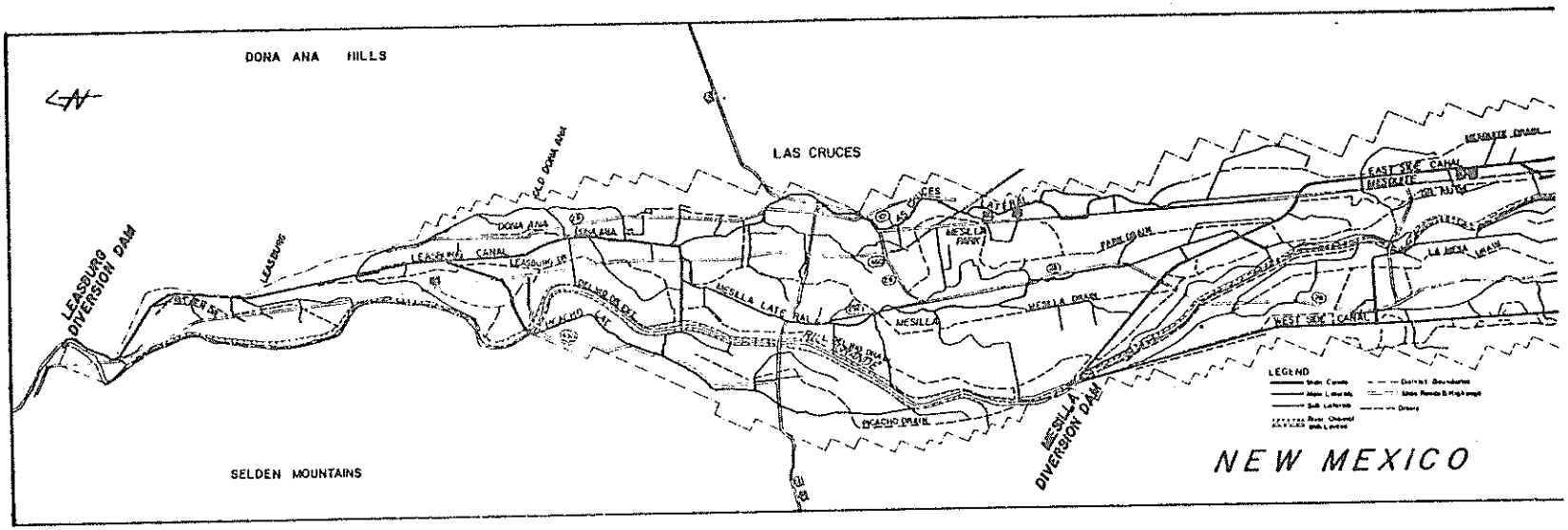


Figure 2a. Conveyance system of the northern portion of the Mesilla Valley

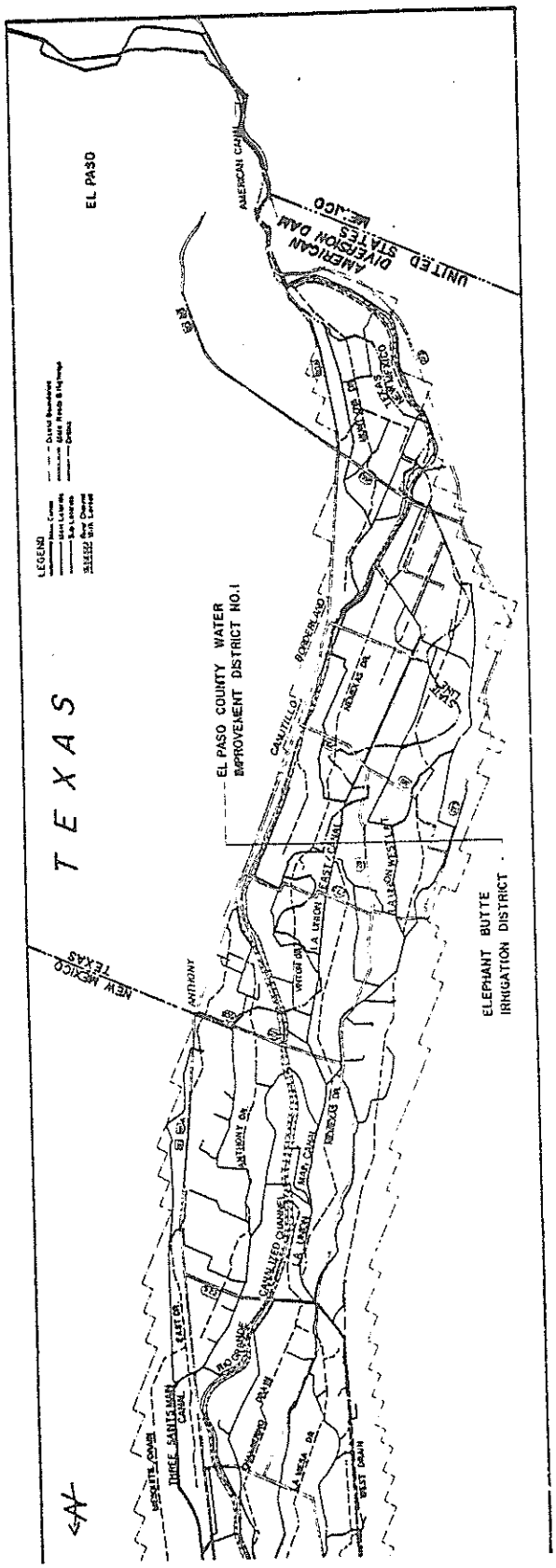


Figure 2b. Conveyance system of the southern portion of the Mesilla Valley

Surface water for the Mesilla Division is diverted by the Leasburg dam into the Leasburg canal, and by the Mesilla dam into the East and West Side canals. The Leasburg dam is located at the head of the Mesilla Valley, and the Mesilla dam (Figure 2a) is located southwest of Las Cruces. Portions of the surface waters diverted for the Rincon division, that are returned to the river channel by drains and wasteways, are diverted again at the Leasburg dam. Also, portions of surface waters diverted at the Leasburg dam, that are returned to the river, are diverted again at the Mesilla dam. In addition, water diverted at the Leasburg dam may be added to the East Side canal diversions from the Mesilla dam (Figures 2a and 2b).

Drainage System

The drains of the Mesilla Valley are a maze of intricately woven open ditches designed to carry excess groundwater away from the cropland into the river channel. The drains are also presented in Figures 2a and 2b. These drains are the primary subjects of studies to reduce irrigation return flow.

Surface Water Sources

Irrigation water in the Mesilla Valley comes from surface and ground sources. The surface water is supplied by the Elephant Butte Irrigation District (EBID) through the facilities of Elephant Butte and Caballo Reservoirs with supplementary supplies being provided by district-owned wells. Groundwater is supplied by individual wells and is used as a supplemental source in most cases, except for lands located outside of the district boundaries where it is the only source of irrigation water. Pumpage is the primary source of irrigation water for approximately 1,940 hectares.

Surface Water Quantity

The quantity of surface water has not been a major limitation to irrigated agriculture in the Mesilla Valley since the drought in 1954-1956. There have been three other years of shortages, 1964, 1972 and 1978.

The quantity of surface water released to project lands varies widely from year to year, depending upon the amount of storage in Elephant Butte and Caballo Reservoirs. Beginning in 1938, water released for irrigation of Rio Grande Project lands originated from Caballo Reservoir. Prior to 1938, surface waters for irrigation were released from Elephant Butte Reservoir.

The annual diversions and average diversions at the two dams in the Mesilla Valley are reported in Table 2 for the period 1938-1976 as well as the average total diversions for this period. The average total diversions from both dams for the 38-year period were 46,022 hectare-meters. The minimum diversion was 17,247 hectare-meters in the middle of the drought of 1954-1956. The maximum diversion was in 1945 with 67,586 hectare-meters.

The diversions were the gross annual diversions in the Mesilla Unit of the Rio Grande Project, a portion of which was returned to the river by way of drains and wasteways to be diverted again. Therefore, a portion of the diversion at the Mesilla dam includes a portion of the diversion from Leasburg dam. Approximately 45 percent of the gross annual diversions of water by the three diversion dams in the Mesilla Valley were delivered to farms in the valley. The balance was El Paso Valley carriage, canal wastage, seepage, and other unaccounted for losses.

Monthly surface water deliveries to lands in the Mesilla

TABLE 2. GROSS ANNUAL DIVERSIONS OF IRRIGATION WATER FROM THE RIO GRANDE IN THE MESILLA VALLEY, FOR THE PERIOD 1938 THROUGH 1976

Year	Leasburg Canal*	Mesilla Dam East Side Canal**	Mesilla Dam West Side Canal†	Total
	(hectare-meters)			
1938	18,621	9,730	24,994	53,345
1939	20,329	11,180	27,437	58,946
1940	19,093	10,039	24,630	53,762
1941	17,161	9,016	22,506	48,683
1942	23,738	11,725	29,314	64,777
1943	27,129	11,201	27,920	66,250
1944	25,205	10,903	26,526	62,634
1945	26,907	12,075	28,604	67,586
1946	25,373	10,700	26,039	62,112
1947	23,767	9,711	24,683	58,161
1948	22,671	10,284	24,902	57,857
1949	23,278	10,909	25,311	59,498
1950	23,931	10,239	24,209	58,379
1951	12,378	6,273	15,600	34,251
1952	12,451	6,938	16,367	35,756
1953	12,417	6,858	17,218	36,493
1954	6,230	4,612	11,103	21,945
1955	4,378	2,905	9,964	17,247
1956	4,359	3,454	10,395	18,208
1957	15,030	4,374	15,300	34,704
1958	20,100	8,608	22,148	50,856
1959	20,038	9,403	20,418	49,859
1960	19,214	9,577	21,400	50,191
1961	15,415	8,217	19,869	43,501
1962	18,251	9,550	21,154	48,955
1963	16,845	8,358	19,789	44,992
1964	9,645	2,373	10,010	22,028
1965	9,854	5,268	13,479	28,601
1966	15,313	7,002	17,386	39,701
1967	15,160	7,288	16,363	38,811
1968	18,467	8,439	20,497	47,403
1969	20,871	8,838	24,936	54,645
1970	20,309	8,888	23,450	52,647
1971	16,258	7,225	19,071	42,554
1972	10,690	4,359	11,516	26,565
1973	15,004	8,223	21,755	44,982
1974	17,603	8,841	23,365	49,809
1975	11,172	8,600	22,733	42,505
1976	18,033	10,219	25,640	53,892
Average	17,248	8,267	20,718	46,233

* Diversion at Leasburg dam to the east side of Rio Grande.
** Diversion at Mesilla dam to the east side of Rio Grande.
† Diversion at Mesilla dam to the west side of Rio Grande.

Source: United States Department of the Interior, Bureau of Reclamation, El Paso Office, unpublished data sheets, 1938-1977.

Division of the Elephant Butte Irrigation District are presented in Table 3. These deliveries were calculated from information from the Bureau of Reclamation (1960-1975) and were the net deliveries to the farm (El Paso carriage, canal wastage, seepage, and other unaccounted for losses have been deducted). The average annual delivery to farms was 19,169 hectare-meters. Based on the 1976 acreage, the Mesilla Division of the Elephant Butte Irrigation District averaged about .59 hectare-meters per cropped hectare.

Surface water, however, does not represent the full supply of water necessary for the irrigation requirements of the crops produced in the Mesilla Division. Although the surface water is generally of better quality, it is necessary to pump some groundwater to meet the irrigation requirements. The groundwater pumpage will be discussed later in the section dealing with groundwater quantity and quality.

Surface Water Quality

Records of chemical analyses of the river at El Paso in 1966 and 1967 (USGS, 1974) indicated that the quality of the surface water varied generally with the quantity of water flowing in the river, becoming of poorer quality with small flows and better with larger flows. During the February to October period 1974, the quality of the river averaged about 920 micromhos of specific conductance and the river flow averaged 570 m^3/sec. During the April to September period 1975, the quality of the river flow averaged 875 micromhos of specific conductance and the river averaged 670 m^3/sec.

In 1974, the U.S. Geological Survey reported in Water Resources Data for New Mexico that chemical quality of water in the Rio Grande

TABLE 3. MONTHLY DELIVERIES* OF SURFACE WATER TO THE LANDS IN THE MESILLA DIVISION, ELEPHANT BUTTE IRRIGATION DISTRICT, NEW MEXICO, 1960-1976

Year	Month												Total
	January	February	March	April	May	June	July	August	September	October	November	December	
	(hectare-meters)												
1960	5	2	3,201	3,316	2,017	3,452	3,617	5,343	3,864	106	28	10	24,960
1961	-	9	1,213	3,177	1,469	2,485	3,926	3,970	2,621	155	33	-	19,956
1962	5	9	2,855	4,239	1,781	4,399	5,139	5,219	2,692	94	14	7	26,454
1963	10	-	3,729	3,231	1,178	2,246	3,910	3,557	1,852	25	16	6	19,761
1964	5	-	280	862	21	284	530	760	956	.62	-	-	3,698
1965	-	-	4	1,069	10	2,031	4,105	4,456	3,089	118	-	3	14,485
1966	-	-	1,324	3,848	1,719	2,312	3,238	4,261	2,778	152	24	-	19,655
1967	5	-	4,110	1,040	719	958	2,062	2,519	2,475	100	37	-	14,024
1968	11	12	2,671	1,642	918	2,342	2,723	3,884	2,121	106	29	-	16,464
1969	-	-	4,161	1,912	1,390	3,485	4,548	6,104	1,739	134	32	-	23,506
1970	-	-	4,014	2,745	2,464	3,230	5,287	4,916	2,981	130	25	-	25,792
1971	-	-	3,365	1,397	909	1,701	2,936	3,147	1,383	24	-	-	14,861
1972	-	-	2,488	852	228	218	1,608	1,437	392	5	-	-	7,228
1973	-	-	2,305	2,601	1,896	3,099	3,730	5,138	3,947	189	-	-	22,904
1974	-	-	4,028	2,986	2,570	4,070	3,459	3,966	2,482	12	-	-	23,572
1975	-	84	2,669	2,701	2,610	3,265	4,443	4,353	2,488	461	-	-	23,074
1976	498	983	3,297	3,338	3,366	3,172	3,562	4,384	2,374	108	-	-	25,048
Average	-	5	2,714	2,358	1,362	2,483	3,455	3,935	2,370	109	1	-	19,169

* Amount of water delivered to the farm headgates excludes: canal wastage, seepage, and other unaccounted for losses (calculated from monthly per acre deliveries and annual irrigated acreage).

Source: United States Department of the Interior, Bureau of Reclamation, El Paso Office, unpublished data sheets, 1960-77, 10 pp.

increased in dissolved solids content by nearly 41 percent between Leasburg, New Mexico and El Paso, Texas. The surface water of the Rio Grande increased in concentration of dissolved solids downstream from Caballo dam to El Paso, with the major increases being in silica, calcium, sodium, sulfate, chloride, and boron. Records of the chemical quality of the surface water diverted at the Mesilla dam were not available, but the surface water is assumed to be lower in quality than when it passed the Leasburg dam and higher in quality than at El Paso.

The quality of surface water in the Mesilla Valley is not considered a limitation for crop production except in the southern portion below Anthony, New Mexico. In this area, the problem of lower quality surface water is compounded by the existence of poor quality groundwater.

Groundwater

Groundwater in the Mesilla Valley is used 1) to supplement surface water for agricultural use, 2) for municipal use in Las Cruces, Anthony, and numerous small villages, 3) for industry, and 4) for rural domestic use.

There are about 1,940 cultivated hectares in the Mesilla Valley dependent entirely on groundwater for irrigation, and about 87 percent of the approximately 32,382 cultivated hectares within the Elephant Butte Irrigation District in 1976 used groundwater as a supplemental source. The irrigation wells in the valley vary in depth, but most are from 12 to 22 meters in depth and in which the water quality is poor in comparison to the surface water. Recently some large wells have been completed down to 100 meters or more. The depth of irrigation wells is greatly affected by the depth of

the water table in the valley. The amount of water in storage in the valley fill and the amount of pumpage is not well known. The pumpage varies from year to year inversely with usable precipitation and the supply of surface water.

Groundwater Quantity

The primary groundwater sources are water seepage from the river, canals, laterals, and irrigation water applied to the lands, precipitation, runoff from arroyos from the mesas to the valley, and groundwater flow from the mesa lands bordering the valley.

Groundwater Quality

The groundwater quality in the Mesilla Valley varies with both depth and location (Figures 3a and 3b). The quality generally decreases with distance down the valley (Figures 3a and 3b). The greatest concentrations in TDS are in the southern portion of the valley. The quality of water is usually better with increased depth. Fresh water exists within the Santa Fe group sub-stratum below ground level to a depth of about 365 meters extending from near the northern end of the Mesilla Valley generally south to Canutillo (King, 1971). The Santa Fe group generally has water quality with electrical conductivity of about $.57 \times 10^{3}$ mmhos/cm. South of Canutillo, the water from the Santa Fe group increases in mineral content until it becomes unfit for most uses. This increase in mineral content of the water in the Santa Fe group from north to south in the valley is thought to be due to incomplete flushing of ancient playa lake sediments and to the increased mineral concentrations of the groundwater in the upper horizons by evapotranspiration (Leggat et al., 1972).

Most of the groundwater used for irrigation in the Mesilla

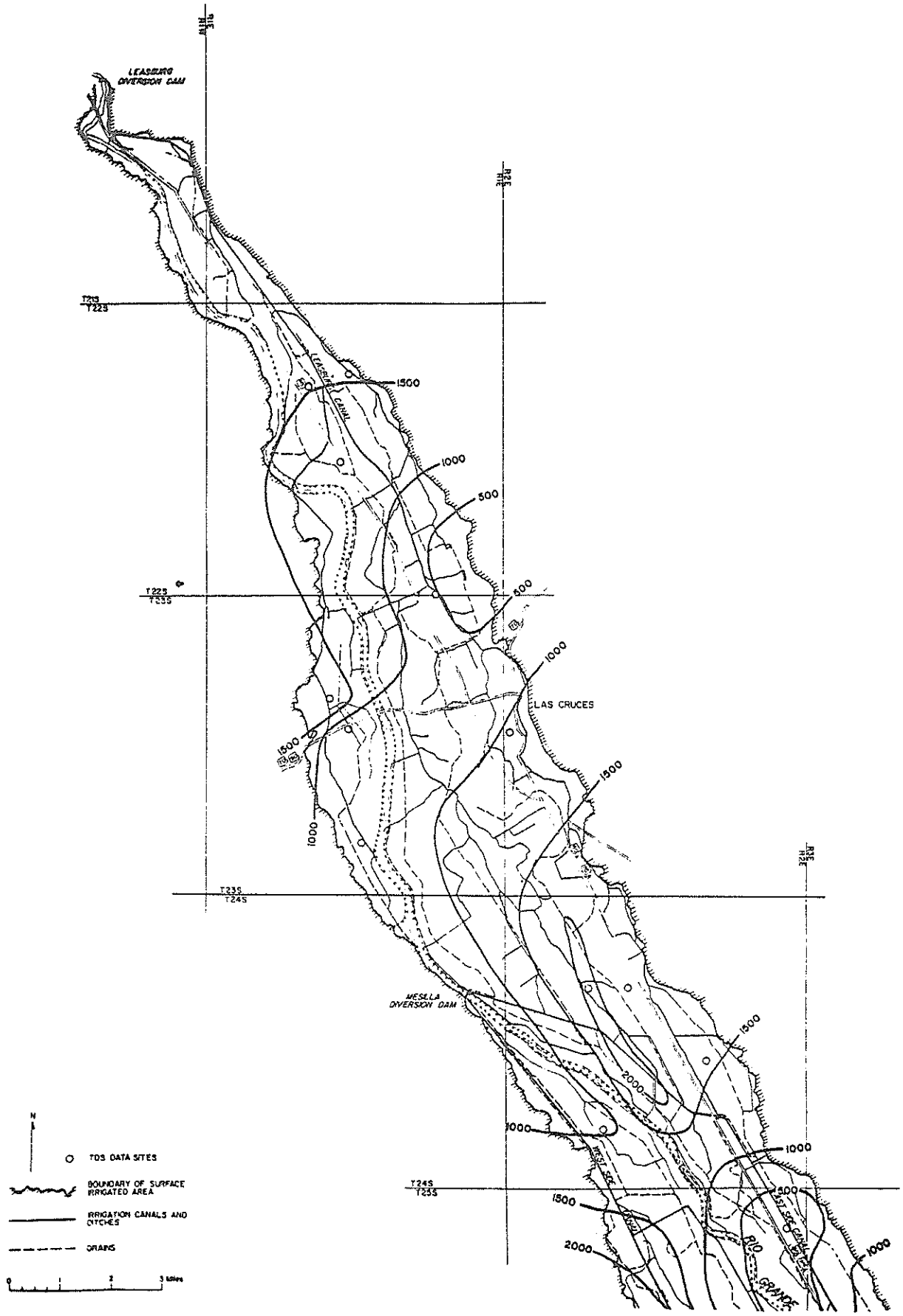


Figure 3a. Total dissolved solids contour map in ppm of soluble salts for the May-June 1967 period, northern portion of the Mesilla Valley

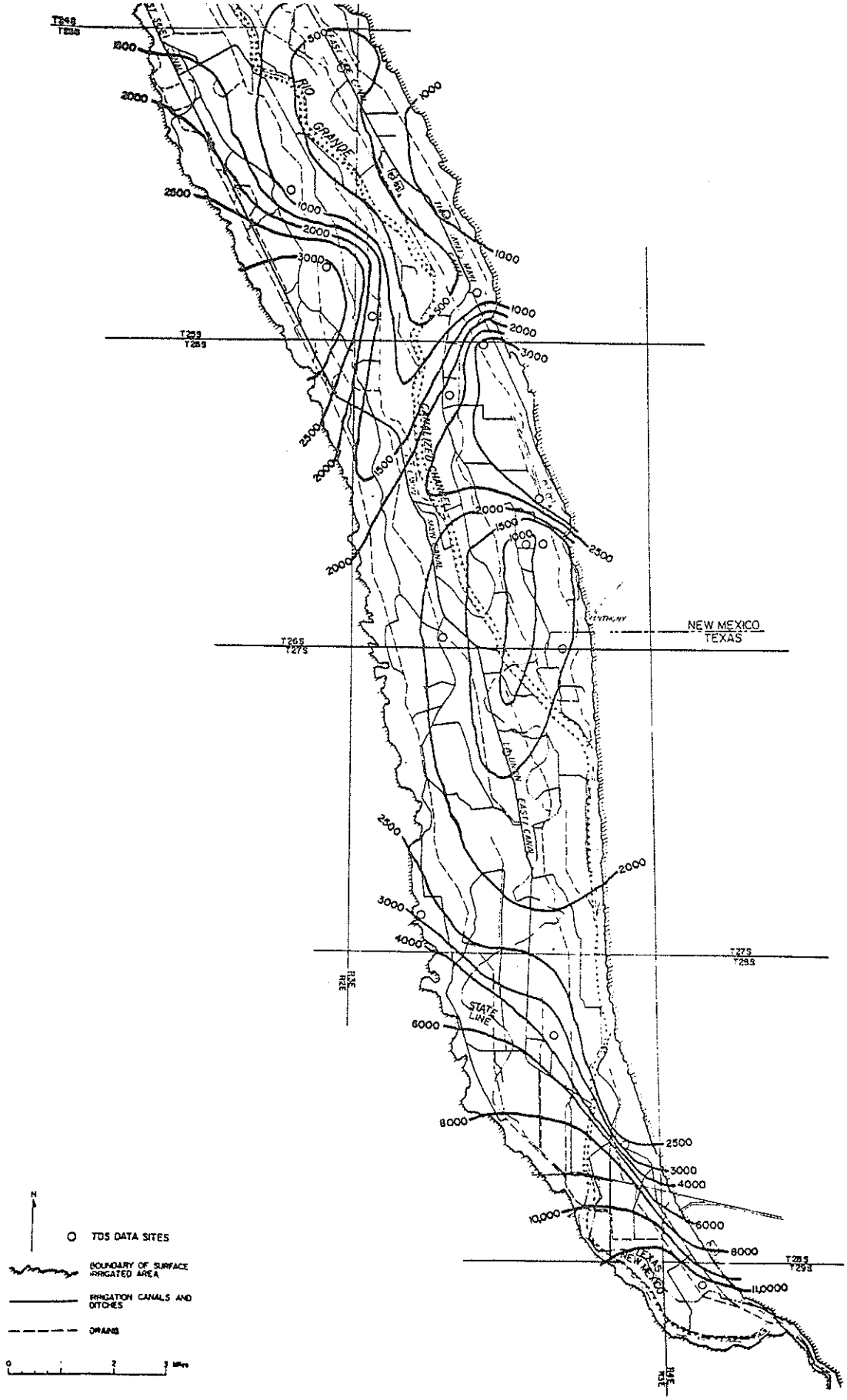


Figure 3b. Total dissolved solids in ppm of soluble salts for the May-June period, southern portion of the Mesilla Valley

Valley is shallow groundwater. This water is relatively good quality (less than 3000 ppm TDS) throughout most of the valley but contains more dissolved solids than the water in the underlying Santa Fe group. South of Canutillo, the shallow wells, while having a high concentration of dissolved solids, are of better quality than the water of the Santa Fe Group. Leggat et al. (1972) reported that increases in groundwater withdrawals in the Mesilla Valley were likely to result in increases in the dissolved solids content of the groundwater. Thus, if the shallow aquifer is to remain a source of supplemental supply for irrigation, withdrawals of water must not be so great that an unfavorable salt balance results. Groundwater quality is considered a moderate limitation to about one-third of the irrigated cropland in the valley, and a severe limitation to about one-sixth, primarily in the southern portion of the valley. The deterioration in the quality of shallow groundwater and groundwater in the Santa Fe group is regarded as a major limitation to the further development of shallow groundwater sources for irrigated cropland in the lower portion of the Mesilla Valley.

SECTION 3

MATERIALS AND METHODS

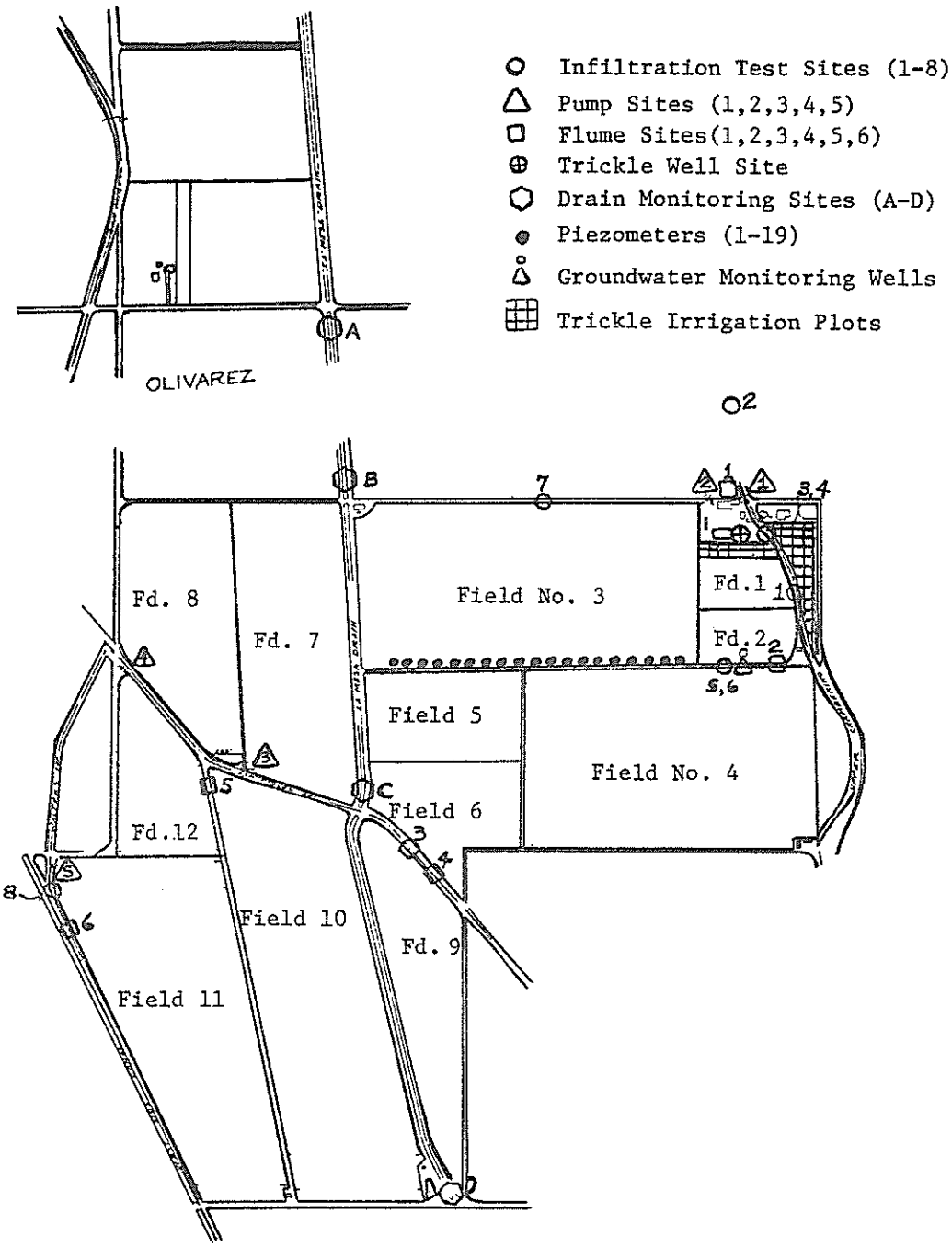
The research on the Demonstration Farm consisted of three main areas:

1. Monitoring of applied water on the fields, and irrigation scheduling to determine irrigation efficiencies for these fields.
2. Installation and demonstration of a trickle-irrigation system, and monitoring of applied water on the trickle-irrigated land to show the increased irrigation efficiency and decreased return flow.
3. Monitoring of the drain water flowing through the farm to determine if changes in irrigation practices could be detected by decreased flow rates and salinity levels in the drain.

The physical layout of the Demonstration Farm is presented in Figure 4. The farm contains an elaborate surface distribution system consisting of lined and unlined ditches and five wells to supplement surface irrigation water. The drain runs through the center of the farm. The crops grown on the farm were wheat, tomatoes, cotton, lettuce, peppers, chile, grain sorghum, and alfalfa. There was also a producing pecan orchard. The cropping pattern, which changed from year to year, is presented in Table 4 for the three years of the demonstration project.

Water-Measuring Equipment

To measure pumped water, 0.3 meter diameter McCrometer



A diagram of the Demonstration Farm and the associated monitoring locations

Figure 4

TABLE 4. HECTARES AND YIELDS PER HECTARE BY CROP FOR THE DEMONSTRATION FARM, 1975, 1976, AND 1977

	Hectares			Yield			
	1975	1976	1977	Units	1975	1976	1977
Alfalfa	28.1	28.1	44.6	mt/ha	13.4	15.7	12.3
Chile	50.3	3.7	2.4				
Green				mt/ha	17.5	17.5	
Red				kg/ha	336	483	
Cotton	41.5	33.7	60.9				
Lint				kg/ha	443	538	841
Seed				kg/ha	740	900	1,400
Grain Sorghum	0	5.7	0	kg/ha		NA	
Lettuce	0	(20.2)*	(13.8)*	ctn/ha		1,236	0
Wheat	5.6	45.6	0	kg/ha	3,925	4,708	
Tomatoes	29.9	38.6	65.6	mt/ha	29.1	38.6	17.9
Pecans	1.3	1.3	1.3	kg/ha	388	448	1,214
Floral Gem Chile	8.0	8.1	3.2	kg/ha	NA	NA	NA
Cayenne Pepper	16.5	16.3	0.0	kg/ha	4,483	2,690	
Miscellaneous Vegetables	0.0	0.1	3.2				
Total	181.2	181.2	181.2				

*Double cropped

NA - Not available

impeller-type flow meters were installed on all of the wells. Parshall flumes (throat width 4.3 cm and 22 cm) with Belfort and Stevens water-stage recorders were installed in all of the surface distribution canals so that a complete record of the applied water by field could be kept. Along with measuring the discharge from the wells, the natural gas consumption for each well on the Demonstration Farm was monitored. The irrigation pumps were tested for pump efficiency and overall efficiency. Two non-recording Taylor 28 cm rain gages were installed at the Demonstration Farm to measure precipitation in the area.

Trickle Irrigation Well

An irrigation well was developed to a depth of 75 m to provide water for the trickle irrigation system. An analysis of a water sample taken from the well is presented in Table 5, and a description of the material encountered from the well drilling is presented in Table 6.

Groundwater Monitoring

Nineteen piezometers were installed on a transect perpendicular to the drain as shown in Figure 4. They consisted of 1.2 cm diameter pipes driven into the ground below the water table. The pipes were slotted at the base to allow water entry. The depth to the water table was measured using a depth gage and the depth corrected back to a datum elevation to account for the irregularities in the land surface.

Three wells, with 5 cm casings, were installed at 6, 10, and 15 meters to monitor the salinity of the groundwater at those depths (Figure 4). The wells were installed with a rotary drill rig and the

TABLE 5. GROUNDWATER QUALITY AT THE DEMONSTRATION FARM

1977 Pump No.	Depth of Well[1]	EC x 10^3	pH	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4
	m	mmhos/cm									
2	60	0.79									
3	33	1.76									
4	33	1.64									
5	33	0.88	7.61	3.82	1.10	3.72	0.14	1.92	0	3.36	3.84
Mean		1.27 ± 0.50									
Standard Deviation											
Trickle Well[2]											
1977	75	0.56	8.09	1.08	0.54	3.77	0.09	1.28	0	3.16	1.32
1976		0.57	7.89	1.74	0.79	3.13	0.28	1.28	0	2.36	1.28

1/ Static water level is 3 meters, upper portion of well No. 2 is cased off.

2/ Trickle well has last 3 meters of casing slotted.

TABLE 6. SOIL COMPOSITION WITH DEPTH OF THE TRICKLE IRRIGATION WELL AT THE DEMONSTRATION FARM

Depth (meters)	Soil Type
0. - 1.52	Soil
1.52-12.20	Sand
12.20-19.82	Sand and gravel
19.82-20.74	Clay and some sand
20.74-22.88	Sand and gravel
22.88-31.42	Sand
31.42-35.38	Some sand and light brown clay
35.38-46.06	Sand and gravel
46.06-48.19	Clay (light brown)
48.19-55.82	Sand and gravel
55.82-58.56	Sand and large gravel
58.56-61.92	Grey to light brown clay and gravel
61.92-62.52	Sand
62.52-64.05	Clay and gravel
64.05-64.66	Sand and gravel
64.66-67.40	Sand and clay
67.40-75.64	Sand and gravel

information obtained from them at the beginning of the measurements should be carefully interpreted due to the contamination process of the drilling operation.

Drain Flow Monitoring

Bridges were built across to allow easy and frequent measurements of the flow rate. Velocity measurements were made at 20 locations across the canal along with water-depth measurements. The area and subsequent flow rates for Sites B and D (Figure 4) were determined by the trapezoidal method.

Stilling wells were also installed in the La Mesa drain. Measurements, using Stevens water stage recorders, were determined at Sites B and D (Figure 4). Water samples were collected at Sites A through D and analyzed in the laboratory for salinity.

Irrigation Scheduling

Irrigation scheduling was furnished to the Demonstration Farm through a contract with Agricultural Technology Incorporated, a commercial company providing irrigation scheduling for local farmers. The irrigation scheduling service was based on a climatological computer model to determine projected transpiration rates. Knowledge about the water-holding capacity and rooting depths of the crops, along with transpiration rates (Jensen, 1975) was used to determine the next irrigation date. The climate information used in the model came from a climatological station maintained at the New Mexico State University's Plant Science Farm. The climate model was based on Jensen-Haise's potential evapotranspiration and crop production coefficients (Jensen, 1973). The information supplied to Agricultural Technology Incorporated for the operation of the model included:

solar radiation, temperature, humidity, and wind speed. A field man checked each field once a week to determine the available moisture within the root zone and compared the estimate of moisture depletion to the computer model's recommendation for the next irrigation. Information was supplied to the farmer on the water status at each of his fields and a recommended irrigation date.

Trickle Irrigation System

Figure 5 shows the orchard and row crop demonstration area with respect to the well and main line.

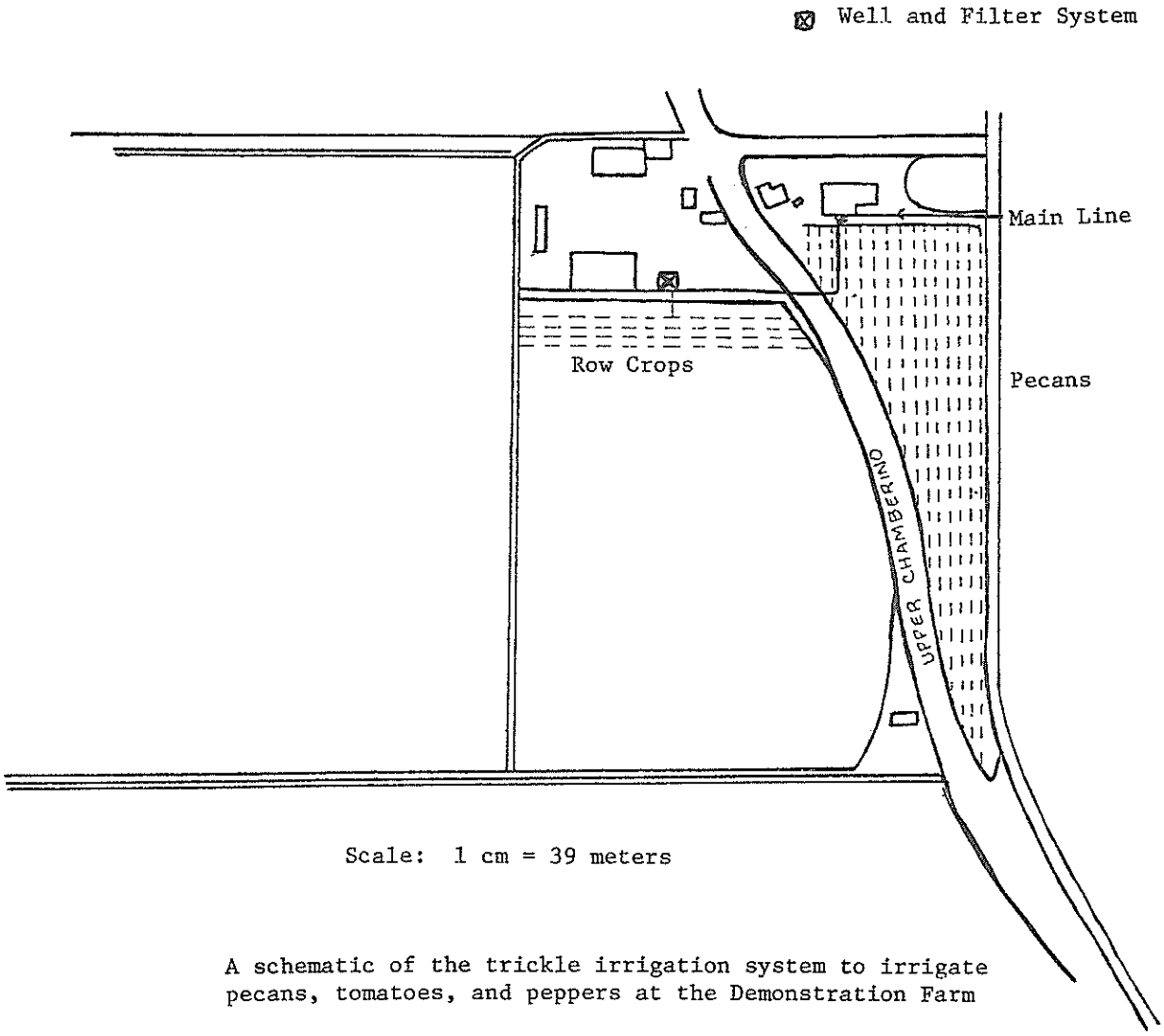
Field 1, which consisted of 1.32 hectares of pecans, was converted from flood to trickle irrigation at the beginning of the demonstration project. A gravel-packed well was drilled in order to supply good quality water for the irrigation system. A 3.7 kw Rusberry submergible turbine pump was installed. The trickle system was used also to irrigate four rows each of tomatoes and peppers.

The system initially had a 200-mesh screen filter which was later supplemented by a sand filter automated to permit backwashing The sand filter was manufactured by Agricultural Products, Burbank, California.

Soil samples were taken and saturation extracts were prepared in the field. The saturation extracts, and all other water quality samples, were analyzed for salt content at the University's water laboratory using the procedures listed in Table 7.

Infiltration Measurements

Two approaches were investigated to estimate the seepage rate of water from the Demonstration Farm and main supply ditch. The first approach was to measure the infiltration rate in a section of



Scale: 1 cm = 39 meters

A schematic of the trickle irrigation system to irrigate pecans, tomatoes, and peppers at the Demonstration Farm

Figure 5

TABLE 7. TABLE OF METHODS USED TO ANALYZE WATER SAMPLES

Ions Tested	Method	Reference
Calcium	Atomic Absorption Spect.	EPA Report (1971)
Magnesium	Atomic Absorption Spect.	"
Sodium	Flame emission	"
Potassium	Flame emission	"
Carbonate	Titration with H_2SO_4	"
Bicarbonate	Titration with H_2SO_4	"
Nitrate	Cd reduction	"
Phosphorus	Molybdo-blue	"
Electrical conductivity		"
Sulfate	Nitrochrome-Azo Titration	Rasnich and Nakayama (1973)

the Upper Chamberino irrigation lateral and several sections of the farm supply ditches by ponding the water.

Bulkheads were fabricated and installed in the irrigation ditches. Test sites, as shown in Figure 4, are locations 4, 6, 7, and 8. Water stage recorders were installed to measure the rate of lowering of the water surface. Testing was conducted until a steady-state condition had occurred. During the infiltration tests the turnouts were sealed by lining with plastic.

The second approach used to determine the infiltration rate for a section of canal was to measure the change in the temperature profile beneath the canal over a 24-hour period. If the infiltration rate normal to the surface reached a steady-state condition and a sinusoidal temperature fluctuation of constant amplitude was assumed at the land surface, the flow of heat and water can be described by:

$$k \frac{\partial^2 T}{\partial z^2} - \nu c_o \rho_o \frac{\partial T}{\partial z} = cp \frac{\partial T}{\partial t}$$

where k = Heat conductivity of the fluid and medium in combination

T = temperature

z = distance of flow

ν = gross velocity of fluid movement

c_o and ρ_o = specific heat and density of fluid

c and p = specific heat and density of fluid and soil in combination

t = time

Using the above equation, Stallman (1965) describes the downward flow of water determined from temperature measurements. The boundary conditions are not met exclusively in an unlined canal. However,

the temperature measurement technique has its advantages over ponding or inflow-outflow techniques in that a pipe can be installed to measure the change in temperature in and beneath a canal without disturbance to the canal or interruption of the irrigation process. The only requirements of this technique are that the water has travelled a sufficient distance so that a steady-state equilibrium has been reached between the water and air temperature and that a radiation load has impinged upon it so that there is a sinusoidal input curve from the irrigation water to the soil beneath. To use this technique, a 1.27 cm diameter pipe was installed to a depth of 2 meters beneath the canal and filled with water. Temperature measurements to a hundredth degree Centigrade were taken at selected depths from the water surface to 1.2 meters beneath the soil surface. The readings were taken at 2-hour intervals for 24 hours.

SECTION 4

RESULTS AND DISCUSSION

Irrigation Scheduling

Jensen (1975) published a review of irrigation water management principles and the probable effects of scientific scheduling on salinity of return flow. Jensen attributes the lack of any significant changes in irrigation efficiencies during the past decade to the problems associated with the water management of a complex soil-crop environment system, the lack of economic incentive to make improvements, and ineffective traditional approaches to improve irrigation-water management.

Recommendations by Jensen were incorporated into the demonstration project. The irrigation-scheduling method made available to the farmer was based upon a climatological program backed up by trained field personnel who readily supplied up-to-date information to the farmer for irrigation scheduling. The climatological data used in the program are presented in Appendix A.

An example of information received by the farmer is presented in Table 8. This information includes the last date of irrigation, the rooting depth of the crop, the water-holding capacity of the particular soil, the optimum depletion level in the soil, present depletion level, and a recommended irrigation date. The farmer also received a recommendation of the amount of water to apply, but this was determined by the irrigation scheme such as the length of surface run and the time duration water was turned into each furrow or border currently being used by the farmer. On the Demonstration Farm, the water application amounts were not varied from traditional practices.

Table 8. Example of the Irrigation Schedule Information Received by the Farmer.

Location - Demonstration Farm

Date: May 5, 1977
Farm No: 8526
Weather: Partly Cloudy
Air Temp: 80° - 1:00

Field No.	Crop	Last Irrig	Root Depth	Hold Cap	Acres	Depletions Bpt	Depletions Pres	Irrig Date	Amt to Apply
HZN	Peppers	4-28	2"	2.0		1.0"	.05	2 weeks+	
HZS	Tomatoes	4-21	4"	2.0		1.0"	.20	2 weeks+	
H3	Tomatoes	4-07	12"	2.0		1.6"	.80	5-12	
H4	Cotton	5-05	6"	2.0			.00	Watering now	
H5	Cotton		6"	2.0		2.4	.30	3 weeks+	
H6	Tomatoes	4-21+	4"	2.0		1.0	.10	2 weeks+	
H7	Alfalfa	5-04	18"	2.0		1.6	.00	Just watered	
H8	Cotton		6"	2.0		2.4	.20	3 weeks+	
H9	Cotton		6"	1.8		2.4	.25	3 weeks+	
H10	Alfalfa	5-02+	48"	1.6		2.0	.00	Just watered	
H11	Tomatoes	4-28n	2"	2.0					
		* * FIELD NOTATIONS * *							
H12n	Peppers	5-05	-	2.0		1.0	.00	Watering now	
H12s	Cotton			1.8		2.4	.20	3 weeks+	

The only thing close to needing an irrigation is Field H3. The lighter spots will be ready for an irrigation by next Thursday.

The cotton needs only warm weather and sunshine for the next several weeks. Irrigation is the worst thing you can do to a good stand of cotton at this time.

The field man also made notes about the conditions within the field, as shown at the bottom of Table 8. This information led to good communication between the field man and farmer. Agricultural Technology also offers other services to the farmer besides irrigation scheduling such as tissue analysis, salinity analysis, and agronomic information. The program offers a complete package which integrates water management into the overall farm-management scheme.

Irrigation scheduling, based upon climatological information coupled with observations by field men, allows scheduling to be done on a scientific basis as much as possible.

An example of the information used in the computer program is represented in Figures 6 and 7. Figure 6 is the plot of the potential evapotranspiration for 1976 and 1977 using the Jensen-Haise method. The potential evapotranspiration is adjusted by using a crop coefficient (k_c) which is presented for wheat, alfalfa, cotton, and barley in Figure 7. The equation to compute actual evapotranspiration is

$$ET = k_c \times PET.$$

Along with the calculated daily ET, it is necessary to know the water-holding capacity of the soil between field capacity and permanent wilting point and the effective rooting depth of the crop (see Figure 7). This information is used to determine how many days' water supply is left in the root zone before moisture depletion occurs. Irrigation should begin at approximately the 50 percent depletion level. The computer program automatically calculated and printed out the number of days before the next irrigation. The

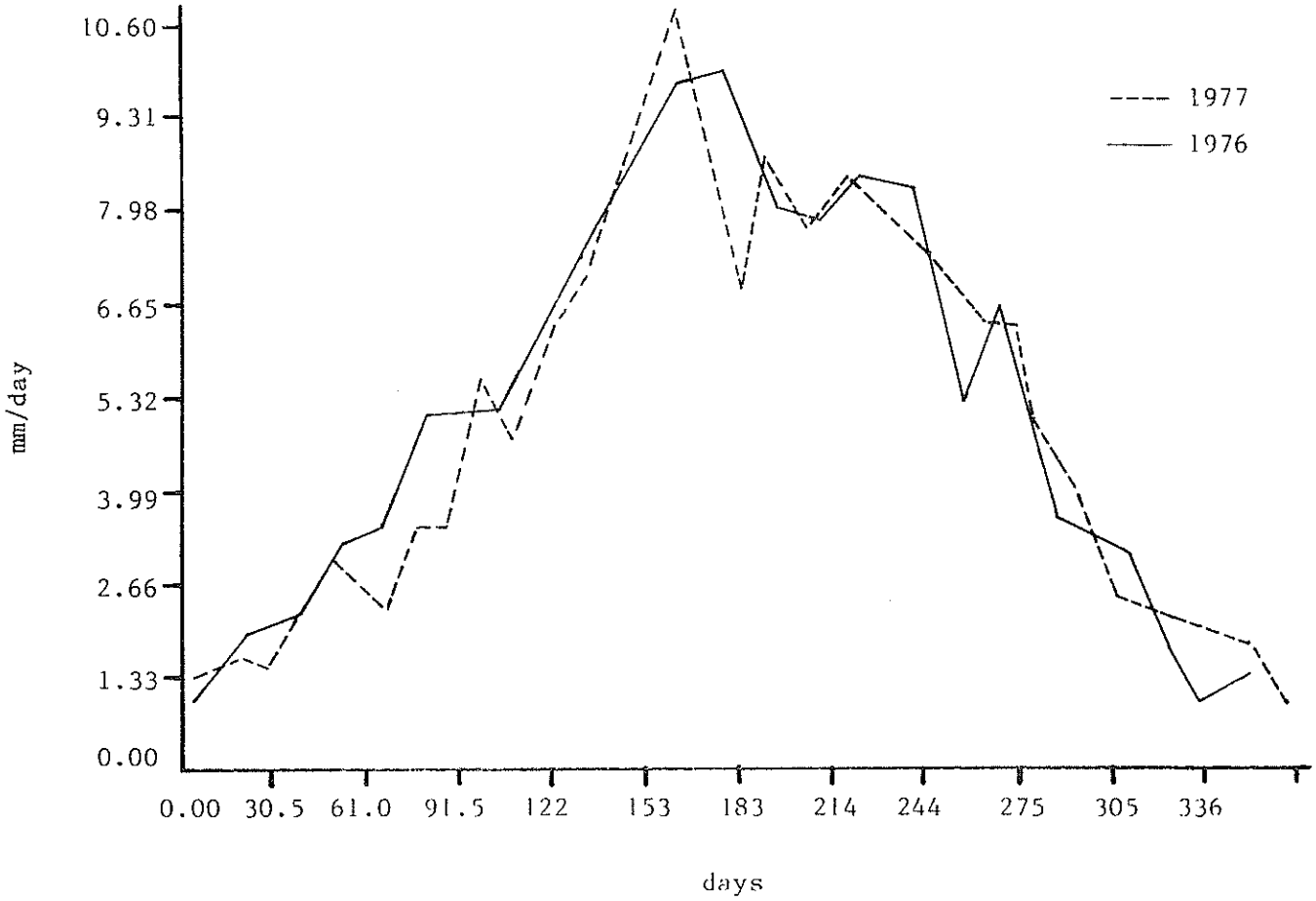


Figure 6. Potential evapotranspiration at the Plant Science Farm.

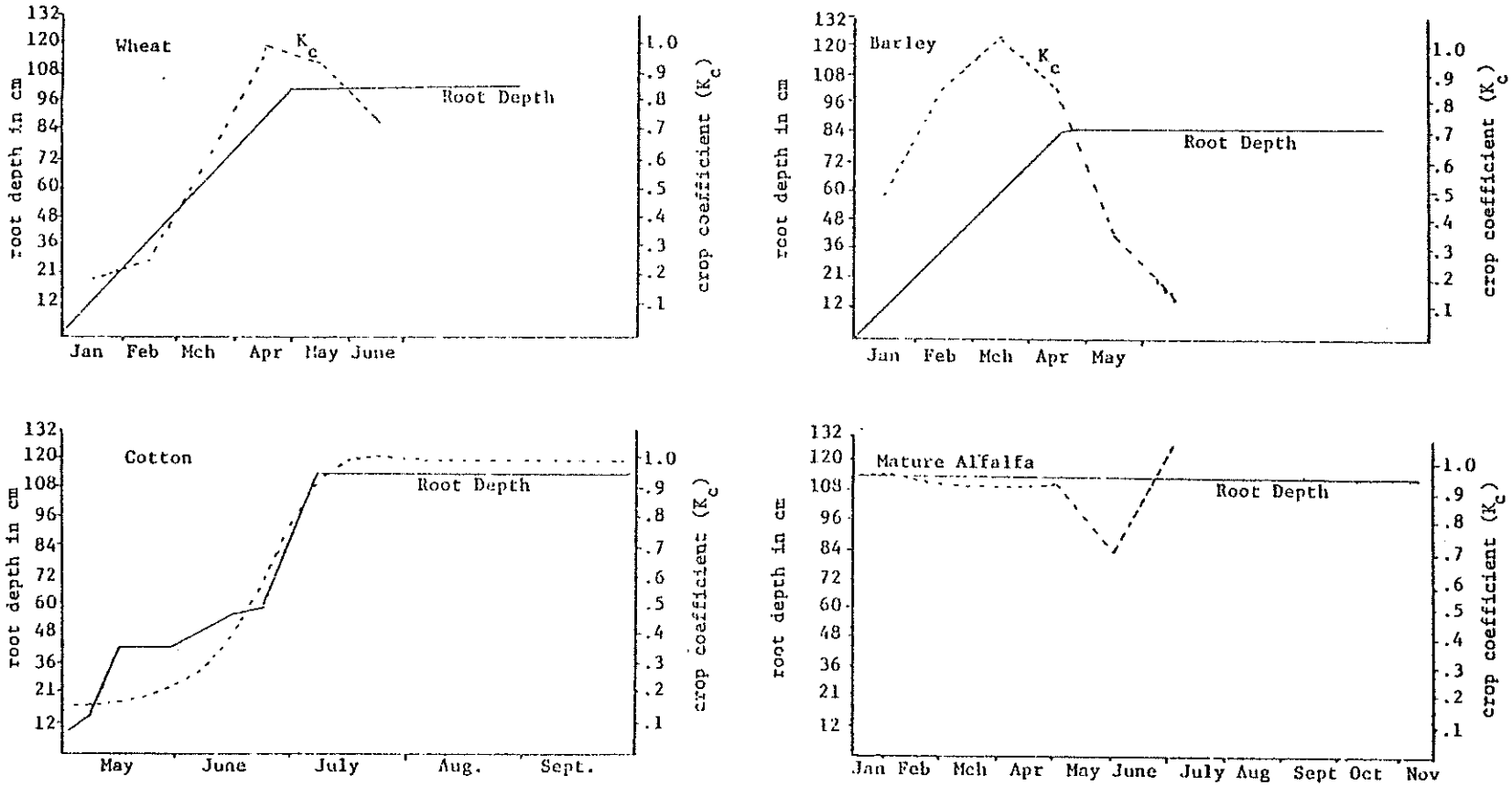


Figure 7. Crop coefficients and root depths for selected crops in the Mesilla Valley, New Mexico.

resultant data were then checked and updated by field personnel.

Farm Irrigation Efficiency

Because the mean annual precipitation averages less than 25 cm in the Mesilla Valley, the consumptive-use requirements of the crops were satisfied mainly by irrigation. Irrigation efficiency is the ratio of consumptive use to irrigation applied plus rainfall. Consumptive use is dependent upon the yield of the crop. It is normally measured under non-limiting moisture conditions that maximize yield. Tables 9 through 14 present computed consumptive-use data used and computed field irrigation efficiencies. The consumptive-use data selected was based upon the best available data. Different irrigation efficiencies would be determined if other methods were used to compute the consumptive use of the crop.

Irrigation scheduling on the Demonstration Farm resulted in an overall computed farm irrigation efficiency of 65 percent for 1976, and 63 percent for 1977. Farm irrigation efficiencies measured in other states by several investigators ranged from 35 to 65 percent with an average of between 40 and 50 percent (Willardson, 1972; Tyler et al., 1964; U. S. Dept. of Interior, Bureau of Reclamation, 1971 and 1973; Advisory Committee, 1974).

It was observed that although the overall farm irrigation efficiency was above average, the field-by-field irrigation efficiencies varied considerably, ranging from 35 to 100 percent. The efficiencies also varied considerably for each particular crop, preventing any correlation between field irrigation efficiencies and particular crops. The efficiency of alfalfa varied from 93 percent in 1976 for Field No. 10 to 76 percent in 1977 for Fields 7 and 10.

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR ALFALFA ON THE DEMONSTRATION FARM.

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Alfalfa-Fd. 10 (28.1 hectares)						
1-01-76	--	--	--	--	--	--
3-15-76	3-17-76	46.34	16.4	S *	--	10.4
5-18-76	5-13-76	25.02	8.8	G **	1.7	19.9
6-03-76	6-08-76	72.34	25.6	G	0.3	9.8
6-22-76	6-24-76	65.86	23.3	--	2.0	12.6
7-12-76	7-10-76	57.31	20.2	S	1.0	14.2
8-07-76	8-05-76	32.50	11.6	S	4.5	22.5
8-20-76	8-21-76	37.63	13.4	S	0.3	22.8
9-19-76	9-18-76	37.63	13.4	S	6.7	33.9
10-08-76	10-07-76	41.91	14.9	S	1.4	7.8
Season Total		416.54	147.8		18.0	154.1 +
Percentage Surface Water		60.7%				
Seasonal Field Irrigation Efficiency		92.9%				
Alfalfa-Fe. 7 (16.48 hectares) Planted 3-26-77 - Harvested 4 times during season						
3-26-77	--	--	--	--	--	--
3-27-77	pre-irrigate	13.19	8.0	G	1.2	--
4-05-77	--	16.35	10.0	G	--	0.7
5-03-77	--	13.17	8.0	G	--	6.9
5-22-77	5-23-77	25.15	15.3	G	0.2	4.5
6-06-77	6-06-77	24.59	14.9	G	0.1	12.5
6-27-77	6-24-77	22.34	13.6	G	--	18.6
7-13-77	7-15-77	19.56	11.9	G & S	4.8	17.4
8-14-77	8-12-77	31.31	19.0	G	2.2	27.2
9-02-77	--	32.20	19.5	G	3.3	12.6
9-30-77	--	22.08	13.4	G	0.7	5.2
10-28-77	--	--	--	--	--	5.9
Season Total		219.94	133.6		12.5	111.5
Percentage Surface Water		8%				
Seasonal Field Irrigation Efficiency		76%				
Alfalfa-Fd. 10 (28.11 hectares) Planted 1974 - Harvested 4 times during season						
1-01-77	--	--	--	--	--	--
3-11-77	--	63.84	22.7	G	1.8	8.8
4-11-77	4-13-77	40.29	14.3	G	1.2	12.9
5-02-77	4-28-77	39.54	14.1	G	--	21.7
5-23-77	5-23-77	65.72	23.4	G	0.2	10.2
6-07-77	6-08-77	65.98	23.5	G	0.1	20.0
6-30-77	6-29-77	66.77	23.8	G	1.0	18.6
7-14-77	7-14-77	56.79	20.2	S	3.8	20.7
8-09-77	8-04-77	64.45	22.9	G	1.5	17.3
8-23-77	--	56.53	20.1	G	1.0	18.7
9-15-77	--	54.51	19.4	G	3.7	8.7
10-28-77	--	--	--	--	2.1	10.9
Season Total		574.42	204.4		16.4	168.5
Percentage Surface Water		10%				
Seasonal Field Irrigation Efficiency		76%				

* S - Surface Water

** G - Groundwater from well

† Based on measurement by the Agricultural Engineering Department at the Plant Science Farm New Mexico State University

Table 9

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR COTTON ON THE DEMONSTRATION FARM

Irrigation Date	Recommended Irrigation Date	Total Water Applied	Application per hectare	Source of Water	Rainfall	Evapotranspiration (ET) for time period
		(ha-cm/ha)			(ha-cm/ha)	(ha-cm/ha)
Cotton-Fd 4 West (16.2 hectares)						
3-27-76	pre-irrigate	39.93	24.5	S*	--	1.5
5-12-76	NI††	15.40	9.4	G**	1.7	7.6
6-28-76	6-30-76	17.99	11.1	S	2.3	20.5
8-05-76	7-31-76	16.27	10.1	S	5.5	6.6
8-17-76	8-22-76	13.19	8.1	S	0.1	6.1
8-28-76	9-02-76	12.94	7.8	S	0.2	17.7
10-27-76	--	--	--	--	8.1	--
Season Total		115.73	71.1		18.0	60.0†
Percentage Surface Water		87.0%				
Seasonal Field Irrigation Efficiency		67.3%				
Cotton-Fd. 9 (10.7 hectares)						
3-29-76	pre-irrigate	24.65	23.0	S	--	--
5-18-76	NI	9.86	9.1	S	1.7	1.8
6-22-76	7-01-76	15.61	14.7	S	2.3	5.3
8-07-76	8-05-76	12.36	11.4	S	5.5	23.0
8-27-76	finished	21.07	19.7	G	0.4	11.4
10-05-76	--	--	--	--	8.1	13.9
10-27-76	--	--	--	--	--	4.3
Season Total		83.57	77.9		18.0	59.7
Percentage Surface Water		75.0%				
Seasonal Field Irrigation Efficiency		62.2%				
Cotton-Fd. 12 (6.8 hectares)						
3-19-76	pre-irrigate	5.02	7.3	S	--	--
5-13-76	NI	5.18	7.6	S	1.8	1.8
6-29-76	7-01-76	6.83	10.1	G	5.3	7.6
7-25-76	7-22-76	6.83	10.1	S	2.7	13.4
8-21-76	8-26-76	6.20	9.1	S	3.2	15.4
8-26-76	--	6.42	9.4	G	7.6	3.0
9-26-76	--	--	--	--	0.5	12.9
10-27-76	--	--	--	--	--	5.8
Season Total		36.48	53.6		18.0	60.0
Percentage Surface Water		63.0%				
Seasonal Field Irrigation Efficiency		83.8%				
Cotton-Fd. 4 (27.94 hectares) Planted 4-19-77 - Harvested 11-3-77						
3-19-77	pre-irrigate	51.35	18.4	S	--	--
5-03-77	5-05-77	15.08	5.4	G	--	0.9
6-27-77	6-27-77	26.84	9.6	G	0.3	12.1
6-29-77	6-27-77	28.38	10.2	S	0.2	0.6
8-02-77	7-30-77	27.73	9.9	S	6.3	21.8
8-19-77	8-22-77	48.03	17.2	G	0.8	10.6
10-28-77	First freeze	--	--		6.0	21.4
Season Total		197.41	70.7		13.6	67.4
Percentage Surface Water		54%				
Seasonal Field Irrigation Efficiency		80%				

(continued)

Table 10

Table 10 (Continued)

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Cotton-Fd. 5 (5.55 hectares) Planted 4-18-77 - Harvested 10-23-77						
3-27-77	pre-irrigate	5.14	9.3	G	--	--
5-25-77	5-30-77	7.18	12.9	S	0.2	3.1
6-15-77	6-25-77	4.05	7.3	G	0.1	4.7
7-21-77	7-18-77	8.38	15.1	G	4.8	19.2
8-22-77	8-14-77	8.59	15.5	G	2.5	20.8
10-28-77	--	--	--	--	5.8	19.3
Season Total		33.34	60.1		13.4	67.1
Percentage Surface Water		14%				
Seasonal Field Irrigation Efficiency		91%				
Cotton-Fd. 8 (13.52 hectares) - Planted 4-16-77 - Harvested 10-15-77						
3-28-77	pre-irrigate	15.81	11.7	--	--	--
5-25-77	5-26-77	20.12	14.9	S	0.2	3.1
7-04-77	6-24-77	16.34	12.1	G	1.3	13.2
7-31-77	7-30-77	13.20	9.8	G	5.3	18.0
8-19-77	8-17-77	21.81	16.1	G	0.8	11.2
9-05-77	--	15.81	11.7	S	3.2	8.8
9-23-77	--	22.19	16.4	G	0.7	6.3
10-05-77	--	19.58	14.5	G	1.0	2.8
10-28-77	--	--	--	--	1.0	2.7
Season Total		144.86	107.2		13.5	66.1
Percentage Surface Water		28%				
Seasonal Field Irrigation Efficiency		55%				
Cotton-Fd. 9 (10.69 hectares) - Planted 4-17-77 - Harvested 10-29-77						
3-28-77	pre-irrigate	15.77	14.8	G	--	--
5-25-77	5-26-77	17.25	16.1	S	0.2	3.2
6-12-77	6-17-77	18.95	17.7	G	0.1	3.6
7-20-77	7-19-77	15.96	14.9	G	4.8	19.8
8-08-77	8-12-77	16.33	15.3	G	1.5	12.9
8-17-77	8-26-77	15.81	14.8	S	0.7	5.2
8-29-77	--	16.54	15.5	G	0.3	6.9
9-15-77	--	16.34	15.3	G	3.7	7.0
10-28-77	--	--	--	--	2.1	8.1
Season Total		132.95	124.4		13.4	66.7
Percentage Surface Water		25%				
Seasonal Field Irrigation Efficiency		48%				
Cotton-Fd. 12 South (3.24 hectares) - Planted 4-22-77 - Harvested 10-28-77						
3-28-77	pre-irrigate	2.97	9.2	--	--	--
5-11-77	--	3.76	11.6	G	0.2	1.4
6-30-77	--	3.54	10.9	G	1.1	12.4
8-09-77	--	4.65	14.4	G	5.3	26.3
9-23-77	--	5.17	16.0	G	4.7	20.9
10-03-77	--	5.21	15.7	G	0.3	2.6
10-28-77	--	--	--	--	2.0	3.0
Season Total		25.30	77.8		13.6	66.6
Percentage Surface Water		0%				
Seasonal Field Irrrigation Efficiency		72%				

* S - Surface Water
** G - Groundwater from well
\+ Based on climatic program used by agricultural technology
†† No irrigation recommended

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR LETTUCE ON THE DEMONSTRATION FARM.

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per Hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Lettuce-Fd. 3 (20.2 hectares)						
7-23-76	None	16.64	8.2	S*	--	--
8-04-76	"	12.22	6.0	S	2.8	--
8-08-76	"	41.04	20.3	S(52%)	--	--
8-18-76	"	11.50	5.7	S	0.3	--
8-21-76	"	32.66	16.2	S(37%)	--	--
8-29-76	"	16.93	8.4	S	--	--
9-16-76	"	12.31	6.1	S	6.7	--
9-27-76	"	31.80	15.7	S(68%)	0.6	--
10-13-76	"	14.66	7.3	G**	0.8	--
11-04-76	"	14.04	7.0	G	0.7	--
Season Total		203.81	100.9		12.0	45.0†
Percentage Surface Water		41.0%				
Seasonal Field Irrigation Efficiency		39.8%				
Lettuce-Fd. 2 North (2.43 hectares) Planted 8-1-77 - Plowed under 9-1-77						
8-02-77	--	3.06	12.6	G	--	--
8-04-77	--	3.68	15.1	G	--	--
8-07-77	--	2.12	8.7	G	--	--
Season Total		8.86	36.4		0.0	22.3
Percentage of Surface Water		0 %				
Lettuce-Fd. 11 (8.10 hectares) Planted 8-1-77 - Plowed under 9-1-77						
8-02-77	--	12.79	15.8	G	--	--
8-12-77	--	11.52	14.2	G	0.6	--
Season Total		24.31	30.0		0.6	22.3
Percentage of Surface Water		0 %				
Lettuce-Fd. 12 North (3.24 hectares) Planted 7-31-77 - Plowed under 9-1-77						
7-31-77	--	--	--	G	--	--
8-02-77	8-01-77	2.75	8.5	G	--	--
8-11-77	8-11-77	2.22	6.8	G	0.2	--
8-19-77	--	1.91	5.9	G	0.6	--
Season Total		6.88	21.2		0.8	22.3
Percentage of Surface Water		0 %				

* S - Surface Water
** G - Ground Water
† Gregory, E. J. and Eldon G. Hanson, Predicting Consumptive Use with Climatological Data, New Mexico Water Resource Research Institute, Report No. 066, April 1976

Table 11

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR PEPPERS ON THE DEMONSTRATION FARM.

Irrigation Date	Recommended Irrigation Date	Total Water Applied	Application per Hectare	Source of Water	Rainfall	Evapotranspiration (ET) for time period
		(km^3)	(ha-cm/ha)		(ha-cm/ha)	(ha-cm/ha)
Peppers-Fd. 2 (5.5 hectares)						
4-12-76	pre-irrigate	6.16	11.1	S*	--	--
4-22-76	--	3.20	5.8	S	1.2	--
5-12-76	--	3.82	6.8	G**	0.5	--
5-15-76	5-15-76	4.81	8.6	S	0.3	--
6-02-76	6-02-76	8.24	14.9	G	2.0	--
6-20-76	6-30-76	8.26	14.0	G	1.0	--
7-08-76	7-16-76	5.54	10.1	G	--	--
8-08-76	8-05-76	5.61	10.1	G	3.7	--
8-18-76	8-17-76	8.21	14.9	S	0.3	--
9-02-76	9-01-76	7.15	12.9	S	--	--
9-27-76	9-21-76	7.21	13.2	S(55%)	7.3	--
10-05-76	--	--	--	-	0.8	--
Season Total		68.21	123.4		17.2	77.9†
Percentage Surface Water			54.0%			
Seasonal Field Irrigation Efficiency			55.4%			
Peppers-Fd. 7 (10.3 hectares) Plus - Grain Sorghum (5.7 hectares)						
5-14-76	5-14-76	9.21	5.6	S	--	--
5-18-76	--	11.21	6.8	S	--	--
5-20-76	6-03-76	11.03	6.6	G	0.3	--
6-12-76	6-20-76	16.54	10.1	S	2.0	--
6-26-76	7-02-76	18.98	11.4	G	--	--
7-15-76	7-13-76	19.72	11.9	S	1.8	--
8-02-76	8-03-76	12.54	7.6	S	3.7	--
8-20-76	8-18-76	35.37	21.5	G	0.4	--
9-03-76	9-02-76	18.49	11.1	S	--	--
9-21-76	9-21-76	6.14	3.8	S	6.7	--
10-01-76	--	13.19	8.1	S	0.8	--
Season Total		172.42	104.5		15.7	71.2† ††
Percentage Surface Water			62.0%			
Seasonal Field Irrigation Efficiency			64.8%			
Peppers-Fd. 4 East (11.7 hectares)						
3-13-76	pre-irrigate	27.85	23.8	S	--	--
6-04-76	6-13-76	10.60	9.1	S	2.1	--
6-22-76	6-31-76	17.25	14.7	S	2.0	--
7-12-76	7-10-76	14.29	12.1	S	1.0	--
8-05-76	7-31-76	14.87	9.9	S	4.5	--
8-18-76	8-17-76	13.06	11.1	S	0.3	--
8-28-76	8-27-76	20.33	17.2	G	--	--
10-05-76	9-20-76	11.71	9.9	G	8.1	--
Season Total		126.89	107.8		18.1	77.9
Percentage Surface Water			75.0%			
Seasonal Field Irrigation Efficiency			61.9%			
Peppers-Fd. 12 North (3.24 hectares) Planted 4-22-77 - Plowed under 7-7-77						
3-28-77	pre-irrigate	2.97	9.2	G	--	--
5-05-77	--	4.39	13.5	G	0.2	--
5-11-77	--	3.25	10.0	G	--	--
6-30-77	7-04-77	3.60	11.1	G	1.1	--
Season Total		14.21	43.8		1.3	24.2
Percentage of Surface Water			0 %			

(continued)

Table 12

Table 12 (Continued)

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per Hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Peppers-Fd. 2 North (2.43 hectares) Planted 4-8-77 - Plowed under 7-1-77						
4-12-77	--	1.82	7.5	S	--	--
4-20-77	--	2.16	8.9	G	--	--
5-16-77	--	3.20	13.2	G	0.2	--
5-25-77	5-26-77	3.72	15.3	G	--	--
6-14-77	6-17-77	2.13	8.8	G	0.1	--
7-01-77	Plowed under; poor stand					
Season Total		13.03	53.7		0.3	28.1
Percentage of Surface Water			8.0%			

* S - Surface Water
** G - Groundwater from well
† Consumptive Irrigation Requirements of Selected Irrigated Areas in New Mexico, New Mexico State University Agricultural Experiment Station Bulletin 531, Henderson and Sorensen, August 1968
†† Weighted average of grain sorghum and peppers according to hectares planted

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR TOMATOES ON THE DEMONSTRATION FARM

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per Hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Tomatoes-Fd. 8 (13.5 hectares)						
3-20-76	--	23.42	17.3	S*	--	--
3-23-76	--	27.73	20.5	S	--	--
5-01-76	5-01-76	19.72	14.6	S	1.3	--
5-07-76	5-07-76	6.53	4.8	S	0.5	--
6-17-76	6-13-76	10.23	7.6	S	2.3	--
7-13-76	7-10-76	11.95	8.8	S	1.0	--
8-04-76	8-02-76	14.82	11.0	G**	4.5	--
8-20-76	finished	1.64	1.2	G	0.3	--
Season Total		116.04	85.8		10.0	57.7†
Percentage Surface Water			85.8%			
Seasonal Field Irrigation Efficiency			60.2%			
Tomatoes-Fd. 11 (25.1 hectares)						
5-18-76	5-18-76	42.00	16.7	S	--	--
6-22-76	6-20-76	83.19	33.1	S & G	2.0	--
7-22-76	7-15-76	32.04	12.6	G	1.8	--
8-03-76	NI	6.16	2.5	G	3.7	--
8-07-76	8-05-76	28.96	11.4	S	--	--
8-27-76	8-22-76	22.08	8.9	G	0.3	--
8-31-76	NI	15.30	6.1	G	--	--
9-29-76	finished	--	--	-	7.4	--
Season Total		229.74	91.3		15.3	57.7
Percentage Surface Water			35.9%			
Seasonal Field Irrigation Efficiency			54.1%			
Tomatoes-Fd. 2 South (2.84 hectares) Planted 4-8-77 - Harvested 8-29-77						
4-12-77	--	2.23	7.8	S	--	--
4-20-77	--	2.50	8.8	G	--	--
5-16-77	--	3.92	13.8	G	0.2	--
5-25-77	5-26-77	4.56	16.0	G	--	--
6-14-77	6-17-77	2.60	9.2	G	0.1	--
7-01-77	7-02-77	3.15	11.1	G	1.0	--
7-12-77	7-12-77	3.57	12.6	G	3.8	--
7-20-77	7-21-77	2.59	9.1	G	--	--
8-02-77	8-01-77	3.35	11.8	G	1.5	--
8-04-77	8-11-77	2.70	9.5	G	--	--
8-07-77	--	2.33	8.2	G	--	--
Season Total		33.50	117.9		6.6	57.7
Percentage Surface Water			8 %			
Seasonal Field Irrigation Efficiency			46.0%			
Tomatoes-Fd. 3 (29.97 hectares) Planted 3-21-77 - Harvested 8-18-77						
3-21-77	--	--	--	-	--	--
3-26-77	--	19.94	6.6	G	1.2	--
3-30-77	--	36.15	12.1	S	--	--
4-07-77	--	9.86	3.3	S	--	--
4-12-77	4-21-77	13.15	4.4	S	--	--
4-19-77	--	3.70	1.2	S	--	--
5-16-77	5-12-77	38.50	12.8	G	0.2	--
6-06-77	6-06-77	32.53	10.8	G	0.1	--
6-22-77	6-22-77	18.89	6.3	S	--	--
7-01-77	7-04-77	38.72	12.9	S	1.0	--
7-14-77	7-13-77	17.14	5.7	G & S	3.8	--
7-21-77	7-23-77	31.68	10.6	G & S	--	--
8-07-77	8-04-77	14.79	4.9	S	1.5	--
Season Total		275.05	91.6		7.8	57.7
Percentage Surface Water			58.0%			
Seasonal Field Irrigation Efficiency			58.0%			

(continued)

Table 13

Table 13 (Continued)

Irrigation Date	Recommended Irrigation Date	Total Water Applied (km^3)	Application per Hectare (ha-cm/ha)	Source of Water	Rainfall (ha-cm/ha)	Evapotranspiration (ET) for time period (ha-cm/ha)
Tomatoes-Fd. 6 (7.70 hectares) Planted 4-12-77 - Harvested 8-29-77						
3-26-77	pre-irrigate	7.85	10.2	G	--	--
4-15-77	4-21-77	13.45	17.5	S	--	--
5-29-77	6-02-77	5.67	7.4	G	0.2	--
6-15-77	6-25-77	5.50	7.1	G	0.1	--
6-29-77	7-09-77	7.22	9.4	G	0.2	--
7-13-77	7-13-77	7.59	9.8	G & S	4.6	--
7-21-77	7-22-77	11.58	15.0	G	--	--
8-02-77	8-04-77	9.29	12.1	G	1.5	--
Season Total		68.15	88.5		6.6	57.7
Percentage Surface Water			29.0%			
Seasonal Field Irrigation Efficiency			61.0%			
Tomatoes-Fd. 11 (25.11 hectares) Planted 4-17-77 - Harvested 9-2-77						
4-26-77	4-28-77	53.73	21.4	G	--	--
5-02-77	--	42.79	17.0	S	--	--
5-11-77	--	51.33	20.4	G	0.2	--
5-25-77	6-02-77	46.49	18.5	G & S	--	--
5-30-77	--	17.75	7.1	G	--	--
6-13-77	6-09-77	30.53	12.2	G	0.1	--
6-18-77	--	34.27	13.6	G	--	--
6-28-77	6-27-77	25.61	10.2	G	--	--
7-01-77	6-30-77	26.88	10.7	G	1.0	--
7-14-77	7-15-77	14.90	5.9	G	3.8	--
7-20-77	7-19-77	17.05	6.8	G	--	--
7-30-77	7-27-77	14.43	5.7	G	1.5	--
8-05-77	8-05-77	26.02	10.4	G	--	--
Season Total		401.78	159.9		6.6	57.7
Percentage of Surface Water			19.0%			
Seasonal Field Irrigation Efficiency			35.0%			

* S - Surface Water
** G - Groundwater from well
† Seasonal estimate based on minimum value measured in San Joaquin Valley, California, Vegetative Water Use, Bulletin 113-3, Department of Water Resources, California, MacGilvray, N. A. 1975.

IRRIGATION WATER APPLICATION, IRRIGATION EFFICIENCY, AND COMPUTED EVAPOTRANSPIRATION FOR WHEAT ON THE DEMONSTRATION FARM

Irrigation Date	Recommended Irrigation Date	Total Water Applied	Application per Hectare	Source of Water	Rainfall	Evapotranspiration (ET) for time period
		(km^3)	(ha-cm/ha)		(ha-cm/ha)	(ha-cm/ha)
Wheat-Fd. 3 (30.0 hectares)						
1-13-76	--	40.87	13.7	G**	--	--
3-14-76	3-17-76	41.90	13.9	S*	1.0	4.8
4-07-76	4-08-76	42.52	14.2	S	0.1	8.6
4-29-76	4-27-76	42.89	14.2	S	1.2	7.6
5-13-76	5-12-76	26.25	8.9	S	0.5	5.8
7-12-76	harvested	--	--	-	3.0	11.6
Season Total		194.43	64.8		6.0	38.5†
Percentage Surface Water			79.0%			
Seasonal Field Irrigation Efficiency			54.5%			
Wheat-Fd. 5 & 6 (13.2 hectares)						
1-28-76	NI	19.22	14.6	S	--	--
3-26-76	3-26-76	15.40	11.7	S	1.0	8.6
4-22-76	4-23-76	35.00	26.5	S	1.3	9.4
5-18-76	5-16-76	22.17	16.8	S	0.5	11.4
6-16-76	harvested	--	--	-	2.3	8.1
Season Total		91.80	69.6		5.1	37.4†
Percentage Surface Water			100.0%			
Seasonal Field Irrigation Efficiency			50.0%			

* S - Surface Water
** G - Groundwater from well
† Based on climatic program used by agricultural technology

Table 14

In 1976, the cotton efficiencies ranged from 63 to 84 percent. In 1977, the cotton efficiencies varied from 48 percent for Field No. 9 to 91 percent for Field No. 5.

The farm irrigation efficiency did not increase when the more expensive well water was used predominantly in 1977, as compared to river water in 1976.

Gas Consumption and Pump Efficiencies

The five wells used on the Demonstration Farm had turbine pumps with power supplied by Waukesha and Minneapolis-Moline engines operating on natural gas.

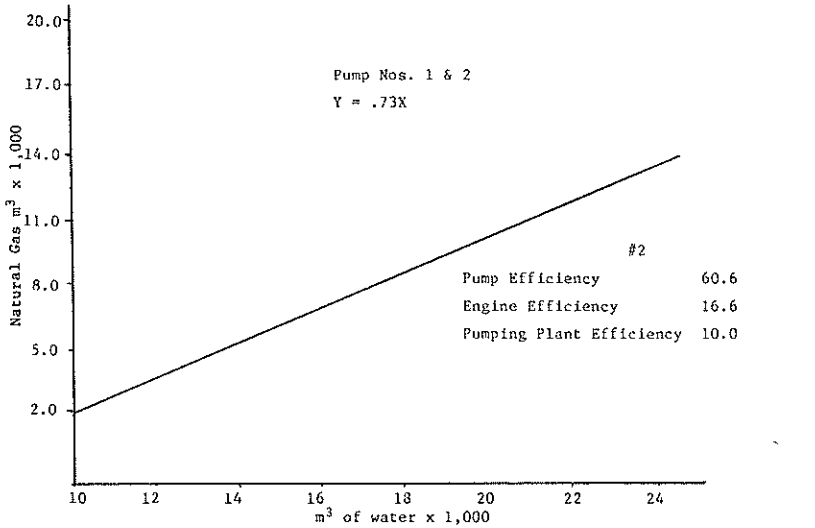
Figure 8 presents the gas consumption per unit of water pumped for the different wells. Pump efficiency is also presented in Figure 8. In general, the overall pumping-plant efficiencies were around 10 percent, pump efficiencies ranged from 44 to 60 percent, and engine efficiencies ranged from 16 to 20 percent. Pumping-plant efficiencies could be improved by increased maintenance and replacement and by proper selection of engine and pump sizes for the specified lifts and flow encountered in the Mesilla Valley. A new pumping plant operated on natural gas should have an overall efficiency of 15 percent (Buckingham, 1978).

Trickle-Irrigation System Used to Irrigate a Pecan Orchard

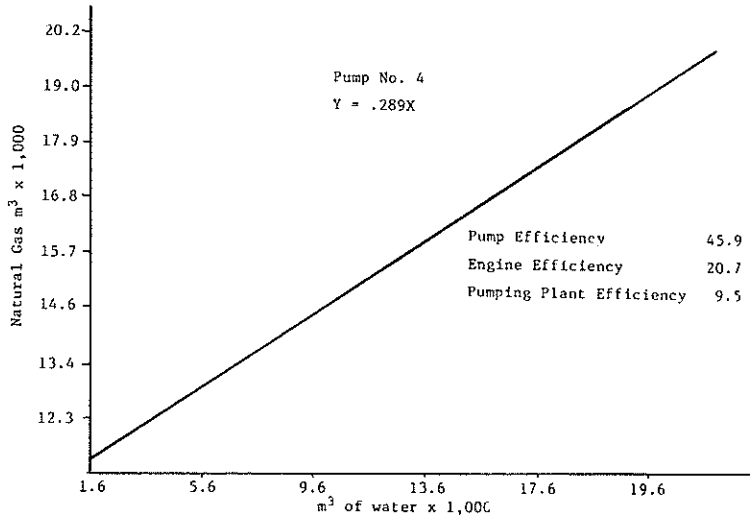
The pecan orchard at the Demonstration Farm was under trickle irrigation for two years. Applied water data are presented in Tables 15 and 16.

Using a water-balance technique, measurements were made on the consumptive use of pecan orchards at New Mexico State University's Plant Science Farm. The trees were 2-3 years younger than those

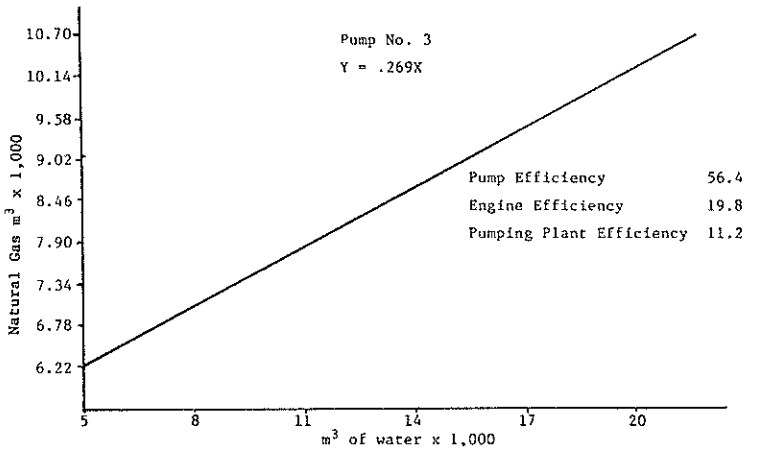
Figure 8



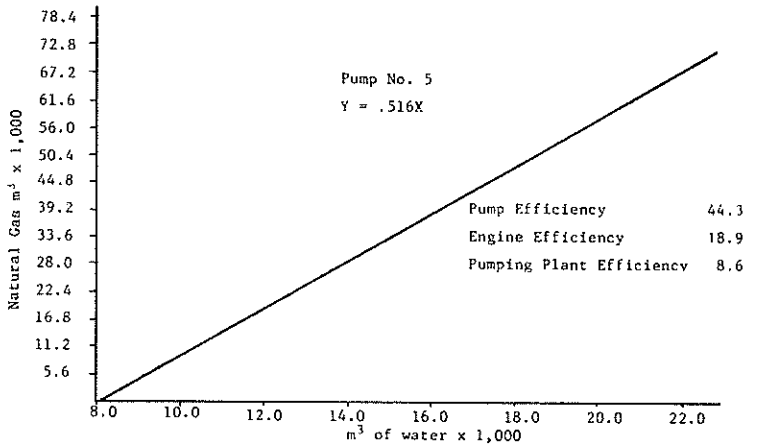
Natural gas consumption vs. water pumped for Pumps 1 & 2, Demonstration Farm



Natural gas consumption vs. water pumped for Pump 4, Demonstration Farm



Natural gas consumption vs. water pumped for Pump 3, Demonstration Farm



Natural gas consumption vs. water pumped for Pump 5, Demonstration Farm

TABLE 15. APPLIED WATER FOR THE DEMONSTRATION FARM IN 1975 AND 1976.

Irrigation Period	Total Water Applied Per Tree	Average Daily Water Applied Per Tree	Total Water Applied	Rainfall	Evapotranspiration (ET)
	m^3	m^3	ha-cm/ha	ha-cm/ha	ha-cm/ha
Pecans (1.32 hectares)					
5-12-75 to 5-19-76	.477	.060	1.19	1.7	
5-20-75 to 5-27-76	.483	.061	1.21	0.3	
5-28-76 to 6-04-76	.354	.059	0.88	-	
6-05-76 to 6-18-76	1.468	.184	3.67	2.0	
6-19-76 to 7-01-76	.285	.026	0.71	-	
7-02-76 to 7-10-76	.424	.047	1.06	1.0	
7-11-76 to 7-17-76	.428	.061	1.06	0.8	
7-18-76 to 7-29-76	.245	.031	0.61	2.6	
7-30-76 to 8-05-76	.829	.118	2.07	1.1	
8-06-76 to 8-27-76	2.078	.094	5.21	0.4	
8-28-76 to 9-07-76	.435	.065	1.47	3.5	
9-08-76 to 9-14-76	.175	.025	0.43	3.2	
9-22-76 to 10-01-76	1.073	.107	2.68	0.9	
10-28-76	-	-	-	0.6	
Season Total	8.754	.938	22.25	18.1	65.7

TABLE 16. APPLIED WATER FOR THE DEMONSTRATION FARM IN 1977

Irrigation Period	Total Water Applied Per Tree	Average Daily Water Applied Per Tree	Total Water Applied	Rainfall	Evapotranspiration (ET)
	m^3	m^3	ha-cm/ha	ha-cm/ha	ha-cm/ha
Pecans (1.32 hectares)					
1-01-77 to 4-07-77			12.45	-	
4-08-77 to 4-28-77	1.153	.058	2.78	-	
4-29-77 to 5-20-77	.421	.020	1.01	0.4	
5-21-77 to 5-27-77	.290	.048	0.73	-	
5-28-77 to 6-03-77	.997	.166	2.39	0.1	
6-04-77 to 6-14-77	.444	.044	1.09	-	
6-15-77 to 6-22-77	.493	.070	1.19	-	
6-23-77 to 6-29-77	.290	.048	0.73	0.2	
6-30-77 to 7-05-77	.483	.080	1.19	5.0	
7-06-77 to 7-18-77	1.707	.142	4.12	-	
7-19-77 to 7-26-77	1.032	.147	2.48	1.2	
7-27-77 to 8-02-77	.959	.160	2.28	0.6	
8-03-77 to 8-09-77	2.432	.405	5.89	-	
8-10-77 to 8-24-77	2.108	.151	5.14	1.0	
8-24-77 to 9-03-77	1.442	.144	3.49	1.9	
First Freeze 10-28					
Season Total	14.251		46.96	15.5	65.7

at the Demonstration Farm and were flood irrigated. They would have had larger evaporation losses than the trees irrigated by the trickle-irrigation system. Preliminary 1976 data for the Plant Science Farm orchards indicated a higher consumptive-use than originally expected. Consumptive use measured for 1977 was 65.7 ha-cm/ha. It was felt that the difference between the applied water plus rainfall at the Demonstration Farm in 1976 (40.3 ha-cm/ha) and the measured consumptive-use at the Plant Science Farm in 1977 (65.7 ha-cm/ha) was not due entirely to additional evaporation losses caused by surface irrigation, but that the Demonstration Farm trees were stressed for moisture in 1976, depleting the soil moisture reservoir and probably consumptively using less water than measured at the Plant Science Farm in 1977. Based upon preliminary 1976 Plant Science Farm consumptive use data, additional water was applied to the Demonstration Farm in 1977 with a flood irrigation at the start of the growing season. This resulted in an irrigation efficiency computed to be 105 percent.

The extra 5 percent was probably due to experimental error. Yield from the trickle-irrigated pecan orchard in 1977 was 1214 kg/ha. The average yield in the Mesilla Valley for a pecan orchard of this age is approximately 784-1009 kg/ha. The trickle yields were comparable to those obtained under flood irrigation but represented a great savings in water. Under a typical flood irrigation, 73-97 ha-cm/ha of water would be applied, compared to 47 ha-cm/ha under trickle irrigation near a 100 percent irrigation efficiency, assuming a normal rainfall year.

Trickle Irrigation and the Plant Water Potential of Pecan Trees

During the summer months of 1977, the trickle-irrigated pecan orchard received water at a rate of approximately .15 m^3 per day per tree. Plant water potential measurements (Slatyer, 1967) were made to determine if the trees were responding as they would under conventional irrigation techniques. Figure 9 is a plot of the daily plant water potential cycle comparing the drip-irrigated with flood-irrigated trees. The plant water potential at night approached the soil water potential where the minimum value observed was approximately -1.6 bars. Measurements were made on August 10, after the drip system had been shut off for four days to allow the foreman to cultivate the field. The results showed a higher peak for the drip-irrigated trees than the flood-irrigated trees indicating that the drip-irrigated plants were undergoing a slight stress. The available soil water reservoir, irrigated by the drip system, was small and the four days appeared to be sufficient to deplete the reservoir. Comparing the two systems, the mid-day reading indicated that the drip- and flood-irrigated pecan trees were very close in plant water potential when the drip system is operated according to schedule.

Drip Irrigation of Row Crops

Applied water information for the drip-irrigated row crop demonstration of tomatoes and peppers is presented in Table 17. The seasonal irrigation efficiency was 48.5 percent for the tomatoes and 65.6 percent for the peppers. The same amount of water was applied to both crops because of the design of the irrigation system. The low irrigation efficiency was due to the three flood irrigations of 10 ha-cm/ha each that had to be applied at the beginning of the

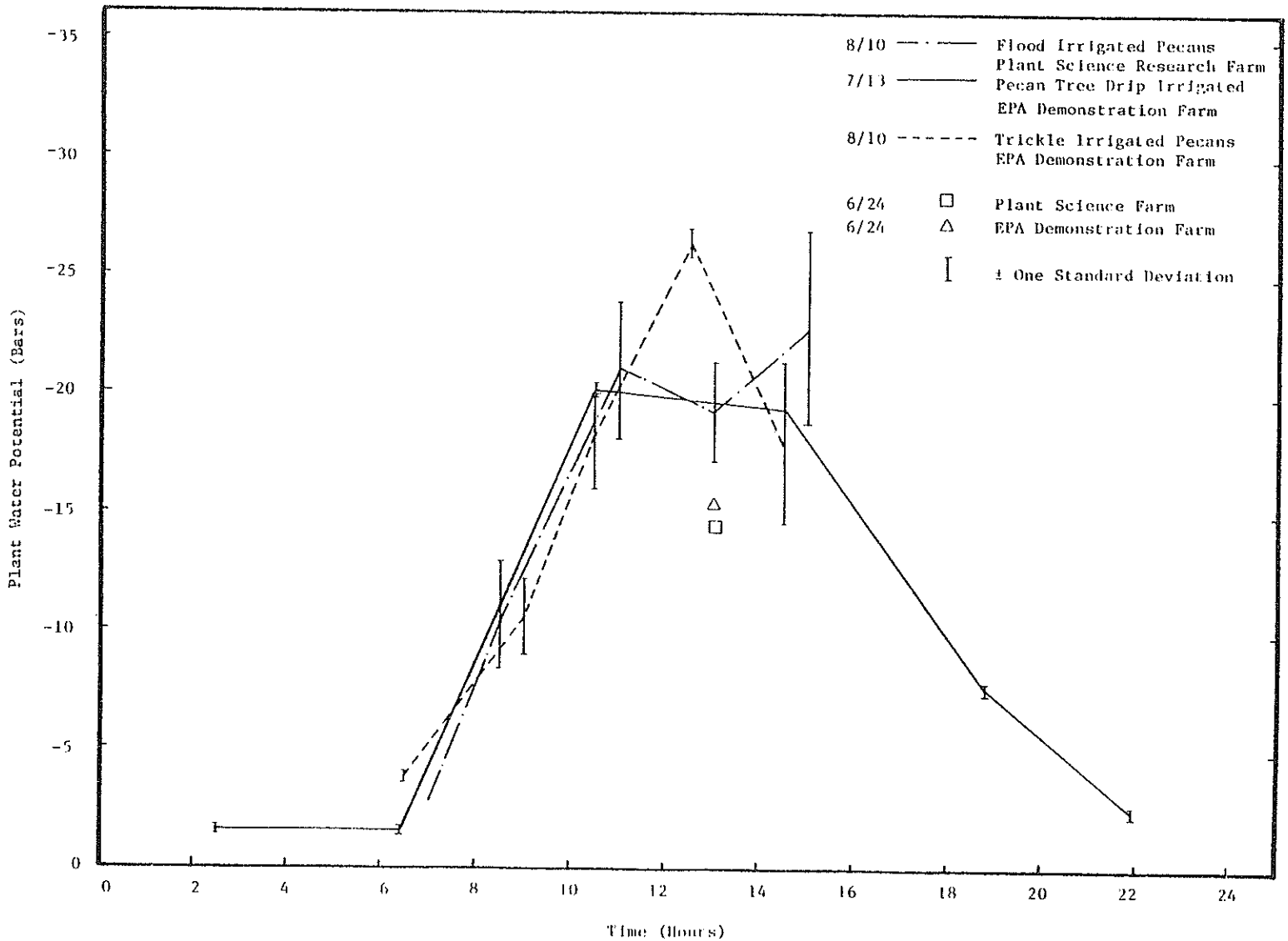


Figure 9. Plant water potential for a pecan tree irrigated under drip and flood irrigation (1977)

TABLE 17. APPLIED WATER INFORMATION FOR THE DRIP IRRIGATED ROW CROP DEMONSTRATION OF TOMATOES AND PEPPERS

Irrigation Date	Total Water Applied	Application per Hectare	Rainfall	Evapotranspiration (ET) for Tomatoes	Evapotranspiration (ET) for Peppers	
	($m^3 x 10^3$)	(ha-cm/ha)	(ha-cm/ha)	(ha-cm/ha)	(ha-cm/ha)	
Trickle Plot (.22 hectares) - Tomatoes and Peppers - Planted 4-8-77 - Harvested 8-26-77						
4-13-77	.411	18.68	-			Seasonal field
4-28-77	.462	21.00	-			Irrigation
5-18-77	.360	16.36	0.4	Flood Irrigation		Efficiency
5-26-77	.308	14.00	-			for Tomatoes
7-01-77	.288	13.09	1.1			48.5%
7-09-77	.005	0.23	3.5			
7-11-77	.016	0.73	-			Seasonal field
7-18-77	.180	8.18	-			Irrigation
7-21-77	.151	6.86	-			Efficiency
8-02-77	.071	3.23	1.5			for Peppers
8-08-77	.155	7.04	-			65.6%
8-14-77	.014	0.64	0.7			
8-20-77	.032	1.45	0.1			
Season Totals	2.459	111.49	7.3	57.7	77.9	

Yields:

Tomatoes	- 36602. kilograms/hectare
Hungarian wax peppers	- 29065. kilograms/hectare
Bell peppers	- 20521. kilograms/hectare
Big Jim peppers	- 20702. kilograms/hectare

growing season since the drip-irrigation system was inoperable due to technical problems.

A yield of 36,602 kg/ha for the drip-irrigated tomatoes compared favorably with Demonstration Farm average yields of 17,900 kg/ha and 29,800 kg/ha for flood-irrigated tomatoes in 1977 and 1976, respectively.

Salt Movement Below a Drip-Irrigation System

The irrigation efficiency, as shown in the drip irrigation of the pecan orchard, can be close to 100 percent. Salts will precipitate and be stored beneath the root zone over a long time period. In order to investigate this problem, soil samples were taken during the second and third years of the demonstration project.

Table 18 presents the salt content of soil samples taken from flood-irrigated alfalfa and lettuce and the drip-irrigated pecan orchard in 1977. Salinity of the soil samples on pecans varied between January and November. This was attributed to variability within the field and/or to actual changes in the salt content within the soil profile. It appeared that near the pecan trees there was a salt buildup to a depth of 1.2 meters. Farther away from the tree trunks the salt buildup was closer to the surface. This was expected due to the shape of the water front around the emitter; the greatest leaching occurred directly beneath the emitter, and less leaching occurred away from the emitter. The location of the emitters around the trees was at the same location as the sample taken at the one meter distance from the tree trunk. The salt content of the pecan orchard appeared to be higher than that encountered under the alfalfa and lettuce fields. The higher salt

Table 18

SOIL ANALYSIS FOR SALT CONTENT FOR SELECTED SAMPLES, EPA DEMONSTRATION FARM, 1977

Plant Type	Sample (cm)	E.C. (mmhos)		pH		Saturation (percent)		Concentration* Ca (meq/L)	Mg	Na	K	Cl		CO_3	HCO_3	SO_4
		Jan.	Nov.	Jan.	Nov.	Jan.	Nov.					Jan.	Nov.			
	0.0- 7.5	.92		7.73		32.5		4.24	1.48	3.84	.51	1.89		0	4.04	4.16
	7.5- 15.0	.89		7.77		29.8		4.13	1.42	3.95	.21	1.70		0	3.50	4.44
	30.0- 37.5	.82		7.85		31.1		3.16	1.24	4.17	.21	1.86		0	3.02	4.36
Alfalfa	60.0- 67.5	1.22		8.03		28.9		3.95	1.41	9.22	.26	2.96		0	3.26	8.00
	90.0- 97.5	2.31		8.03		25.6		3.76	2.92	18.28	.39	6.76		0	3.18	15.40
	120.0-127.5	1.03		8.20		23.8		2.18	.99	8.02	.19	2.42		0	1.48	7.20
	150.0-157.5	.74		8.35		22.0		1.59	.59	6.24	.14	1.98		0	2.08	3.96
	175.0-182.0	.54		8.54		25.8		.68	.38	4.59	.14	1.62		0	1.68	2.52
	0.0- 7.5	1.58		8.08		61.3		4.28	2.31	7.87	.58	4.91		0	2.18	7.60
	7.5- 15.0	1.61		7.94		56.2		4.60	2.85	7.74	.65	4.91		0	3.08	7.70
	30.0- 37.5	1.19		8.15		40.4		2.76	1.98	5.97	.45	3.29		0	2.40	5.10
Lettuce	60.0- 67.5	.88		8.29		31.9		1.81	1.47	4.75	.32	2.13		0	1.54	3.60
	90.0- 97.5	1.02		8.48		30.1		2.24	1.54	5.28	.31	2.48		0	1.54	5.00
	120.0-127.5	.61		8.35		33.8		.53	.75	4.75	.20	1.20		0	1.98	2.76
	150.0-157.5	.74		8.32		28.8		1.91	.72	5.84	.22	2.13		0	1.78	4.70
	175.0-182.0	.97		8.28		24.2		1.22	1.22	7.39	.20	2.15		0	2.46	5.08
	0.0- 7.5	1.21	3.56	7.88	7.85	50.0	35.8	1.95	1.68	8.30	1.07	3.12	16.16	0	5.50	5.00
Pecan	7.5- 15.0	1.11		7.85		50.1		2.01	1.64	7.94	.94	2.76		0	5.64	4.70
samples	30.0- 37.5	1.25	3.70	8.01	7.72	66.2	59.8	1.31	1.26	10.05	.88	4.58	17.61	0	2.58	6.10
located	60.0- 67.5	1.81	4.67	8.01	7.71	50.4	46.3	4.13	1.46	14.91	.05	6.67	11.99	0	3.38	10.60
at tree	90.0- 97.5	4.00	2.60	7.83	7.87	54.8	44.9	21.51	8.20	25.64	.60	5.08	11.28	0	.84	51.60
trunk	120.0-127.5	7.58	6.59	7.99	7.50	50.5	40.1	14.43	15.14	54.90	.79	5.62	28.54	0	1.46	73.60
	150.0-157.5	5.55		8.26		34.5		7.69	7.39	53.62	.45	19.11		0	1.46	48.80
	175.0-182.0	5.33		8.26		31.3		5.43	5.87	55.54	.47	18.23		0	1.62	44.40
Pecan	0.0- 7.5	1.27		8.02		46.1		2.94	1.56	8.86	.91	4.29		0	4.54	5.40
samples	7.5- 15.0	1.09		8.08		50.8		3.20	1.13	7.58	.75	3.48		0	3.34	5.40
located	30.0- 37.5	1.53		8.06		71.7		1.42	1.17	13.45	.36	4.16		0	2.16	9.90
.5 m	60.0- 67.5	4.25		7.88		85.0		22.14	9.12	28.83	.50	7.07		0	1.20	51.60
from	90.0- 97.5	4.41		7.85		52.3		18.38	9.91	29.68	.45	11.34		0	1.32	48.80
trunk	120.0-127.5	6.40		7.95		46.4		15.38	12.52	54.26	.54	23.16		0	1.32	60.80
of tree	150.0-157.5	5.64		8.36		35.1		6.63	6.93	55.76	.43	20.54		0	1.48	47.60
	175.0-182.0	7.17		8.21		33.0		5.93	7.97	74.04	.50	28.61		0	1.50	60.00
Pecan	0.0- 7.5	1.11	1.39	8.08	7.71	49.0	46.2	3.88	1.27	7.70	.72	3.86	4.10	0	3.48	5.80
samples	7.5- 15.0	4.34		7.91		80.1		17.77	9.81	29.68	.43	12.87		0	1.26	46.00
located	30.0- 37.5	1.40	0.67	8.12	7.82	53.7	40.1	1.57	1.19	11.15	.63	4.75	1.35	0	3.18	7.10
1 m	60.0- 67.5	2.58	0.64	7.99	7.83	85.0	39.1	5.07	3.19	21.37	.51	8.35	1.39	0	1.72	20.20
from	90.0- 97.5	1.76	1.03	8.24	8.03	30.5	24.7	4.92	1.77	13.78	.24	5.66	1.63	0	2.06	13.20
trunk	120.0-127.5	5.33	1.73	7.98	8.19	35.1	25.4	16.50	8.28	40.06	.69	21.52	1.31	0	13.60	44.00
of tree	150.0-157.5	6.72		8.21		31.9		11.89	10.40	60.37	.59	26.90		0	1.36	57.20
	175.0-182.0	1.48		8.58		23.1		.53	.86	13.68	.16	3.85		0	2.22	9.30
Pecan	0.0- 7.5	2.11	1.95	8.03	7.87	49.4	45.4	6.17	2.43	14.57	.87	7.32	6.51	0	2.86	14.20
samples	7.5- 15.0	2.20		8.14		53.6		6.15	2.41	16.01	.86	7.69		0	2.26	15.60
located	30.0- 37.5	3.71	4.36	8.00	7.80	54.5	43.2	12.73	5.10	30.06	.83	14.80	20.20	0	1.46	37.60
2.7 m	60.0- 67.5	4.91	6.52	7.84	7.70	80.9	68.7	20.47	10.37	34.44	.72	15.31	28.99	0	1.28	48.00
from	90.0- 97.5	4.44	6.36	7.97	7.58	29.8	100.7	20.33	9.75	29.12	.45	10.93	21.01	0	1.22	46.00
trunk	120.0-127.5	5.06	6.48	8.16	7.64	36.8	27.3	10.82	8.13	43.70	.47	21.38	25.89	0	1.18	38.00
of tree	150.0-157.5	3.63		8.32		28.0		4.70	4.32	34.25	.30	11.29		0	1.80	30.80
	175.0-182.0	1.41		8.45		25.5		1.16	1.08	12.68	.18	2.78		0	1.50	10.50

* Based on analysis of saturation extract samples at indicated saturation percent.

concentrations in the area of the drip-irrigated pecan orchard could be due to the irrigation method or soil types present. The high level of gypsum in the low layers has been encountered in other areas of the valley that were flood irrigated.

Infiltration Measurements in Canals

Deep seepage from the main and distribution canals in an irrigation system has been measured to be as much as 30-50 percent of the total flow Rohwer (1946). It is difficult to estimate transmission losses because of the large variability associated with seepage measurements from site to site.

In studying the influence of concrete lining on seepage losses from farm ditches Hanson (1966) reported a large variability in the transmission losses from unlined farm ditches. Losses varied from less than one percent of the flow to as much as sixteen percent with an average loss of about seven percent when the turnouts were sealed. Seepage loss depends upon the type of soil and the sediment load in the water as it affects surface sealing. Other factors that affect seepage loss percentage are the velocity and flow depth at which the water moves through the canal. For a given discharge, higher velocities require less cross-sectional area and wetted perimeter through which seepage may flood, a shorter time for water to be lost by seepage, and consequently, less seepage percentage. If weeds are allowed to grow in a ditch the velocity is lower, thus increasing the flow depth, the time opportunity for seepage, and the seepage loss percentage.

Using the ponding technique, measurements of the steady-state infiltration rate ranged from 51 cm/day for a section of Walter

lateral to 11.6 cm/day for a farm field ditch, and 6 cm/day for the Upper Chamberino and main distribution canal (see Table 19). Water temperature data were analyzed using the technique described by Stallman (1965). With this technique, the lower detectable limit of percolation loss is about 2 cm/day. All the measurements indicated losses greater than this amount. The temperature determinations of infiltration rate in the farm supply ditches and Upper Chamberino lateral are presented in Table 19.

Infiltration rates determined for the Upper Chamberino lateral from temperature profile measurements were greater than those determined by using the ponding technique. The increased infiltration rate could be accounted for the by fact that there was a greater head or height of water in the canal when the temperature measurements were made than during the ponding test. In the farm ditches, the ponding measurements of infiltration were greater than those determined using the temperature technique.

Using the average infiltration rate in the Upper Chamberino lateral of 12 cm/day, the present loss per 1000 meters of canal was calculated for different flow levels and presented in Figure 10. The loss represents a small percent unless the flow becomes very low or the length of canal excessively long.

Based on an infiltration rate of 10 cm/day (the average of the two lower infiltration rates in the farm ditches), the seepage loss from the entire farm distribution system represents 1.1 percent of the applied water over the growing season. Based on the average of the two largest infiltration measurements, 47.2 cm/day, the seepage loss represents 5.6 percent of the applied water.

TABLE 19. INFILTRATION RATE IN THE UPPER CHAMBERINO AND FARM SUPPLY DITCH

Date	Test No. 1/	Location 2/	Method	Final Infiltration Rate
				(cm/day)
8-09-77	1	Upper Chamberino	Temperature	12.9
8-09-77	2	Upper Chamberino	Temperature	16.8
7-12-77	3	Upper Chamberino Drain	Temperature	13.0
10-22-76	4	Upper Chamberino	Ponding	6.0
8-26-77	5	Farm Ditch Field 4 Location 1	Temperature	8.0
8-26-77	6	Farm Ditch Field 4	Ponding	11.6
10-06-76	7	Field Ditch Field 3	Ponding	43.2
11-17-77	8	Walter's Lateral	Ponding	51.2

1/ Locations of test sites are shown on Figure 2.

2/ Clay soil

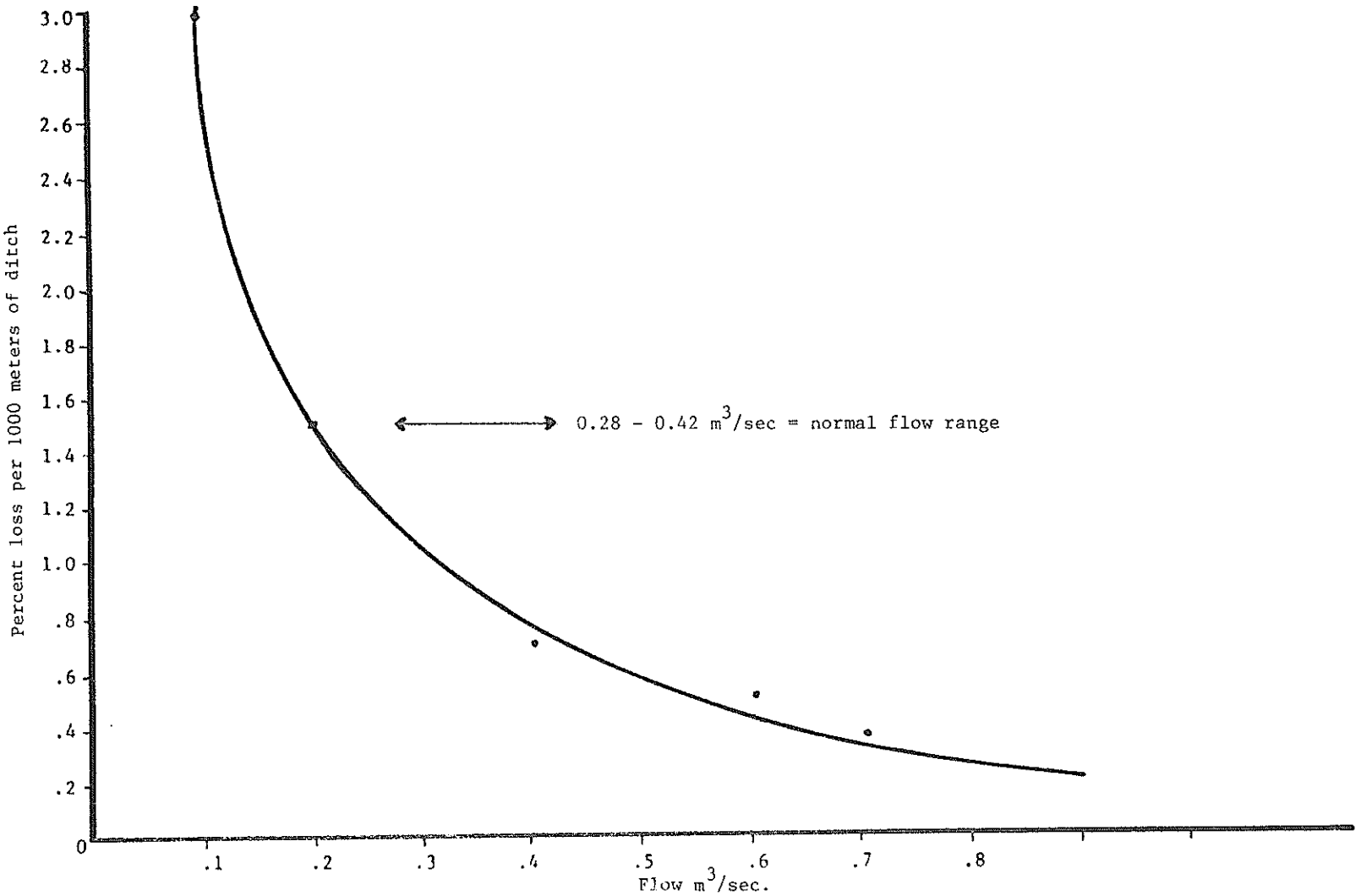


Figure 10

Seepage loss for a main distribution canal per 1000 m of length

Drain Flow Measurements

Weekly measurements of the drain flow were made using current meters. Water samples were taken at the time that the flow measurements were made at Sites B and D (Figure 4).

As flow rate from B to D in the drains increases, electrical conductivity or salt content of the drain water decreases (Figure 11). The measured data for flow are presented in Appendix B and the water quality data in Appendix C. The salt content of the drain water did not change significantly from Sites B to D. At the 5 percent level of probability, there was no difference in the mean flow during the growing season (April through September) between Sites B and D for 1975 and 1976. This was due to the nonsteady-state condition of the drains. Excess irrigation water was constantly being dumped into the drains causing marked increases or decreases in flow between measurement Sites B and D. During the 1977 growing season, most of the water in the valley near the measurement drain sites was pumped water and the drain was closer to a steady-state condition during the measurement periods. The differences in flow between Sites B and D for 1977 are presented in Figure 12. During most of the growing season, the flow rate increased significantly at the 5 percent level of probability from Site B to Site D, indicating that the farm was contributing return flow to the drain system.

Along with measurements in flow obtained with a current meter, water depths were measured at La Mesa Drain Sites B and D with water stage recorders. A rating curve was determined for the sites using the flow data. Analysis of the data indicated that the canal bottom shifted by scouring and deposits and was insufficiently stable for

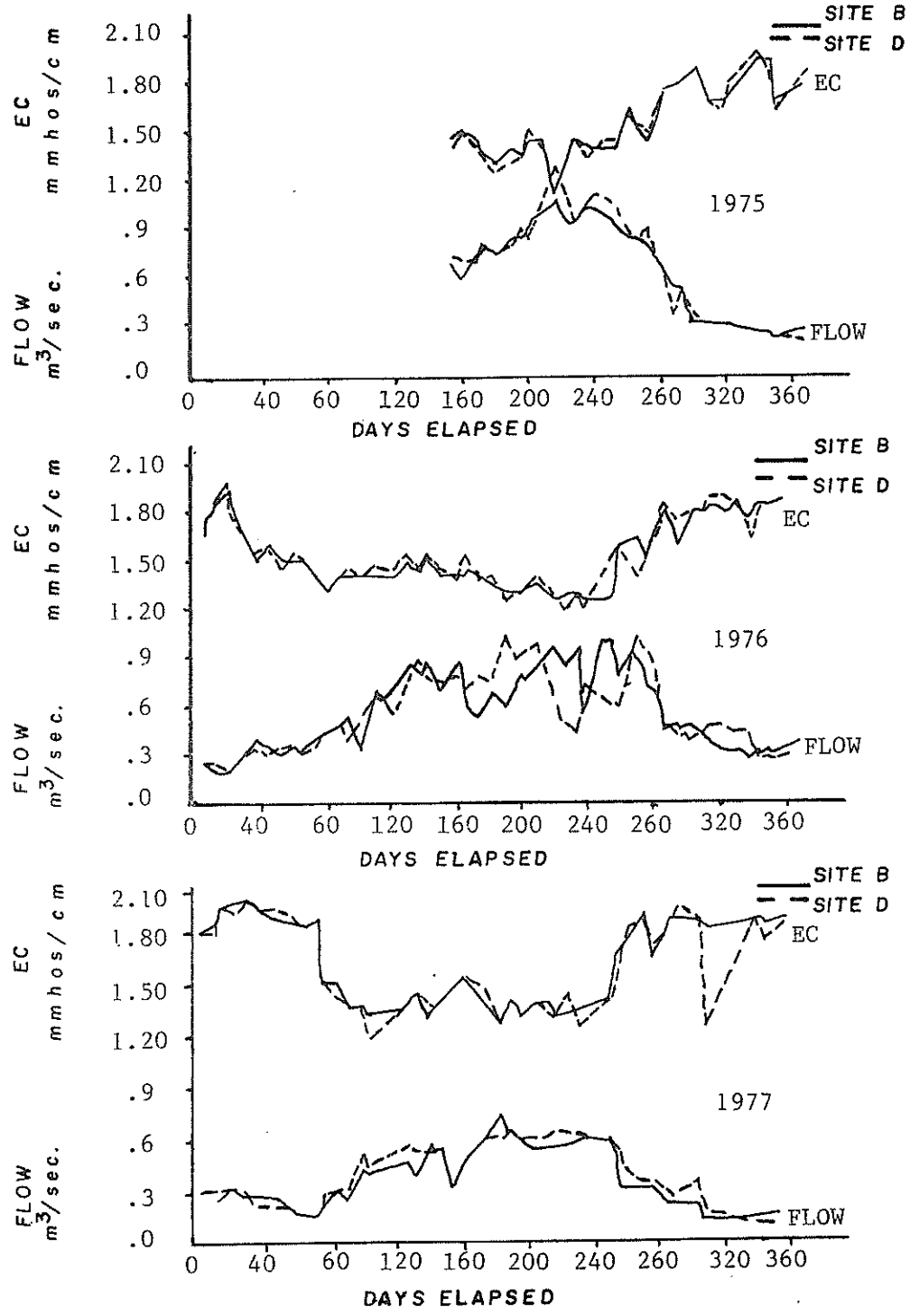


Figure 11. Flow and electrical conductivity at La Mesa Drain Sites B and D for 1975, 1976, and 1977.

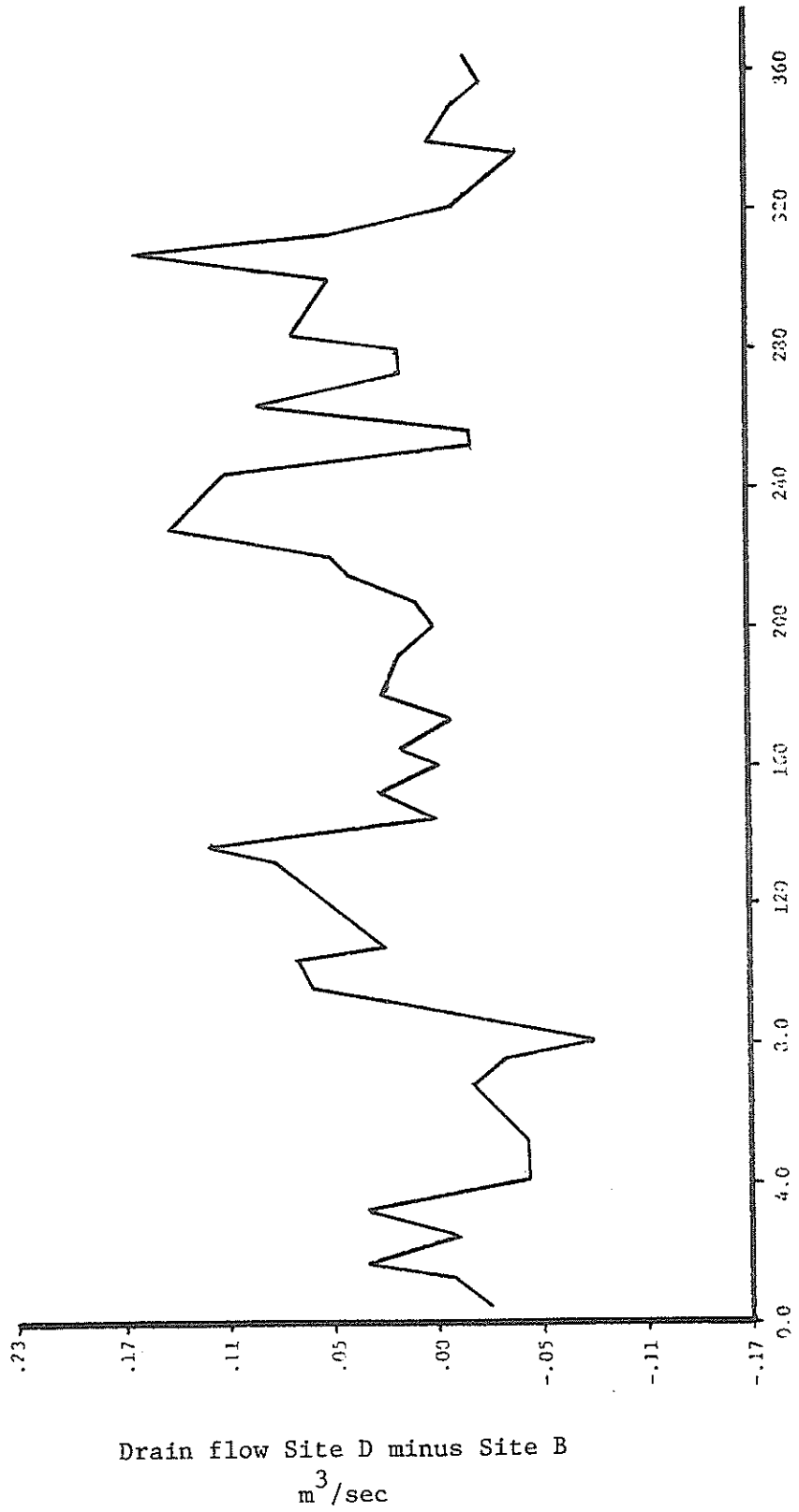


Figure 12. Difference in flow between La Mesa Drain Sites B and D.

a rating curve of flow depth vs. flow rate to be determined for Site B. However, the rating curve for Site D was estimated to fit a straight line with a correlation coefficient of .9. The rating curve equation is:

$$\text{depth} = .0017\ \text{flow} + .14$$

where depth = meters

flow = cubic meters per second.

Using this equation and the water stage levels determined with the water stage recorder, the daily flows for 1976 and 1977 were calculated for Site D (Figure 13). The daily flows for each month are presented in Appendix A. The daily flows fluctuated considerably during the 1976 irrigation season due to the dumping of excess irrigation water from the irrigation canals into the drainage canals. There appeared to be as much variation in the daily flows as there was in the weekly flows measured with a current meter. It has not been possible to determine the amount of fluctuation due to return groundwater flow, and how much was due to surface waste water.

Groundwater Level Fluctuations

Weekly piezometer measurements were made on a transect perpendicular to the La Mesa Drain. The data are presented in Appendix D. Several of the piezometers became plugged with soil toward the end of the study and had to be abandoned. A statistical analysis was done using a steady-state drain-flow model to try to correlate piezometer height and increase in drain flow between Sites B and D in 1977. An increased gradient, due to the rise in the water table from excess irrigation water, should have caused an increase in flow between Sites B and D. An analysis was conducted only on 1977 data when the increased flow

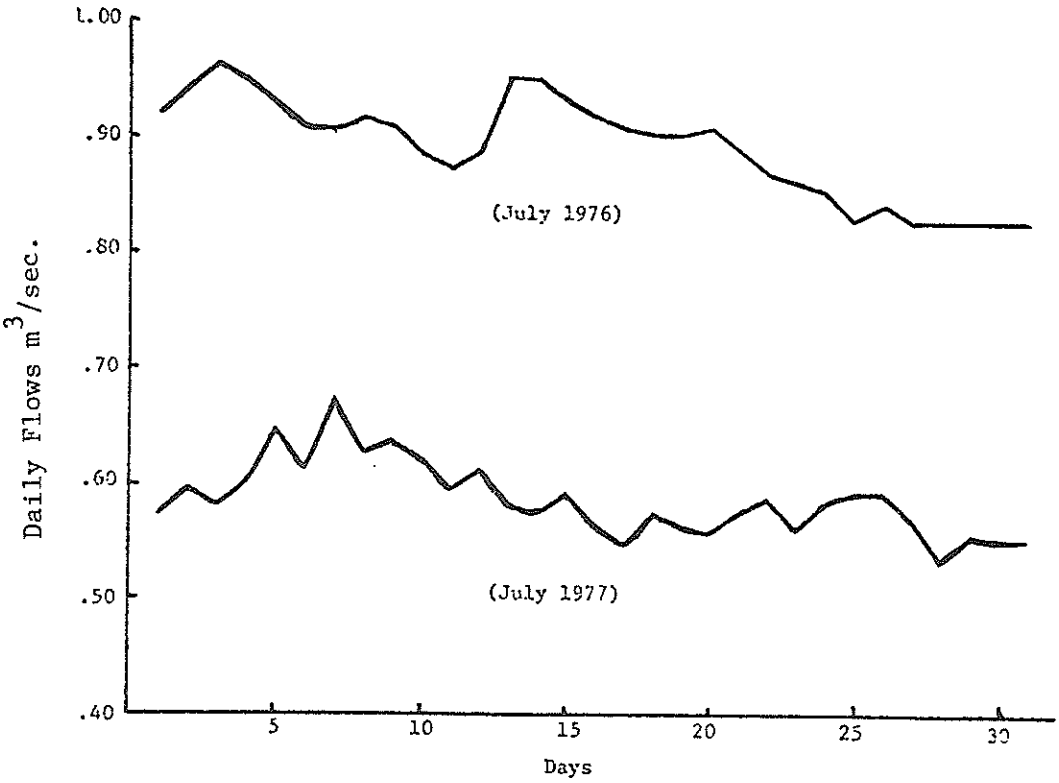


Figure 13. Daily drain flows at Site D in the La Mesa Drain.

was statistically significant. However, the results indicated that the system could not be statistically described at the 5 percent level of probability by a steady-state model applied to each measurement point. As can be observed from a plot of the water table level, the groundwater system (Figures 14 and 15) was not homogenous but contained lenses of high and low permeability. This resulted in an uneven gradient of the groundwater away from the drains. The plot of the groundwater level represents a response to both excess irrigation water and pumping from the wells in the area. During 1976, the groundwater table was low in January, February, and March and started to rise by May after water had been released into the irrigation system. This rise continued through September due to excess irrigation water. After September, the groundwater table again dropped as excess irrigation water decreased and the drains lowered. In 1977, when most of the irrigation water was supplied by groundwater, the groundwater table continued to decline throughout the year, from January through December. Due to the cropping pattern, there was less return flow although the overall farm-irrigation efficiency did not change.

Groundwater Salinity

There was a significant increase in salinity in groundwater monitoring Wells 1 and 3 between 1976 and 1977 (Table 20). The salinity in Well 2 increased in value but was not statistically significant at the 95 percent confidence level. The level of salinity in the 15-meter well was significantly different from the level of salinity in the 10-meter well which, in turn, was significantly different from the salinity level in the 6-meter well for both years.

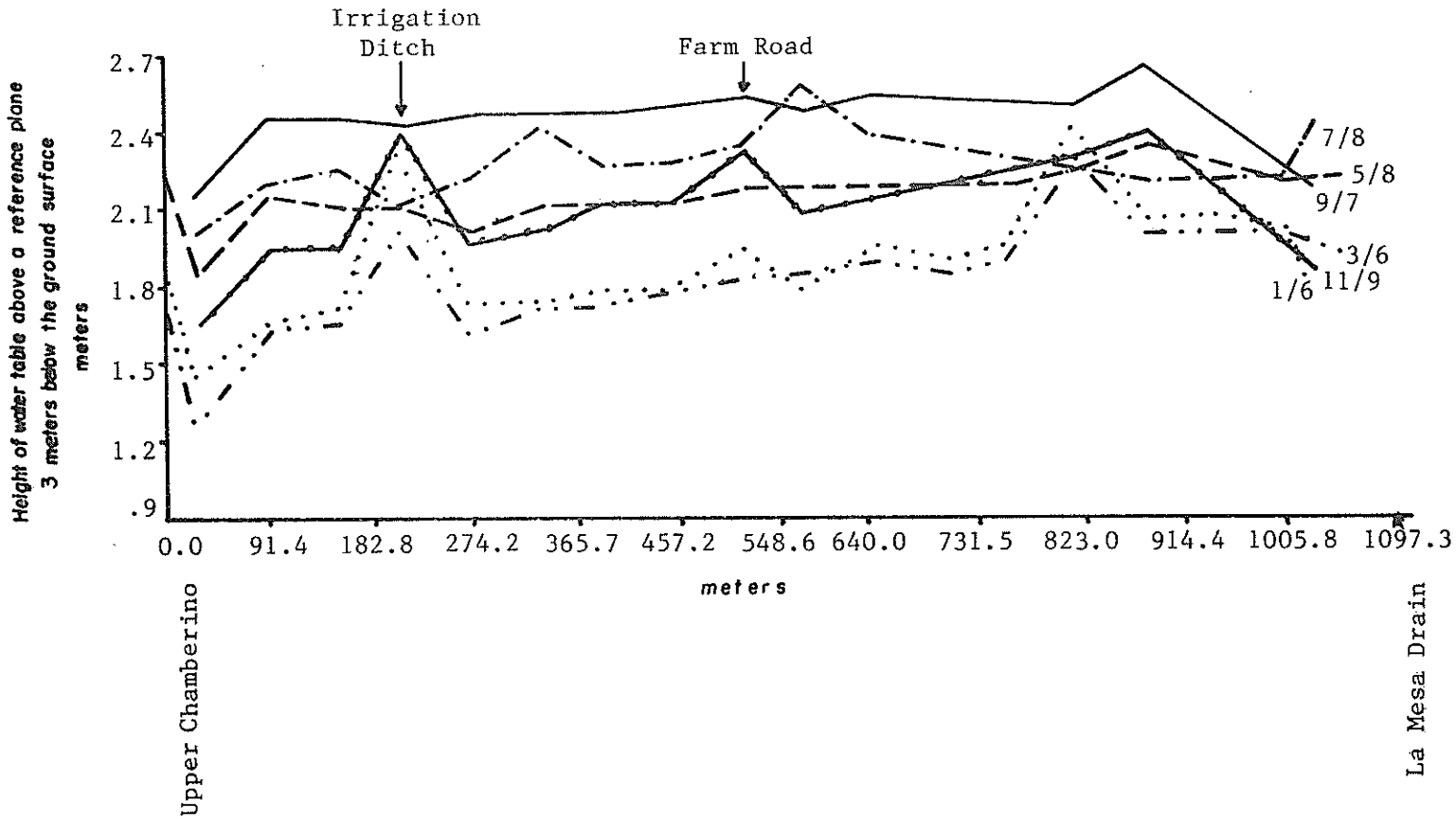


Figure 14. Groundwater height fluctuation for selected dates along a transect from the Upper Chamberino in the La Mesa Drain for 1976.

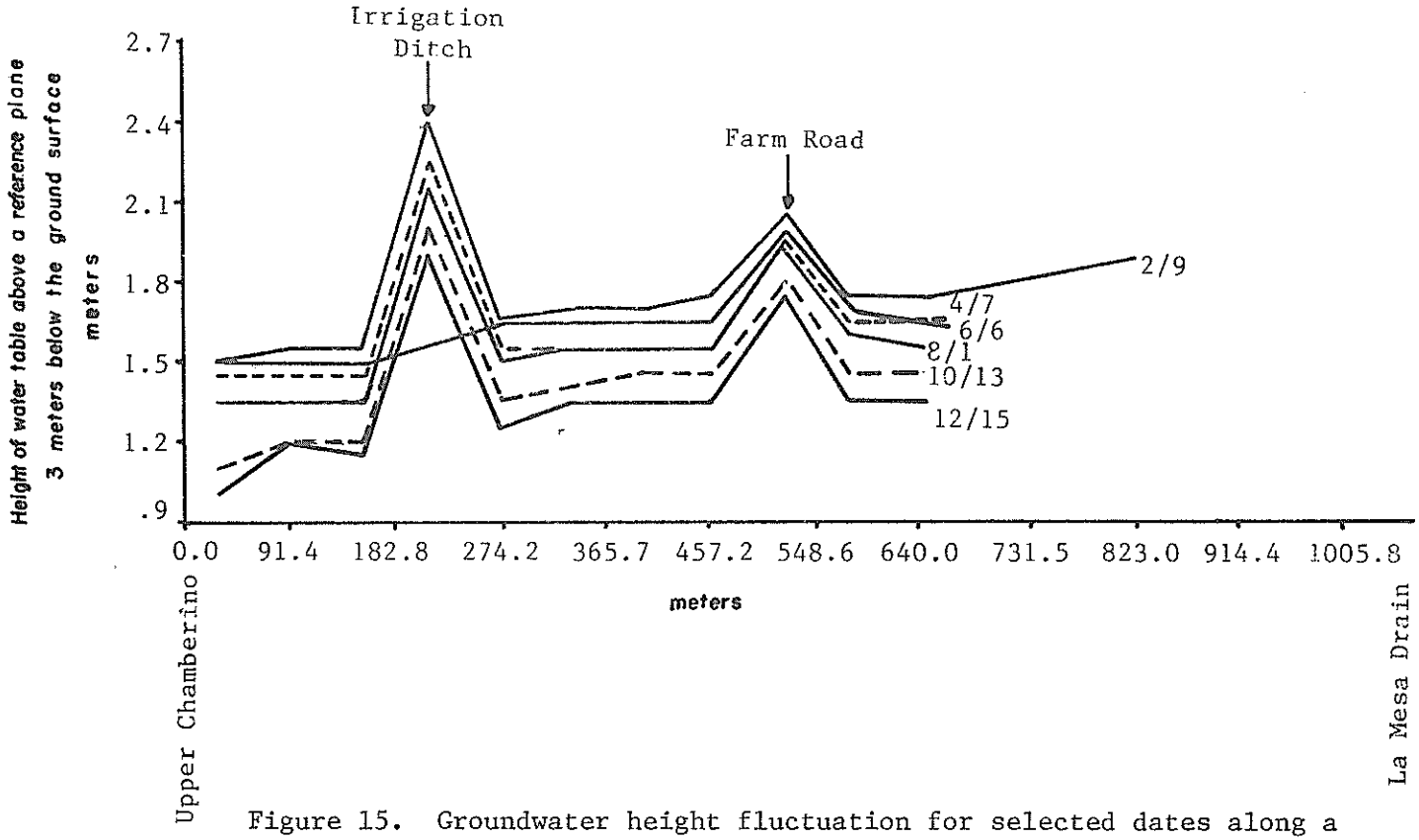


Figure 15. Groundwater height fluctuation for selected dates along a transect from the Upper Chamberino in the La Mesa Drain for 1977.

TABLE 20. A TABLE OF WATER QUALITY DATA SIGNIFICANT AT THE 95 PERCENT CONFIDENCE LEVEL FOR THREE GROUNDWATER OBSERVATION WELLS AT 15, 10, AND 6 METER DEPTHS

Well Comparison* For Yearly Mean Values	$EC \times 10^3$	Chemical Constituents meq/ℓ										
		pH	Cations	Anions	Ca	Mg	Ha	K	Cl	CO_3	HCO_3	SO_4	NO_3
Well 1, 1977 Minus Well 1, 1976	+.18	**			-1.4		-1.3		- .4				
Well 2, 1976 Minus Well 2, 1977			2.4	4.5		.5	2.2		1.56				
Well 3, 1976 Minus Well 3, 1977	-.3				-1.9		1.27						
Well 2, 1976 Minus Well 1, 1976	+.5		-6.4	-5.61	+3.2	-.7	-2.3		-3.2			-3.1	-36.4
Well 1, 1976 Minus Well 3, 1976	-.68		7.8	7.4	2.0	.5	-6.3		3.6			-8.0	37.7
Well 2, 1976 Minus Well 3, 1976	-.18			1.8		1.2	-4.0						
Well 1, 1977 Minus Well 2, 1977	-.3		-3.9	-3.6	2.0		-1.7		2.1			-2.3	36.7
Well 2, 1977 Minus Well 3, 1977	-.5		-4.6	-4.8		.7	-4.9	-.1	1.8		-1.1	2.0	

* Depth of Wells: Well 1 = 15 meters; Well 2 = 10 meters; Well 3 - 6 meters.

** Blanks indicate there was no significance.

The water quality continually degraded from the deeper to the shallower wells.

The changes of individual constituents do not present a clear picture. The nitrate content did not change statistically from year 1976 to 1977, but there was a degradation of the nitrate concentration from the shallower to the deeper wells increasing to an average of 38.7 ppm. There was no significant difference between Well 2 and Well 3 at the top two depths (6 and 10 meters). Both of the top two depths were significantly different from the bottom depth.

SECTION 5

CONCLUSION

Using irrigation scheduling on the 450-acre demonstration, the yearly farm irrigation efficiency was 63 percent, a 13 to 23 percent increase over the 40 to 50 percent irrigation efficiency considered normal for the Mesilla Valley.

The results of this study show that although the overall irrigation efficiency of the Demonstration Farm (63 percent) was good with irrigation scheduling, with large variations from field to field ranging from 80 percent to 35 to 40 percent. Field irrigation efficiencies did not correlate with the type of crop being grown or field size.

The canals at the measurement sites had very low seepage losses. In the main canal, the maximum loss per 1000 meters of canal ranged from 3 percent down to .2 percent, depending upon the flow in the canal. Seepage losses from the farm ditches measured were 5.6 to 1.1 percent of the total applied water over the growing season.

Trickle irrigation of the pecan orchard resulted in irrigation efficiencies of nearly 100 percent. Measurements are necessary to determine if any detrimental effects would occur from salt accumulation due to the continued use of trickle irrigation with irrigation efficiencies approaching 100 percent.

There was a negative correlation between groundwater height on the Demonstration Farm and increase in drain flow through the farm during 1977. During 1975 and 1976, drain-flow measurements at two locations did not show a statistical increase or decrease in

the flow through the Demonstration Farm. Consequently, change in drain flow did not correlate to changes in groundwater height. Short-term changes in flow rates during the growing season may be influenced by the amount of excess surface water being returned into the drains rather than by the height of the groundwater table.

The effect of irrigation scheduling on drain flow quantity was not detectable. However, irrigation scheduling at the Demonstration Farm was estimated to increase the irrigation efficiency by approximately 13 percent.

Salinity of the drain water showed a negative correlation with flow, decreasing as drain flow increased in all years. Groundwater quality at the sampling points on the Demonstration Farm indicated an increase in nitrate content and a decrease in total salinity with depth below the water table.

SECTION 6

RECOMMENDATIONS

1. For maximum benefit of water supplies in the Mesilla Valley, farm irrigation systems should be designed for minimum leaching.
2. Increased efforts are needed to better define the actual water use of crops in the Mesilla Valley, in particular the water requirements of pecan orchards.
3. Increased efforts are needed to further encourage the utilization of irrigation management scheduling and sprinkler irrigation of vegetable crops for seed germination in the Mesilla Valley.
4. Use of combination of irrigation systems should be investigated for seed germination, i.e., trickle or sprinkler and flood.
5. Equipment to measure applied water to each field should be incorporated in farm irrigation systems to improve field irrigation efficiencies.
6. Continued monitoring of the salinity in the soil beneath the field sites where irrigation sheduling is practiced would help to determine the long-range effect of increased efficiency on salinity buildup.

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Appendix A

CLIMATIC DATA

Legend for Climatological Data

T (Max) = Maximum Air Temperature ^{o}C

T (Min) = Minimum Air Temperature ^{o}C

H (Max) = Maximum Humidity in percent

H (Min) = Minimum Humidity in percent

DBT = Dry Bulb Temperature ^{o}C measured on specified day at recorded time

WBT = Wet Bulb Temperature measured on specified day at recorded time

S(Ly) = Solar Radiation in L angles for 24 hours

Wind (24 hr.) = Accumulated wind run in km/day

Pan (E) = Class A Evaporation Pan (cm)

PRE = Precipitation (cm)

Total E = Accumulated Pan Evaporation

—0.00 = No data collected

0.0 = No data collected for solar radiation

Table A-1. Climatological data for Las Cruces, New Mexico 1975.

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
10175	LASCRUC	830	3.9	1.1	-3.3	-0.0	-0.0	-0.0	68.0	193.	-0.00	0.20	-0.00
10275	LASCRUC	830	7.8	-2.2	-4.4	-0.0	-0.0	-0.0	253.0	183.	0.20	0.0	0.20
10375	LASCRUC	830	3.9	-6.1	-5.6	-0.0	-0.0	-0.0	360.0	233.	0.10	0.0	0.30
10475	LASCRUC	830	7.8	-8.9	-7.2	-0.0	-0.0	-0.0	353.0	106.	0.10	0.0	0.41
10575	LASCRUC	830	10.0	-8.3	-10.0	-0.0	-0.0	-0.0	339.0	146.	0.13	0.0	0.53
10675	LASCRUC	830	12.2	-7.2	-5.0	-0.0	-0.0	-0.0	326.0	72.	0.15	0.0	0.69
10775	LASCRUC	830	15.6	-4.4	-2.2	-0.0	-0.0	-0.0	232.0	124.	0.20	0.0	0.89
10875	LASCRUC	830	17.2	-6.1	-3.3	-0.0	-0.0	-0.0	318.0	180.	0.25	0.13	1.14
10975	LASCRUC	830	9.5	-0.6	-2.2	-0.0	-0.0	-0.0	187.0	483.	0.20	0.15	1.35
11075	LASCRUC	830	9.5	-2.2	-6.7	-0.0	-0.0	-0.0	248.0	418.	0.38	0.0	1.73
11175	LASCRUC	830	10.0	-3.9	-8.9	-0.0	-0.0	-0.0	308.0	282.	0.41	0.0	2.13
11275	LASCRUC	830	3.9	-8.9	-11.1	-0.0	-0.0	-0.0	352.0	145.	0.15	0.0	2.29
11375	LASCRUC	830	10.6	-10.0	-8.9	-0.0	-0.0	-0.0	346.0	217.	0.53	0.0	2.82
11475	LASCRUC	830	16.7	-7.2	-8.3	-0.0	-0.0	-0.0	341.0	209.	0.53	0.0	3.35
11575	LASCRUC	830	18.9	-5.0	-6.7	-0.0	-0.0	-0.0	347.0	130.	0.08	0.0	3.43
11675	LASCRUC	830	16.7	-5.6	-3.9	-0.0	-0.0	-0.0	316.0	174.	0.03	0.0	3.45
11775	LASCRUC	830	18.3	-5.6	-6.7	-0.0	-0.0	-0.0	238.0	201.	0.84	0.0	4.29
11875	LASCRUC	830	18.9	-3.3	-3.3	-0.0	-0.0	-0.0	0.0	146.	0.23	0.0	4.52
11975	LASCRUC	830	15.0	-2.8	-2.2	-0.0	-0.0	-0.0	0.0	151.	0.33	0.0	4.85
12075	LASCRUC	830	13.9	-7.8	-5.6	-0.0	-0.0	-0.0	0.0	93.	0.25	0.0	5.11
12175	LASCRUC	830	20.0	-7.8	-7.8	-0.0	-0.0	-0.0	0.0	491.	0.43	0.08	5.54
12275	LASCRUC	830	4.4	-2.2	-1.1	-0.0	-0.0	-0.0	0.0	108.	0.25	0.0	5.79
12375	LASCRUC	830	11.1	-6.7	-4.4	-0.0	-0.0	-0.0	0.0	69.	0.05	0.0	5.84
12475	LASCRUC	830	17.8	-7.2	-6.1	-0.0	-0.0	-0.0	0.0	85.	0.18	0.0	6.02
12575	LASCRUC	830	23.4	-5.0	-6.7	-0.0	-0.0	-0.0	0.0	109.	0.28	0.0	6.30
12675	LASCRUC	830	23.9	-2.8	-7.2	-0.0	-0.0	-0.0	0.0	103.	0.51	0.0	6.81
12775	LASCRUC	830	18.9	-0.6	3.9	-0.0	-0.0	-0.0	137.2	150.	0.15	0.0	6.96
12875	LASCRUC	830	22.2	-1.1	-6.7	-0.0	-0.0	-0.0	323.8	227.	0.61	0.0	7.57
12975	LASCRUC	830	12.2	5.6	5.0	-0.0	-0.0	-0.0	58.1	130.	-0.00	0.28	7.57
13075	LASCRUC	830	18.9	6.7	5.6	-0.0	-0.0	-0.0	215.9	140.	0.23	0.0	7.80
13175	LASCRUC	830	13.9	5.0	6.7	-0.0	-0.0	-0.0	118.2	163.	0.13	0.38	7.92
	MEAN		13.8	-3.9	-4.3	0.0	0.0	0.0	186.6	183.	0.27		
	STANDARD DEV		5.8	4.3	4.5	0.0	0.0	0.0	145.5	107.	0.19		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	OBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
20175	LASCRUC	830	11.7	7.2	5.6	-0.0	-0.0	-0.0	145.4	85.	0.18	0.0	8.10
20275	LASCRUC	830	15.0	5.6	3.9	-0.0	-0.0	-0.0	257.5	85.	0.18	0.74	8.28
20375	LASCRUC	830	16.1	5.0	1.1	-0.0	-0.0	-0.0	256.3	137.	0.38	0.0	8.66
20475	LASCRUC	830	15.0	0.6	-3.9	-0.0	-0.0	-0.0	377.7	246.	0.30	0.0	8.97
20575	LASCRUC	830	15.6	-2.2	-1.1	-0.0	-0.0	-0.0	347.6	117.	0.36	0.0	9.32
20675	LASCRUC	830	12.9	-3.9	-6.7	-0.0	-0.0	-0.0	377.0	274.	0.30	0.0	9.63
20775	LASCRUC	830	16.1	-4.4	-5.6	-0.0	-0.0	-0.0	360.2	71.	0.23	0.0	9.85
20875	LASCRUC	830	18.9	3.9	-1.7	-0.0	-0.0	-0.0	380.0	225.	0.58	0.0	10.44
20975	LASCRUC	830	20.0	-5.6	-2.2	-0.0	-0.0	-0.0	384.3	225.	0.61	0.0	11.05
21075	LASCRUC	830	19.5	-1.1	-1.7	-0.0	-0.0	-0.0	356.9	219.	0.51	0.0	11.56
21175	LASCRUC	830	16.1	-0.6	-0.6	-0.0	-0.0	-0.0	407.7	172.	0.38	0.0	11.94
21275	LASCRUC	830	18.3	-2.8	-2.8	-0.0	-0.0	-0.0	407.1	58.	0.28	0.0	12.22
21375	LASCRUC	830	22.8	-7.2	-6.1	-0.0	-0.0	-0.0	401.5	84.	0.36	0.0	12.57
21475	LASCRUC	830	17.2	-0.6	-0.0	-0.0	-0.0	-0.0	186.5	161.	0.28	0.0	12.85
21575	LASCRUC	830	19.5	-0.0	-0.6	-0.0	-0.0	-0.0	364.4	398.	1.22	0.0	14.07
21675	LASCRUC	830	15.6	-0.6	-0.6	-0.0	-0.0	-0.0	401.5	232.	0.41	0.0	14.48
21775	LASCRUC	830	13.9	-3.9	-2.2	-0.0	-0.0	-0.0	355.2	430.	0.66	0.0	15.14
21875	LASCRUC	830	12.8	-5.6	-3.9	-0.0	-0.0	-0.0	425.1	105.	0.20	0.0	15.34
21975	LASCRUC	830	15.4	-7.2	-6.7	-0.0	-0.0	-0.0	432.5	77.	0.23	0.0	15.57
22075	LASCRUC	830	20.6	-7.8	-5.6	-0.0	-0.0	-0.0	426.4	206.	0.76	0.0	16.33
22175	LASCRUC	830	12.8	-2.8	-1.1	-0.0	-0.0	-0.0	143.8	291.	0.18	0.18	16.51
22275	LASCRUC	830	4.4	-7.2	-5.6	-0.0	-0.0	-0.0	272.0	150.	0.13	0.0	16.64
22375	LASCRUC	830	10.5	-8.9	-8.9	-0.0	-0.0	-0.0	469.7	140.	0.30	0.0	16.94
22475	LASCRUC	830	17.8	-8.9	-6.7	-0.0	-0.0	-0.0	457.8	89.	0.28	0.0	17.22
22575	LASCRUC	830	21.1	-5.6	-5.0	-0.0	-0.0	-0.0	423.7	111.	0.43	0.0	17.65
22675	LASCRUC	830	22.2	-3.9	-2.8	-0.0	-0.0	-0.0	450.7	106.	0.41	0.0	18.06
22775	LASCRUC	830	22.2	-2.8	-0.0	-0.0	-0.0	-0.0	457.4	187.	0.63	0.0	18.69
22875	LASCRUC	830	23.4	-0.6	2.2	-0.0	-0.0	-0.0	457.2	90.	0.46	0.0	19.15
	MEAN		16.7	-2.7	-2.1	0.0	0.0	0.0	363.7	170.	0.40		
	STANDARD DEV		4.3	4.4	3.5	0.0	0.0	0.0	91.9	96.	0.23		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DEW DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
30175	LASCRUC	830	25.6	-1.7	1.7	-0.0	-0.0	-0.0	461.5	80.	0.41	0.0	19.56
30275	LASCRUC	830	27.8	-1.1	-1.1	-0.0	-0.0	-0.0	456.8	182.	0.76	0.0	20.32
30375	LASCRUC	830	25.6	-2.2	-4.4	-0.0	-0.0	-0.0	433.0	182.	0.33	0.0	20.65
30475	LASCRUC	830	19.5	-1.1	-0.0	-0.0	-0.0	-0.0	416.5	92.	0.46	0.0	21.11
30575	LASCRUC	830	16.7	-2.8	-0.0	-0.0	-0.0	-0.0	450.1	187.	0.76	0.0	21.87
30675	LASCRUC	830	14.5	5.0	-0.0	-0.0	-0.0	-0.0	484.3	303.	0.94	0.0	22.81
30775	LASCRUC	830	25.0	-2.2	-0.0	-0.0	-0.0	-0.0	458.7	111.	0.53	0.0	23.34
30875	LASCRUC	830	22.2	4.4	-0.0	-0.0	-0.0	-0.0	204.8	295.	0.56	0.0	23.90
30975	LASCRUC	830	17.8	5.6	-0.0	-0.0	-0.0	-0.0	462.3	377.	0.69	0.0	24.59
31075	LASCRUC	830	22.2	-2.2	-0.0	-0.0	-0.0	-0.0	485.9	188.	0.63	0.0	25.22
31175	LASCRUC	830	15.6	1.7	-0.0	-0.0	-0.0	-0.0	331.8	422.	0.66	0.38	25.88
31275	LASCRUC	830	11.7	2.2	-0.0	-0.0	-0.0	-0.0	269.3	179.	0.33	0.10	26.21
31375	LASCRUC	830	16.1	-2.2	-0.0	-0.0	-0.0	-0.0	524.4	145.	0.38	0.0	26.59
31475	LASCRUC	830	19.5	-2.2	-0.0	-0.0	-0.0	-0.0	404.4	328.	0.63	0.0	27.23
31575	LASCRUC	830	15.6	-1.1	-0.0	-0.0	-0.0	-0.0	497.3	402.	0.69	0.0	27.91
31675	LASCRUC	830	18.9	-4.4	-0.0	-0.0	-0.0	-0.0	536.4	215.	0.61	0.0	28.52
31775	LASCRUC	830	17.2	-2.8	-0.0	-0.0	-0.0	-0.0	540.5	386.	0.89	0.0	29.41
31875	LASCRUC	830	21.7	-3.9	-0.0	-0.0	-0.0	-0.0	671.6	85.	0.46	0.0	29.87
31975	LASCRUC	830	26.1	-2.2	-0.0	-0.0	-0.0	-0.0	412.5	92.	0.46	0.0	30.33
32075	LASCRUC	830	27.3	-0.6	-0.0	-0.0	-0.0	-0.0	496.1	230.	0.89	0.0	31.22
32175	LASCRUC	830	23.4	7.8	-0.0	-0.0	-0.0	-0.0	428.1	306.	0.81	0.0	32.03
32275	LASCRUC	830	26.1	1.7	-0.0	-0.0	-0.0	-0.0	540.8	391.	1.22	0.0	33.25
32375	LASCRUC	830	17.8	3.9	-0.0	-0.0	-0.0	-0.0	511.1	435.	1.04	0.0	34.29
32475	LASCRUC	830	23.4	-2.2	-0.0	-0.0	-0.0	-0.0	551.3	217.	0.71	0.0	35.00
32575	LASCRUC	830	27.8	0.6	-0.0	-0.0	-0.0	-0.0	506.6	327.	1.12	0.0	36.12
32675	LASCRUC	830	22.2	2.8	0.6	-0.0	-0.0	-0.0	0.0	663.	1.09	0.0	37.21
32775	LASCRUC	830	13.3	2.8	1.1	-0.0	-0.0	-0.0	464.5	422.	0.81	0.0	38.02
32875	LASCRUC	830	12.2	1.1	3.3	-0.0	-0.0	-0.0	186.3	367.	0.28	0.05	38.30
32975	LASCRUC	830	7.2	-1.7	1.7	-0.0	-0.0	-0.0	316.5	224.	0.20	0.0	38.51
33075	LASCRUC	830	11.7	-3.3	-3.9	-0.0	-0.0	-0.0	566.1	220.	0.63	0.0	39.14
33175	LASCRUC	830	20.0	-2.2	-1.7	-0.0	-0.0	-0.0	780.7	220.	0.66	0.0	39.80
	MEAN		19.7	-0.1	-0.3	0.0	0.0	0.0	446.8	267.	0.67		
	STANDARD DEV		5.5	3.1	2.7	0.0	0.0	0.0	144.6	133.	0.26		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
40175	LASCRUC	830	21.7	3.3	-4.4	-0.0	-0.0	-0.0	578.7	463.	1.02	0.0	40.82
40275	LASCRUC	830	17.2	1.1	-4.4	-0.0	-0.0	-0.0	611.1	185.	0.58	0.0	41.40
40375	LASCRUC	830	22.2	-3.3	-5.0	-0.0	-0.0	-0.0	576.5	106.	0.61	0.0	42.01
40475	LASCRUC	830	26.1	-0.0	-3.3	-0.0	-0.0	-0.0	542.3	177.	0.79	0.0	42.80
40575	LASCRUC	830	24.5	-0.6	-4.4	-0.0	-0.0	-0.0	544.2	132.	0.74	0.0	43.54
40675	LASCRUC	830	21.1	2.8	-1.7	-0.0	-0.0	-0.0	296.7	233.	0.46	0.0	43.99
40775	LASCRUC	830	12.8	2.2	-1.1	-0.0	-0.0	-0.0	511.3	385.	0.71	0.0	44.70
40875	LASCRUC	830	14.5	-1.1	-2.8	-0.0	-0.0	-0.0	505.5	282.	0.66	0.0	45.36
40975	LASCRUC	830	19.5	-3.3	-3.3	-0.0	-0.0	-0.0	433.8	127.	0.51	0.0	45.87
41075	LASCRUC	830	17.8	5.0	-0.0	-0.0	-0.0	-0.0	424.6	365.	0.79	0.0	46.66
41175	LASCRUC	830	19.5	2.8	4.4	-0.0	-0.0	-0.0	542.6	715.	0.91	0.0	47.57
41275	LASCRUC	830	22.8	6.7	1.7	-0.0	-0.0	-0.0	584.7	328.	0.84	0.0	48.41
41375	LASCRUC	830	18.9	-0.0	1.1	-0.0	-0.0	-0.0	602.5	246.	0.76	0.0	49.17
41475	LASCRUC	830	22.8	-1.1	-1.7	-0.0	-0.0	-0.0	624.3	126.	0.61	0.0	49.78
41575	LASCRUC	830	27.8	1.1	-4.4	-0.0	-0.0	-0.0	634.5	132.	0.79	0.0	50.57
41675	LASCRUC	830	29.5	6.1	4.4	-0.0	-0.0	-0.0	588.4	283.	1.09	0.0	51.66
41775	LASCRUC	830	26.7	8.9	1.1	-0.0	-0.0	-0.0	587.0	623.	1.52	0.0	53.19
41875	LASCRUC	830	16.7	3.9	1.7	-0.0	-0.0	-0.0	640.2	275.	0.79	0.0	53.97
41975	LASCRUC	830	22.2	1.7	-0.0	-0.0	-0.0	-0.0	636.7	275.	0.79	0.0	54.76
42075	LASCRUC	830	27.8	1.1	-3.9	-0.0	-0.0	-0.0	640.4	132.	0.76	0.0	55.52
42175	LASCRUC	830	30.0	2.8	-0.6	-0.0	-0.0	-0.0	510.3	148.	0.71	0.0	56.23
42275	LASCRUC	830	28.9	9.5	1.1	-0.0	-0.0	-0.0	403.6	171.	0.56	0.0	56.79
42375	LASCRUC	830	27.2	2.8	-0.0	-0.0	-0.0	-0.0	544.2	196.	0.91	0.0	57.71
42475	LASCRUC	830	28.4	1.1	-0.0	-0.0	-0.0	-0.0	630.3	114.	0.76	0.0	58.47
42575	LASCRUC	830	28.9	6.1	1.1	-0.0	-0.0	-0.0	607.7	180.	0.86	0.0	59.33
42675	LASCRUC	830	26.4	7.8	3.3	-0.0	-0.0	-0.0	157.9	274.	0.63	0.0	59.97
42775	LASCRUC	830	20.3	7.8	-0.6	-0.0	-0.0	-0.0	666.2	338.	1.04	0.0	61.01
42875	LASCRUC	830	23.9	-2.2	-1.1	-0.0	-0.0	-0.0	659.2	143.	0.76	0.0	61.77
42975	LASCRUC	830	24.5	1.1	-1.1	-0.0	-0.0	-0.0	653.4	253.	0.99	0.0	62.76
43075	LASCRUC	830	24.5	2.8	2.2	-0.0	-0.0	-0.0	584.2	93.	0.61	0.0	63.37
	MEAN		23.2	2.7	-0.8	0.0	0.0	0.0	550.8	250.	0.79		
	STANDARD DEV		4.7	3.5	2.9	0.0	0.0	0.0	112.9	148.	0.21		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
50175	LASCRUC	830	26.1	1.7	-0.6	-0.0	-0.0	-0.0	653.0	171.	0.97	0.0	64.34
50275	LASCRUC	830	26.7	5.0	1.7	-0.0	-0.0	-0.0	650.5	204.	1.02	0.0	65.35
50375	LASCRUC	830	27.8	6.1	1.1	-0.0	-0.0	-0.0	0.0	90.	0.66	0.0	66.01
50475	LASCRUC	830	27.2	6.1	1.7	-0.0	-0.0	-0.0	0.0	274.	1.17	0.0	67.18
50575	LASCRUC	830	25.5	6.7	-0.0	-0.0	-0.0	-0.0	651.2	399.	1.09	0.0	68.27
50675	LASCRUC	830	22.8	4.4	1.1	-0.0	-0.0	-0.0	672.5	209.	0.71	0.0	68.99
50775	LASCRUC	830	23.9	0.6	0.6	-0.0	-0.0	-0.0	673.2	116.	0.71	0.0	69.70
50875	LASCRUC	830	27.2	0.6	-0.6	-0.0	-0.0	-0.0	670.2	142.	0.79	0.0	70.48
50975	LASCRUC	830	29.5	2.2	-0.0	-0.0	-0.0	-0.0	659.7	100.	0.79	0.23	71.27
51075	LASCRUC	830	29.5	9.5	12.2	-0.0	-0.0	-0.0	294.6	209.	0.46	0.0	71.73
51175	LASCRUC	830	29.5	6.7	5.6	-0.0	-0.0	-0.0	657.9	151.	0.71	0.0	72.44
51275	LASCRUC	830	32.2	6.1	-0.0	-0.0	-0.0	-0.0	664.7	217.	1.09	0.0	73.53
51375	LASCRUC	830	31.1	7.8	-2.8	-0.0	-0.0	-0.0	678.0	203.	0.94	0.0	74.47
51475	LASCRUC	830	31.7	7.2	-0.0	-0.0	-0.0	-0.0	673.4	204.	1.04	0.0	75.51
51575	LASCRUC	830	31.7	17.2	-1.1	-0.0	-0.0	-0.0	671.8	312.	1.32	0.0	76.83
51675	LASCRUC	830	30.6	17.8	-1.7	-0.0	-0.0	-0.0	375.1	409.	0.84	0.13	77.67
51775	LASCRUC	830	29.5	11.1	7.2	-0.0	-0.0	-0.0	583.9	225.	0.94	0.0	78.61
51875	LASCRUC	830	30.0	10.6	2.2	-0.0	-0.0	-0.0	43.6	188.	0.99	0.0	79.60
51975	LASCRUC	830	25.0	7.8	4.4	-0.0	-0.0	-0.0	555.5	196.	0.84	0.05	80.44
52075	LASCRUC	830	26.7	9.5	-4.4	-0.0	-0.0	-0.0	687.2	293.	1.19	0.0	81.63
52175	LASCRUC	830	30.0	9.5	2.2	-0.0	-0.0	-0.0	695.0	251.	1.17	0.0	82.80
52275	LASCRUC	830	22.8	8.3	5.0	-0.0	-0.0	-0.0	628.5	243.	1.04	0.0	83.84
52375	LASCRUC	830	24.5	6.7	1.7	-0.0	-0.0	-0.0	650.9	109.	0.71	0.0	84.56
52475	LASCRUC	830	3.3	2.2	-0.0	-0.0	-0.0	-0.0	690.8	101.	0.76	0.0	85.32
52575	LASCRUC	830	31.7	5.6	2.2	-0.0	-0.0	-0.0	688.9	101.	0.76	0.0	86.08
52675	LASCRUC	830	12.8	7.2	2.8	-0.0	-0.0	-0.0	0.0	161.	0.89	0.0	86.97
52775	LASCRUC	830	12.2	3.9	6.7	-0.0	-0.0	-0.0	616.5	238.	1.22	0.0	88.19
52875	LASCRUC	830	28.9	8.9	7.8	-0.0	-0.0	-0.0	567.1	319.	1.12	0.0	89.31
52975	LASCRUC	830	26.7	7.8	6.7	-0.0	-0.0	-0.0	542.4	225.	0.74	0.0	90.04
53075	LASCRUC	830	24.5	8.3	7.2	-0.0	-0.0	-0.0	535.0	113.	0.61	0.0	90.65
53175	LASCRUC	830	31.7	6.1	8.9	-0.0	-0.0	-0.0	693.1	124.	0.84	0.0	91.49
	MEAN		27.5	7.1	3.0	0.0	0.0	0.0	542.7	203.	0.91		
	STANDARD DEV		5.4	3.9	4.0	0.0	0.0	0.0	226.5	84.	0.21		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
60175	LASCRUC	830	33.4	8.9	4.4	-0.0	-0.0	-0.0	651.8	97.	0.84	0.0	92.33
60275	LASCRUC	830	35.6	10.0	3.3	-0.0	-0.0	-0.0	676.5	148.	0.97	0.0	93.29
60375	LASCRUC	830	36.7	15.0	4.4	-0.0	-0.0	-0.0	664.3	146.	1.17	0.0	94.46
60475	LASCRUC	830	35.0	11.7	5.6	-0.0	-0.0	-0.0	642.6	164.	1.19	0.0	95.66
60575	LASCRUC	830	35.6	7.8	3.3	-0.0	-0.0	-0.0	675.8	143.	1.02	0.0	96.67
60675	LASCRUC	830	36.7	11.1	2.2	-0.0	-0.0	-0.0	665.0	216.	1.27	0.0	97.94
60775	LASCRUC	830	32.2	14.5	13.3	-0.0	-0.0	-0.0	408.7	145.	0.74	0.0	98.68
60875	LASCRUC	830	32.8	12.8	10.6	-0.0	-0.0	-0.0	641.2	159.	0.94	0.0	99.62
60975	LASCRUC	830	32.2	11.7	9.5	-0.0	-0.0	-0.0	594.8	151.	0.99	0.0	100.61
61075	LASCRUC	830	32.8	11.1	9.5	-0.0	-0.0	-0.0	0.0	220.	1.22	0.0	101.83
61175	LASCRUC	830	31.1	11.7	9.5	-0.0	-0.0	-0.0	686.4	106.	0.79	0.0	102.61
61275	LASCRUC	830	35.0	13.9	13.9	-0.0	-0.0	-0.0	657.5	124.	0.89	0.0	103.50
61375	LASCRUC	830	35.6	14.5	12.2	-0.0	-0.0	-0.0	641.5	114.	0.94	0.0	104.44
61475	LASCRUC	830	37.8	13.9	5.0	-0.0	-0.0	-0.0	630.4	303.	1.93	0.0	106.37
61575	LASCRUC	830	37.8	14.5	1.7	-0.0	-0.0	-0.0	690.0	153.	1.35	0.0	107.72
61675	LASCRUC	830	35.6	15.0	7.8	-0.0	-0.0	-0.0	693.7	214.	1.37	0.0	109.09
61775	LASCRUC	830	33.9	11.1	7.8	-0.0	-0.0	-0.0	685.7	229.	1.35	0.0	110.44
61875	LASCRUC	830	35.4	16.7	8.3	-0.0	-0.0	-0.0	650.4	299.	1.60	0.0	112.04
61975	LASCRUC	830	32.2	12.8	13.9	-0.0	-0.0	-0.0	671.1	150.	1.04	0.0	113.08
62075	LASCRUC	830	32.2	13.9	16.1	-0.0	-0.0	-0.0	671.9	167.	1.12	0.0	114.20
62175	LASCRUC	830	32.2	12.8	13.9	-0.0	-0.0	-0.0	0.0	145.	1.12	0.0	115.31
62275	LASCRUC	830	33.9	10.6	8.9	-0.0	-0.0	-0.0	0.0	105.	0.79	0.0	116.10
62375	LASCRUC	830	35.0	15.0	16.7	-0.0	-0.0	-0.0	0.0	314.	1.19	0.0	117.30
62475	LASCRUC	830	36.1	21.7	17.8	-0.0	-0.0	-0.0	0.0	175.	0.94	0.0	118.24
62575	LASCRUC	830	36.1	19.5	15.0	-0.0	-0.0	-0.0	0.0	140.	1.14	0.0	119.38
62675	LASCRUC	830	37.3	13.3	5.6	-0.0	-0.0	-0.0	0.0	85.	0.86	0.0	120.24
62775	LASCRUC	830	37.8	12.8	11.1	-0.0	-0.0	-0.0	0.0	159.	1.09	0.0	121.33
62875	LASCRUC	830	37.8	17.2	18.9	-0.0	-0.0	-0.0	0.0	177.	1.14	0.0	122.48
62975	LASCRUC	830	37.3	17.8	16.1	-0.0	-0.0	-0.0	0.0	217.	1.12	0.0	123.60
63075	LASCRUC	830	34.5	22.2	20.6	-0.0	-0.0	-0.0	668.3	257.	1.17	0.0	124.76
	MEAN		34.9	13.8	10.2	0.0	0.0	0.0	432.3	174.	1.11		
	STANDARD DEV		2.0	3.4	5.3	0.0	0.0	0.0	314.8	60.	0.25		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
70175	LASCRUC	830	32.8	18.9	20.0	-0.0	-0.0	-0.0	683.5	229.	1.14	0.0	125.91
70275	LASCRUC	830	32.8	20.0	17.2	-0.0	-0.0	-0.0	677.1	270.	1.27	0.0	127.18
70375	LASCRUC	830	31.7	20.6	20.0	-0.0	-0.0	-0.0	483.8	261.	0.89	0.0	128.07
70475	LASCRUC	830	32.2	20.0	21.1	-0.0	-0.0	-0.0	443.5	161.	0.79	0.0	128.85
70575	LASCRUC	830	33.4	17.2	16.7	-0.0	-0.0	-0.0	612.0	114.	0.51	0.0	129.36
70675	LASCRUC	830	33.4	18.9	20.6	-0.0	-0.0	-0.0	544.7	126.	0.94	0.0	130.30
70775	LASCRUC	830	35.5	17.8	18.3	-0.0	-0.0	-0.0	633.6	169.	1.02	0.13	131.32
70875	LASCRUC	830	32.8	19.5	17.8	-0.0	-0.0	-0.0	591.3	129.	0.86	0.05	132.18
70975	LASCRUC	830	35.0	16.7	13.9	-0.0	-8.1	-0.0	649.5	121.	0.91	0.0	133.09
71075	LASCRUC	830	36.7	17.8	15.6	-0.0	-0.0	-8.6	601.3	182.	1.02	0.13	134.11
71175	LASCRUC	830	35.6	20.6	18.3	-0.0	-0.0	-7.5	486.3	193.	0.56	0.28	134.67
71275	LASCRUC	830	28.9	18.3	16.1	-0.0	-0.0	-0.0	354.9	154.	0.91	0.30	135.58
71375	LASCRUC	830	31.7	15.0	12.8	-0.0	-0.0	-8.1	663.1	95.	0.79	0.0	136.37
71475	LASCRUC	830	33.4	12.8	15.0	-0.0	-0.0	-9.7	630.5	142.	1.09	0.0	137.46
71575	LASCRUC	830	33.9	20.0	12.2	-0.0	-0.0	-8.6	666.5	262.	1.12	0.0	138.58
71675	LASCRUC	830	32.2	20.6	16.1	-0.0	-0.0	-8.3	672.5	253.	1.09	0.0	139.67
71775	LASCRUC	830	30.0	17.8	18.9	-0.0	-0.0	-8.9	461.4	150.	0.69	0.0	140.36
71875	LASCRUC	830	33.9	15.6	15.6	-0.0	-0.0	-8.6	0.0	130.	0.71	0.0	141.07
71975	LASCRUC	830	35.6	17.2	16.7	-0.0	-0.0	-7.8	0.0	93.	0.66	0.0	141.73
72075	LASCRUC	830	34.5	17.2	16.7	-0.0	-0.0	-8.1	554.6	198.	1.04	0.33	142.77
72175	LASCRUC	830	31.7	17.8	19.5	-0.0	-0.0	-7.8	543.2	134.	0.71	0.0	143.48
72275	LASCRUC	830	35.0	18.3	18.9	-0.0	-0.0	-7.5	622.1	146.	0.84	0.0	144.32
72375	LASCRUC	830	35.0	18.9	17.8	-0.0	-0.0	-7.2	390.6	159.	0.71	0.10	145.03
72475	LASCRUC	830	32.2	18.3	17.8	-0.0	-0.0	-0.0	598.4	158.	0.84	0.0	145.87
72575	LASCRUC	830	31.1	15.0	16.1	-0.0	-0.0	-8.1	0.0	200.	0.86	0.0	146.73
72675	LASCRUC	830	31.1	17.8	16.7	-0.0	-0.0	-7.2	554.9	158.	0.69	0.0	147.42
72775	LASCRUC	830	32.2	16.7	16.1	-0.0	-0.0	-8.6	648.8	203.	0.99	0.0	148.41
72875	LASCRUC	830	35.6	16.7	17.2	-0.0	-0.0	-7.2	0.0	122.	1.88	2.67	150.29
72975	LASCRUC	830	28.9	17.2	18.9	-0.0	-0.0	-6.7	365.8	84.	0.48	0.08	150.77
73075	LASCRUC	830	33.4	16.1	13.3	-0.0	-0.0	-7.5	616.3	101.	0.81	0.0	151.59
73175	LASCRUC	830	36.7	15.0	11.7	-0.0	-0.0	-8.9	649.9	63.	1.07	0.0	152.65
	MEAN		33.2	17.8	16.9	0.0	0.0	-8.0	496.8	160.	0.90		
	STANDARD DEV		2.1	1.9	2.4	0.0	0.0	0.7	214.9	55.	0.26		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
80175	LASCRUC	830	16.1	15.0	8.3	-0.0	-6.7	-8.1	570.5	98.	0.46	0.0	153.11
80275	LASCRUC	830	34.5	17.2	14.5	-0.0	-4.4	-8.1	578.9	206.	1.12	0.0	154.23
80375	LASCRUC	830	33.9	18.9	17.2	-0.0	-6.1	-7.5	517.0	161.	2.06	2.77	156.28
80475	LASCRUC	830	31.7	15.6	17.2	-0.0	-5.3	-7.2	0.0	183.	0.86	0.0	157.15
80575	LASCRUC	830	33.4	13.9	13.3	-0.0	-6.9	-8.3	643.3	130.	0.89	0.0	158.04
80675	LASCRUC	830	32.8	16.1	8.9	-0.0	-4.7	-8.3	0.0	145.	0.94	0.0	158.98
80775	LASCRUC	830	31.7	17.2	11.7	-0.0	-6.7	-9.5	641.0	90.	0.79	0.0	159.76
80875	LASCRUC	830	31.1	14.5	10.6	-0.0	-5.3	-8.6	559.2	103.	0.81	0.0	160.58
80975	LASCRUC	830	31.7	13.3	13.3	-0.0	-5.8	-8.3	521.4	174.	1.09	0.0	161.67
81075	LASCRUC	830	32.2	15.6	8.9	-0.0	-6.9	-9.7	524.1	196.	0.97	0.0	162.63
81175	LASCRUC	830	31.7	17.8	10.6	-0.0	-6.4	-9.5	613.5	122.	0.79	0.0	163.42
81275	LASCRUC	830	33.4	15.6	17.8	-0.0	-7.2	-9.2	437.8	116.	0.56	0.43	163.98
81375	LASCRUC	830	34.5	14.5	14.5	-0.0	-7.2	-8.3	0.0	117.	0.69	0.08	164.67
81475	LASCRUC	830	33.4	15.6	15.6	-0.0	-6.4	-8.3	531.6	105.	0.66	0.0	165.33
81575	LASCRUC	830	36.1	17.8	13.3	-0.0	-5.6	-7.2	605.7	175.	0.99	0.0	166.32
81675	LASCRUC	830	32.2	15.6	13.9	-0.0	-3.1	-7.5	588.9	140.	0.86	0.0	167.18
81775	LASCRUC	830	27.8	17.8	12.8	-0.0	-2.8	-6.9	581.0	135.	1.04	0.74	168.22
81875	LASCRUC	830	32.2	16.7	15.0	-0.0	-5.8	-7.5	607.6	85.	0.66	0.0	168.88
81975	LASCRUC	830	31.7	17.2	15.0	-0.0	-6.1	-8.1	503.3	180.	0.76	0.58	169.65
82075	LASCRUC	830	32.2	16.7	18.3	-0.0	-6.4	-7.8	403.0	122.	0.48	0.10	170.13
82175	LASCRUC	830	34.5	17.2	17.8	-0.0	-5.8	-7.2	497.6	163.	0.71	1.85	170.84
82275	LASCRUC	830	34.5	16.7	17.8	-0.0	-7.2	-8.6	447.5	87.	0.46	0.03	171.30
82375	LASCRUC	830	34.5	17.8	15.0	-0.0	-5.3	-8.6	573.1	84.	0.66	0.0	171.96
82475	LASCRUC	830	34.5	17.2	15.6	-0.0	-6.7	-8.1	545.5	85.	0.74	0.0	172.69
82575	LASCRUC	830	34.5	16.7	12.2	-0.0	-6.7	-8.1	594.4	138.	0.84	0.0	173.53
82675	LASCRUC	830	34.5	17.8	12.8	-0.0	-3.1	-6.4	575.6	208.	0.74	0.0	174.27
82775	LASCRUC	830	30.0	17.2	17.8	-0.0	-3.9	-7.8	607.7	177.	0.89	0.0	175.16
82875	LASCRUC	830	32.2	18.3	16.7	-0.0	-5.3	-6.9	562.6	79.	0.69	0.0	175.84
82975	LASCRUC	830	35.0	16.1	14.5	-0.0	-6.4	-7.8	572.4	82.	0.76	0.0	176.60
83075	LASCRUC	830	36.1	13.3	10.6	-0.0	-4.7	-8.1	571.3	109.	0.79	0.0	177.39
83175	LASCRUC	830	34.5	15.0	13.3	-0.0	-8.6	-9.5	571.5	156.	0.89	0.0	178.28
	MEAN		33.2	16.3	14.0	0.0	-5.8	-8.1	501.5	134.	0.83		
	STANDARD DEV		1.9	1.5	2.9	0.0	1.3	0.8	175.7	40.	0.28		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TYPE	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	GBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
90175	LASCRUC	830	33.4	14.5	13.3	-0.0	-6.4	-8.3	517.3	154.	0.84	0.0	179.12
90275	LASCRUC	830	32.8	17.2	14.5	-0.0	-5.0	-8.1	554.5	295.	0.94	0.10	180.06
90375	LASCRUC	830	27.8	16.1	16.7	-0.0	-7.5	-7.8	411.9	203.	0.61	0.20	180.67
90475	LASCRUC	830	30.0	16.1	14.5	-0.0	-6.4	-7.5	498.6	187.	0.76	0.15	181.43
90575	LASCRUC	830	27.8	16.7	13.3	-0.0	-7.2	-8.3	239.2	161.	0.43	0.05	181.86
90675	LASCRUC	830	25.0	16.7	17.2	-0.0	-7.8	-8.6	186.4	240.	0.23	0.0	182.09
90775	LASCRUC	830	30.0	15.6	13.3	-0.0	-7.5	-8.9	443.7	129.	0.86	0.15	182.95
90875	LASCRUC	830	29.5	15.6	14.5	-0.0	-6.9	-7.5	355.3	179.	0.41	0.0	183.36
90975	LASCRUC	830	31.1	17.2	13.9	-0.0	-6.4	-7.5	474.3	122.	0.71	0.03	184.07
91075	LASCRUC	830	32.2	17.2	15.6	-0.0	-7.2	-8.1	529.6	246.	0.58	0.0	184.66
91175	LASCRUC	830	32.2	16.7	15.0	-0.0	-6.7	-8.1	332.1	380.	0.69	3.17	185.34
91275	LASCRUC	830	20.6	14.5	11.1	-0.0	-6.7	-8.6	339.3	295.	1.12	1.02	186.46
91375	LASCRUC	830	18.3	11.1	10.6	-0.0	-10.8	-11.7	290.0	40.	0.46	0.10	186.92
91475	LASCRUC	830	25.0	13.9	13.9	-0.0	-5.3	-7.2	403.5	71.	0.25	0.0	187.17
91575	LASCRUC	830	29.5	11.7	6.7	-0.0	-9.2	-9.7	526.0	66.	0.53	0.0	187.70
91675	LASCRUC	830	30.6	12.2	8.3	-0.0	-7.8	-8.9	531.9	79.	0.58	0.0	188.29
91775	LASCRUC	830	32.2	10.6	11.7	-0.0	-8.9	-9.7	469.9	130.	0.56	0.0	188.85
91875	LASCRUC	830	32.2	12.8	13.3	-0.0	-7.8	-8.6	504.3	127.	0.71	0.05	189.56
91975	LASCRUC	830	32.2	13.9	12.2	-0.0	-8.1	-8.9	504.7	117.	0.61	0.30	190.17
92075	LASCRUC	830	29.5	15.6	15.6	-0.0	-6.7	-7.8	497.2	270.	0.66	0.0	190.83
92175	LASCRUC	830	25.0	11.1	11.7	-0.0	-4.7	-8.3	390.2	124.	0.69	0.0	191.51
92275	LASCRUC	830	22.8	7.2	3.3	-0.0	-12.5	-13.1	523.9	89.	0.51	0.0	192.02
92375	LASCRUC	830	25.6	4.4	2.8	-0.0	-12.0	-13.1	517.2	109.	0.58	0.0	192.61
92475	LASCRUC	830	26.1	5.6	2.8	-0.0	-12.0	-13.1	509.9	109.	0.58	0.0	193.19
92575	LASCRUC	830	27.9	4.4	0.6	-0.0	-12.0	-13.1	500.6	64.	0.48	0.0	193.67
92675	LASCRUC	830	28.4	4.4	-2.8	-0.0	-12.5	-13.6	503.1	66.	0.33	0.0	194.00
92775	LASCRUC	830	30.0	4.4	-1.1	-0.0	-12.5	-13.6	469.7	48.	0.69	0.0	194.69
92875	LASCRUC	830	30.0	5.0	-1.7	-0.0	-13.6	-13.9	486.8	55.	0.28	0.0	194.97
92975	LASCRUC	830	30.5	6.1	-1.7	-0.0	-12.0	-13.1	460.1	69.	0.51	0.0	195.48
93075	LASCRUC	830	28.9	7.8	3.9	-0.0	-11.1	-12.5	419.8	193.	0.46	0.0	195.93
	MEAN		28.6	11.9	9.4	0.0	-8.7	-9.9	446.4	147.	0.59		
	STANDARD DEV		3.7	4.7	6.4	0.0	2.6	2.4	92.7	86.	0.20		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
100175	LASCRUC	830	23.9	8.3	7.8	-0.0	-10.8	-12.0	454.9	219.	0.69	0.0	196.62
100275	LASCRUC	830	24.5	6.1	5.6	-0.0	-10.3	-12.2	460.7	204.	0.66	0.0	197.28
100375	LASCRUC	830	24.5	5.0	5.0	-0.0	-12.8	-13.9	460.8	89.	0.46	0.0	197.74
100475	LASCRUC	830	27.8	3.9	1.1	-0.0	-13.9	-14.5	465.4	61.	0.43	0.0	198.17
100575	LASCRUC	830	29.5	3.9	-0.0	-0.0	-14.2	-14.7	465.4	71.	0.33	0.0	198.50
100675	LASCRUC	830	29.5	3.9	-5.0	-0.0	-11.7	-13.9	461.4	74.	0.58	0.0	199.08
100775	LASCRUC	830	27.8	3.9	1.1	-0.0	-12.2	-13.6	454.5	159.	0.58	0.0	199.67
100875	LASCRUC	830	26.7	7.2	3.3	-0.0	-12.0	-13.3	453.9	114.	0.46	0.0	200.12
100975	LASCRUC	830	27.2	3.9	2.8	-0.0	-12.0	-13.9	447.1	85.	0.41	0.0	200.53
101075	LASCRUC	830	30.0	4.4	-0.6	-0.0	-12.5	-13.9	441.1	79.	0.41	0.0	200.94
101175	LASCRUC	830	29.5	5.0	-0.0	-0.0	-12.2	-13.9	434.4	114.	0.51	0.0	201.45
101275	LASCRUC	830	30.0	6.7	-0.6	-0.0	-0.0	-0.0	430.4	114.	0.51	0.0	201.95
101375	LASCRUC	830	25.6	2.8	5.0	-0.0	-11.1	-13.3	390.8	140.	0.46	0.0	202.41
101475	LASCRUC	830	23.4	2.2	-6.1	-0.0	-13.9	-15.3	442.0	129.	0.46	0.0	202.87
101575	LASCRUC	830	22.8	-0.0	-11.7	-0.0	-17.2	-18.1	437.4	92.	0.36	0.0	203.22
101675	LASCRUC	830	24.5	1.1	-13.9	-0.0	-14.5	-15.3	433.4	87.	0.36	0.0	203.58
101775	LASCRUC	830	23.4	1.1	-6.7	-0.0	-14.7	-16.1	423.7	117.	0.33	0.0	203.91
101875	LASCRUC	830	25.6	3.9	-6.1	-0.0	-0.0	-0.0	420.3	117.	0.33	0.0	204.24
101975	LASCRUC	830	27.8	2.8	-3.3	-0.0	-4.7	-9.2	397.4	50.	0.28	0.0	204.52
102075	LASCRUC	830	27.8	6.1	-0.0	-0.0	-12.5	-13.9	379.1	108.	0.38	0.30	204.90
102175	LASCRUC	830	18.9	8.3	-0.0	-0.0	-9.5	-9.5	152.4	175.	0.94	1.90	205.84
102275	LASCRUC	830	22.2	4.4	-0.0	-0.0	-14.5	-14.7	397.0	143.	0.36	0.0	206.20
102375	LASCRUC	830	22.8	4.4	-0.0	-0.0	-12.8	-13.9	403.7	224.	0.48	0.0	206.68
102475	LASCRUC	830	20.6	2.8	-2.2	-0.0	-14.2	-15.0	400.4	121.	0.58	0.0	207.26
102575	LASCRUC	830	18.9	3.9	-3.3	-0.0	-13.1	-15.8	397.1	122.	0.36	0.0	207.62
102675	LASCRUC	830	23.4	1.1	-3.9	-0.0	-15.0	-15.8	396.5	74.	0.33	0.0	207.95
102775	LASCRUC	830	23.4	1.1	-6.7	-0.0	-12.5	-14.2	400.3	129.	0.48	0.0	208.43
102875	LASCRUC	830	26.1	1.1	-6.1	-0.0	-12.5	-14.5	389.2	79.	0.18	0.0	208.61
102975	LASCRUC	830	23.9	3.3	3.3	-0.0	-12.0	-14.5	377.4	203.	0.58	0.0	209.19
103075	LASCRUC	830	24.5	5.6	4.4	-0.0	-10.6	-12.5	375.9	187.	0.56	0.0	209.75
103175	LASCRUC	830	24.5	5.6	1.7	-0.0	-9.5	-12.0	371.6	201.	0.63	0.0	210.39
	MEAN		25.2	4.1	-1.4	0.0	-12.4	-13.9	413.4	125.	0.47		
	STANDARD DEV		3.0	2.0	5.6	0.0	2.3	1.8	57.2	49.	0.15		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
110175	LASCRUC	830	20.6	2.2	2.8	-0.0	-0.0	-0.0	329.0	177.	0.33	0.0	210.72
110275	LASCRUC	830	21.1	1.7	-3.9	-0.0	-0.0	-0.0	372.5	98.	0.38	0.0	211.10
110375	LASCRUC	830	23.4	-0.6	-0.6	-0.0	-0.0	-0.0	368.5	69.	0.30	0.0	211.40
110475	LASCRUC	830	25.0	2.8	-2.2	-0.0	-0.0	-0.0	362.4	76.	0.30	0.0	211.71
110575	LASCRUC	830	25.0	2.2	-0.6	-0.0	-0.0	-0.0	355.3	43.	0.28	0.0	211.99
110675	LASCRUC	830	26.1	-0.0	-5.6	-0.0	-0.0	-0.0	0.0	124.	0.48	0.0	212.47
110775	LASCRUC	830	26.1	-0.0	-2.8	-0.0	-0.0	-0.0	355.0	64.	0.23	0.0	212.70
110875	LASCRUC	830	26.1	-0.0	-4.4	-0.0	-0.0	-0.0	356.4	177.	0.61	0.0	213.31
110975	LASCRUC	830	23.4	0.6	0.6	-0.0	-0.0	-0.0	356.5	148.	0.51	0.0	213.82
111075	LASCRUC	830	23.4	-0.0	5.0	-0.0	-0.0	-0.0	347.8	61.	0.10	0.0	213.92
111175	LASCRUC	830	22.8	-2.2	0.6	-0.0	-0.0	-0.0	352.3	114.	0.43	0.0	214.35
111275	LASCRUC	830	17.2	-0.6	-2.8	-0.0	-0.0	-0.0	352.6	103.	0.41	0.0	214.75
111375	LASCRUC	830	20.0	-6.7	-1.1	-0.0	-0.0	-0.0	354.7	72.	0.25	0.0	215.01
111475	LASCRUC	830	21.1	-3.3	-0.6	-0.0	-0.0	-0.0	346.5	43.	0.25	0.0	215.26
111575	LASCRUC	830	22.2	-3.9	1.7	-0.0	-0.0	-0.0	295.5	60.	0.20	0.0	215.47
111675	LASCRUC	830	24.5	-2.8	3.3	-0.0	-0.0	-0.0	320.6	56.	0.28	0.0	215.75
111775	LASCRUC	830	23.9	-3.9	1.7	-0.0	-0.0	-0.0	330.2	92.	0.30	0.0	216.05
111875	LASCRUC	830	22.2	-2.8	7.8	-0.0	-0.0	-0.0	217.0	220.	0.33	0.38	216.38
111975	LASCRUC	830	15.0	2.2	3.9	-0.0	-0.0	-0.0	334.4	148.	0.38	0.0	216.76
112075	LASCRUC	830	13.9	-5.6	-0.0	-0.0	-0.0	-0.0	335.4	55.	0.33	0.05	217.09
112175	LASCRUC	830	16.7	-6.1	-3.9	-0.0	-0.0	-0.0	326.0	161.	0.15	0.0	217.24
112275	LASCRUC	830	10.0	-6.7	-1.7	-0.0	-0.0	-0.0	339.8	60.	0.23	0.0	217.47
112375	LASCRUC	830	13.3	-7.8	-3.3	-0.0	-0.0	-0.0	210.3	71.	0.10	0.0	217.57
112475	LASCRUC	830	12.8	-7.2	-2.8	-0.0	-0.0	-0.0	329.9	74.	0.18	0.0	217.75
112575	LASCRUC	830	19.5	-7.8	-5.6	-0.0	-0.0	-0.0	310.4	282.	0.56	0.0	218.31
112675	LASCRUC	830	21.1	-8.3	-6.1	-0.0	-0.0	-0.0	298.5	130.	0.25	0.0	218.56
112775	LASCRUC	830	21.1	-8.3	-5.6	-0.0	-0.0	-0.0	307.6	117.	0.28	0.0	218.84
112875	LASCRUC	830	17.8	1.1	5.6	-0.0	-0.0	-0.0	101.7	573.	0.20	0.0	219.05
112975	LASCRUC	830	9.5	-2.2	4.4	-0.0	-0.0	-0.0	190.1	230.	0.48	0.15	219.53
113075	LASCRUC	830	8.3	-7.2	-7.8	-0.0	-0.0	-0.0	325.4	132.	0.18	0.0	219.71
	MEAN		19.8	-3.1	-0.8	0.0	0.0	0.0	306.1	128.	0.31		
	STANDARD DEV		5.2	3.8	4.0	0.0	0.0	0.0	83.7	103.	0.13		

Table A-1. Climatological data for Las Cruces, New Mexico 1975 (continued).

DATE	SITE	TYPE	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
120175	LASCRUC	830	12.2	-7.8	-5.0	-0.0	-0.0	-0.0	319.1	97.	0.13	0.0	219.83
120275	LASCRUC	830	18.3	-6.1	-0.0	-0.0	-0.0	-0.0	307.8	97.	0.13	0.0	219.96
120375	LASCRUC	830	18.3	-7.2	0.6	-0.0	-0.0	-0.0	297.2	61.	0.18	0.0	220.14
120475	LASCRUC	830	19.5	-5.0	-3.3	-0.0	-0.0	-0.0	0.0	116.	0.33	0.0	220.47
120575	LASCRUC	830	18.9	-6.1	-2.2	-0.0	-0.0	-0.0	0.0	103.	0.30	0.0	220.77
120675	LASCRUC	830	17.2	-3.9	-0.0	-0.0	-0.0	-0.0	294.0	105.	0.23	0.0	221.00
120775	LASCRUC	830	17.0	-5.0	-3.9	-0.0	-0.0	-0.0	300.5	129.	0.28	0.0	221.28
120975	LASCRUC	830	18.9	-2.2	1.1	-0.0	-0.0	-0.0	290.7	82.	0.28	0.0	221.56
121075	LASCRUC	830	20.0	-5.6	-0.6	-0.0	-0.0	-0.0	294.1	42.	0.20	0.0	221.77
121175	LASCRUC	830	21.1	-6.1	-2.8	-0.0	-0.0	-0.0	287.2	74.	0.28	0.0	222.04
121275	LASCRUC	830	20.6	-6.7	-4.4	-0.0	-0.0	-0.0	296.4	164.	0.36	0.0	222.40
121375	LASCRUC	830	17.8	-2.8	0.6	-0.0	-0.0	-0.0	275.6	229.	0.41	0.0	222.81
121475	LASCRUC	830	14.5	-7.2	2.8	-0.0	-0.0	-0.0	296.4	230.	0.41	0.0	223.21
121575	LASCRUC	830	10.0	-5.0	-2.2	-0.0	-0.0	-0.0	286.0	98.	0.15	0.0	223.37
121675	LASCRUC	830	12.8	-7.2	-1.7	-0.0	-0.0	-0.0	449.4	111.	0.20	0.0	223.57
121775	LASCRUC	830	27.8	-6.1	-2.2	-0.0	-0.0	-0.0	436.0	121.	0.38	0.0	223.95
121875	LASCRUC	830	10.0	-2.2	-1.1	-0.0	-0.0	-0.0	264.4	200.	0.18	0.0	224.13
121975	LASCRUC	830	12.2	-6.1	-1.1	-0.0	-0.0	-0.0	276.6	63.	0.05	0.0	224.18
122075	LASCRUC	830	14.5	-5.0	-2.2	-0.0	-0.0	-0.0	234.4	146.	0.23	0.23	224.41
122175	LASCRUC	830	7.3	1.7	3.3	-0.0	-0.0	-0.0	73.2	124.	-0.00	0.28	224.41
122275	LASCRUC	830	13.9	3.3	5.6	-0.0	-0.0	-0.0	229.5	153.	0.18	0.20	224.58
122375	LASCRUC	830	7.8	3.9	5.0	-0.0	-0.0	-0.0	80.9	211.	0.15	0.25	224.74
122475	LASCRUC	830	10.0	2.2	-0.0	-0.0	-0.0	-0.0	214.4	185.	0.28	0.08	225.02
122575	LASCRUC	830	10.6	-6.1	-3.3	-0.0	-0.0	-0.0	301.1	113.	0.13	0.0	225.14
122675	LASCRUC	830	13.3	-3.3	-2.8	-0.0	-0.0	-0.0	306.8	98.	0.15	0.0	225.30
122775	LASCRUC	830	13.3	-5.0	-3.3	-0.0	-0.0	-0.0	252.0	158.	0.23	0.0	225.52
122875	LASCRUC	830	10.5	-1.1	-4.4	-0.0	-0.0	-0.0	307.5	198.	0.38	0.0	225.90
122975	LASCRUC	830	8.3	-7.8	-6.1	-0.0	-0.0	-0.0	305.0	84.	0.15	0.0	226.06
123075	LASCRUC	830	11.7	-8.9	-7.8	-0.0	-0.0	-0.0	308.8	71.	0.13	0.0	226.18
	MEAN		14.8	-4.3	-1.6	0.0	0.0	0.0	261.6	126.	0.23		
	STANDARD DEV		4.8	3.4	3.2	0.0	0.0	0.0	103.5	52.	0.10		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976.

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	CBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
10176	LASCRUC	830	5.8	-1.3	-1.1	-0.0	-0.0	-0.0	47.7	182.	0.18	0.23	0.18
10276	LASCRUC	830	4.4	-1.8	-5.5	-0.0	-0.0	-0.0	299.0	68.	0.13	0.0	0.30
10376	LASCRUC	830	5.0	-11.1	-6.8	-0.0	-0.0	-0.0	333.6	85.	0.13	0.0	0.43
10476	LASCRUC	830	7.7	-1.4	-6.6	-0.0	-0.0	-0.0	291.6	85.	0.14	0.0	0.56
10576	LASCRUC	830	4.4.4	-10.3	-4.4	-0.0	-0.0	-0.0	315.5	85.	0.15	0.0	0.71
10676	LASCRUC	830	13.3	-3.3	-7.2	-0.0	-0.0	-0.0	*	296.	0.43	0.0	1.14
10776	LASCRUC	830	7.8	-3.9	-8.9	-0.0	-0.0	-0.0	318.5	142.	0.25	0.0	0.25
10876	LASCRUC	830	12.2	-10.0	-8.9	-0.0	10.6	3.9	313.6	71.	0.20	0.0	0.46
10976	LASCRUC	830	13.9	-7.8	-5.6	-0.0	12.2	9.5	297.5	48.	0.10	0.0	0.56
11076	LASCRUC	830	18.9	-5.0	-2.8	-0.0	-0.0	-0.0	290.2	148.	0.33	0.0	0.89
11176	LASCRUC	830	13.3	-5.0	-2.8	-0.0	-0.0	-0.0	315.5	148.	0.30	0.0	1.19
11276	LASCRUC	830	18.3	-7.8	-1.7	-0.0	17.8	9.5	316.7	105.	0.23	0.0	1.42
11376	LASCRUC	830	18.3	-6.7	-2.2	-0.0	-0.0	-0.0	317.1	108.	0.28	0.0	1.70
11476	LASCRUC	830	16.1	-5.0	-0.0	-0.0	-0.0	-0.0	314.5	134.	0.28	0.0	1.98
11576	LASCRUC	830	18.3	-5.0	0.6	-0.0	-0.0	-0.0	321.6	138.	0.30	0.0	2.29
11676	LASCRUC	830	19.5	-4.4	2.2	-0.0	-0.0	-0.0	317.3	138.	0.25	0.0	2.54
11776	LASCRUC	830	17.8	-3.9	1.1	-0.0	-0.0	-0.0	318.9	65.	0.28	0.0	2.82
11876	LASCRUC	830	18.3	-5.0	1.7	-0.0	-0.0	-0.0	313.9	69.	0.28	0.0	3.10
11976	LASCRUC	830	12.8	-1.7	1.1	-0.0	-0.0	-0.0	204.7	452.	0.53	0.0	3.63
12076	LASCRUC	830	10.0	-0.6	2.2	-0.0	-0.0	-0.0	248.5	100.	0.30	0.0	3.94
12176	LASCRUC	830	13.9	-7.2	-0.0	-0.0	12.2	7.8	269.0	29.	0.10	0.0	4.04
12276	LASCRUC	830	16.1	-4.4	2.2	-0.0	-0.0	-0.0	316.1	61.	0.20	0.0	4.24
12376	LASCRUC	830	16.1	-1.1	4.4	-0.0	-0.0	-0.0	149.4	138.	0.15	0.48	4.39
12476	LASCRUC	830	14.5	5.0	4.4	-0.0	-0.0	-0.0	270.0	364.	0.41	0.05	4.80
12576	LASCRUC	830	12.2	-1.7	-0.0	-0.0	-0.0	-0.0	341.5	229.	0.33	0.0	5.13
12676	LASCRUC	830	7.3	-5.0	-8.9	-0.0	7.2	1.1	0.0	150.	0.38	0.0	5.51
12776	LASCRUC	830	10.0	-7.2	-4.4	-0.0	-0.0	-0.0	291.6	108.	0.20	0.0	5.71
12876	LASCRUC	830	15.5	-7.2	-3.3	-0.0	-0.0	-0.0	353.5	92.	0.18	0.0	5.89
12976	LASCRUC	830	17.8	-5.0	-2.2	-0.0	-0.0	-0.0	356.4	90.	0.30	0.0	6.20
13076	LASCRUC	830	20.6	-5.0	-0.0	-0.0	-0.0	-0.0	347.7	142.	0.41	0.0	6.60
13176	LASCRUC	830	13.9	-0.6	2.2	-0.0	-0.0	-0.0	352.1	126.	0.13	0.0	6.73
	MEAN		13.51	-5.2	-2.3	0.0	12.0	6.3	298.0	135.9	0.26		
	STANDARD DEV		4.64	3.3	4.2	0.0	3.8	3.7	67.3	91.8	0.12		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
20176	LASCRUC	830	17.8	-3.9	-1.1	-0.0	14.5	7.2	364.4	66.	0.38	0.0	7.11
20276	LASCRUC	830	20.0	-6.7	-1.1	-0.0	-0.0	-0.0	311.8	64.	0.30	0.0	7.42
20376	LASCRUC	830	21.1	-6.1	-2.2	-0.0	17.2	10.0	82.9	161.	0.48	0.0	7.90
20476	LASCRUC	830	12.8	2.8	7.2	-0.0	7.8	3.9	246.5	122.	0.05	0.15	7.95
20576	LASCRUC	830	17.8	-0.6	3.3	-0.0	-0.0	-0.0	268.9	100.	0.23	0.05	8.18
20676	LASCRUC	830	19.5	-1.1	2.2	-0.0	-0.0	-0.0	361.4	127.	0.28	0.0	8.46
20776	LASCRUC	830	20.0	-1.1	1.1	-0.0	-0.0	-0.0	351.9	82.	0.25	0.0	8.71
20876	LASCRUC	830	22.0	1.1	3.3	-0.0	21.1	13.9	168.5	55.	0.41	0.0	9.12
20976	LASCRUC	830	22.2	6.1	3.9	-0.0	9.5	7.2	96.5	253.	0.51	0.0	9.63
21076	LASCRUC	830	18.3	6.1	11.1	-0.0	13.9	10.6	261.5	237.	0.33	0.0	9.96
21176	LASCRUC	830	18.9	5.0	6.7	-0.0	10.0	6.7	263.7	98.	0.25	0.61	10.21
21276	LASCRUC	830	18.9	6.1	8.9	-0.0	8.9	8.3	302.3	100.	0.20	0.03	10.41
21376	LASCRUC	830	23.4	7.8	7.2	-0.0	13.9	12.2	407.1	203.	0.63	0.41	11.05
21476	LASCRUC	830	16.7	2.8	-1.1	-0.0	8.9	6.1	411.9	174.	0.53	0.03	11.58
21576	LASCRUC	830	21.1	-2.2	-4.4	-0.0	10.9	10.0	400.4	204.	0.53	0.0	12.12
21676	LASCRUC	830	16.1	-2.2	-3.9	-0.0	8.9	3.9	410.4	183.	0.43	0.0	12.55
21776	LASCRUC	830	17.8	1.1	1.1	-0.0	9.5	5.0	409.2	340.	0.63	0.0	13.18
21876	LASCRUC	830	21.1	-2.2	-1.7	-0.0	6.7	2.2	421.5	177.	0.56	0.0	13.74
21976	LASCRUC	830	21.1	-2.2	-0.0	-0.0	7.8	2.8	433.4	264.	0.58	0.0	14.33
22076	LASCRUC	830	14.5	5.0	-6.7	-0.0	5.0	-0.0	439.7	478.	0.99	0.0	15.32
22176	LASCRUC	830	10.0	-5.0	-4.4	-0.0	-0.0	-0.0	450.7	132.	0.38	0.0	15.70
22276	LASCRUC	830	13.9	-7.2	-5.6	-0.0	-0.0	-0.0	452.3	58.	0.25	0.0	15.95
22376	LASCRUC	830	17.2	-8.3	-11.7	-0.0	-0.0	-3.0	440.2	124.	0.43	0.0	16.38
22476	LASCRUC	830	23.9	-2.2	-4.4	-0.0	11.1	3.3	440.2	211.	0.69	0.0	17.07
22576	LASCRUC	830	20.6	-0.6	-5.0	-0.0	7.8	1.7	456.5	127.	0.53	0.0	17.60
22676	LASCRUC	830	22.2	-6.7	-3.3	-0.0	-0.0	-0.0	455.1	105.	0.51	0.0	18.11
22776	LASCRUC	830	22.2	-2.2	1.1	-0.0	7.2	2.2	382.4	113.	0.56	0.0	18.67
22876	LASCRUC	830	25.0	2.2	-1.1	-0.0	-0.0	-0.0	353.0	113.	0.58	0.0	19.25
22976	LASCRUC	830	24.5	-1.1	-2.2	-0.0	22.8	10.0	456.2	146.	0.66	0.0	19.91
	MEAN		19.4	-0.5	-0.1	0.0	11.6	6.7	355.1	159.	0.45		
	STANDARD DEV		3.6	4.5	5.2	0.0	5.0	3.7	105.8	92.	0.19		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DPT DEG.C	MBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
30176	LASCRUC	830	23.4	2.2	3.9	-0.0	13.3	6.7	442.6	248.	0.86	0.0	20.78
30276	LASCRUC	830	22.8	3.9	7.2	-0.0	11.1	6.1	389.9	319.	0.56	0.0	21.34
30376	LASCRUC	830	22.8	5.6	5.0	-0.0	-0.0	-0.0	327.4	637.	1.17	0.0	22.50
30476	LASCRUC	830	10.0	-0.0	-1.1	-0.0	3.9	-0.6	489.3	286.	0.53	0.0	23.04
30576	LASCRUC	830	16.1	-7.8	-3.3	-0.0	-0.0	-0.0	456.4	198.	0.46	0.0	23.49
30676	LASCRUC	830	20.0	3.3	2.2	-0.0	-0.0	-0.0	392.5	357.	0.66	0.0	24.16
30776	LASCRUC	830	17.8	1.1	3.3	-0.0	-0.0	-0.0	419.0	357.	0.63	0.0	24.79
30876	LASCRUC	830	17.2	1.1	3.3	-0.0	7.2	2.8	466.3	103.	0.46	0.0	25.25
30976	LASCRUC	830	21.1	-2.2	2.8	-0.0	7.2	2.2	486.0	122.	0.56	0.0	25.81
31076	LASCRUC	830	22.2	2.2	4.4	-0.0	10.0	3.9	316.0	267.	0.61	0.0	26.42
31176	LASCRUC	830	17.2	6.7	8.9	-0.0	11.1	6.1	498.0	348.	0.86	0.0	27.28
31276	LASCRUC	830	18.9	-3.3	-1.1	-0.0	7.8	2.8	504.9	-0.	0.63	0.0	27.91
31376	LASCRUC	830	14.5	-0.0	-2.2	-0.0	2.8	-0.0	491.3	-0.	0.53	0.0	28.45
31476	LASCRUC	830	21.7	-5.6	-0.0	-0.0	17.8	7.2	512.3	-0.	0.43	0.0	28.88
31576	LASCRUC	830	22.8	1.1	-0.0	-0.0	12.2	5.6	0.0	-0.	0.71	0.0	29.59
31676	LASCRUC	830	18.3	-1.1	-0.0	-0.0	-0.0	-0.0	511.2	52.	0.46	0.0	30.05
31776	LASCRUC	830	23.9	-1.7	-0.0	-0.0	8.3	6.1	420.9	111.	0.56	0.0	30.61
31876	LASCRUC	830	26.7	1.7	4.4	-0.0	-0.0	-0.0	504.4	142.	0.71	0.0	31.32
31976	LASCRUC	830	25.6	4.4	4.4	-0.0	-0.0	-0.0	485.4	362.	1.14	0.0	32.46
32076	LASCRUC	830	21.1	6.7	2.2	-0.0	-0.0	-0.0	544.4	196.	0.86	0.0	33.32
32176	LASCRUC	830	22.2	-1.1	2.2	-0.0	-0.0	-0.0	0.0	97.	0.43	0.0	33.76
32276	LASCRUC	830	25.0	1.1	2.2	-0.0	9.5	2.8	0.0	270.	0.91	0.0	34.67
32376	LASCRUC	830	24.5	8.9	10.6	-0.0	16.1	9.5	362.2	158.	0.66	0.0	35.33
32476	LASCRUC	830	25.0	2.8	5.6	-0.0	11.7	5.6	0.0	92.	-0.00	0.0	35.33
32576	LASCRUC	830	26.7	-0.0	-1.1	-0.0	11.1	4.4	0.0	295.	-0.00	0.0	35.33
32676	LASCRUC	830	18.9	5.0	-5.0	-0.0	10.6	4.4	0.0	232.	0.86	0.0	36.19
32776	LASCRUC	830	23.4	2.2	1.1	-0.0	-0.0	-0.0	0.0	286.	0.74	0.0	36.93
32876	LASCRUC	830	19.5	5.0	5.0	-0.0	8.3	5.6	0.0	481.	0.66	0.10	37.59
32976	LASCRUC	830	16.1	2.2	4.4	-0.0	5.5	5.6	0.0	393.	0.69	0.0	38.28
33076	LASCRUC	830	15.6	-0.0	-2.2	-0.0	5.6	2.2	0.0	163.	0.61	0.0	38.89
33176	LASCRUC	830	21.1	-5.0	-3.3	-0.0	5.5	3.3	0.0	97.	0.56	0.0	39.45
	MEAN		20.7	1.5	2.4	0.0	9.7	4.7	291.0	247.	0.67		
	STANDARD DEV		3.9	4.0	3.8	0.0	3.6	2.1	225.4	136.	0.19		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
40176	LASCRUC	830	25.0	-2.2	-2.2	-0.0	-0.0	-0.0	0.0	145.	0.66	0.0	40.11
40276	LASCRUC	830	23.9	2.8	1.1	-0.0	-0.0	6.7	0.0	95.	0.46	0.0	40.56
40376	LASCRUC	830	26.7	2.2	3.3	-0.0	-0.0	3.3	0.0	171.	0.79	0.0	41.35
40476	LASCRUC	830	24.5	4.4	10.0	-0.0	-0.0	8.3	0.0	351.	0.89	0.0	42.24
40576	LASCRUC	830	26.1	10.0	6.7	-0.0	-0.0	12.2	0.0	269.	1.04	0.0	43.28
40676	LASCRUC	830	22.8	7.2	1.1	-0.0	-0.0	7.8	585.5	177.	0.74	0.0	44.02
40776	LASCRUC	830	25.0	2.2	0.6	-0.0	-0.0	5.0	675.8	161.	0.76	0.0	44.78
40876	LASCRUC	830	27.2	3.9	3.9	-0.0	-0.0	-0.0	556.2	312.	0.76	0.0	45.54
40976	LASCRUC	830	25.6	12.2	8.3	-0.0	-0.0	-0.0	536.1	312.	0.79	0.0	46.33
41076	LASCRUC	830	27.8	7.8	7.8	-0.0	-0.0	-0.0	618.2	95.	0.79	0.0	47.12
41176	LASCRUC	830	28.4	6.1	5.0	-0.0	-0.0	-0.0	660.4	248.	0.76	0.0	47.88
41276	LASCRUC	830	28.4	6.1	11.1	-0.0	-0.0	15.6	564.9	220.	1.04	0.0	48.92
41376	LASCRUC	830	26.1	7.8	5.0	-0.0	-0.0	11.1	260.0	177.	0.84	0.0	49.76
41476	LASCRUC	830	23.9	4.4	7.8	-0.0	-0.0	10.6	404.4	290.	0.69	1.09	50.44
41576	LASCRUC	830	12.2	5.6	7.8	-0.0	-0.0	6.7	495.5	349.	0.43	0.20	50.88
41676	LASCRUC	830	14.5	2.2	4.4	-0.0	-0.0	6.1	608.6	402.	0.51	0.05	51.38
41776	LASCRUC	830	12.2	-0.0	-0.0	-0.0	-0.0	1.1	591.9	293.	0.63	0.0	52.02
41876	LASCRUC	830	21.1	-1.7	-1.1	-0.0	-0.0	-0.0	600.5	151.	0.58	0.0	52.60
41976	LASCRUC	830	22.2	2.8	2.2	-0.0	-0.0	6.7	642.1	248.	0.86	0.0	53.47
42076	LASCRUC	830	23.4	2.8	2.2	-0.0	-0.0	7.8	614.7	93.	0.56	0.0	54.03
42176	LASCRUC	830	27.8	2.8	3.3	-0.0	-0.0	8.3	547.4	103.	0.71	0.0	54.74
42276	LASCRUC	830	27.8	8.9	4.4	-0.0	-0.0	11.1	586.0	166.	0.94	0.0	55.68
42376	LASCRUC	830	27.8	7.8	6.7	-0.0	-0.0	11.1	586.0	196.	0.94	0.0	56.62
42476	LASCRUC	830	28.4	4.4	4.4	-0.0	-0.0	-0.0	600.2	129.	0.86	0.0	57.48
42576	LASCRUC	830	30.0	5.0	4.4	-0.0	-0.0	17.2	595.1	153.	0.89	0.0	58.37
42676	LASCRUC	830	28.4	7.8	4.4	-0.0	-0.0	8.9	649.4	248.	1.14	0.0	59.51
42776	LASCRUC	830	26.7	8.3	7.8	-0.0	-0.0	11.1	598.3	180.	0.81	0.0	60.32
42876	LASCRUC	830	31.7	6.1	10.0	-0.0	-0.0	10.0	590.7	212.	0.97	0.0	61.29
42976	LASCRUC	830	26.7	17.2	15.6	-0.0	-0.0	12.8	519.4	272.	0.91	0.0	62.20
43076	LASCRUC	830	27.8	14.5	5.6	-0.0	-0.0	11.1	607.4	203.	0.89	0.0	63.09
	MEAN		25.0	5.8	5.2	0.0	0.0	9.2	476.6	214.	0.79		
	STANDARD DEV		4.7	4.2	3.8	0.0	0.0	3.7	230.4	83.	0.17		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR OPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
50176	LASCRUC	83C	22.2	6.1	7.8	-0.0	-0.0	7.2	655.7	95.	0.69	0.0	63.78
50276	LASCRUC	830	27.8	2.2	2.8	-0.0	-0.0	4.4	635.7	114.	0.79	0.0	64.57
50376	LASCRUC	830	27.8	7.8	10.0	-0.0	-0.0	8.9	352.0	275.	0.84	0.0	65.40
50476	LASCRUC	83C	27.2	11.1	14.5	-0.0	-0.0	12.8	414.6	253.	0.71	0.36	66.12
50576	LASCRUC	830	22.2	9.5	14.5	-0.0	-0.0	8.9	428.0	307.	0.61	0.13	66.73
50676	LASCRUC	830	23.9	6.7	8.9	-0.0	-0.0	10.6	514.2	317.	0.79	0.13	67.51
50776	LASCRUC	830	20.0	7.8	11.1	-0.0	-0.0	9.5	630.9	669.	1.22	0.0	68.73
50876	LASCRUC	830	21.1	4.4	10.6	-0.0	-0.0	-0.0	632.1	322.	0.76	0.0	69.49
50976	LASCRUC	830	26.1	6.1	4.4	-0.0	-0.0	7.8	637.5	93.	0.63	0.0	70.13
51076	LASCRUC	83C	30.0	6.1	5.0	-0.0	-0.0	11.1	647.9	109.	0.79	0.0	70.92
51176	LASCRUC	830	32.2	10.0	10.6	-0.0	-0.0	13.9	575.5	161.	0.84	0.0	71.75
51276	LASCRUC	830	31.7	7.8	10.0	-0.0	-0.0	13.3	595.7	266.	1.37	0.0	73.13
51376	LASCRUC	830	28.4	6.7	3.3	-0.0	-0.0	10.0	674.1	142.	0.94	0.0	74.07
51476	LASCRUC	83C	32.2	3.9	5.6	-0.0	-0.0	9.5	661.5	100.	0.86	0.0	74.93
51576	LASCRUC	830	33.9	7.8	8.9	-0.0	-0.0	11.1	622.4	225.	1.17	0.0	76.10
51676	LASCRUC	830	27.8	7.8	17.2	-0.0	-0.0	14.5	624.8	455.	1.83	0.0	77.93
51776	LASCRUC	830	27.8	8.9	18.9	-0.0	-0.0	-0.0	597.8	217.	0.97	0.0	78.89
51876	LASCRUC	830	26.7	8.9	13.3	-0.0	-0.0	17.8	610.2	222.	0.86	0.0	79.76
51976	LASCRUC	830	25.0	9.5	13.3	-0.0	-0.0	15.0	404.0	129.	0.33	0.0	80.09
52076	LASCRUC	83C	25.6	9.5	13.3	-0.0	-0.0	13.9	486.8	124.	0.69	0.05	80.77
52176	LASCRUC	83C	30.0	12.2	11.1	-0.0	-0.0	13.9	631.3	177.	1.04	0.03	81.81
52276	LASCRUC	830	30.6	8.3	6.7	-0.0	-0.0	11.7	665.3	169.	1.17	0.0	82.98
52376	LASCRUC	830	31.1	6.7	7.8	-0.0	-0.0	10.0	662.2	106.	0.99	0.0	83.97
52476	LASCRUC	83C	31.1	7.8	6.7	-0.0	-0.0	11.7	614.8	190.	1.19	0.0	85.17
52576	LASCRUC	83C	27.8	7.8	2.2	-0.0	-0.0	9.5	673.5	298.	1.42	0.0	86.59
52676	LASCRUC	83C	32.2	6.7	7.8	-0.0	-0.0	10.0	673.3	254.	1.19	0.0	87.78
52776	LASCRUC	83C	31.7	15.0	15.6	-0.0	-0.0	14.5	654.8	166.	0.91	0.0	88.70
52876	LASCRUC	830	32.8	8.9	6.7	-0.0	-0.0	13.3	660.3	180.	0.97	0.0	89.66
52976	LASCRUC	83C	32.2	10.0	-1.1	-0.0	-0.0	11.7	677.3	238.	1.27	0.0	90.93
53076	LASCRUC	830	28.9	9.5	3.3	-0.0	-0.0	11.1	693.3	219.	1.35	0.0	92.28
53176	LASCRUC	830	31.7	6.1	3.3	-0.0	-0.0	8.9	672.0	77.	0.74	0.0	93.01
	MEAN		28.4	8.0	8.8	0.0	0.0	11.3	602.6	215.	0.97		
	STANDARD DEV		3.7	2.5	4.8	0.0	0.0	2.8	91.6	121.	0.30		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	OBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
60176	LASCRUC	830	32.8	6.1	8.9	-0.0	-0.0	10.6	679.7	132.	0.99	0.0	94.00
60276	LASCRUC	830	33.9	13.3	10.6	-0.0	-0.0	16.7	608.4	312.	1.24	0.0	95.25
60376	LASCRUC	830	33.9	19.5	17.2	-0.0	-0.0	16.7	623.9	303.	1.22	0.0	96.47
60476	LASCRUC	830	32.2	17.8	17.8	-0.0	-0.0	17.8	619.4	245.	1.12	0.0	97.59
60576	LASCRUC	830	32.2	18.3	18.3	-0.0	-0.0	15.6	627.0	211.	1.07	0.0	98.65
60676	LASCRUC	830	31.7	16.7	17.8	-0.0	-0.0	16.7	622.6	290.	2.18	2.67	100.84
60776	LASCRUC	830	30.0	17.2	15.6	-0.0	-0.0	17.2	672.4	203.	0.89	0.0	101.73
60876	LASCRUC	830	31.7	17.8	15.6	-0.0	-0.0	17.8	650.1	113.	0.76	0.0	102.49
60976	LASCRUC	830	33.4	17.8	12.2	-0.0	-0.0	17.8	663.5	121.	1.02	0.0	103.50
61076	LASCRUC	830	33.9	14.5	14.5	-0.0	-0.0	17.8	684.0	146.	1.12	0.0	104.62
61176	LASCRUC	830	32.2	13.9	8.9	-0.0	-0.0	17.2	687.5	196.	1.19	0.0	105.82
61276	LASCRUC	830	32.2	8.3	5.6	-0.0	-0.0	11.1	712.3	97.	1.35	0.0	107.16
61376	LASCRUC	830	32.2	8.9	10.0	-0.0	-0.0	12.2	616.6	143.	0.89	0.0	108.05
61476	LASCRUC	830	32.8	10.6	2.2	-0.0	-0.0	13.9	686.9	227.	1.45	0.0	109.50
61576	LASCRUC	830	32.2	12.2	2.2	-0.0	-0.0	9.5	703.9	164.	0.94	0.0	110.44
61676	LASCRUC	830	34.5	12.2	10.0	-0.0	-0.0	13.3	687.4	138.	1.27	0.0	111.71
61776	LASCRUC	830	33.4	13.9	10.6	-0.0	-0.0	12.8	685.5	286.	1.47	0.0	113.18
61876	LASCRUC	830	33.9	12.2	10.0	-0.0	-0.0	14.5	690.4	143.	0.97	0.0	114.15
61976	LASCRUC	830	33.9	11.1	12.8	-0.0	-0.0	17.2	670.0	290.	1.32	0.0	115.47
62076	LASCRUC	830	37.3	21.7	20.6	-0.0	-0.0	19.5	629.0	122.	1.02	0.0	116.48
62176	LASCRUC	830	37.8	15.6	16.7	-0.0	-0.0	17.2	586.4	103.	1.02	0.0	117.50
62276	LASCRUC	830	37.3	20.6	16.7	-0.0	-0.0	17.2	548.7	233.	1.22	0.0	118.72
62376	LASCRUC	830	32.8	17.2	15.6	-0.0	-0.0	15.6	717.1	267.	1.75	0.0	120.47
62476	LASCRUC	830	32.8	11.1	13.3	-0.0	-0.0	10.6	715.5	126.	0.91	0.0	121.39
62576	LASCRUC	830	32.8	10.6	11.7	-0.0	-0.0	10.0	684.6	129.	1.04	0.0	122.43
62676	LASCRUC	830	33.9	12.2	12.2	-0.0	-0.0	15.0	701.6	127.	0.76	0.0	123.19
62776	LASCRUC	830	34.5	13.9	15.0	-0.0	-0.0	17.2	692.8	224.	1.19	0.0	124.38
62876	LASCRUC	830	32.8	14.5	16.7	-0.0	-0.0	17.8	648.7	114.	1.60	0.0	125.98
62976	LASCRUC	830	35.0	15.0	16.7	-0.0	-0.0	18.9	659.8	145.	1.07	0.0	127.05
63076	LASCRUC	830	32.8	17.8	-0.0	-0.0	-0.0	17.8	0.0	-0.	-0.00	0.0	127.05
	MEAN		33.4	14.4	13.0	0.0	0.0	15.4	639.2	184.	1.17		
	STANDARD DEV		1.7	3.8	4.6	0.0	0.0	2.9	127.4	69.	0.30		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
70176	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	0.0	127.05
70276	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	0.0	127.05
70376	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	0.38	127.05
70476	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	0.0	127.05
70576	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	0.13	127.05
70676	LASCRUC	830	-0.0	-0.0	-0.0	-0.0	-0.0	-0.0	0.0	-0.	-0.00	1.14	127.05
70776	LASCRUC	830	31.7	-0.0	-0.0	-0.0	-0.0	-0.0	612.1	-0.	-0.00	0.0	127.05
70876	LASCRUC	830	32.8	17.8	13.3	-0.0	-0.0	16.1	643.0	196.	1.24	0.0	128.29
70976	LASCRUC	830	34.5	20.0	17.8	-0.0	-0.0	17.8	641.3	196.	1.04	0.0	129.33
71076	LASCRUC	830	36.1	22.2	20.6	-0.0	-0.0	23.4	611.2	220.	1.75	0.0	131.09
71176	LASCRUC	830	32.2	20.6	21.1	-0.0	-0.0	18.9	525.6	174.	0.69	0.51	131.77
71276	LASCRUC	830	32.2	17.2	18.9	-0.0	-0.0	18.9	505.2	121.	0.41	0.13	132.18
71376	LASCRUC	830	32.2	16.7	17.2	-0.0	-0.0	18.9	505.2	130.	0.13	1.63	132.31
71476	LASCRUC	830	32.2	16.7	17.2	-0.0	-0.0	18.9	539.5	130.	0.13	1.63	132.43
71576	LASCRUC	830	33.4	17.8	19.5	-0.0	-0.0	19.5	596.9	150.	0.71	2.03	133.14
71676	LASCRUC	830	28.9	17.8	20.0	-0.0	-0.0	18.9	419.9	137.	0.61	0.0	133.75
71776	LASCRUC	830	37.3	18.9	18.9	-0.0	-0.0	18.9	526.2	266.	1.12	0.0	134.87
71876	LASCRUC	830	32.2	19.5	18.9	-0.0	-0.0	19.5	573.3	163.	0.97	0.0	135.84
71976	LASCRUC	830	32.8	17.8	17.8	-0.0	-0.0	19.5	624.0	154.	0.99	0.0	136.83
72076	LASCRUC	830	32.2	18.9	21.1	-0.0	-0.0	20.6	423.6	111.	0.38	0.0	137.21
72176	LASCRUC	830	31.1	16.7	18.9	-0.0	-0.0	20.6	339.1	179.	0.08	0.58	137.28
72276	LASCRUC	830	28.9	17.2	18.9	-0.0	-0.0	18.3	476.3	135.	0.48	0.05	137.77
72376	LASCRUC	830	32.2	17.8	18.3	-0.0	-0.0	17.8	602.5	127.	0.81	0.13	138.58
72476	LASCRUC	830	31.1	16.7	16.1	-0.0	-0.0	18.3	480.4	111.	0.08	2.57	138.66
72576	LASCRUC	830	28.9	15.6	-0.0	-0.0	-0.0	18.3	539.6	203.	0.76	0.03	139.42
72676	LASCRUC	830	31.7	16.7	-0.0	-0.0	-0.0	18.9	546.6	105.	0.56	0.28	139.98
72776	LASCRUC	830	31.7	15.0	16.7	-0.0	-0.0	18.3	551.1	87.	0.61	0.0	140.59
72876	LASCRUC	830	32.2	17.2	17.2	-0.0	-0.0	18.9	563.4	93.	0.86	0.0	141.45
72976	LASCRUC	830	31.1	16.1	18.9	-0.0	-0.0	18.3	535.9	124.	0.84	0.0	142.29
73076	LASCRUC	830	32.8	17.8	20.0	-0.0	-0.0	18.3	547.8	134.	0.56	0.10	142.85
73176	LASCRUC	830	32.2	18.3	17.8	-0.0	-0.0	19.5	430.9	98.	0.66	0.0	143.51
73276	LASCRUC	830	32.3	17.8	17.8	-0.0	-0.0	18.3	592.5	100.	0.81	0.0	144.32
	MEAN		32.2	17.8	18.4	0.0	0.0	18.9	436.1	146.	0.69		
	STANDARD DEV		1.9	1.6	1.7	0.0	0.0	1.3	223.2	44.	0.39		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
80176	LASCRUC	83C	30.0	15.0	16.7	-0.0	-0.0	17.8	323.3	95.	0.46	0.0	144.78
80276	LASCRUC	830	32.2	16.1	17.8	-0.0	-0.0	18.3	610.1	129.	0.81	0.0	145.59
80376	LASCRUC	83C	33.4	15.6	16.7	-0.0	-0.0	18.9	609.8	169.	0.84	0.15	146.43
80476	LASCRUC	830	34.5	17.8	19.5	-0.0	-0.0	19.5	593.1	68.	0.63	0.0	147.06
80576	LASCRUC	830	37.8	13.9	12.8	-0.0	-0.0	17.8	616.5	87.	0.91	0.0	147.98
80676	LASCRUC	83C	37.3	13.3	8.9	-0.0	-0.0	15.0	612.2	98.	0.91	0.0	148.89
80776	LASCRUC	830	34.5	15.6	15.0	-0.0	-0.0	18.3	531.6	135.	0.81	0.0	149.71
80876	LASCRUC	83C	34.5	16.1	14.5	-0.0	-0.0	18.3	575.8	135.	0.97	0.05	150.67
80976	LASCRUC	830	34.5	15.6	16.7	-0.0	-0.0	17.8	547.2	132.	0.76	0.0	151.43
81076	LASCRUC	83C	33.9	15.6	16.7	-0.0	-0.0	18.9	542.6	124.	0.74	0.05	152.17
81176	LASCRUC	830	32.8	17.2	17.8	-0.0	-0.0	18.9	577.9	61.	0.71	0.0	152.88
81276	LASCRUC	83C	35.6	15.6	13.9	-0.0	-0.0	18.3	541.6	145.	0.97	0.0	153.85
81376	LASCRUC	83C	34.5	17.2	17.2	-0.0	-0.0	18.3	576.2	90.	0.79	0.0	154.63
81476	LASCRUC	83C	33.9	13.3	14.5	-0.0	-0.0	17.2	533.8	95.	0.81	0.0	155.45
81576	LASCRUC	83C	34.5	15.0	17.2	-0.0	-0.0	15.6	538.4	114.	0.79	0.0	156.23
81676	LASCRUC	830	36.7	15.6	15.6	-0.0	-0.0	16.7	454.6	161.	0.91	0.0	157.15
81776	LASCRUC	83C	31.7	16.1	18.9	-0.0	-0.0	18.9	496.7	166.	1.42	0.10	158.57
81876	LASCRUC	830	30.6	16.1	18.3	-0.0	-0.0	17.8	500.8	166.	0.79	0.0	159.36
81976	LASCRUC	830	31.1	18.9	18.9	-0.0	-0.0	18.3	540.5	204.	0.84	0.0	160.20
82076	LASCRUC	83C	31.7	15.6	16.1	-0.0	-0.0	17.8	521.4	140.	0.94	0.0	161.14
82176	LASCRUC	83C	32.2	16.7	15.6	-0.0	-0.0	17.2	585.6	92.	0.69	0.0	161.82
82276	LASCRUC	830	33.4	16.1	16.7	-0.0	-0.0	17.8	551.5	200.	1.60	0.0	163.42
82376	LASCRUC	830	40.6	20.0	13.9	-0.0	-0.0	17.8	526.5	127.	0.86	0.0	164.28
82476	LASCRUC	83C	41.1	13.9	15.6	-0.0	-0.0	17.8	569.9	103.	0.84	0.0	165.12
82576	LASCRUC	830	33.9	15.0	16.1	-0.0	-0.0	17.8	552.4	100.	0.79	0.0	165.91
82676	LASCRUC	830	33.9	15.6	-0.0	-0.0	-0.0	16.7	544.7	87.	0.71	0.0	166.62
82776	LASCRUC	830	32.8	15.0	-0.0	-0.0	-0.0	17.2	315.5	163.	0.41	0.20	167.03
82876	LASCRUC	830	31.7	15.6	17.2	-0.0	-0.0	16.7	420.3	203.	0.61	0.0	167.64
82976	LASCRUC	830	29.5	15.0	15.6	-0.0	-0.0	16.7	574.5	163.	0.74	0.0	168.37
83076	LASCRUC	83C	30.6	13.9	14.5	-0.0	-0.0	16.7	542.6	111.	0.74	0.0	169.11
83176	LASCRUC	83C	31.1	13.9	13.3	-0.0	-0.0	16.7	460.7	148.	0.56	0.08	169.67
	MEAN		33.8	15.7	15.9	0.0	0.0	17.7	531.9	129.	0.82		
	STANDARD DEV		2.8	1.5	2.2	0.0	0.0	1.0	72.9	39.	0.23		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
90176	LASCRUC	0830	29.0	12.0	100.0	49.0	17.0	14.5	454.1	135.	0.80	0.0	170.47
90276	LASCRUC	0830	27.5	16.0	98.0	52.0	21.5	17.0	418.7	129.	0.48	0.0	170.95
90376	LASCRUC	0830	31.0	13.0	99.0	33.0	19.5	16.0	529.7	53.	0.69	0.0	171.64
90476	LASCRUC	0830	34.0	14.0	99.0	28.0	18.5	15.5	471.6	114.	0.79	0.0	172.43
90576	LASCRUC	0830	23.0	17.5	100.0	100.0	18.5	17.0	156.4	95.	2.09	2.11	174.52
90676	LASCRUC	0830	26.5	15.0	100.0	63.0	18.5	17.0	422.6	71.	0.40	0.0	174.92
90776	LASCRUC	0830	30.0	13.5	100.0	46.0	19.0	17.5	524.3	60.	0.60	0.0	175.52
90876	LASCRUC	0830	31.5	17.0	100.0	40.0	22.5	17.5	427.5	183.	0.56	0.0	176.08
90976	LASCRUC	0830	23.5	16.5	100.0	79.0	22.5	17.0	146.0	354.	0.34	0.05	176.42
91076	LASCRUC	0830	25.5	13.5	100.0	68.0	17.5	9.0	482.1	163.	0.54	0.0	176.96
91176	LASCRUC	0830	30.0	13.0	100.0	51.0	18.0	16.5	499.6	79.	0.55	0.0	177.51
91276	LASCRUC	0830	30.5	13.0	100.0	19.0	19.5	15.5	544.3	80.	0.68	0.0	178.19
91376	LASCRUC	0830	32.5	13.5	100.0	30.0	16.5	13.5	490.2	145.	0.64	0.0	178.83
91476	LASCRUC	0830	28.5	18.0	100.0	67.0	21.5	18.0	429.8	235.	0.79	0.0	179.62
91576	LASCRUC	0830	28.5	15.5	100.0	48.0	18.0	15.5	491.1	121.	1.05	0.0	180.67
91676	LASCRUC	0830	30.0	14.5	100.0	50.0	21.0	17.5	434.1	148.	0.79	0.0	181.46
91776	LASCRUC	0830	29.5	15.5	99.0	47.0	21.5	18.0	462.5	177.	-0.04	0.81	181.42
91876	LASCRUC	0830	30.0	12.0	99.0	44.0	18.0	15.5	558.6	64.	0.35	0.0	181.77
91976	LASCRUC	0830	31.0	11.5	99.0	35.0	19.0	15.5	491.8	124.	0.79	0.0	182.56
92076	LASCRUC	0830	29.0	12.5	99.0	47.0	18.5	14.0	508.7	146.	0.62	0.0	183.18
92176	LASCRUC	0830	27.0	12.0	100.0	50.0	14.0	12.5	502.9	111.	0.77	0.0	183.95
92276	LASCRUC	0830	27.5	12.0	97.0	36.0	17.0	14.0	486.1	74.	0.41	0.0	184.36
92376	LASCRUC	0830	30.0	11.5	99.0	36.0	16.5	13.0	416.2	113.	0.50	0.0	184.86
92476	LASCRUC	0830	27.0	15.5	100.0	67.0	19.5	17.5	275.1	104.	0.14	0.0	185.00
92576	LASCRUC	0830	26.5	14.0	100.0	50.0	17.0	15.5	397.3	161.	0.59	0.20	185.59
92676	LASCRUC	0830	26.5	10.0	100.0	60.0	16.5	13.5	409.0	101.	0.27	0.05	185.86
92776	LASCRUC	0830	25.5	11.0	100.0	40.0	18.0	14.5	490.3	159.	0.69	0.0	186.55
92876	LASCRUC	0830	24.0	8.0	97.0	52.0	14.0	10.5	520.4	141.	0.49	0.0	187.04
92976	LASCRUC	0830	27.0	6.5	100.0	29.0	12.5	10.5	512.9	171.	0.67	0.0	187.71
93076	LASCRUC	0830	28.5	8.5	99.0	25.0	15.5	11.0	489.9	124.	1.53	0.0	189.24
	MEAN		28.3	13.2	99.5	48.0	18.2	15.0	448.1	131.	0.65		
	STANDARD DEV		2.6	2.7	0.9	17.1	2.4	2.4	98.1	59.	0.39		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	OBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
100176	LASCRUC	0830	25.0	9.5	98.0	31.0	14.5	10.5	255.2	177.	-0.66	0.91	188.58
100276	LASCRUC	0830	25.5	12.0	99.0	47.0	18.5	16.0	488.5	126.	0.56	0.0	189.14
100376	LASCRUC	0830	26.0	11.5	99.0	37.0	19.0	15.0	477.5	141.	0.54	0.0	189.68
100476	LASCRUC	0830	25.0	8.5	99.0	31.0	14.0	10.5	510.3	98.	0.68	0.0	190.36
100576	LASCRUC	0830	24.0	6.0	99.0	43.0	15.5	11.5	490.8	168.	0.55	0.0	190.91
100676	LASCRUC	0830	27.0	6.5	97.0	29.0	14.5	11.0	504.1	128.	0.49	0.0	191.40
100776	LASCRUC	0830	18.5	6.5	99.0	36.0	11.0	6.5	494.0	131.	0.60	0.0	192.00
100876	LASCRUC	0830	18.5	-2.0	99.0	35.0	5.0	2.5	0.0	50.	0.31	0.0	192.31
100976	LASCRUC	0830	25.0	-0.0	99.0	22.0	6.0	3.5	436.2	51.	0.39	0.0	192.70
101076	LASCRUC	0830	26.5	2.0	100.0	46.0	8.5	5.0	456.4	35.	0.35	0.0	193.05
101176	LASCRUC	0830	27.0	0.5	100.0	23.0	8.5	5.5	462.6	59.	0.35	0.0	193.40
101276	LASCRUC	0830	28.0	2.0	100.0	17.0	7.5	5.0	431.6	77.	0.65	0.0	194.06
101376	LASCRUC	0830	20.0	6.5	-0.0	-0.0	14.5	10.0	147.0	101.	0.10	0.25	194.16
101476	LASCRUC	0830	20.0	9.5	100.0	64.0	13.0	12.5	330.8	87.	0.30	0.05	194.46
101576	LASCRUC	0830	22.0	4.5	100.0	67.0	8.0	7.5	372.7	113.	0.37	0.0	194.83
101676	LASCRUC	0830	21.5	7.5	96.0	46.0	12.0	7.0	418.2	151.	0.38	0.0	195.21
101776	LASCRUC	0830	24.0	4.5	-0.0	-0.0	12.0	9.0	385.9	103.	0.65	0.0	195.86
101876	LASCRUC	0830	25.0	4.0	100.0	26.0	10.5	8.0	377.8	175.	0.49	0.0	196.35
101976	LASCRUC	0830	18.0	3.0	98.0	22.0	7.0	3.5	426.5	113.	0.41	0.0	196.76
102076	LASCRUC	0830	20.0	-0.0	100.0	17.0	4.5	2.0	371.6	156.	0.40	0.0	197.16
102176	LASCRUC	0830	20.5	3.5	99.0	61.0	9.0	5.0	242.5	112.	0.32	0.0	197.48
102276	LASCRUC	0830	23.5	3.5	-0.0	-0.0	9.5	8.0	295.0	67.	0.05	0.30	197.53
102376	LASCRUC	0830	22.0	6.0	100.0	39.0	11.0	10.0	339.0	126.	0.54	0.03	198.07
102476	LASCRUC	0830	21.5	4.0	-0.0	-0.0	13.5	10.0	368.3	56.	0.59	0.0	198.66
102576	LASCRUC	0830	22.0	1.0	100.0	25.0	11.0	9.0	397.7	126.	0.27	0.0	198.93
102676	LASCRUC	0830	20.5	1.0	100.0	24.0	8.0	6.0	383.2	176.	0.39	0.0	199.32
102776	LASCRUC	0830	9.0	5.5	85.0	45.0	6.5	5.5	56.1	336.	0.93	0.0	200.24
102876	LASCRUC	0830	6.0	1.0	100.0	70.0	4.0	2.0	61.5	177.	-0.47	0.69	199.77
102976	LASCRUC	0830	14.5	2.0	100.0	27.0	7.5	4.0	336.8	107.	0.13	0.0	199.90
103076	LASCRUC	0830	18.5	-3.0	100.0	21.0	3.5	-0.0	397.6	79.	0.33	0.0	200.23
103176	LASCRUC	0830	20.0	-0.0	97.0	28.0	12.5	10.0	376.5	0.	0.0	0.0	200.23
	MEAN		21.4	4.6	98.6	36.3	10.3	7.7	357.8	116.	0.35		
	STANDARD DEV		4.9	3.8	2.9	15.3	4.1	3.7	134.1	61.	0.32		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
110176	LASCRUC	0830	20.5	0.5	97.0	28.0	12.5	10.0	413.7	153.	0.67	0.0	200.90
110276	LASCRUC	0830	21.5	-1.0	-0.0	-0.0	14.0	8.5	310.5	56.	0.11	0.0	201.01
110376	LASCRUC	0830	21.0	-0.5	95.0	15.0	10.5	6.5	372.4	134.	0.39	0.0	201.40
110476	LASCRUC	0830	19.5	2.0	86.0	12.0	10.5	6.5	359.4	70.	0.42	0.0	201.82
110576	LASCRUC	0830	21.0	-1.0	99.0	24.0	13.5	8.5	358.7	48.	0.31	0.0	202.13
110676	LASCRUC	0830	22.5	-1.0	99.0	16.0	11.5	7.5	349.6	53.	0.68	0.0	202.81
110776	LASCRUC	0830	19.0	-0.0	99.0	17.0	13.5	7.0	355.6	223.	0.02	0.0	202.83
110876	LASCRUC	0830	18.5	0.5	96.0	23.0	11.5	8.0	354.7	52.	0.87	0.0	203.70
110976	LASCRUC	0830	22.5	-2.5	96.0	24.0	8.0	5.0	340.4	51.	0.21	0.0	203.91
111076	LASCRUC	0830	24.0	-2.5	97.0	9.0	12.0	7.0	346.4	107.	0.51	0.0	204.42
111176	LASCRUC	0830	22.0	-2.0	96.0	9.0	8.0	5.0	300.8	498.	0.69	0.0	205.11
111276	LASCRUC	0830	5.5	3.5	100.0	78.0	5.0	3.0	57.4	510.	-0.00	0.0	205.11
111376	LASCRUC	0830	-1.0	15.0	100.0	90.0	-3.5	-2.0	173.7	112.	-0.00	0.0	205.11
111476	LASCRUC	0830	1.5	-10.0	99.0	77.0	-5.0	-1.0	195.8	66.	-0.00	0.0	205.11
111576	LASCRUC	0830	5.5	-1.0	-0.0	-0.0	-0.0	-1.0	134.8	89.	-0.00	0.23	205.11
111676	LASCRUC	0830	13.0	-2.0	-0.0	-0.0	3.0	3.0	268.2	144.	0.07	0.0	205.18
111776	LASCRUC	0830	12.5	-2.0	99.0	23.0	5.5	3.0	159.6	139.	-0.03	0.03	205.15
111876	LASCRUC	0830	14.0	1.0	99.0	52.0	8.0	6.5	155.9	52.	0.06	0.0	205.21
111976	LASCRUC	0830	15.5	2.0	99.0	47.0	11.5	9.0	217.8	87.	0.10	0.0	205.31
112076	LASCRUC	0830	19.5	-0.5	99.0	26.0	12.0	10.0	283.6	75.	0.43	0.0	205.74
112176	LASCRUC	0830	15.5	-2.0	99.0	26.0	14.0	8.5	342.6	200.	0.45	0.0	206.19
112276	LASCRUC	0830	16.0	-4.0	98.0	35.0	5.5	3.5	316.6	94.	0.03	0.0	206.22
112376	LASCRUC	0830	18.0	-3.5	99.0	28.0	9.0	7.0	274.1	90.	0.33	0.0	206.55
112476	LASCRUC	0830	17.5	-3.0	99.0	28.0	6.5	4.5	262.0	65.	0.18	0.0	206.73
112576	LASCRUC	0830	20.5	-1.0	100.0	19.0	11.5	8.0	285.9	234.	0.36	0.0	207.09
112676	LASCRUC	0830	19.5	3.0	87.0	18.0	12.0	6.5	302.9	302.	1.57	0.0	208.65
112776	LASCRUC	0830	10.0	2.0	100.0	44.0	5.0	2.0	169.2	310.	-0.95	0.97	207.70
112876	LASCRUC	0830	-2.0	-14.0	100.0	60.0	-3.5	-7.0	312.1	48.	-0.00	0.0	207.70
112976	LASCRUC	0830	-1.0	-24.0	100.0	43.0	-0.0	-0.0	322.9	83.	-0.00	0.0	207.70
113076	LASCRUC	0830	3.5	-17.0	100.0	44.0	-3.0	-5.0	307.9	64.	-0.00	0.0	207.70
	MEAN		14.5	-2.2	97.7	33.9	7.8	4.8	280.2	140.	0.32		
	STANDARD DEV		8.3	6.9	3.5	21.7	5.7	4.4	85.0	123.	0.45		

Table A-2. Climatological data for Las Cruces, New Mexico, 1976 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DPG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
120176	LASCRUC	0830	8.0	-11.0	98.0	36.0	1.0	-2.5	301.4	83.	-0.00	0.0	207.70
120276	LASCRUC	0830	8.0	-7.0	98.0	35.0	2.0	-2.0	295.0	47.	0.23	0.0	207.93
120376	LASCRUC	0830	12.3	-7.5	98.0	22.0	1.0	-2.0	342.4	80.	0.08	0.0	208.01
120476	LASCRUC	0830	13.0	-6.0	99.0	22.0	8.5	5.0	294.1	62.	0.04	0.0	208.05
120576	LASCRUC	0830	15.5	-5.0	98.0	27.0	9.5	6.0	270.4	60.	0.28	0.0	208.33
120676	LASCRUC	0830	12.0	-4.0	98.0	14.0	4.0	1.0	297.7	126.	0.09	0.0	208.42
120776	LASCRUC	0830	12.0	-8.5	99.0	12.0	-0.0	-1.5	294.7	84.	0.20	0.0	208.62
120876	LASCRUC	0830	15.3	-7.0	99.0	15.0	4.0	2.0	284.8	48.	0.16	0.0	208.78
120976	LASCRUC	0830	15.0	-6.5	100.0	17.0	5.0	2.0	252.9	57.	0.19	0.0	208.97
121076	LASCRUC	0830	16.5	-6.5	100.0	9.0	5.0	3.0	252.6	155.	0.26	0.05	209.23
121176	LASCRUC	0830	9.0	-0.0	100.0	44.0	6.0	3.5	221.5	84.	0.01	0.0	209.24
121276	LASCRUC	0830	14.5	-4.0	100.0	21.0	10.0	5.0	236.9	80.	0.29	0.0	209.53
121376	LASCRUC	0830	13.5	-3.0	99.0	20.0	4.5	1.0	274.9	84.	0.17	0.0	209.70
121476	LASCRUC	0830	13.5	-7.5	100.0	27.0	4.5	3.0	288.8	53.	0.22	0.0	209.92
121576	LASCRUC	0830	13.0	-8.0	99.0	19.0	1.0	-0.0	303.8	92.	0.24	0.0	210.16
121676	LASCRUC	0830	15.0	-6.5	93.0	20.0	2.0	-0.5	292.3	128.	0.42	0.0	210.59
121776	LASCRUC	0830	5.5	-5.5	100.0	41.0	4.0	0.5	91.4	59.	-0.22	0.25	210.37
121876	LASCRUC	0830	11.5	-2.0	100.0	70.0	4.5	3.0	177.2	105.	0.14	0.0	210.51
121976	LASCRUC	0830	13.0	-2.5	100.0	45.0	4.0	3.0	166.3	212.	0.06	0.0	210.57
122076	LASCRUC	0830	10.0	-0.0	86.0	18.0	4.5	2.5	265.5	248.	0.42	0.0	210.99
122176	LASCRUC	0830	10.0	-0.5	97.0	16.0	5.5	1.0	247.8	141.	0.44	0.0	211.43
122276	LASCRUC	0830	12.5	-8.0	100.0	17.0	2.0	-0.5	303.4	90.	0.03	0.0	211.46
122376	LASCRUC	0830	12.5	-9.0	-0.0	-0.0	1.5	-0.5	280.2	79.	0.14	0.0	211.60
122476	LASCRUC	0830	15.5	-7.0	98.0	26.0	5.5	2.0	277.0	149.	0.32	0.0	211.92
122576	LASCRUC	0830	11.0	-7.0	95.0	7.0	-0.0	-2.5	300.3	207.	0.08	0.0	212.00
122676	LASCRUC	0830	10.5	-8.0	95.0	17.0	-2.0	-4.0	21.2	96.	0.32	0.0	212.32
122776	LASCRUC	0830	15.0	-11.0	99.0	7.0	-3.5	-0.0	293.5	103.	0.25	0.0	212.57
122876	LASCRUC	0830	15.5	-6.5	90.0	6.0	2.0	-1.0	243.9	115.	0.20	0.0	212.77
122976	LASCRUC	0830	12.5	-5.0	83.0	12.0	4.5	-0.5	158.8	91.	0.08	0.0	212.85
123076	LASCRUC	0830	15.5	-2.5	99.0	29.0	8.0	5.5	260.0	220.	0.44	0.0	213.29
	MEAN		12.5	-6.2	97.2	23.1	3.9	1.3	253.0	108.	0.19		
	STANDARD DEV		2.7	2.6	4.2	14.0	3.1	2.9	68.6	54.	0.15		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977.

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DDT DEG.C	NDT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
10177	LASCRUC	0830	12.0	-2.0	99.0	54.0	10.5	6.5	170.5	103.	0.09	0.0	0.09
10277	LASCRUC	0830	12.5	-5.5	99.0	25.0	5.0	5.5	252.2	145.	0.09	0.15	0.18
10377	LASCRUC	0830	16.5	-4.5	99.0	20.0	5.0	3.0	324.6	168.	0.48	0.0	0.66
10477	LASCRUC	0830	14.6	-0.5	99.0	20.0	7.5	4.5	258.4	156.	0.26	0.0	0.92
10577	LASCRUC	0830	10.0	0.5	99.0	34.0	6.0	3.0	70.3	130.	0.23	0.0	1.15
10677	LASCRUC	0830	10.5	-7.0	100.0	20.0	-1.0	-1.0	290.7	144.	0.0	0.0	1.15
10777	LASCRUC	0830	12.5	-6.0	99.0	25.0	-0.5	-2.0	302.3	103.	0.08	0.0	1.23
10877	LASCRUC	0830	11.0	-2.5	100.0	21.0	5.0	2.5	206.8	411.	0.35	0.0	1.58
10977	LASCRUC	0830	7.0	-1.0	98.0	4.0	0.0	0.0	305.4	255.	-0.00	0.0	1.58
11077	LASCRUC	0830	9.0	-11.0	90.0	10.0	-3.0	-4.0	328.8	131.	-0.00	0.0	1.58
11177	LASCRUC	0830	13.0	-9.0	87.0	9.0	0.0	-3.0	317.1	161.	0.16	0.0	1.74
11277	LASCRUC	0830	8.5	-2.0	100.0	54.0	3.5	-0.5	203.4	116.	0.02	0.10	1.76
11377	LASCRUC	0830	13.5	-7.0	100.0	16.0	1.0	-1.0	313.5	113.	0.04	0.0	1.80
11477	LASCRUC	0830	13.0	-6.5	100.0	14.0	1.5	-0.5	329.3	169.	0.35	0.0	2.15
11577	LASCRUC	0830	11.0	-6.0	-0.0	-0.0	2.0	0.0	329.8	144.	0.40	0.0	2.55
11677	LASCRUC	0830	12.0	-8.0	99.0	20.0	-0.5	-2.5	340.0	128.	0.09	0.0	2.64
11777	LASCRUC	0830	14.0	-6.0	88.0	11.0	3.0	-0.5	324.8	134.	0.37	0.0	3.01
11877	LASCRUC	0830	13.0	-5.0	88.0	28.0	3.5	0.0	303.4	131.	0.74	0.0	3.75
11977	LASCRUC	0830	17.5	-6.0	99.0	13.0	0.0	-2.0	299.4	219.	0.38	0.0	4.13
12077	LASCRUC	0830	15.5	-1.0	93.0	30.0	1.0	-1.0	240.9	93.	0.23	0.0	4.36
12177	LASCRUC	0830	12.0	1.0	100.0	47.0	9.0	4.5	101.3	126.	0.01	0.0	4.37
12277	LASCRUC	0830	10.0	4.0	99.0	76.0	5.0	7.0	127.9	61.	0.03	0.79	4.40
12377	LASCRUC	0830	15.0	2.5	100.0	-0.0	5.5	5.0	272.5	142.	0.27	0.05	4.67
12477	LASCRUC	0830	14.0	-1.0	98.0	18.0	6.0	3.5	361.6	87.	0.24	0.0	4.91
12577	LASCRUC	0830	14.5	-4.0	98.0	20.0	5.0	3.0	344.3	121.	0.21	0.0	5.12
12677	LASCRUC	0830	17.0	1.0	99.0	23.0	5.0	2.0	346.0	239.	0.54	0.0	5.66
12777	LASCRUC	0830	16.5	-0.0	99.0	23.0	6.5	4.0	295.7	356.	0.54	0.0	6.20
12877	LASCRUC	0830	16.0	-3.0	100.0	13.0	5.5	3.0	359.5	105.	0.28	0.0	6.48
12977	LASCRUC	0830	13.0	-1.0	100.0	26.0	10.0	5.0	177.4	169.	0.11	0.0	6.59
13077	LASCRUC	0830	5.5	2.0	100.0	76.0	3.0	2.5	121.7	120.	0.10	0.48	6.69
13177	LASCRUC	0830	9.0	-3.0	100.0	50.0	2.5	1.0	351.4	74.	0.13	0.0	6.82
	MEAN		12.5	-3.1	97.6	27.6	3.9	1.5	270.0	153.	0.24		
	STANDARD DEV		2.9	3.8	4.0	18.6	3.6	3.0	82.5	75.	0.19		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TYPE	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
20177	LASCRUC	0830	15.0	-5.5	100.0	20.0	2.5	1.5	358.5	91.	0.25	0.0	7.07
20277	LASCRUC	0830	15.5	-1.5	100.0	25.0	6.5	5.0	258.5	204.	0.27	0.0	7.34
20377	LASCRUC	0830	12.5	-3.5	100.0	25.0	8.0	5.0	358.9	120.	0.37	0.0	7.71
20477	LASCRUC	0830	15.0	-3.0	100.0	19.0	1.5	0.5	411.7	139.	0.14	0.0	7.85
20577	LASCRUC	0830	14.5	-5.0	100.0	36.0	7.5	3.0	404.7	98.	0.19	0.0	8.05
20677	LASCRUC	0830	15.5	-5.5	100.0	17.0	2.0	0.0	139.8	144.	0.29	0.25	8.34
20777	LASCRUC	0830	12.5	4.0	99.0	42.0	5.5	3.5	247.0	118.	0.16	0.0	8.50
20877	LASCRUC	0830	15.5	-4.5	99.0	11.0	4.0	2.0	389.1	83.	0.41	0.0	8.91
20977	LASCRUC	0830	17.0	-5.0	100.0	24.0	4.0	1.0	398.4	108.	0.24	0.0	9.15
21077	LASCRUC	0830	17.0	-1.0	100.0	11.0	5.5	3.0	364.5	223.	0.40	0.0	9.55
21177	LASCRUC	0830	19.0	-4.0	100.0	6.0	8.0	5.0	420.9	163.	0.70	0.0	10.25
21277	LASCRUC	0830	17.5	-0.5	97.0	11.0	6.0	2.0	421.6	86.	0.27	0.0	10.52
21377	LASCRUC	0830	20.0	-4.5	96.0	15.0	3.0	0.0	400.5	158.	0.32	0.0	10.84
21477	LASCRUC	0830	15.0	-1.5	80.0	29.0	10.5	5.0	410.7	361.	0.63	0.0	11.47
21577	LASCRUC	0830	15.0	-1.5	98.0	24.0	6.5	3.0	0.0	67.	0.34	0.0	11.81
21677	LASCRUC	0830	21.0	-6.0	100.0	14.0	6.0	2.0	395.2	91.	0.38	0.0	12.19
21777	LASCRUC	0830	24.5	-5.0	100.0	17.0	6.5	2.5	406.9	116.	0.60	0.0	12.79
21877	LASCRUC	0830	24.5	-2.0	87.0	11.0	11.5	4.5	417.8	114.	0.71	0.0	13.50
21977	LASCRUC	0830	20.5	-0.0	99.0	10.0	9.5	3.0	438.1	104.	0.35	0.0	13.85
22077	LASCRUC	0830	22.0	-4.0	99.0	10.0	12.5	5.5	404.9	66.	0.48	0.0	14.33
22177	LASCRUC	0830	24.5	-5.0	96.0	-0.0	6.5	2.0	373.6	150.	0.52	0.0	14.85
22277	LASCRUC	0830	24.5	-0.0	58.0	8.0	12.5	5.0	318.0	652.	1.45	0.0	16.30
22377	LASCRUC	0830	18.0	-5.0	76.0	9.0	8.0	1.5	433.2	288.	1.09	0.0	17.39
22477	LASCRUC	0830	23.5	0.5	64.0	14.0	13.5	5.5	392.1	349.	1.23	0.0	18.62
22577	LASCRUC	0830	13.0	-0.5	88.0	26.0	9.5	4.5	349.4	479.	0.87	0.0	19.49
22677	LASCRUC	0830	12.0	-7.5	93.0	15.0	4.0	0.0	468.8	204.	0.43	0.0	19.92
22777	LASCRUC	0830	13.0	-7.0	71.0	13.0	9.0	1.5	411.7	163.	0.50	0.0	20.42
22877	LASCRUC	0830	14.5	-10.0	75.0	11.0	3.0	-0.5	488.5	106.	0.39	0.0	20.81
	MEAN		17.5	-3.6	92.0	17.5	6.9	2.7	367.3	180.	0.50		
	STANDARD DEV		4.2	2.9	12.3	8.8	3.3	1.9	100.5	135.	0.32		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DPT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
30177	LASCRUC	0830	20.5	-4.5	68.0	10.0	14.0	5.0	311.4	323.	0.83	0.0	21.64
30277	LASCRUC	0830	12.5	3.5	80.0	13.0	6.0	1.0	459.2	351.	0.75	0.0	22.39
30377	LASCRUC	0830	12.5	-8.0	87.0	19.0	3.0	-2.0	420.1	309.	0.68	0.0	23.07
30477	LASCRUC	0830	14.0	-9.0	87.0	16.0	4.5	-1.0	440.6	227.	0.57	0.0	23.64
30577	LASCRUC	0830	8.5	-2.0	99.0	46.0	5.5	1.5	306.4	325.	0.35	0.0	23.99
30677	LASCRUC	0830	13.5	-8.5	99.0	11.0	2.0	-0.5	401.7	91.	0.25	0.0	24.24
30777	LASCRUC	0830	19.5	-6.5	92.0	9.0	7.5	3.0	460.4	89.	0.32	0.0	24.56
30877	LASCRUC	0830	21.5	-4.0	80.0	4.0	6.0	1.0	396.1	73.	0.54	0.0	25.10
30977	LASCRUC	0830	24.0	4.0	51.0	14.0	12.5	6.0	409.6	322.	1.33	0.0	26.43
31077	LASCRUC	0830	17.0	10.0	57.0	4.0	15.0	5.0	405.1	650.	2.16	0.0	28.59
31177	LASCRUC	0830	15.5	-2.0	57.0	20.0	6.0	1.5	502.9	243.	0.54	0.0	29.13
31277	LASCRUC	0830	19.5	-3.0	77.0	10.0	11.5	4.0	511.1	102.	0.46	0.0	29.59
31377	LASCRUC	0830	23.0	-5.0	98.0	4.0	16.0	7.0	426.6	147.	0.66	0.0	30.25
31477	LASCRUC	0830	22.5	-4.0	98.0	1.0	13.5	4.5	502.0	230.	1.09	0.0	31.34
31577	LASCRUC	0830	21.0	-4.5	90.0	14.0	8.5	2.5	457.6	207.	1.05	0.0	32.39
31677	LASCRUC	0830	20.5	6.0	40.0	21.0	11.0	4.0	240.8	265.	0.83	0.0	33.22
31777	LASCRUC	0830	20.0	8.0	36.0	21.0	13.5	4.5	465.1	450.	1.05	0.0	34.27
31877	LASCRUC	0830	16.0	-2.5	92.0	27.0	10.0	5.0	271.6	201.	0.49	0.0	34.76
31977	LASCRUC	0830	20.5	-4.0	90.0	8.0	5.5	1.0	504.5	128.	0.64	0.0	35.40
32077	LASCRUC	0830	22.5	-4.5	86.0	6.0	20.5	7.5	519.7	227.	1.05	0.0	36.45
32177	LASCRUC	0830	21.5	-2.0	73.0	11.0	12.5	4.5	505.8	162.	0.70	0.0	37.15
32277	LASCRUC	0830	22.5	-0.0	64.0	20.0	11.0	4.0	500.2	251.	0.94	0.0	38.09
32377	LASCRUC	0830	23.5	3.5	60.0	15.0	17.0	8.0	452.7	219.	0.80	0.0	38.89
32477	LASCRUC	0830	23.5	-1.0	89.0	11.0	15.5	7.5	485.9	183.	0.81	0.0	39.70
32577	LASCRUC	0830	21.5	6.0	60.0	15.0	17.5	6.5	283.3	256.	0.63	0.0	40.33
32677	LASCRUC	0830	18.0	5.0	100.0	55.0	12.0	8.5	437.8	398.	0.71	0.0	41.04
32777	LASCRUC	0830	11.0	-0.0	97.0	47.0	8.0	5.0	280.1	453.	0.27	0.81	41.31
32877	LASCRUC	0830	18.0	4.0	76.0	21.0	9.0	5.0	535.9	382.	1.14	0.0	42.45
32977	LASCRUC	0830	18.0	3.0	81.0	15.0	13.0	6.5	526.1	322.	0.90	0.0	43.35
33077	LASCRUC	0830	20.0	-2.0	96.0	3.0	12.0	6.5	548.8	264.	0.96	0.0	44.31
33177	LASCRUC	0830	23.5	6.0	42.0	7.0	15.0	7.5	554.5	283.	0.74	0.0	45.05
	MEAN		18.8	-0.5	77.5	16.1	10.8	4.2	438.2	262.	0.78		
	STANDARD DEV		4.1	5.5	19.1	12.8	4.6	2.8	88.4	124.	0.37		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
40177	LASCRUC	0830	17.5	-3.0	78.0	9.0	13.5	6.0	557.3	353.	0.92	0.0	45.97
40277	LASCRUC	0830	20.0	-3.0	99.0	8.0	8.5	4.5	529.9	497.	0.76	0.0	46.73
40377	LASCRUC	0830	13.0	0.5	92.0	22.0	11.5	6.5	536.4	328.	0.77	0.0	47.50
40477	LASCRUC	0830	19.0	-3.5	97.0	3.0	13.5	6.5	585.3	199.	0.84	0.0	48.34
40577	LASCRUC	0830	21.5	-2.5	99.0	7.0	15.0	10.0	572.3	135.	0.62	0.0	48.96
40677	LASCRUC	0830	25.5	2.0	75.0	2.0	17.0	15.0	556.5	204.	0.82	0.0	49.78
40777	LASCRUC	0830	29.0	5.0	68.0	4.0	19.0	14.0	543.7	132.	0.59	0.0	50.37
40877	LASCRUC	0830	30.0	6.0	85.0	5.0	15.5	12.0	547.8	114.	0.76	0.0	51.13
40977	LASCRUC	0830	31.5	7.0	93.0	9.0	20.0	20.0	467.3	116.	1.11	0.0	52.24
41077	LASCRUC	0830	29.0	14.0	82.0	10.0	20.0	19.5	574.8	211.	1.20	0.0	53.44
41177	LASCRUC	0830	25.5	3.5	97.0	2.0	17.0	15.0	585.3	220.	1.06	0.0	54.50
41277	LASCRUC	0830	25.0	2.0	73.0	5.0	14.0	14.0	551.7	156.	0.59	0.0	55.09
41377	LASCRUC	0830	26.0	7.0	74.0	13.0	15.0	10.0	490.4	259.	1.26	0.0	56.35
41477	LASCRUC	0830	18.0	10.5	100.0	42.0	14.0	12.0	214.8	217.	0.57	0.0	56.92
41577	LASCRUC	0830	20.0	8.0	99.0	28.0	17.5	15.0	346.4	201.	0.48	0.0	57.40
41677	LASCRUC	0830	22.5	5.5	99.0	20.0	14.0	13.5	632.8	106.	0.61	0.0	58.01
41777	LASCRUC	0830	27.0	3.5	99.0	1.0	23.0	17.0	489.2	117.	0.63	0.0	58.64
41877	LASCRUC	0830	29.0	5.5	83.0	0.0	20.5	15.0	530.0	216.	0.91	0.0	59.55
41977	LASCRUC	0830	23.0	14.0	93.0	25.0	18.5	15.0	373.2	239.	0.67	0.0	60.22
42077	LASCRUC	0830	22.0	10.0	95.0	12.0	17.0	14.0	577.8	256.	1.14	0.03	61.36
42177	LASCRUC	0830	24.0	1.0	99.0	10.0	17.0	13.0	576.5	176.	0.67	0.0	62.03
42277	LASCRUC	0830	25.5	5.5	91.0	10.0	18.5	15.0	521.0	102.	0.65	0.0	62.68
42377	LASCRUC	0830	26.0	8.0	82.0	6.0	15.0	12.0	375.7	293.	0.94	0.0	63.62
42477	LASCRUC	0830	20.0	12.5	97.0	30.0	18.5	16.0	217.2	120.	0.25	0.0	63.87
42577	LASCRUC	0830	25.5	9.5	99.0	10.0	15.0	14.0	486.5	164.	0.58	0.0	64.45
42677	LASCRUC	0830	27.5	10.0	99.0	18.0	21.5	18.0	453.9	80.	0.46	0.0	64.91
42777	LASCRUC	0830	28.5	7.5	99.0	18.0	19.0	16.0	529.5	148.	1.24	0.0	66.15
42877	LASCRUC	0830	29.0	10.5	99.0	3.0	23.0	16.0	544.9	172.	0.85	0.0	67.00
42977	LASCRUC	0830	29.5	7.5	94.0	6.0	20.5	15.0	602.1	120.	0.91	0.0	67.91
43077	LASCRUC	0830	30.0	6.0	94.0	5.0	15.5	14.0	599.0	125.	0.93	0.0	68.84
	MEAN		24.6	5.9	90.4	11.4	17.0	13.4	505.6	199.	0.79		
	STANDARD DEV		4.5	4.6	10.9	9.9	3.5	3.8	104.1	91.	0.25		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
50177	LASCRUC	0830	30.0	10.5	74.0	7.0	17.5	9.5	617.3	153.	1.01	0.0	69.85
50277	LASCRUC	0830	30.5	7.0	98.0	7.0	16.0	13.0	553.0	83.	0.71	0.0	70.56
50377	LASCRUC	083C	28.5	11.5	97.0	15.0	16.5	14.5	289.8	198.	0.78	0.0	71.34
50477	LASCRUC	083C	27.5	11.5	87.0	27.0	17.0	15.0	493.8	241.	0.91	0.0	72.24
50577	LASCRUC	0830	24.5	12.5	100.0	34.0	16.5	15.5	563.8	208.	0.84	0.18	73.08
50677	LASCRUC	0830	27.0	6.5	100.0	8.0	17.0	15.0	636.9	142.	0.63	0.0	73.71
50777	LASCRUC	0830	29.5	6.5	92.0	6.0	17.0	13.0	570.8	126.	1.02	0.0	74.73
50877	LASCRUC	083C	30.0	10.5	90.0	15.0	24.0	20.0	619.8	101.	0.86	0.0	75.59
50977	LASCRUC	0830	29.5	8.0	100.0	9.0	21.0	15.0	617.0	160.	1.06	0.0	76.65
51077	LASCRUC	0830	26.0	9.0	88.0	6.0	16.5	13.5	666.1	200.	1.04	0.0	77.69
51177	LASCRUC	0830	28.0	4.0	100.0	14.0	16.0	12.0	577.5	164.	0.82	0.0	78.51
51277	LASCRUC	0830	27.0	14.0	95.0	32.0	19.0	16.0	355.3	385.	0.72	0.0	79.23
51377	LASCRUC	0830	26.5	14.0	100.0	4.0	20.0	17.0	591.4	301.	1.09	0.18	80.32
51477	LASCRUC	0830	23.0	7.0	81.0	14.0	15.0	10.0	652.8	230.	1.06	0.0	81.38
51577	LASCRUC	083C	26.5	4.5	98.0	9.0	16.0	14.0	636.3	96.	0.71	0.0	82.09
51677	LASCRUC	0830	27.5	4.0	93.0	3.0	16.5	13.0	689.7	190.	1.05	0.0	83.14
51777	LASCRUC	083C	28.0	7.0	73.0	3.0	17.5	14.5	671.8	150.	1.12	0.0	84.26
51877	LASCRUC	0830	28.0	5.0	86.0	3.0	17.0	15.0	693.0	220.	1.17	0.0	85.43
51977	LASCRUC	0830	27.0	3.5	100.0	8.0	14.5	11.0	692.6	108.	0.80	0.0	86.23
52077	LASCRUC	0830	24.5	4.0	100.0	9.0	17.0	14.0	674.3	320.	1.30	0.0	87.53
52177	LASCRUC	0830	28.0	3.0	100.0	3.0	15.5	13.0	704.3	121.	0.84	0.0	88.37
52277	LASCRUC	0830	30.5	4.0	100.0	0.0	16.5	14.5	700.0	93.	0.87	0.0	89.24
52377	LASCRUC	083C	32.0	5.5	100.0	0.0	16.5	14.0	709.1	152.	1.00	0.0	90.24
52477	LASCRUC	083C	30.5	13.0	100.0	0.0	20.5	18.0	541.7	193.	1.01	0.0	91.25
52577	LASCRUC	0830	26.5	12.5	89.0	17.0	17.5	15.0	315.9	138.	0.57	0.0	91.82
52677	LASCRUC	0830	29.0	14.5	85.0	17.0	19.5	15.5	550.7	174.	0.92	0.0	92.74
52777	LASCRUC	0830	28.5	10.0	90.0	19.0	20.5	17.0	422.3	172.	0.82	0.0	93.56
52877	LASCRUC	083C	32.0	9.0	96.0	10.0	19.0	13.0	716.1	141.	1.02	0.0	94.58
52977	LASCRUC	083C	33.5	8.0	99.0	10.0	18.5	13.0	727.3	45.	0.84	0.0	95.42
53077	LASCRUC	0830	36.0	9.5	99.0	4.0	22.5	17.0	703.2	-0.	0.91	0.0	96.33
53177	LASCRUC	083C	35.5	12.5	99.0	13.0	22.0	20.0	551.1	-0.	0.54	0.0	96.87
	MEAN		28.8	8.5	93.8	10.5	17.9	14.5	596.9	173.	0.90		
	STANDARD DEV		2.9	3.6	7.8	8.6	2.3	2.4	117.2	74.	0.18		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DPT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
60177	LASCRUC	0830	33.0	13.5	80.0	19.0	22.5	21.0	683.7	-0.	0.89	0.0	97.76
60277	LASCRUC	0830	34.0	12.5	80.0	15.0	25.5	24.0	662.8	121.	1.21	0.0	98.97
60377	LASCRUC	0830	34.0	18.5	100.0	24.0	26.5	23.5	618.3	175.	0.93	0.10	99.90
60477	LASCRUC	0830	29.0	16.5	95.0	52.0	21.0	20.5	552.2	166.	0.76	0.0	100.66
60577	LASCRUC	0830	31.0	16.5	98.0	13.0	24.0	22.0	681.8	143.	0.84	0.0	101.50
60677	LASCRUC	0830	31.5	12.0	100.0	11.0	21.0	21.0	661.4	187.	1.09	0.0	102.59
60777	LASCRUC	0830	31.0	13.0	99.0	20.0	22.0	21.5	655.1	215.	0.98	0.0	103.57
60877	LASCRUC	0830	31.0	12.5	80.0	22.0	23.0	20.0	636.3	174.	1.13	0.0	104.70
60977	LASCRUC	0830	33.5	16.0	94.0	15.0	22.0	21.0	692.3	98.	0.87	0.0	105.57
61077	LASCRUC	0830	35.0	13.0	94.0	17.0	22.0	17.0	703.0	103.	1.06	0.0	106.63
61177	LASCRUC	0830	34.5	12.5	91.0	14.0	22.5	17.5	665.4	125.	0.83	0.0	107.46
61277	LASCRUC	0830	33.5	11.5	91.0	12.0	21.0	17.0	665.6	107.	0.85	0.0	108.31
61377	LASCRUC	0830	36.5	9.5	100.0	5.0	20.0	19.5	778.7	118.	0.89	0.0	109.20
61477	LASCRUC	0830	37.0	14.0	94.0	8.0	28.0	22.0	709.7	223.	1.25	0.0	110.45
61577	LASCRUC	0830	37.5	15.0	100.0	6.0	25.0	22.0	752.6	104.	0.95	0.0	111.40
61677	LASCRUC	0830	39.0	14.0	100.0	0.0	25.5	19.5	759.6	94.	1.10	0.0	112.50
61777	LASCRUC	0830	38.0	11.5	87.0	0.0	25.0	18.5	763.9	112.	1.08	0.0	113.58
61877	LASCRUC	0830	39.5	13.5	100.0	4.0	23.5	20.0	736.1	102.	1.02	0.0	114.60
61977	LASCRUC	0830	38.0	13.0	100.0	6.0	27.0	19.0	637.3	90.	0.83	0.0	115.43
62077	LASCRUC	0830	32.5	17.5	94.0	19.0	27.5	18.0	393.6	195.	0.95	0.0	116.38
62177	LASCRUC	0830	32.5	18.0	94.0	32.0	22.5	19.5	492.9	216.	0.93	0.0	117.31
62277	LASCRUC	0830	31.0	14.0	99.0	31.0	20.0	19.0	561.1	211.	0.95	0.0	118.26
62377	LASCRUC	0830	31.0	13.0	100.0	19.0	20.5	16.0	495.3	107.	0.79	0.0	119.05
62477	LASCRUC	0830	33.5	12.0	100.0	19.0	21.0	17.5	454.0	113.	0.82	0.0	119.87
62577	LASCRUC	0830	35.5	15.0	93.0	18.0	23.0	20.0	574.1	139.	1.07	0.03	120.94
62677	LASCRUC	0830	36.5	15.5	93.0	14.0	23.5	20.0	503.0	164.	1.06	0.0	122.00
62777	LASCRUC	0830	37.5	16.5	93.0	15.0	27.0	20.0	534.9	176.	1.29	0.0	123.29
62877	LASCRUC	0830	37.5	17.0	94.0	20.0	27.5	20.0	491.7	219.	1.07	0.0	124.36
62977	LASCRUC	0830	33.0	19.0	100.0	20.0	26.0	22.0	173.2	173.	1.07	0.20	125.43
63077	LASCRUC	0830	35.0	17.5	100.0	17.0	23.5	22.0	406.0	126.	0.80	0.76	126.24
	MEAN		34.4	14.4	94.8	16.2	23.6	20.0	603.4	148.	0.98		
	STANDARD DEV		2.3	2.4	6.2	10.3	2.4	1.9	135.2	44.	0.14		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
70177	LASCRUC	0830	33.0	15.5	97.0	14.0	25.5	21.0	568.0	131.	0.93	0.15	127.17
70277	LASCRUC	0830	35.5	19.0	100.0	28.0	24.0	21.0	609.9	138.	1.11	0.0	128.28
70377	LASCRUC	0830	35.5	17.5	100.0	26.0	25.0	22.0	516.5	158.	0.81	0.10	129.09
70477	LASCRUC	0830	30.5	18.5	100.0	35.0	25.0	21.5	409.6	136.	1.35	0.0	130.44
70577	LASCRUC	0830	29.0	17.0	100.0	41.0	22.5	21.5	470.0	66.	0.64	3.38	131.08
70677	LASCRUC	0830	34.0	17.0	100.0	24.0	26.5	21.5	569.4	164.	0.95	0.0	132.03
70777	LASCRUC	0830	33.0	16.0	100.0	31.0	21.0	20.5	563.1	33.	0.75	0.43	132.78
70877	LASCRUC	0830	33.5	18.0	100.0	32.0	24.5	21.0	476.2	260.	1.07	0.0	133.85
70977	LASCRUC	0830	35.5	19.7	100.0	32.0	25.0	22.5	604.9	98.	0.77	0.0	134.62
71077	LASCRUC	0830	35.5	17.0	100.0	23.0	26.5	23.0	580.2	100.	0.88	0.0	135.50
71177	LASCRUC	0830	37.0	18.0	99.0	18.0	26.0	21.0	599.6	154.	1.17	0.0	136.67
71277	LASCRUC	0830	35.5	17.0	100.0	21.0	24.0	20.5	561.0	117.	0.94	0.10	137.61
71377	LASCRUC	0830	34.5	19.0	100.0	26.0	25.5	21.0	196.2	166.	0.89	0.0	138.50
71477	LASCRUC	0830	34.5	14.5	100.0	26.0	21.0	20.5	485.6	135.	1.18	0.13	139.67
71577	LASCRUC	0830	33.0	18.0	100.0	33.0	20.5	20.0	431.3	105.	0.62	1.02	140.29
71677	LASCRUC	0830	35.0	16.5	100.0	27.0	26.5	22.0	592.0	139.	1.01	0.03	141.30
71777	LASCRUC	0830	34.5	21.0	71.0	26.0	28.0	22.0	622.1	144.	1.17	0.0	142.47
71877	LASCRUC	0830	35.5	22.0	89.0	26.0	27.5	19.5	592.9	156.	1.02	0.0	143.48
71977	LASCRUC	0830	34.0	19.0	100.0	29.0	25.0	21.0	553.5	118.	0.87	0.08	144.35
72077	LASCRUC	0830	33.5	18.0	92.0	30.0	21.0	20.0	508.3	116.	1.42	0.0	145.78
72177	LASCRUC	0830	33.5	19.0	100.0	38.0	23.0	21.0	430.3	119.	0.88	0.58	146.66
72277	LASCRUC	0830	32.0	17.0	100.0	33.0	25.0	23.0	488.5	184.	0.34	0.43	147.00
72377	LASCRUC	0830	30.0	17.5	100.0	38.0	21.5	19.5	412.2	182.	1.19	0.0	148.19
72477	LASCRUC	0830	30.0	18.5	100.0	61.0	23.0	23.0	541.7	101.	0.68	1.17	148.86
72577	LASCRUC	0830	34.0	18.0	100.0	31.0	21.5	21.5	577.4	118.	0.86	0.08	149.72
72677	LASCRUC	0830	34.5	17.5	100.0	25.0	24.5	20.0	581.8	93.	0.87	0.0	150.59
72777	LASCRUC	0830	36.5	17.0	100.0	15.0	24.5	21.0	604.8	117.	1.06	0.0	151.65
72877	LASCRUC	0830	35.0	20.0	100.0	27.0	26.0	21.0	530.7	113.	0.99	0.0	152.64
72977	LASCRUC	0830	35.5	18.0	100.0	25.0	24.0	21.0	575.5	94.	0.97	0.36	153.61
73077	LASCRUC	0830	36.5	17.0	100.0	19.0	24.0	20.5	574.7	79.	0.87	0.0	154.48
73177	LASCRUC	0830	35.5	17.0	100.0	24.0	26.0	21.0	561.9	111.	0.92	0.0	155.40
	MEAN		34.0	17.9	98.3	28.5	24.3	21.1	528.7	127.	0.94		
	STANDARD DEV		2.0	1.5	5.6	8.7	2.0	0.9	87.0	41.	0.22		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
80177	LASCRUC	0830	36.5	17.0	100.0	19.0	26.0	20.0	571.2	146.	1.11	0.0	156.51
80277	LASCRUC	083C	36.5	16.5	100.0	18.0	25.5	20.5	482.4	130.	0.94	0.0	157.45
80377	LASCRUC	083C	38.0	17.0	100.0	15.0	25.5	19.5	544.8	124.	1.11	0.0	158.56
80477	LASCRUC	0830	37.0	17.0	100.0	17.0	26.0	20.0	521.1	94.	0.95	0.0	159.51
80577	LASCRUC	083C	38.0	18.0	100.0	16.0	24.0	20.0	529.9	99.	0.82	0.0	160.33
80677	LASCRUC	0830	37.0	16.0	100.0	19.0	26.5	20.0	537.1	80.	0.98	0.0	161.31
80777	LASCRUC	0830	36.5	17.5	100.0	20.0	24.5	20.0	551.5	99.	0.94	0.0	162.25
80877	LASCRUC	0830	36.0	17.0	100.0	18.0	26.0	20.5	568.3	127.	1.02	0.0	163.27
80577	LASCRUC	0830	36.5	21.0	94.0	28.0	27.0	20.5	527.4	154.	1.12	0.0	164.39
81077	LASCRUC	0830	38.0	21.0	100.0	38.0	26.0	20.0	556.1	191.	0.99	0.0	165.38
81177	LASCRUC	0830	30.5	18.5	100.0	46.0	22.0	21.0	320.6	174.	0.89	0.23	166.27
81277	LASCRUC	0830	31.0	19.0	100.0	41.0	21.0	21.0	461.6	167.	0.53	0.33	166.80
81377	LASCRUC	0830	32.0	18.0	100.0	34.0	21.0	21.0	520.3	34.	0.72	0.13	167.52
81477	LASCRUC	0830	32.5	18.5	100.0	36.0	23.5	22.0	479.8	167.	0.94	0.0	168.46
81577	LASCRUC	0830	32.0	20.0	98.0	41.0	26.0	21.0	496.0	159.	0.88	0.0	169.33
81677	LASCRUC	0830	33.5	19.0	100.0	34.0	24.0	23.0	524.5	125.	0.84	0.03	170.17
81777	LASCRUC	083C	34.0	17.0	100.0	27.0	24.0	23.0	474.2	87.	0.59	0.0	170.76
81677	LASCRUC	0830	35.5	19.0	98.0	25.0	24.0	24.0	528.9	108.	1.01	0.10	171.77
81977	LASCRUC	0830	36.0	18.0	98.0	23.0	24.0	20.0	475.1	107.	0.80	0.0	172.57
82077	LASCRUC	0830	35.5	18.0	98.0	25.0	23.5	21.0	512.5	93.	0.84	0.0	173.41
82177	LASCRUC	0830	36.0	20.0	98.0	34.0	25.0	21.5	488.8	133.	0.67	0.05	174.08
82277	LASCRUC	083C	35.5	18.0	98.0	46.0	25.0	21.5	460.2	105.	0.73	0.0	174.81
82377	LASCRUC	083C	35.0	17.5	99.0	25.0	24.0	20.5	509.6	99.	1.16	0.0	175.97
82477	LASCRUC	083C	36.5	18.5	100.0	27.0	24.5	22.0	483.3	110.	0.79	0.0	176.76
82577	LASCRUC	083C	35.0	17.0	100.0	32.0	24.0	20.0	493.1	99.	0.81	0.13	177.57
82677	LASCRUC	0830	35.0	18.5	100.0	22.0	25.0	21.5	421.2	117.	0.83	0.0	178.40
82777	LASCRUC	0830	32.5	15.0	100.0	18.0	22.0	18.5	508.6	133.	0.94	0.0	179.34
82877	LASCRUC	0830	34.5	16.0	100.0	18.0	21.5	18.0	546.6	78.	0.67	0.0	180.01
82577	LASCRUC	083C	33.5	15.0	91.0	34.0	26.5	23.0	526.1	213.	1.09	0.0	181.10
83077	LASCRUC	083C	33.5	20.5	100.0	38.0	25.5	21.0	513.8	121.	0.85	0.0	181.95
83177	LASCRUC	083C	33.5	16.0	100.0	45.0	24.0	22.0	486.8	171.	0.87	0.0	182.82
	MEAN		34.9	17.9	99.1	28.4	24.4	20.9	503.9	124.	0.88		
	STANDARD DEV		2.0	1.6	2.0	9.7	1.6	1.3	48.2	38.	0.16		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
90177	LASCRUC	0830	30.0	18.0	100.0	52.0	20.0	20.0	351.8	136.	1.63	0.13	184.45
90277	LASCRUC	0830	28.5	16.5	100.0	68.0	21.0	21.0	442.0	167.	0.69	3.05	185.14
90377	LASCRUC	0830	32.0	17.0	100.0	32.0	22.5	21.0	317.5	114.	0.76	0.0	185.90
90477	LASCRUC	0830	34.0	16.5	100.0	27.0	21.0	21.0	486.2	83.	0.65	0.0	186.55
90577	LASCRUC	0830	30.5	16.0	100.0	44.0	22.5	21.5	441.2	111.	1.05	0.0	187.59
90677	LASCRUC	0830	30.5	15.0	100.0	45.0	22.0	21.0	497.3	78.	0.64	1.40	188.23
90777	LASCRUC	0830	31.0	14.5	100.0	30.0	20.0	18.5	512.3	60.	1.17	0.0	189.40
90877	LASCRUC	0830	31.5	14.0	100.0	24.0	21.5	19.0	489.4	67.	0.74	0.0	190.14
90977	LASCRUC	0830	34.0	13.0	100.0	22.0	19.0	17.5	497.7	114.	0.83	0.0	190.97
91077	LASCRUC	0830	32.5	14.5	100.0	32.0	20.0	17.0	444.1	134.	0.79	0.0	191.76
91177	LASCRUC	0830	29.0	16.0	100.0	39.0	20.0	18.5	419.7	109.	0.75	0.0	192.51
91277	LASCRUC	0830	27.5	15.0	100.0	37.0	20.5	18.0	470.1	228.	0.91	0.66	193.42
91377	LASCRUC	0830	29.5	14.0	100.0	26.0	19.5	18.0	471.1	134.	0.72	0.0	194.14
91477	LASCRUC	0830	29.5	15.0	100.0	36.0	18.5	17.0	495.7	57.	0.52	0.0	194.66
91577	LASCRUC	0830	31.5	14.0	100.0	20.0	22.5	19.5	420.7	95.	0.73	0.0	195.39
91677	LASCRUC	0830	30.5	14.5	100.0	24.0	18.5	17.0	422.5	132.	0.82	0.0	196.21
91777	LASCRUC	0830	31.0	11.5	100.0	28.0	20.0	17.5	459.0	79.	0.57	0.0	196.78
91877	LASCRUC	0830	31.0	10.0	100.0	12.0	17.0	13.0	488.2	69.	0.65	0.0	197.43
91977	LASCRUC	0830	33.5	10.5	99.0	23.0	17.5	15.0	460.8	90.	0.62	0.0	198.05
92077	LASCRUC	0830	32.0	11.5	100.0	17.0	20.0	18.0	486.5	112.	0.83	0.0	198.88
92177	LASCRUC	0830	31.5	9.5	100.0	24.0	20.0	16.5	483.8	86.	0.62	0.0	199.50
92277	LASCRUC	0830	31.5	11.0	100.0	22.0	17.0	15.5	402.1	145.	0.78	0.0	200.28
92377	LASCRUC	0830	30.0	15.5	100.0	57.0	20.5	18.0	370.7	111.	0.59	0.0	200.87
92477	LASCRUC	0830	32.1	13.5	100.0	26.0	18.5	17.5	497.1	144.	0.87	0.0	201.74
92577	LASCRUC	0830	33.5	9.5	100.0	16.0	18.5	16.8	506.5	106.	0.73	0.0	202.47
92677	LASCRUC	0830	34.0	11.5	100.0	26.0	20.0	17.0	452.5	133.	0.76	0.0	203.23
92777	LASCRUC	0830	33.5	13.5	100.0	33.0	20.5	17.5	483.2	135.	0.67	0.0	203.90
92877	LASCRUC	0830	32.0	14.5	100.0	32.0	20.0	19.5	476.9	66.	0.54	0.13	204.44
92977	LASCRUC	0830	33.5	13.5	100.0	21.0	20.0	19.0	484.3	88.	0.66	0.0	205.10
93077	LASCRUC	0830	32.5	11.5	100.0	16.0	20.0	18.0	492.1	168.	1.02	0.0	206.12
	MEAN		31.5	13.7	100.0	30.4	19.9	18.1	457.4	112.	0.78		
	STANDARD DEV		1.7	2.3	0.2	12.7	1.5	1.9	47.5	38.	0.22		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
100177	LASCRUC	0830	31.0	9.0	95.0	19.0	17.0	14.5	497.0	136.	0.70	0.0	206.82
100277	LASCRUC	0830	27.5	12.0	100.0	45.0	21.5	16.5	362.1	331.	0.77	0.0	207.59
100377	LASCRUC	083C	20.0	13.5	100.0	61.0	17.0	17.0	149.2	128.	0.13	0.36	207.72
100477	LASCRUC	083C	21.5	14.0	100.0	91.0	17.0	17.0	205.4	75.	0.20	0.81	207.92
100577	LASCRUC	0830	27.0	15.0	100.0	60.0	20.0	20.0	373.4	61.	0.36	0.05	208.28
100677	LASCRUC	0830	27.5	14.5	100.0	58.0	20.0	20.0	372.2	145.	0.54	0.0	208.81
100777	LASCRUC	0830	25.5	16.0	100.0	58.0	18.0	18.0	282.8	166.	0.42	0.69	209.23
100877	LASCRUC	0830	24.0	16.0	100.0	65.0	18.0	18.0	313.2	123.	0.33	0.0	209.56
100977	LASCRUC	083C	19.5	13.5	100.0	88.0	16.0	16.0	467.8	86.	0.14	0.0	209.71
101077	LASCRUC	0830	26.0	11.5	100.0	33.0	15.0	15.0	477.0	253.	0.75	0.71	210.46
101177	LASCRUC	0830	19.0	9.0	100.0	30.0	11.5	8.5	474.5	269.	0.68	0.0	211.14
101277	LASCRUC	083C	21.0	8.5	100.0	28.0	13.5	8.5	440.5	177.	0.47	0.0	211.61
101377	LASCRUC	0830	23.0	3.0	100.0	29.0	9.5	8.5	445.7	84.	0.40	0.0	212.01
101477	LASCRUC	0830	27.5	6.0	100.0	14.0	13.0	11.5	454.0	82.	0.48	0.0	212.49
101577	LASCRUC	0830	25.5	3.0	100.0	23.0	9.5	8.5	451.2	238.	0.80	0.0	213.29
101677	LASCRUC	083C	24.5	4.5	100.0	32.0	15.0	14.0	441.2	80.	0.41	0.0	213.70
101777	LASCRUC	0830	27.5	5.0	100.0	25.0	13.5	12.0	433.2	58.	0.37	0.0	214.07
101877	LASCRUC	0830	27.0	5.0	100.0	18.0	13.5	17.0	437.6	66.	0.44	0.0	214.51
101977	LASCRUC	0830	27.0	4.5	100.0	24.0	12.0	11.5	421.2	63.	0.44	0.0	214.95
102077	LASCRUC	0830	26.5	7.0	99.0	15.0	14.0	13.5	435.9	108.	0.56	0.0	215.51
102177	LASCRUC	0830	25.5	3.0	99.0	14.0	9.5	9.0	390.9	84.	0.82	0.0	216.33
102277	LASCRUC	0830	24.5	3.0	96.0	21.0	13.0	10.5	281.5	202.	0.15	0.33	216.48
102377	LASCRUC	083C	22.0	9.5	100.0	40.0	13.0	12.0	345.6	66.	0.35	0.0	216.83
102477	LASCRUC	0830	25.0	2.5	100.0	15.0	10.0	10.0	301.1	66.	0.37	0.0	217.20
102577	LASCRUC	0830	25.5	1.5	100.0	12.0	11.0	8.0	316.1	75.	0.49	0.0	217.69
102677	LASCRUC	0830	25.5	2.0	100.0	16.0	9.0	6.5	292.7	82.	0.44	0.0	218.13
102777	LASCRUC	0830	24.5	5.5	100.0	28.0	11.0	9.0	241.9	77.	0.25	0.0	218.38
102877	LASCRUC	0830	25.5	3.5	100.0	22.0	12.0	11.0	232.0	78.	0.50	0.0	218.88
102977	LASCRUC	0830	24.0	3.5	100.0	40.0	11.5	10.5	47.5	106.	0.33	0.0	219.21
103077	LASCRUC	0830	23.0	9.0	100.0	49.0	18.5	18.0	110.7	109.	0.20	0.53	219.41
103177	LASCRUC	0830	23.5	5.0	100.0	30.0	14.5	12.5	29.2	174.	0.54	0.0	219.95
	MEAN		24.7	7.7	99.6	35.6	14.1	13.0	341.1	124.	0.45		
	STANDARD DEV		2.7	4.7	1.1	21.3	3.5	3.9	127.5	71.	0.19		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	DBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
110177	LASCRUC	0830	17.5	6.5	93.0	22.0	12.5	10.0	342.1	159.	0.58	0.0	220.53
110277	LASCRUC	0830	20.5	-2.5	100.0	27.0	9.5	7.5	359.7	88.	0.30	0.0	220.83
110377	LASCRUC	0830	25.0	-1.0	92.0	26.0	11.5	10.5	348.0	106.	0.43	0.0	221.26
110477	LASCRUC	0830	24.5	-2.0	93.0	30.0	19.0	12.0	349.8	119.	0.47	0.0	221.73
110577	LASCRUC	0830	26.0	2.5	100.0	32.0	14.5	10.5	324.8	97.	0.46	0.0	222.19
110677	LASCRUC	0830	24.5	4.5	100.0	34.0	17.0	13.0	269.0	253.	0.56	0.0	222.75
110777	LASCRUC	0830	12.0	1.5	100.0	52.0	8.5	7.5	244.8	158.	0.27	0.20	223.02
110877	LASCRUC	0830	17.0	0.5	100.0	38.0	10.5	7.5	332.5	286.	0.54	0.0	223.56
110977	LASCRUC	0830	12.0	-1.0	99.0	28.0	4.5	1.0	345.5	91.	0.28	0.0	223.84
111077	LASCRUC	0830	17.0	-0.5	100.0	25.0	6.5	2.5	328.6	76.	0.26	0.0	224.10
111177	LASCRUC	0830	19.0	-5.0	96.0	27.0	6.5	3.0	299.7	117.	0.43	0.0	224.53
111277	LASCRUC	0830	20.0	-1.0	92.0	35.0	9.5	4.5	268.0	94.	0.21	0.0	224.74
111377	LASCRUC	0830	22.0	-1.0	92.0	28.0	11.5	7.0	307.1	69.	0.32	0.0	225.06
111477	LASCRUC	0830	21.5	-0.5	89.0	31.0	7.5	5.0	260.9	58.	0.23	0.0	225.29
111577	LASCRUC	0830	22.5	-2.0	100.0	25.0	9.0	6.0	307.5	84.	0.39	0.0	225.68
111677	LASCRUC	0830	23.0	-1.5	75.0	23.0	10.5	5.0	324.9	104.	0.37	0.0	226.05
111777	LASCRUC	0830	22.5	-5.0	100.0	29.0	9.0	5.0	307.0	54.	0.35	0.0	226.40
111877	LASCRUC	0830	23.0	-3.0	100.0	27.0	8.5	7.0	296.7	120.	0.36	0.0	226.76
111977	LASCRUC	0830	23.0	-1.5	100.0	35.0	18.0	12.0	260.9	274.	0.48	0.0	227.24
112077	LASCRUC	0830	20.5	1.0	100.0	39.0	11.5	8.0	305.8	154.	0.53	0.0	227.77
112177	LASCRUC	0830	21.5	-1.0	100.0	40.0	10.5	7.0	284.7	110.	0.28	0.0	228.05
112277	LASCRUC	0830	22.5	-3.5	100.0	26.0	8.5	5.0	306.9	125.	0.51	0.0	228.56
112377	LASCRUC	0830	23.5	-4.0	76.0	20.0	7.5	3.0	281.6	176.	0.52	0.0	229.08
112477	LASCRUC	0830	16.5	-3.0	79.0	36.0	6.5	2.0	229.5	92.	0.24	0.0	229.32
112577	LASCRUC	0830	23.5	-1.0	92.0	35.0	10.0	4.5	278.9	72.	0.33	0.0	229.65
112677	LASCRUC	0830	25.5	-3.0	87.0	28.0	9.0	5.5	286.0	131.	0.41	0.0	230.12
112777	LASCRUC	0830	24.3	-1.0	87.0	29.0	6.5	4.0	262.9	141.	0.47	0.0	230.59
112877	LASCRUC	0830	22.0	5.5	99.0	32.0	12.5	7.5	291.8	230.	0.56	0.0	231.15
112977	LASCRUC	0830	14.5	-2.0	99.0	47.0	6.5	4.5	283.1	73.	0.31	0.0	231.46
113077	LASCRUC	0830	17.0	-6.0	87.0	29.0	4.0	1.5	294.8	142.	0.32	0.0	231.78
	MEAN		20.8	-1.0	94.2	31.2	9.9	6.4	299.6	129.	0.39		
	STANDARD DEV		3.8	2.9	7.5	7.1	3.6	3.2	33.0	62.	0.11		

Table A-3. Climatological data for Las Cruces, New Mexico, 1977 (continued).

DATE	SITE	TIME	T(MAX) DEG.C	T(MIN) DEG.C	H(MAX) PERCENT OR DPT	H(MIN) PERCENT	OBT DEG.C	WBT DEG.C	SOLAR LY	WIND 24-HRS KM	PAN EVAP CM	PRECIP CM	TOTAL EVAP CM
120177	LASCRUC	0830	15.0	-8.0	84.0	23.0	0.0	1.0	272.6	99.	0.28	0.0	232.06
120277	LASCRUC	0830	18.5	-6.5	85.0	32.0	3.0	0.5	231.7	86.	0.27	0.0	232.33
120377	LASCRUC	0830	23.0	-5.0	89.0	32.0	7.0	2.5	271.0	127.	0.30	0.0	232.63
120477	LASCRUC	0830	23.5	1.0	76.0	30.0	9.0	6.0	276.3	374.	1.00	0.0	233.63
120577	LASCRUC	0830	23.0	6.0	60.0	34.0	11.5	5.0	279.9	202.	0.63	0.0	234.26
120677	LASCRUC	0830	15.0	-1.5	95.0	51.0	7.5	3.5	267.1	109.	0.28	0.0	234.54
120777	LASCRUC	0830	22.5	-2.5	90.0	22.0	3.5	1.0	279.5	145.	0.44	0.0	234.98
120877	LASCRUC	0830	22.5	-2.5	62.0	22.0	13.5	5.5	282.8	271.	0.62	0.0	235.60
120977	LASCRUC	0830	14.5	-3.0	69.0	46.0	7.5	3.5	269.6	250.	0.57	0.0	236.17
121077	LASCRUC	0830	15.5	-4.0	85.0	43.0	5.0	2.5	238.0	100.	0.29	0.0	236.46
101177	LASCRUC	0830	18.5	-4.5	85.0	40.0	4.0	0.0	247.7	55.	0.26	0.0	236.72
121277	LASCRUC	0830	21.5	5.0	95.0	34.0	6.0	3.0	266.6	205.	0.53	0.0	237.25
121377	LASCRUC	0830	17.5	-5.0	92.0	33.0	6.5	2.0	276.0	98.	0.25	0.0	237.50
121477	LASCRUC	0830	17.0	-5.5	70.0	33.0	2.5	-0.5	272.5	52.	0.10	0.0	237.60
121577	LASCRUC	0830	22.0	-6.5	85.0	34.0	4.0	2.0	267.2	294.	0.65	0.0	238.25
121677	LASCRUC	0830	17.5	1.0	67.0	22.0	12.0	6.5	276.1	397.	0.96	0.0	239.21
121777	LASCRUC	0830	18.5	-1.5	88.0	29.0	3.0	-1.0	286.6	119.	0.31	0.0	239.52
121877	LASCRUC	0830	21.5	-6.5	88.0	23.0	8.0	3.0	262.9	155.	0.36	0.0	239.88
121977	LASCRUC	0830	17.5	-5.0	80.0	48.0	6.0	3.0	237.2	294.	0.63	0.0	240.51
122077	LASCRUC	0830	8.0	-5.5	77.0	30.0	-1.0	-3.0	294.8	187.	0.24	0.0	240.75
122177	LASCRUC	0830	10.0	-13.0	64.0	29.0	-2.0	-5.0	229.5	82.	0.21	0.0	240.96
122277	LASCRUC	0830	13.0	-5.5	52.0	28.0	2.5	-1.5	180.5	72.	0.18	0.0	241.14
122377	LASCRUC	0830	15.5	-0.0	82.0	35.0	7.5	2.0	131.6	194.	0.30	0.0	241.44
122477	LASCRUC	0830	16.5	4.5	96.0	50.0	10.0	7.5	241.5	114.	0.35	0.0	241.79
122577	LASCRUC	0830	17.0	-2.5	76.0	34.0	5.0	2.5	190.6	67.	0.20	0.0	241.99
122677	LASCRUC	0830	12.0	-1.5	100.0	42.0	4.0	-2.0	94.6	86.	0.17	0.0	242.16
122777	LASCRUC	0830	10.0	1.5	100.0	85.0	6.5	5.0	52.2	85.	0.05	0.05	242.21
122877	LASCRUC	0830	11.5	5.0	100.0	70.0	8.5	8.0	69.2	94.	0.11	0.05	242.32
122977	LASCRUC	0830	11.0	1.0	100.0	55.0	5.0	5.0	180.5	122.	0.17	0.66	242.49
123077	LASCRUC	0830	16.5	-1.5	100.0	47.0	6.0	6.0	232.8	125.	0.24	0.0	242.73
	MEAN		16.8	-2.5	83.1	37.9	5.2	2.5	242.4	155.	0.37		
	STANDARD DEV		4.4	4.4	13.4	14.3	3.4	3.1	66.2	93.	0.24		

Appendix B

DAILY FLOW OF IRRIGATION RETURN WATER

Table B-1. Daily flow of irrigation return water in the La Mesa drainage canal at Site D in 1976.

Day	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec
						m^3/sec						
1	.224	.157	.235	.470	.694	.829	.902	.840	.549	.325	.078	.134
2	.218	.179	.235	.448	.739	.750	.946	.874	.538	.314	.078	.123
3	.207	.185	.258	.437	.750	.767	.963	.902	.610	.291	.056	.123
4	.224	.185	.246	.448	.795	.818	.952	.834	.538	.258	.056	.112
5	.218	.190	.241	.459	.840	.857	.930	.840	.650	.246	.056	.112
6	.224	.174	.246	.487	.829	.907	.913	.818	.605	.196	.056	.101
7	.213	.241	.207	.482	.773	.941	.907	.907	.616	.207	.056	.101
8	.196	.224	.218	.526	.784	.958	.918	.935	.504	.224	.056	.095
9	.213	.235	.224	.532	.762	.890	.907	.885	.493	.179	.056	.101
10	.213	.218	.241	.532	.790	.885	.885	.874	.504	.146	.045	.101
11	.202	.196	.269	.577	.795	.851	.874	.874	.504	.112	.045	.095
12	.207	.213	.263	.549	.773	.834	.885	.885	.448	.101	.078	.090
13	.213	.190	.319	.566	.762	.829	.874	.862	.465	.112	.123	.078
14	.179	.235	.325	.571	.773	.806	.952	.851	.414	.112	.095	.084
15	.185	.235	.330	.605	.784	.806	.952	.902	.414	.106	.090	.067
16	.168	.235	.353	.594	.745	.773	.930	.885	.426	.101	.084	.067
17	.168	.246	.364	.650	.784	.812	.918	.874	.454	.073	.078	.078
18	.168	.230	.386	.655	.806	.818	.907	.885	.437	.062	.078	.078
19	.168	.241	.325	.638	.806	.806	.902	.885	.482	.050	.067	.078
20	.162	.252	.336	.610	.750	.812	.902	.896	.482	.045	.073	.056
21	.078	.263	.374	.610	.829	.829	.907	.907	.482	.045	.112	.067
22	.084	.263	.370	.627	.879	.829	.885	.930	.482	.056	.112	.062
23	.101	.274	.437	.638	.857	.851	.868	.941	.482	.078	.134	.056
24	.106	.269	.392	.616	.857	.907	.862	.890	.403	.078	.129	.051
25	.101	.269	.403	.627	.851	.862	.851	.874	.437	.056	.056	.056
26	.101	.263	.403	.638	.829	.834	.829	.784	.448	.022	.185	.045
27	.118	.263	.414	.627	.818	.918	.840	.638	.515	.062	.174	.045
28	.146	.274	.448	.616	.818	.874	.829	.403	.420	.078	.202	.045
29	.157		.454	.627	.812	.913	.829	.403	.403	.078	.213	.078
30	.168		.437	.706	.851	.896	.829	.403	.347	.078	.213	.090
31	.174		.437		.829		.829	.638		.078		.090

Table B-2. Daily flow of irrigation return water in the La Mesa drainage canal at Site D in 1977.

Day	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec
						m^3/sec						
1	.275	.248	.167	.266	.465	.641	.574	.506	.582	.456	.334	.352
2	.271	.253	.167	.275	.492	.628	.596	.497	.560	.461	.330	.366
3	.271	.271	.153	.284	.573	.614	.582	.483	.578	.474	.343	.370
4	.266	.253	.149	.284	.564	.605	.601	.483	.551	.465	.325	.357
5	.266	.257	.144	.280	.569	.573	.646	.537	.537	.452	.316	.361
6	.262	.253	.140	.284	.573	.560	.614	.515	.569	.452	.334	.348
7	.253	.248	.144	.298	.537	.555	.673	.587	.578	.424	.352	.352
8	.257	.253	.140	.312	.555	.546	.628	.582	.587	.375	.357	.352
9	.253	.262	.126	.312	.560	.555	.637	.605	.560	.357	.339	.366
10	.244	.253	.162	.325	.564	.555	.623	.573	.537	.361	.330	.375
11	.248	.244	.135	.330	.569	.542	.596	.515	.555	.325	.339	.379
12	.244	.235	.126	.339	.623	.560	.614	.524	.574	.316	.334	.384
13	.253	.226	.104	.393	.646	.528	.582	.510	.564	.321	.334	.370
14	.253	.221	.158	.366	.641	.537	.574	.506	.582	.330	.334	.370
15	.248	.199	.144	.352	.632	.524	.587	.542	.592	.334	.339	.361
16	.248	.176	.135	.370	.628	.501	.564	.497	.533	.339	.339	.361
17	.248	.181	.167	.370	.637	.528	.546	.506	.519	.325	.339	.348
18	.257	.176	.172	.375	.637	.564	.574	.497	.528	.348	.343	.339
19	.275	.167	.172	.397	.632	.533	.564	.483	.492	.325	.343	.361
20	.257	.172	.185	.393	.628	.542	.555	.479	.465	.325	.334	.348
21	.262	.167	.190	.379	.623	.555	.578	.474	.456	.316	.339	.357
22	.271	.144	.190	.388	.619	.560	.587	.489	.452	.312	.348	.361
23	.257	.154	.199	.402	.614	.510	.560	.501	.461	.307	.361	.366
24	.257	.172	.208	.411	.610	.533	.574	.489	.447	.316	.370	.379
25	.253	.172	.208	.420	.637	.546	.582	.542	.461	.334	.357	.366
26	.253	.162	.217	.438	.623	.551	.582	.524	.456	.325	.343	.352
27	.257	.162	.235	.442	.632	.560	.569	.560	.442	.339	.348	.357
28	.244	.162	.235	.461	.628	.560	.537	.564	.456	.348	.357	.375
29	.248		.226	.452	.614	.537	.555	.546	.452	.352	.330	.370
30	.253		.266	.465	.619	.551	.551	.569	.465	.339	.343	.379
31	.253		.257		.632			.573		.334		.375

Appendix C

ELECTRICAL CONDUCTIVITY AND FLOW OF LA MESA DRAIN

Table C-1. Electrical conductivity (mmhos/cm) and flow (m^3/sec) of water at La Mesa drain sampling Sites A, B, C, and D during 1975. (Sampling was begun in April.)

Site A		Site B		Site C		Site D	
Date	ECX10^3	ECX10^3	Flow (m^3/sec)	Date	ECX10^3	ECX10^3	Flow (m^3/sec)
4-21-75	1.37	1.39	-	4-21-75	1.39	1.33	-
4-28-75	1.49	1.50	-	4-28-75	1.49	1.52	-
5-05-75	1.46	1.41	-	5-05-75	1.43	1.45	-
5-12-75	1.40	1.49	-	5-12-75	1.52	1.52	-
5-19-75	1.42	1.43	-	5-19-75	1.41	1.36	-
5-26-75	1.50	1.52	-	5-26-75	1.53	1.54	-
6-02-75	1.42	1.42	.725	6-02-75	1.43	1.46	.767
6-09-75	1.46	1.49	.623	6-09-75	1.51	1.52	.710
6-16-75	1.40	1.43	.743	6-16-75	1.46	1.48	.725
6-23-75	1.36	1.36	.822	6-23-75	1.41	1.38	.812
6-30-75	1.29	1.28	.754	6-30-75	1.44	1.33	.774
7-07-75	1.29	1.32	.799	7-07-75	1.28	1.40	.858
7-14-75	1.35	1.36	.898	7-14-75	1.31	1.38	.846
7-21-75	1.43	1.50	.878	7-21-75	1.47	1.47	.963
7-28-75	1.43	1.42	.942	7-28-75	1.46	1.46	1.000
8-04-75	1.07	1.11	1.296	8-04-75	1.11	1.11	1.150
8-11-75	1.43	1.45	1.024	8-11-75	1.46	1.48	.982
8-18-75	1.40	1.45	.983	8-18-75	1.46	1.48	.977
8-25-75	1.38	1.40	1.096	8-25-75	1.36	1.35	1.082
9-01-75	1.41	1.43	1.118	9-01-75	1.44	1.45	1.028
9-08-75	1.39	1.41	1.056	9-08-75	1.47	1.44	.969
9-16-75	1.64	1.64	.928	9-16-75	1.57	1.61	.870
9-23-75	1.51	1.56	.882	9-23-75	1.51	1.57	.843
9-30-75	1.46	1.49	.934	9-30-75	1.46	1.47	.801
10-07-75	1.73	1.74	.642	10-07-75	1.76	1.76	.642
10-14-75	1.71	1.82	.537	10-14-75	1.81	1.83	.427
10-21-75	2.01	1.88	.574	10-21-75	1.87	1.88	.548
10-28-75	1.91	1.93	.381	10-28-75	1.91	1.92	.424
11-04-75	1.62	1.73	.375	11-04-75	1.72	1.69	.359
11-11-75	1.63	1.71	.350	11-11-75	1.72	1.64	.370
11-18-75	1.74	1.78	.345	11-18-75	1.80	1.80	.362
11-26-75	1.84	1.88	-	11-26-75	1.86	1.88	-
12-02-75	2.00	1.98	.320	12-02-75	1.96	1.99	.310
12-09-75	1.94	1.94	.290	12-09-75	1.93	1.93	.291
12-16-75	1.61	1.70	.281	12-16-75	1.64	1.66	.257
12-30-75	1.89	1.83	.287	12-23-75	-	1.51	-
				12-30-75	1.91	1.88	.266
Mean	1.54	1.56	.720		1.56	1.57	.704
SD	.22	.21	.296		.21	.21	.280
Weighted Mean		1.497				1.510	

Table C-2. Electrical conductivity (mmhos/cm) and flow m^3/sec) of water at La Mesa drain sampling Sites A, B, C, and D during 1976.

Site A		Site B		Site C		Site D	
Date	ECX10^3	ECX10^3	Flow (m^3/sec)	Date	ECX10^3	ECX10^3	Flow (m^3/sec)
1-06-76	1.67	1.65	.242	1-06-76	1.62	1.70	.272
1-13-76	1.89	1.90	.259	1-13-76	1.89	1.92	.216
1-21-76	1.93	1.95	.226	1-21-76	1.91	1.93	.203
1-26-76	1.71	1.74	.273	1-26-76	1.74	1.74	.259
2-02-76	1.16	1.18	-	2-02-76	1.39	1.33	-
2-07-76	1.52	1.50	.394	2-07-76	1.62	1.57	.376
2-14-76	1.60	1.62	.347	2-14-76	1.62	1.63	.319
2-21-76	1.49	1.50	.316	2-21-76	1.46	1.46	.336
2-28-76	1.60	1.49	.341	2-28-76	1.54	1.57	.340
3-06-76	1.46	1.49	.308	3-06-76	1.53	1.52	.329
3-13-76	1.41	1.44	.385	3-13-76	1.47	1.44	.363
3-20-76	1.36	1.32	.459	3-20-76	1.40	1.33	.469
3-27-76	1.38	1.43	.503	3-27-76	1.42	1.43	.497
4-03-76	1.38	1.41	.544	4-03-76	1.43	1.47	.408
4-10-76	1.34	1.40	.385	4-10-76	1.40	1.43	.528
4-17-76	1.41	1.42	.715	4-17-76	1.44	1.46	.672
4-24-76	1.42	1.40	.645	4-24-76	1.44	1.46	.650
5-01-76	1.39	1.39	.720	5-01-76	1.41	1.42	.563
5-08-76	1.51	1.52	.851	5-08-76	1.54	1.54	.765
5-15-76	1.44	1.46	.788	5-15-76	1.49	1.45	.929
5-20-76	1.50	1.56	.921	5-20-76	1.54	1.56	.805
5-28-76	1.39	1.40	.735	5-28-76	1.43	1.46	.774
6-07-76	1.44	1.39	.925	6-07-76	1.38	1.39	.810
6-11-76	1.48	1.47	.591	6-11-76	-	1.58	.714
6-21-76	1.38	1.41	.543	6-21-76	1.41	1.42	.791
6-28-76	1.35	1.40	.723	6-28-76	1.39	1.38	.750
7-08-76	1.28	1.24	.615	7-08-76	1.29	1.30	1.055
7-13-76	1.30	1.30	.816	7-13-76	1.34	1.33	.913
7-19-76	1.39	1.35	.771	7-19-76	-	1.42	-
7-26-76	1.33	1.37	.920	7-26-76	-	1.43	1.020
8-03-76	1.31	1.28	.940	8-03-76	1.33	1.31	.748
8-11-76	1.25	1.29	.863	8-11-76	1.28	1.23	.492
8-18-76	1.30	1.29	.986	8-18-76	1.31	1.30	.480
8-25-76	1.21	1.28	.543	8-25-76	1.22	1.23	.774
8-31-76	1.29	1.28	1.008	8-31-76	1.33	1.39	-
9-07-76	1.38	1.30	1.002	9-07-76	1.41	1.35	-
9-14-76	1.61	1.60	.830	9-14-76	1.63	1.63	.612
9-23-76	1.45	1.65	.946	9-23-76	1.45	1.41	1.055
9-28-76	1.58	1.50	.773	9-28-76	1.54	-	1.083
10-05-76	1.82	1.69	.702	10-05-76	1.69	1.69	.865
10-12-76	1.84	1.84	.523	10-12-76	1.84	1.84	.466
10-19-76	1.62	1.60	.461	10-19-76	1.61	1.76	.507
10-26-76	1.78	1.79	.489	10-26-76	1.75	1.80	.414
11-02-76	1.83	1.81	.464	11-02-76	1.84	1.82	.443
11-09-76	1.88	1.85	.416	11-09-76	1.85	1.90	.510
11-16-76	1.88	1.81	.372	11-16-76	1.89	1.91	.498
11-23-76	1.89	1.89	.355	11-23-76	1.89	1.88	.468
11-30-76	1.85	1.68	.328	11-30-76	1.90	1.76	.476
12-07-76	1.89	1.88	.352	12-07-76	1.88	1.88	.333
12-14-76	1.88	1.86	.323	12-14-76	1.85	1.88	.338
12-21-76	1.95	1.90	.360	12-21-76	1.93	1.96	.301
12-28-76	-	1.81	-	12-28-76	-	1.79	-
Mean	1.54	1.54	.586		1.56	1.56	.574
SD	.23	.21	.241		.21	.21	.244
Weighted Mean		1.489				1.527	

Table C-3. Electrical conductivity (mmhos/cm) and flow m^3/sec) of water at La Mesa drain sampling Sites A, B, C, and D during 1977.

Site A		Site B		Site C		Site D	
Date	ECX10^3	ECX10^3	Flow (m^3/sec)	Date	ECX10^3	ECX10^3	Flow (m^3/sec)
1-04-77	1.69	1.89	.327	1-04-77	1.68	1.90	.304
1-11-77	1.93	1.94	.330	1-11-77	1.93	1.93	.323
1-18-77	2.08	2.06	.280	1-18-77	2.05	2.05	.324
1-26-77	1.99	2.03	.301	1-26-77	2.02	2.06	.294
2-02-77	2.09	2.11	.282	2-02-77	2.08	2.09	.320
2-09-77	2.05	2.06	.274	2-09-77	2.04	2.06	.229
2-16-77	2.07	2.07	-	2-16-77	2.07	2.06	-
2-23-77	2.07	2.06	.265	2-23-77	2.04	2.05	.217
3-02-77	2.08	2.12	-	3-02-77	2.04	2.01	-
3-09-77	2.03	1.98	.172	3-09-77	1.98	1.97	.157
3-16-77	2.01	2.01	.172	3-16-77	1.99	1.99	.140
3-23-77	1.61	1.61	.267	3-23-77	1.62	1.61	.187
3-30-77	1.54	1.55	.314	3-30-77	1.55	1.54	.309
4-06-77	1.41	1.45	.261	4-06-77	1.46	1.47	.332
4-13-77	1.43	1.44	.479	4-13-77	1.45	1.45	.553
4-20-77	1.28	1.28	.408	4-20-77	1.33	1.39	.442
4-28-77	1.32	1.32	-	4-28-77	1.33	1.33	-
5-04-77	1.32	1.33	-	5-04-77	1.32	1.34	-
5-11-77	1.48	1.49	.502	5-11-77	1.48	1.47	.592
5-18-77	1.53	1.53	.429	5-18-77	1.54	1.55	.557
5-25-77	1.44	1.39	.586	5-25-77	1.50	1.46	.585
6-01-77	1.58	1.55	.564	6-01-77	1.53	1.55	.596
6-08-77	1.62	1.61	.370	6-08-77	1.62	1.62	.371
6-15-77	1.67	1.67	.453	6-15-77	1.66	1.65	.472
6-22-77	1.60	1.57	.609	6-22-77	1.66	1.59	.603
6-29-77	1.51	1.50	.652	6-29-77	1.51	1.52	.680
7-06-77	1.42	1.38	.800	7-06-77	1.34	1.38	.660
7-13-77	1.50	1.49	.686	7-13-77	1.50	1.50	.705
7-20-77	1.50	1.44	.649	7-20-77	1.52	1.42	.653
7-27-77	1.50	1.51	.630	7-27-77	1.51	1.50	.646
8-03-77	1.46	1.47	.616	8-03-77	1.49	1.52	.669
8-10-77	1.42	1.43	.633	8-10-77	1.43	1.43	.691
8-17-77	1.55	1.56	.630	8-24-77	1.38	1.37	-
8-24-77	1.37	1.36	.635	8-31-77	-	-	.738
8-31-77	-	-	.622	9-08-77	1.50	1.49	.646
9-08-77	1.49	1.50	.667	9-15-77	1.74	1.76	.646
9-15-77	1.75	1.82	.668	9-22-77	1.93	1.96	.464
9-22-77	1.90	1.93	.368	9-29-77	2.03	2.03	.396
9-29-77	2.05	2.04	.374	10-06-77	1.81	1.81	.398
10-06-77	1.84	1.84	.378	10-13-77	-	-	.294
10-13-77	-	-	.221	10-20-77	2.09	2.09	.310
10-20-77	2.06	2.08	.244	10-27-77	-	-	.308
10-27-77	-	-	.249	11-03-77	2.00	2.01	.400
11-03-77	2.01	2.01	.236	11-10-77	1.95	1.37	.208
11-10-77	1.37	1.97	.151	11-17-77	-	-	.178
11-17-77	-	-	.185	12-01-77	-	-	.161
12-01-77	-	-	.204	12-08-77	2.05	2.05	.183
12-08-77	2.04	2.06	.182	12-15-77	2.05	2.03	.177
12-15-77	2.05	1.92	.184	12-22-77	2.00	2.04	.161
12-22-77	2.03	2.03	.186	12-29-77	-	-	.166
12-29-77	-	-	.186				
Mean	1.71	1.72	.402		1.72	1.72	.410
SD	.28	.28	.188		.27	.28	.192
Weighted Mean		1.636				1.651	

Appendix D

COMPLETE WATER ANALYSIS

OF LA MESA DRAIN WATER

Table D-1. Water analysis of the La Mesa drain water sampled at Site A, 1975.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
A	4/21/75	1.37	7.97	15.19	14.00	5.83	2.04	7.09	0.23	3.77	0.0	3.26	6.96	0.66
A	5/ 5/75	1.46	7.99	16.28	15.30	6.78	2.07	7.19	0.24	3.60	0.0	4.52	7.16	1.31
A	5/19/75	1.42	8.24	16.64	15.45	6.78	2.24	7.40	0.22	3.62	0.0	4.62	7.20	0.47
A	6/ 2/75	1.42	8.11	14.95	15.39	5.85	2.04	6.85	0.21	3.43	0.0	4.80	7.16	0.19
A	6/16/75	1.40	8.00	12.22	12.54	4.11	1.51	6.36	0.24	3.35	0.0	2.50	6.68	0.38
A	6/30/75	1.29	8.29	12.78	12.96	3.59	1.69	7.24	0.26	3.50	0.0	2.18	7.28	0.0
A	7/14/75	1.35	8.32	14.85	13.80	5.73	2.01	6.87	0.24	3.39	0.36	3.08	6.96	0.47
A	7/28/75	1.43	7.85	15.61	15.24	6.50	1.89	7.00	0.22	3.35	0.0	4.64	7.24	0.47
A	8/11/75	1.43	8.27	15.21	14.93	6.68	1.92	6.39	0.22	3.45	0.0	4.78	6.68	1.48
A	8/25/75	1.38	7.64	14.58	13.57	6.14	1.86	6.35	0.23	3.29	0.0	4.12	6.13	1.76
A	9/ 8/75	1.39	7.90	15.29	14.46	6.63	1.89	6.53	0.24	3.39	0.0	4.60	6.47	0.0
A	9/23/75	1.51	8.36	16.58	16.14	7.24	2.11	6.99	0.24	3.90	0.0	4.98	7.24	1.29
A	10/ 7/75	1.73	7.89	19.53	18.62	8.16	2.57	8.56	0.24	4.34	0.0	5.56	8.70	1.45
A	10/21/75	2.01	7.95	20.58	21.03	10.00	2.78	7.51	0.29	6.44	0.0	5.64	8.95	0.0
A	11/ 4/75	1.62	7.86	22.02	20.88	11.44	2.99	7.30	0.29	5.43	0.0	5.36	10.06	1.85
A	11/18/75	1.74	8.27	19.92	20.61	9.61	2.81	7.23	0.27	5.25	0.0	6.00	9.32	2.47
A	12/ 2/75	2.00	8.06	19.93	20.85	9.74	2.74	7.39	0.06	5.21	0.0	5.82	9.78	2.34
A	12/16/75	1.61	7.87	20.16	20.89	9.98	2.76	7.14	0.28	5.27	0.0	5.68	9.92	1.43
A	12/30/75	1.89	7.86	21.02	20.93	10.72	2.81	7.24	0.25	5.33	0.0	5.64	9.96	0.0
Mean		1.55	8.04	17.02	16.72	7.45	2.25	7.09	0.24	4.17	0.02	4.62	7.89	0.95
Std. Dev.		0.22	0.20	2.94	3.17	2.22	0.45	0.51	0.05	0.98	0.08	1.13	1.35	0.82

Table D-2. Water analysis of the La Mesa drain water sampled at Site B, 1975.

Site	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
B	4/21/75	1.39	7.94	15.28	14.48	5.78	2.11	7.18	0.21	3.74	0.0	3.36	7.36	1.37
B	5/ 5/75	1.41	7.92	15.49	14.64	5.88	2.11	7.25	0.25	3.70	0.0	3.48	7.44	1.53
B	5/19/75	1.43	8.34	17.48	15.99	7.46	2.23	7.56	0.23	3.67	0.0	4.82	7.48	1.39
B	6/ 2/75	1.42	8.18	15.59	15.31	6.38	2.11	6.88	0.22	3.42	0.0	4.76	7.12	0.57
B	6/16/75	1.43	8.10	14.22	14.94	6.05	1.71	6.21	0.25	3.51	0.0	4.66	6.76	0.38
B	6/30/75	1.28	8.28	16.13	12.86	6.96	2.05	6.87	0.25	3.42	0.0	2.20	7.24	0.0
B	7/14/75	1.36	8.38	14.89	13.89	5.73	1.99	6.93	0.24	3.43	0.0	3.54	6.92	0.28
B	7/28/75	1.42	8.23	15.91	14.91	6.68	2.02	6.98	0.23	3.46	0.0	3.64	7.80	0.63
B	8/11/75	1.45	8.08	16.15	15.85	6.92	2.00	7.00	0.23	3.54	0.0	4.82	7.47	1.35
B	8/25/75	1.40	7.84	14.45	13.22	6.18	1.87	6.15	0.25	3.33	0.0	4.14	5.73	1.44
B	9/ 8/75	1.41	7.98	14.77	14.55	6.37	1.87	6.26	0.25	3.41	0.0	4.64	6.50	0.0
B	9/23/75	1.56	8.33	16.59	16.76	7.88	2.24	6.22	0.25	3.98	0.0	5.00	7.77	0.67
B	10/ 7/75	1.74	7.99	17.27	18.70	5.49	2.67	8.86	0.25	4.40	0.0	5.54	8.73	1.73
B	10/21/75	1.88	7.81	18.46	19.84	5.98	2.78	9.43	0.27	5.51	0.0	5.44	8.89	0.30
B	11/ 4/75	1.73	7.82	22.23	22.01	11.35	3.18	7.42	0.28	5.53	0.0	5.98	10.50	0.0
B	11/18/75	1.78	8.27	20.06	21.77	9.80	2.82	7.19	0.25	5.26	0.0	5.90	10.56	2.95
B	12/ 2/75	1.98	8.10	20.67	21.12	10.21	2.96	7.44	0.06	5.25	0.0	5.64	10.18	2.86
B	12/16/75	1.70	7.89	19.95	21.03	9.84	2.81	7.02	0.28	5.36	0.0	5.64	10.00	1.91
B	12/30/75	1.83	7.85	20.19	20.03	9.84	2.76	7.32	0.27	5.43	0.0	4.57	10.03	0.0
Mean		1.56	8.07	17.15	16.94	7.41	2.33	7.17	0.24	4.18	0.0	4.62	8.13	1.02
Std. Dev.		0.21	0.19	2.41	3.11	1.84	0.44	0.83	0.05	0.88	0.0	1.01	1.48	0.92

Table D-3. Water analysis of the La Mesa drain water sampled at Site C, 1975.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
C	4/21/75	1.39	8.04	15.03	14.23	5.38	2.06	7.35	0.24	4.09	0.0	2.64	7.48	1.02
C	5/ 5/75	1.43	7.94	15.33	14.58	5.78	2.15	7.17	0.23	3.77	0.0	3.40	7.40	0.69
C	5/19/75	1.41	8.28	16.69	15.46	7.10	2.21	7.17	0.21	3.57	0.0	4.72	7.16	0.81
C	6/ 2/75	1.43	8.14	15.53	15.48	6.19	2.11	7.02	0.21	3.44	0.0	4.76	7.28	0.12
C	6/16/75	1.46	7.70	14.31	15.35	6.05	1.78	6.24	0.24	3.52	0.0	4.70	7.12	0.53
C	6/30/75	1.44	8.35	14.67	12.13	5.08	2.04	7.30	0.25	2.69	0.0	2.04	7.40	0.0
C	7/14/75	1.31	8.38	14.04	13.67	5.36	1.98	6.46	0.24	3.38	0.0	3.32	6.96	0.80
C	7/28/75	1.46	7.66	15.46	15.91	6.57	1.91	6.75	0.23	3.48	0.0	4.82	7.60	0.63
C	8/11/75	1.46	8.01	15.55	16.06	6.74	2.00	6.58	0.23	3.60	0.0	4.84	7.60	1.35
C	8/25/75	1.36	8.12	14.02	13.78	5.77	1.75	6.27	0.23	3.10	0.0	4.08	6.58	1.51
C	9/ 8/75	1.47	7.76	15.96	14.62	6.67	1.92	7.08	0.29	3.68	0.0	4.60	6.32	1.00
C	9/23/75	1.51	8.38	17.76	16.53	7.32	2.13	8.06	0.25	4.04	0.0	5.04	7.43	1.29
C	10/ 7/75	1.76	7.93	19.46	19.14	7.73	2.68	8.80	0.25	4.53	0.0	5.56	9.01	2.28
C	10/21/75	1.87	8.10	19.00	19.59	5.99	2.74	9.99	0.28	5.09	0.0	5.46	9.04	0.0
C	11/ 4/75	1.72	8.01	21.15	21.59	10.65	2.95	7.29	0.26	5.34	0.0	5.82	10.40	2.15
C	11/18/75	1.80	8.50	19.28	21.17	9.30	2.69	7.03	0.26	4.90	0.0	5.96	10.25	3.95
C	12/ 2/75	1.96	8.24	20.43	20.73	10.13	2.86	7.38	0.06	5.25	0.0	5.62	9.81	3.11
C	12/16/75	1.64	8.12	20.48	20.84	10.22	2.81	7.19	0.26	5.35	0.0	5.50	9.96	1.91
C	12/30/75	1.91	8.06	21.19	21.34	10.76	2.89	7.29	0.25	5.41	0.0	5.71	10.22	0.0
Mean		1.57	8.09	17.12	16.96	7.30	2.30	7.29	0.24	4.12	0.0	4.66	8.16	1.22
Std. Dev.		0.20	0.23	2.57	3.08	1.93	0.42	0.88	0.05	0.86	0.0	1.11	1.38	1.08

Table D-4. Water analysis of the La Mesa drain water sampled at Site D, 1975.

Site	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
D	4/21/75	1.33	8.04	14.43	13.79	4.89	2.06	7.26	0.22	3.77	0.0	2.56	7.44	1.16
D	5/ 5/75	1.45	8.22	16.33	15.04	6.37	2.17	7.52	0.27	3.74	0.0	3.96	7.28	3.62
D	5/19/75	1.36	8.20	15.46	14.95	5.95	2.13	7.17	0.21	3.57	0.0	3.88	7.48	1.05
D	6/ 2/75	1.46	8.22	15.96	15.57	6.46	2.13	7.17	0.22	3.50	0.0	4.82	7.24	0.80
D	6/16/75	1.48	8.00	14.13	15.49	5.76	1.77	6.36	0.24	3.58	0.0	4.74	7.16	0.61
D	6/30/75	1.33	8.31	16.88	15.60	7.20	2.14	7.28	0.26	3.74	0.0	4.30	7.56	0.0
D	7/14/75	1.38	8.41	13.39	13.41	4.55	1.89	6.70	0.25	2.55	0.0	4.10	6.76	0.28
D	7/28/75	1.46	8.33	16.41	15.84	6.88	2.03	7.27	0.23	3.55	0.0	4.20	8.08	0.88
D	8/11/75	1.48	7.94	15.93	16.20	6.78	2.00	6.92	0.23	3.58	0.0	4.80	7.80	1.48
D	8/25/75	1.35	8.47	14.32	12.96	5.93	1.79	6.35	0.25	3.22	0.20	3.92	5.60	1.26
D	9/ 8/75	1.44	8.04	16.32	15.23	6.67	1.98	7.41	0.26	3.33	0.0	4.90	7.00	0.0
D	9/23/75	1.57	8.20	15.84	16.48	7.20	2.10	6.28	0.26	4.04	0.0	5.04	7.37	1.58
D	10/ 7/75	1.76	7.88	18.44	19.19	7.10	2.48	8.56	0.30	4.52	0.0	5.66	8.98	1.86
D	10/21/75	1.88	8.03	21.66	19.71	9.44	2.66	9.27	0.29	5.11	0.0	5.50	9.10	0.0
D	11/ 4/75	1.69	7.99	21.00	21.14	10.43	3.07	7.25	0.25	5.43	0.0	5.02	10.68	0.54
D	11/18/75	1.80	8.31	20.11	21.99	9.76	2.81	7.27	0.27	5.27	0.0	6.10	10.56	3.95
D	12/ 2/75	1.99	7.96	20.79	21.24	10.38	2.96	7.39	0.06	5.33	0.0	5.72	10.15	2.24
D	12/16/75	1.66	7.91	20.57	21.06	10.10	2.75	7.43	0.29	5.44	0.0	5.52	10.07	2.07
D	12/30/75	1.88	7.98	21.91	21.24	11.33	2.93	7.38	0.27	5.41	0.0	5.57	10.26	0.0
Mean		1.57	8.13	17.36	17.17	7.54	2.31	7.28	0.24	4.14	0.01	4.75	8.24	1.23
Std. Dev.		0.21	0.18	2.79	3.03	2.04	0.42	0.70	0.05	0.91	0.05	0.86	1.49	1.14

Table D-5. Water analysis of the La Mesa drain water sampled at Site A, 1976.

Site	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
A	1/13/76	1.89	8.03	22.14	21.61	11.33	3.02	7.52	0.27	5.43	0.0	6.07	10.11	0.0
A	1/26/76	1.71	--	19.07	19.31	9.86	2.43	6.55	0.23	4.27	0.0	6.81	8.23	0.0
A	2/ 7/76	1.52	7.69	17.57	17.38	7.01	2.36	7.96	0.24	4.20	0.0	5.57	7.61	0.0
A	2/21/76	1.49	8.22	16.93	16.60	6.14	2.55	7.96	0.28	4.58	0.0	4.07	7.93	1.11
A	3/ 6/76	1.46	8.11	16.89	16.06	6.59	2.31	7.76	0.23	4.13	0.0	4.86	7.06	0.89
A	3/20/76	1.36	8.29	16.64	15.92	6.80	2.25	7.36	0.23	4.14	0.0	5.04	6.73	0.69
A	4/ 3/76	1.38	8.25	16.27	15.80	6.25	2.12	7.69	0.21	3.69	0.0	5.00	7.09	1.35
A	4/10/76	1.34	8.30	16.06	15.27	6.57	2.08	7.17	0.24	3.63	0.0	4.82	6.80	1.50
A	5/ 1/76	1.39	8.09	14.52	14.29	5.14	2.10	7.07	0.21	3.44	0.0	4.62	6.21	1.22
A	5/15/76	1.44	8.48	16.35	15.84	6.52	2.21	7.41	0.21	3.70	0.0	4.54	7.59	0.50
A	5/28/76	1.39	8.43	14.94	15.08	6.37	1.96	6.39	0.22	3.54	0.65	3.65	7.22	1.10
A	6/11/76	1.48	7.64	16.57	16.89	7.23	2.09	7.01	0.24	3.86	1.11	4.25	7.67	0.06
A	6/28/76	1.35	8.54	15.40	15.31	6.37	2.05	6.75	0.23	3.57	1.68	3.30	6.76	0.28
A	7/13/76	1.30	8.42	14.97	14.36	6.19	1.99	6.56	0.23	3.32	0.64	3.84	6.56	0.15
A	7/26/76	1.33	8.44	15.12	14.41	5.72	2.14	7.06	0.20	3.62	0.72	3.06	6.96	3.03
A	8/11/76	1.25	8.46	14.02	14.33	5.53	1.98	6.30	0.21	3.25	0.44	4.08	6.52	2.20
A	8/25/76	1.21	8.39	13.69	14.31	4.77	2.02	6.53	0.37	3.62	0.24	2.58	7.80	4.25
A	9/ 7/76	1.38	8.65	14.56	14.50	5.40	2.12	6.82	0.22	3.66	0.96	1.80	8.04	2.64
A	9/23/76	1.45	8.57	15.71	16.02	6.31	2.25	6.92	0.23	3.83	0.32	3.66	8.12	5.62
A	10/ 5/76	1.82	7.88	20.29	20.06	9.65	2.54	7.87	0.23	5.78	0.0	5.44	8.84	0.04
A	10/19/76	1.62	8.18	19.63	21.54	7.33	2.89	9.18	0.23	4.73	0.60	3.28	12.84	5.50
A	11/ 2/76	1.83	8.42	23.39	24.68	10.57	2.95	9.64	0.23	5.14	0.84	5.06	13.60	2.29
A	11/16/76	1.88	8.23	23.56	23.50	10.53	2.87	9.93	0.23	5.36	0.0	5.74	12.36	2.45
A	11/30/76	1.85	7.69	23.48	22.75	10.53	2.82	9.91	0.22	5.50	0.64	5.38	11.20	2.05
A	12/14/76	1.88	7.93	24.80	24.53	10.97	2.98	10.60	0.25	5.38	0.0	6.40	12.72	2.00
Mean		1.52	8.22	17.70	17.61	7.43	2.36	7.68	0.24	4.21	0.35	4.52	8.50	1.64
Std. Dev.		0.22	0.29	3.37	3.51	2.06	0.36	1.23	0.03	0.79	0.46	1.21	2.25	1.62

Table D-6. Water analysis of the La Mesa drain water sampled at Site B, 1976.

Site	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
B	1/13/76	1.90	8.00	22.47	21.16	11.60	3.08	7.53	0.26	5.46	0.0	5.78	9.92	0.0
B	1/26/76	1.74	--	18.98	19.39	9.90	2.31	6.51	0.26	4.36	0.0	6.78	8.23	1.26
B	2/ 7/76	1.50	7.66	17.34	17.02	6.70	2.39	8.01	0.24	4.20	0.0	5.17	7.65	0.06
B	2/21/76	1.50	8.19	16.98	16.55	6.14	2.58	7.99	0.27	4.54	0.0	4.12	7.86	1.69
B	3/ 6/76	1.49	8.27	16.96	17.08	6.71	2.28	7.74	0.23	4.23	0.0	4.94	7.89	1.11
B	3/20/76	1.32	8.35	15.74	15.44	6.00	2.21	7.30	0.23	4.07	0.0	4.40	6.95	1.22
B	4/ 3/76	1.41	8.26	16.61	15.91	6.25	2.25	7.88	0.23	3.86	0.0	5.26	6.76	1.70
B	4/10/76	1.40	8.41	16.13	15.55	6.62	2.08	7.19	0.24	3.73	0.16	4.74	6.88	2.50
B	5/ 1/76	1.39	8.23	14.77	14.57	4.95	2.12	7.48	0.22	3.45	0.0	4.70	6.40	1.41
B	5/15/76	1.46	8.45	16.22	15.53	6.56	2.25	7.20	0.21	3.75	0.73	3.52	7.51	1.32
B	5/28/76	1.40	8.34	14.81	15.15	6.33	1.83	6.44	0.21	3.49	0.54	3.90	7.20	1.10
B	6/11/76	1.47	8.30	15.66	16.17	6.38	1.90	7.14	0.24	3.88	0.0	4.64	7.63	1.39
B	6/28/76	1.40	8.55	13.85	14.10	5.00	2.03	6.59	0.23	3.55	0.88	2.74	6.92	0.59
B	7/13/76	1.30	8.54	14.84	14.05	6.19	1.97	6.44	0.24	3.35	0.0	4.08	6.60	1.38
B	7/26/76	1.37	8.59	15.85	15.15	6.41	2.16	7.08	0.20	3.62	0.48	3.88	7.12	2.87
B	8/11/76	1.29	8.27	14.50	14.22	5.55	1.98	6.75	0.22	3.28	0.48	4.08	6.32	3.59
B	8/25/76	1.28	8.66	14.61	15.31	5.75	1.96	6.69	0.21	3.47	0.80	3.32	7.68	2.20
B	9/ 7/76	1.30	8.24	14.18	14.81	4.38	2.12	7.44	0.24	3.87	0.0	2.62	8.24	5.26
B	9/23/76	1.65	8.43	19.51	18.76	9.45	2.42	7.40	0.24	6.57	0.96	3.80	7.40	2.06
B	10/ 5/76	1.69	8.37	18.18	19.05	8.09	1.79	8.08	0.22	4.38	0.68	4.70	9.24	3.19
B	10/19/76	1.60	8.36	19.11	20.80	7.18	2.88	8.82	0.23	4.76	0.76	2.74	12.48	3.90
B	11/ 2/76	1.81	8.39	23.08	23.98	10.53	2.95	9.37	0.23	5.08	0.84	5.02	13.00	2.32
B	11/16/76	1.81	8.10	21.68	20.74	8.96	2.86	9.63	0.23	5.42	0.0	4.40	10.88	2.35
B	11/30/76	1.68	8.13	21.99	21.64	9.27	2.81	9.68	0.23	5.35	0.52	4.20	11.52	2.85
B	12/14/76	1.86	8.07	24.79	23.57	11.08	3.05	10.41	0.25	5.28	0.0	6.30	11.96	1.95
B	12/28/76	1.81	8.10	23.42	22.89	10.01	2.96	10.22	0.23	5.45	0.0	5.40	12.00	2.30
Mean		1.53	8.29	17.78	17.64	7.38	2.35	7.81	0.23	4.32	0.30	4.43	8.55	1.98
Std. Dev.		0.20	0.21	3.26	3.16	2.03	0.41	1.18	0.02	0.86	0.36	1.03	2.10	1.18

Table D-7. Water analysis of the La Mesa drain water sampled at Site C, 1976.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
C	1/13/76	1.89	7.97	22.20	21.60	11.25	3.01	7.67	0.27	5.48	0.0	5.85	10.26	0.49
C	1/26/76	1.74	--	19.01	19.62	9.79	2.41	6.58	0.23	4.43	0.0	6.76	8.42	0.91
C	2/ 7/76	1.62	8.35	17.78	18.52	6.82	2.44	8.28	0.24	4.36	0.0	6.29	7.87	0.0
C	2/21/76	1.46	8.06	16.22	16.04	6.03	2.54	7.38	0.27	4.47	0.0	3.72	7.79	3.79
C	3/ 6/76	1.53	8.19	16.74	17.25	6.58	2.36	7.56	0.24	4.32	0.0	4.90	8.00	1.63
C	3/20/76	1.40	8.26	17.15	16.36	7.33	2.25	7.34	0.23	4.14	0.0	5.24	6.95	1.70
C	4/ 3/76	1.43	8.36	16.35	15.64	6.29	2.19	7.65	0.22	3.79	0.0	4.98	6.84	1.91
C	4/10/76	1.40	8.30	16.23	15.97	6.59	2.13	7.27	0.24	3.83	0.0	4.98	7.13	1.72
C	5/ 1/76	1.41	8.04	15.29	14.77	5.28	2.11	7.67	0.23	3.53	0.0	4.68	6.54	0.95
C	5/15/76	1.49	8.38	16.75	16.26	6.70	2.21	7.62	0.22	3.78	1.08	4.07	7.31	1.25
C	5/28/76	1.43	7.97	15.11	15.75	6.90	1.99	6.01	0.21	3.56	1.04	3.92	7.20	1.62
C	6/28/76	1.39	8.42	14.15	14.01	5.18	2.05	6.69	0.23	3.57	0.40	3.12	6.92	0.28
C	7/13/76	1.34	8.53	15.39	15.18	6.70	1.98	6.46	0.25	3.96	0.96	3.68	6.56	1.05
C	8/11/76	1.28	8.66	14.98	14.84	6.54	1.90	6.33	0.21	3.30	0.76	4.26	6.52	0.21
C	8/25/76	1.22	8.38	14.05	14.20	4.77	2.11	6.94	0.23	3.62	0.28	2.20	8.04	3.85
C	9/ 7/76	1.41	8.34	15.41	16.25	5.67	2.24	7.27	0.23	3.78	0.40	3.60	8.40	4.06
C	9/23/76	1.45	8.49	16.00	16.03	6.29	2.20	7.29	0.22	3.88	0.60	3.28	8.16	6.78
C	10/ 5/76	1.69	8.33	18.43	19.36	7.90	2.40	7.92	0.21	4.38	0.92	4.64	9.36	3.72
C	10/19/76	1.61	8.43	20.37	22.07	7.99	2.93	9.22	0.23	4.90	0.80	3.50	12.80	4.60
C	11/ 2/76	1.84	8.36	23.22	22.22	10.73	3.01	9.25	0.23	5.15	0.88	5.06	11.08	2.90
C	11/16/76	1.89	7.58	23.84	23.38	10.87	2.93	9.81	0.23	5.41	0.0	5.90	12.04	2.15
C	11/30/76	1.90	7.64	23.55	23.11	10.66	2.90	9.76	0.23	5.53	0.72	5.58	11.24	2.55
C	12/14/76	1.85	7.99	24.38	23.25	10.71	2.97	10.46	0.24	5.27	0.0	6.18	11.76	2.25
Mean		1.55	8.23	17.94	17.90	7.55	2.40	7.76	0.23	4.28	0.38	4.63	8.57	2.19
Std. Dev.		0.21	0.27	3.32	3.20	2.05	0.37	1.19	0.02	0.70	0.42	1.16	1.97	1.66

Table D-8. Water analysis of the La Mesa drain water sampled at Site D, 1976.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
D	1/13/76	1.92	8.00	23.04	21.55	12.02	3.09	7.67	0.26	5.44	0.0	6.00	10.11	0.17
D	1/26/76	1.74	--	18.93	19.60	9.82	2.37	6.51	0.23	4.45	0.0	6.73	8.42	0.0
D	2/ 7/76	1.57	7.76	18.65	17.97	7.73	2.47	8.21	0.24	4.38	0.0	5.47	8.12	0.06
D	2/21/76	1.46	8.23	15.89	15.43	5.73	2.54	7.34	0.28	4.52	0.0	3.23	7.64	2.79
D	3/ 6/76	1.52	8.12	16.91	16.62	6.66	2.32	7.69	0.24	4.25	0.0	5.00	7.35	1.53
D	3/20/76	1.33	8.30	16.41	15.77	6.57	2.30	7.32	0.22	4.07	0.0	4.70	6.98	1.40
D	4/ 3/76	1.47	8.48	16.90	15.26	6.25	2.12	8.30	0.23	3.92	0.0	4.23	7.09	1.05
D	4/10/76	1.43	8.17	16.33	15.85	6.59	2.18	7.32	0.24	3.87	0.0	4.96	7.00	1.38
D	5/ 1/76	1.42	8.13	15.46	14.73	5.32	2.23	7.69	0.22	3.53	0.0	4.71	6.47	1.30
D	5/15/76	1.45	8.52	17.35	16.68	6.79	2.35	7.99	0.22	3.93	1.08	3.94	7.71	1.25
D	5/28/76	1.46	8.23	15.89	16.13	6.55	1.92	7.20	0.22	3.55	1.31	3.90	7.36	0.69
D	6/11/76	1.58	8.06	15.76	17.01	7.30	2.12	6.04	0.30	4.06	1.04	4.29	7.59	1.60
D	6/28/76	1.38	8.48	13.92	14.04	4.88	2.04	6.76	0.24	3.61	0.60	2.94	6.88	0.37
D	7/13/76	1.33	8.29	15.48	14.98	6.70	2.01	6.53	0.24	3.41	0.88	4.08	6.60	0.50
D	7/26/76	1.43	8.63	16.26	15.57	6.92	2.14	6.99	0.21	3.81	0.68	4.06	6.96	3.58
D	8/11/76	1.23	8.59	14.03	13.53	5.68	1.99	6.15	0.21	3.27	0.56	3.34	6.32	2.35
D	8/25/76	1.23	8.44	13.88	14.17	4.69	2.03	6.94	0.22	3.54	0.44	2.26	7.88	2.92
D	9/ 7/76	1.35	8.23	15.40	15.88	5.52	2.21	7.44	0.23	3.81	0.0	3.68	8.32	4.51
D	9/23/76	1.41	8.52	15.55	16.07	6.37	2.23	6.73	0.22	3.86	0.60	3.22	8.28	7.12
D	10/ 5/76	1.69	8.10	18.44	19.17	8.26	2.39	7.58	0.21	4.17	0.96	4.62	9.36	3.91
D	10/19/76	1.76	8.43	19.87	20.83	7.64	2.99	9.01	0.23	4.78	0.24	4.06	11.68	4.30
D	11/ 2/76	1.82	8.48	22.93	22.08	10.41	2.92	9.37	0.23	5.07	0.96	5.00	11.00	2.80
D	11/16/76	1.91	7.60	23.70	22.05	10.61	2.93	9.93	0.23	5.46	0.0	5.82	10.72	2.80
D	11/30/76	1.76	8.16	22.17	21.35	9.44	2.82	9.68	0.23	5.37	0.88	4.10	10.96	2.45
D	12/14/76	1.88	8.11	24.75	24.08	11.03	3.12	10.35	0.25	5.32	0.0	6.20	12.52	2.25
D	12/28/76	1.79	8.14	22.54	22.14	9.78	2.92	9.60	0.24	5.44	0.36	4.70	11.60	2.70
Mean		1.55	8.25	17.94	17.64	7.51	2.41	7.78	0.23	4.26	0.41	4.43	8.50	2.15
StD. Dev.		0.21	0.25	3.29	3.07	2.04	0.38	1.20	0.02	0.70	0.44	1.05	1.85	1.65

Table D-9. Water analysis of the La Mesa drain water sampled at Site A, 1977.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
								(meq/l)						(ppm)
A	1/11/77	1.93	7.99	22.16	22.87	10.28	2.86	8.77	0.25	5.23	0.84	5.32	11.44	2.20
A	1/26/77	1.99	8.14	21.93	22.32	7.29	2.79	11.62	0.23	5.27	0.0	5.66	11.36	1.70
A	2/ 9/77	2.05	8.32	21.89	22.31	9.87	2.54	9.26	0.22	5.49	0.28	5.46	11.06	1.45
A	2/23/77	2.07	8.22	22.30	22.04	9.57	2.84	9.62	0.27	5.50	0.48	4.96	11.06	2.55
A	3/ 9/77	2.03	8.28	21.28	22.36	9.25	2.73	9.05	0.25	5.44	0.0	5.56	11.35	0.75
A	3/23/77	1.61	8.14	16.68	17.34	7.27	2.18	6.98	0.25	4.09	0.40	4.42	8.42	0.80
A	4/ 6/77	1.41	8.43	14.69	15.01	5.96	2.00	6.55	0.18	3.68	0.48	3.60	7.25	0.15
A	4/20/77	1.28	8.49	13.93	14.08	5.93	1.88	5.92	0.20	3.40	0.52	3.30	6.86	0.30
A	5/ 4/77	1.32	8.60	14.07	14.53	5.78	1.74	6.32	0.23	3.36	0.84	3.52	6.81	--
A	6/ 1/77	1.58	7.55	16.02	16.61	6.72	2.02	7.03	0.25	4.02	0.0	4.86	7.72	0.40
A	7/13/77	1.50	7.99	15.32	15.62	6.66	1.84	6.60	0.22	3.58	0.44	3.76	7.84	--
A	8/ 3/77	1.46	7.25	14.57	15.23	6.57	1.74	6.05	0.21	3.33	0.0	4.76	7.12	1.30
A	9/15/77	1.75	8.10	17.45	17.85	7.91	2.25	7.08	0.21	4.35	0.0	5.04	8.44	1.10
A	10/ 6/77	1.84	8.28	18.89	18.84	8.50	2.48	7.68	0.23	4.50	0.0	5.04	9.28	1.00
A	12/ 8/77	2.04	8.24	21.45	20.90	9.51	2.70	8.97	0.27	5.41	0.0	5.40	10.06	1.70
Mean		1.72	8.13	18.18	18.53	7.80	2.31	7.83	0.23	4.44	0.29	4.71	9.07	1.18
Std. Dev.		0.29	0.35	3.35	3.31	1.57	0.42	1.64	0.03	0.87	0.31	0.80	1.82	0.73

Table D-10. Water analysis of the La Mesa drain water sampled at Site B, 1977.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
B	1/11/77	1.94	7.96	21.90	22.71	10.15	2.83	8.67	0.25	5.22	0.80	5.26	11.40	2.05
B	1/26/77	2.03	8.05	22.59	23.05	10.15	2.88	9.34	0.22	5.33	0.0	5.88	11.81	1.75
B	2/ 9/77	2.06	8.38	22.97	22.26	10.38	2.93	9.43	0.23	5.54	0.44	5.08	11.17	1.70
B	2/23/77	2.06	8.26	22.25	22.06	9.38	2.77	9.83	0.27	5.47	0.0	5.68	10.87	2.30
B	3/ 9/77	1.98	8.22	21.14	22.02	9.43	2.81	8.66	0.24	5.28	0.0	5.58	11.15	0.68
B	3/23/77	1.61	8.17	16.66	17.30	7.39	2.17	6.85	0.25	4.12	0.36	4.50	8.31	0.80
B	4/ 6/77	1.45	8.51	14.85	15.60	6.08	1.90	6.69	0.18	3.71	0.76	3.84	7.29	0.25
B	4/20/77	1.28	8.29	14.20	13.89	6.09	1.90	6.01	0.20	3.40	0.44	3.38	6.67	0.06
B	5/ 4/77	1.33	8.63	13.84	13.91	5.93	1.79	5.89	0.23	3.38	0.20	3.52	6.81	--
B	6/ 1/77	1.55	8.33	16.30	16.37	7.06	2.11	6.88	0.25	3.90	0.44	4.42	7.60	0.50
B	7/13/77	1.49	8.03	15.28	16.07	6.76	1.90	6.40	0.22	3.59	0.56	4.04	7.88	--
B	8/ 3/77	1.47	7.26	14.72	15.46	6.73	1.60	6.16	0.23	3.34	0.0	4.74	7.36	1.30
B	9/15/77	1.82	8.22	18.49	17.84	8.66	2.50	7.12	0.21	4.28	0.0	4.98	8.56	1.35
B	10/ 6/77	1.84	8.15	18.53	19.22	8.10	2.42	7.78	0.23	4.54	0.0	4.86	9.80	1.00
B	12/ 8/77	2.06	8.26	21.70	20.91	9.51	2.76	9.15	0.28	5.46	0.0	5.36	10.06	1.65
Mean		1.73	8.18	18.36	18.58	8.12	2.35	7.66	0.23	4.44	0.27	4.74	9.12	1.18
Std. Dev.		0.29	0.31	3.44	3.34	1.63	0.46	1.39	0.03	0.87	0.29	0.78	1.85	0.70

Table D-11. Water analysis of the La Mesa drain water sampled at Site C, 1977.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
C	1/11/77	1.95	7.99	22.36	22.28	10.28	2.86	8.97	0.25	4.86	0.16	5.66	11.56	2.40
C	1/26/77	2.02	8.04	22.89	22.51	8.06	2.89	11.71	0.23	5.32	0.0	5.72	11.44	2.00
C	2/ 9/77	2.04	8.36	21.25	22.31	9.34	2.66	9.02	0.23	5.54	0.44	5.12	11.17	2.35
C	2/23/77	2.04	8.17	21.65	22.16	9.10	2.77	9.50	0.28	5.63	0.0	5.62	10.87	2.55
C	3/ 9/77	1.98	8.34	21.37	21.71	9.11	2.74	9.26	0.26	5.34	0.20	5.16	11.00	0.85
C	3/23/77	1.62	8.17	17.55	17.48	7.65	2.30	7.34	0.26	4.13	0.32	4.56	8.46	0.90
C	4/ 6/77	1.46	8.47	15.41	15.66	6.35	2.14	6.73	0.19	3.83	0.48	3.58	7.76	0.52
C	4/20/77	1.33	8.58	14.82	15.00	6.24	1.95	6.42	0.21	3.58	1.00	3.36	7.06	0.10
C	5/ 4/77	1.32	8.62	14.30	14.58	5.97	1.79	6.30	0.24	3.39	0.96	3.46	6.77	—
C	6/ 1/77	1.53	8.56	16.21	16.29	6.98	2.07	6.92	0.24	3.86	0.80	3.98	7.64	0.60
C	7/13/77	1.50	8.10	15.23	15.74	6.94	1.86	6.21	0.22	3.60	0.32	3.94	7.88	—
C	8/ 3/77	1.49	7.29	14.92	15.64	6.55	1.95	6.21	0.21	3.42	0.0	4.80	7.40	1.42
C	9/15/77	1.74	8.17	17.74	18.08	7.91	2.28	7.33	0.22	4.33	0.0	5.08	8.64	1.60
C	10/ 6/77	1.81	8.19	18.46	18.33	8.24	2.38	7.62	0.22	4.43	0.0	4.92	8.96	1.20
C	12/ 8/77	2.05	8.21	21.79	20.79	9.21	2.69	9.62	0.27	5.52	0.0	5.20	10.03	2.30
Mean		1.73	8.22	18.40	18.57	7.86	2.36	7.94	0.24	4.45	0.31	4.68	9.11	1.45
Std. Dev.		0.28	0.32	3.18	3.06	1.34	0.39	1.64	0.03	0.84	0.36	0.82	1.73	0.82

Table D-12. Water analysis of the La Mesa drain water sampled at Site D, 1977.

Site	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
								(meq/l)						(ppm)
D	1/11/77	1.93	8.07	21.52	22.38	9.82	2.76	8.69	0.25	5.14	0.84	4.84	11.52	2.40
D	1/26/77	2.06	7.96	22.67	23.13	8.29	2.93	11.20	0.25	5.44	0.0	5.72	11.94	2.00
D	2/ 9/77	2.06	8.30	21.92	22.26	9.77	2.55	9.35	0.25	5.59	0.0	5.54	11.10	2.15
D	2/23/77	2.05	8.25	21.96	21.69	9.38	2.83	9.48	0.27	5.48	0.40	4.86	10.91	2.50
D	3/ 9/77	1.97	8.27	21.44	21.92	9.03	2.74	9.42	0.25	5.31	0.0	5.48	11.12	0.85
D	3/23/77	1.61	8.19	16.98	17.36	7.24	2.17	7.32	0.25	4.09	0.64	4.16	8.46	0.80
D	4/ 6/77	1.47	8.28	15.18	15.73	5.45	2.02	7.52	0.19	3.84	0.32	3.84	7.72	0.70
D	4/20/77	1.39	8.56	15.43	15.62	6.71	2.03	6.47	0.22	3.79	0.80	3.74	7.29	0.25
D	5/ 4/77	1.34	8.62	13.54	14.11	5.89	1.76	5.66	0.23	3.37	0.20	3.64	6.90	--
D	6/ 1/77	1.55	8.43	16.74	16.71	6.79	2.04	7.66	0.25	4.02	0.40	4.52	7.76	0.60
D	7/13/77	1.50	8.12	16.35	16.27	7.30	2.01	6.82	0.22	3.59	0.68	4.16	7.84	--
D	8/ 3/77	1.52	7.33	15.35	16.10	6.91	1.88	6.30	0.26	3.66	0.0	4.58	7.84	1.25
D	9/15/77	1.76	8.15	18.03	17.86	8.22	2.38	7.22	0.21	4.40	0.0	4.84	8.60	1.50
D	10/ 6/77	1.81	8.16	18.70	18.39	8.19	2.44	7.85	0.22	4.43	0.0	4.86	9.08	1.40
D	12/ 8/77	2.05	8.29	21.70	20.94	9.14	2.65	9.65	0.26	5.42	0.0	5.28	10.21	1.80
Mean		1.74	8.20	18.50	18.70	7.88	2.35	8.04	0.24	4.50	0.29	4.67	9.22	1.40
Std. Dev.		0.27	0.30	3.10	3.03	1.39	0.38	1.53	0.02	0.81	0.32	0.66	1.73	0.73

Appendix E

PIEZOMETER HEIGHTS

Table E-1. Water stage below surface measured in piezometers (1975).

Date	Piezometer No.																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	(meters)																		
8-25-75	1.7	1.9	1.6	1.6	1.2	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5	1.5	1.6	1.4	1.5	1.5	-
9-02-75	1.3	1.9	1.5	1.5	1.2	1.5	1.4	1.3	1.3	1.2	1.3	1.3	1.4	1.5	1.5	1.3	1.4	1.5	-
9-08-75	1.2	1.9	1.6	1.6	1.2	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.4	1.4	1.4	1.3	1.4	1.5	1.6
9-16-75	-	1.9	1.6	1.6	1.3	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.5	1.6
9-23-75	1.3	2.0	1.7	1.7	1.3	1.6	1.7	1.5	1.6	1.5	1.5	1.5	1.4	1.5	1.4	1.4	1.5	1.8	1.7
9 30-75	1.5	2.0	1.8	1.7	1.4	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.4	1.5	1.3	1.5	1.6	1.7	1.7
10-07-75	1.6	2.1	1.8	1.8	1.4	1.8	1.7	1.7	1.7	1.6	1.7	1.6	1.4	1.5	1.5	1.5	1.6	1.7	1.7
10-12-75	1.7	2.2	1.8	1.9	1.4	1.9	1.8	1.7	1.7	1.7	1.7	1.6	1.4	1.6	1.5	1.5	1.7	1.8	-
10-22-75	1.7	2.2	2.0	1.9	1.5	1.9	1.8	2.1	1.8	1.7	1.8	1.7	1.5	1.7	1.5	1.6	1.7	1.8	1.9
10-28-75	1.8	2.2	2.0	2.0	1.5	2.0	1.9	1.8	1.8	1.8	1.8	1.8	1.5	1.8	1.6	1.7	1.7	1.9	1.9
11-04-75	1.9	2.3	2.0	2.0	1.5	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.5	1.8	1.6	1.7	1.8	1.9	1.9
11-11-75	2.0	2.2	2.1	2.1	1.5	2.1	2.0	1.9	2.0	1.9	1.9	1.8	1.6	1.9	1.6	1.7	1.9	2.0	2.0
11-18-75	1.9	2.3	2.1	2.1	1.6	2.0	2.0	2.0	2.0	1.9	1.9	1.8	1.7	1.8	1.6	1.7	1.9	2.0	2.0
12-18-75	-	2.4	2.1	2.2	1.6	2.1	2.1	2.0	2.0	2.0	2.0	1.9	1.9	1.9	1.6	1.8	2.0	2.0	-
12-30-75	2.0	2.4	2.2	2.0	1.6	2.2	2.2	2.1	2.4	2.0	1.7	2.0	2.0	2.0	1.6	1.9	2.0	2.0	2.0

Table E-2. Water stage below surface measured in piezometers (1976).

Date	Piezometer No. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	(meters)																		
1-06-76	2.1	2.5	2.3	2.3	1.6	2.3	2.3	2.2	2.2	2.0	2.2	2.0	2.1	2.0	1.6	2.0	2.0	2.0	2.1
1-13-76	2.1	2.4	2.3	2.3	1.6	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.3	2.0	1.6	2.0	2.0	2.0	2.1
1-21-76	2.6	2.5	2.4	2.3	1.7	2.3	2.2	2.1	2.1	2.0	2.0	2.0	-	-	1.6	-	2.0	2.0	2.1
1-29-76	2.2	2.5	2.3	2.3	1.7	2.3	2.2	2.2	2.2	2.1	2.0	2.0	1.9	1.9	1.9	2.0	-	2.0	2.0
2-07-76	2.2	2.5	2.3	2.3	1.8	2.3	2.3	2.2	2.2	2.1	2.1	2.1	2.0	2.0	1.6	1.9	2.0	2.0	2.1
2-21-76	2.2	2.6	2.4	2.3	1.9	2.3	2.3	2.2	2.2	2.0	2.2	2.1	2.1	2.1	1.6	2.0	2.0	2.0	2.1
2-28-76	2.2	2.6	2.3	2.3	1.9	2.3	2.3	2.2	2.2	2.2	2.2	2.1	2.1	2.1	1.7	2.2	2.0	1.9	2.2
3-06-76	2.2	2.7	2.3	2.3	2.0	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	1.7	2.0	2.0	2.0	2.1
3-13-76	2.2	2.6	2.3	2.2	2.0	2.3	2.3	2.2	2.2	2.1	2.2	2.1	2.1	2.1	1.7	2.0	2.0	2.0	2.1
3-20-76	2.0	2.4	2.0	2.2	2.0	2.2	2.1	2.0	2.1	1.9	2.0	2.0	2.0	1.9	1.7	1.9	2.0	2.1	2.1
3-27-76	1.9	2.3	2.0	2.0	2.0	2.0	2.0	1.8	2.0	1.8	1.9	1.8	1.9	1.9	1.7	1.8	1.9	2.0	2.1
4-03-76	1.9	2.3	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.9	1.8	1.8	1.8	1.8	1.8	1.7	1.8	1.9	2.1
4-10-76	1.8	2.3	1.9	2.0	1.9	2.0	1.9	1.7	1.7	1.8	1.8	1.7	1.8	1.8	1.7	1.7	1.8	1.9	2.1
4-17-76	1.8	2.2	1.9	2.0	1.9	2.0	1.9	1.8	1.9	1.8	1.9	1.8	1.8	1.8	1.7	1.7	1.8	1.6	2.0
4-24-76	1.7	2.2	2.0	2.0	1.9	2.0	2.0	1.9	1.9	1.9	1.9	1.9	-	1.9	-	1.7	-	1.8	2.1
5-01-76	1.7	2.2	1.9	1.9	1.8	1.9	1.9	1.7	1.8	1.8	1.8	1.7	-	1.7	1.7	1.6	-	1.8	1.8
5-08-76	1.7	2.1	1.8	1.8	1.9	1.9	1.9	1.8	1.9	1.8	1.8	1.8	-	1.8	1.7	1.6	-	1.8	1.8
5-15-76	1.6	2.1	1.7	1.7	1.7	1.6	1.5	1.4	1.5	1.5	1.6	1.7	-	1.7	1.7	1.6	-	1.8	1.7
5-20-76	1.7	2.0	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.7	1.7	1.7	-	1.6	1.8	1.6	-	1.8	2.1
5-28-76	2.1	2.1	1.8	1.9	1.9	2.0	1.8	1.8	1.8	1.7	1.8	1.7	-	1.8	1.8	1.7	-	1.8	1.8
6-07-76	1.7	2.0	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	-	1.8	1.8	1.7	-	1.8	1.9
6-21-76	-	2.1	1.9	1.8	1.8	1.8	1.8	1.8	1.9	1.7	1.7	1.6	-	1.6	1.7	1.9	-	1.8	1.8
6-29-76	-	2.0	1.5	1.6	1.9	1.5	1.3	1.3	1.4	1.3	1.4	1.5	-	-	1.7	1.8	-	1.8	1.7

Table E-2. Water stage below surface measured in piezometers (1976) (continued).

Date	Piezometer No. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	(meters)																		
7-08-76	-	2.0	1.7	1.7	1.9	1.7	1.6	1.7	1.7	1.6	1.4	1.6	-	-	1.7	1.8	-	1.8	1.7
8-11-76	-	2.0	1.6	1.6	1.5	1.6	1.7	1.7	1.5	1.4	1.4	1.7	-	-	1.5	-	-	-	1.6
8-25-76	-	1.9	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.4	1.5	1.4	-	-	1.5	1.4	-	-	1.5
8-31-76	-	2.0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.7	-	-	1.5	1.4	-	-	1.7
9-07-76	-	1.8	1.5	1.5	1.6	1.5	1.5	1.5	-	1.4	1.5	1.4	-	-	1.5	1.3	-	-	1.8
9-14-76	-	2.0	1.3	1.4	1.3	1.6	1.4	1.3	1.3	1.2	1.3	1.3	-	-	1.3	1.2	-	-	1.6
9-23-76	-	2.0	1.7	1.7	1.6	1.8	1.8	1.7	1.7	1.6	1.7	1.6	-	-	1.6	1.5	-	-	1.6
9-29-76	-	2.0	1.7	1.7	1.6	1.8	1.7	1.6	1.7	1.5	1.7	-	-	-	1.6	1.5	-	-	1.7
10-05-76	-	2.2	1.9	1.9	1.7	1.9	1.9	1.8	1.8	1.6	1.8	1.7	-	-	1.6	1.5	-	-	2.0
10-12-76	-	2.3	1.9	1.9	1.6	2.0	1.9	1.9	1.8	1.6	1.9	1.8	-	-	1.7	1.5	-	-	2.1
10-19-76	-	2.3	2.0	2.0	1.6	2.0	2.0	1.9	1.9	1.6	1.9	1.5	-	-	1.8	1.6	-	-	2.1
10-26-76	-	2.2	1.9	1.9	1.6	1.9	1.9	1.8	1.8	1.6	1.9	1.8	-	-	1.7	1.5	-	-	2.1
11-02-76	-	2.3	2.0	2.0	1.5	2.0	2.0	1.9	1.9	1.6	1.9	1.8	-	-	1.7	1.6	-	-	2.1
11-09-76	-	2.3	2.0	2.0	1.6	2.0	1.9	1.9	1.9	1.6	1.9	1.8	-	-	1.7	1.6	-	-	2.1
11-16-76	-	2.3	2.1	2.1	1.6	2.1	2.0	2.0	2.0	1.6	2.0	1.9	-	-	1.8	1.7	-	-	2.1
11-23-76	-	2,3	2.1	2.1	1.6	2.1	2.0	2.0	2.0	1.6	2.0	1.9	-	-	1.8	1.7	-	-	2.1
11-30-76	-	2.3	2.1	2.0	1.6	2.0.	2.0	2.0	1.9	1.6	2.0	1.9	-	-	1.8	1.6	-	-	2.1
12-07-76	-	2.3	2.1	2.0	1.5	2.0	2.0	2.0	1.9	1.6	1.9	1.8	-	-	1.8	1.6	-	-	2.1
12-14-76	-	2.3	2.1	2.0	1.6	2.0	2.0	2.0	1.9	1.6	1.9	1.8	-	-	1.8	1.6	-	-	2.1

Table E-3. Water stage below surface measured in piezometers (1977).

Date	Piezometer No. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	(meters)																		
2-02-77	-	2.5	2.4	2.4	1.6	2.3	2.2	2.2	2.2	1.8	2.2	2.1	-	-	2.1	2.0	-	-	-
2-09-77	-	2.5	2.4	2.4	1.6	2.3	2.3	2.2	2.2	1.9	2.2	2.2	-	-	2.0	2.0	-	-	-
3-02-77	-	2.5	2.4	2.5	1.6	2.3	2.3	2.3	2.3	1.9	2.2	2.3	-	-	-	-	-	-	-
3-30-77	-	2.4	2.4	2.4	1.6	2.3	2.3	2.3	2.3	1.9	2.2	2.3	-	-	-	-	-	-	-
4-07-77	-	2.5	2.4	2.5	1.6	2.3	2.3	2.3	2.3	1.9	2.3	2.3	-	-	-	-	-	-	-
4-21-77	-	2.5	2.5	2.5	1.6	2.3	2.3	2.4	2.4	2.0	2.3	2.3	-	-	-	-	-	-	-
5-05-77	-	2.5	2.5	2.5	1.6	2.3	2.4	2.4	2.4	2.0	2.3	2.3	-	-	-	-	-	-	-
5-26-77	-	2.5	2.5	2.5	1.6	2.3	2.4	2.3	2.3	2.0	2.3	2.3	-	-	-	-	-	-	-
6-16-77	-	2.5	2.5	2.5	1.7	2.4	2.4	2.4	2.4	2.0	2.3	2.3	-	-	-	-	-	-	-
6-30-77	-	2.6	2.5	2.5	1.6	2.3	2.3	2.3	2.3	1.9	2.3	2.3	-	-	-	-	-	-	-
8-01-77	-	2.6	2.6	2.6	1.8	2.4	2.4	2.4	2.4	2.0	2.3	2.4	-	-	-	-	-	-	-
8-25-77	-	2.6	2.6	2.6	1.8	2.4	2.3	2.4	2.4	2.0	2.3	2.3	-	-	-	-	-	-	-
9-15-77	-	2.7	2.6	2.7	1.8	2.5	2.4	2.4	2.4	2.0	2.4	2.4	-	-	-	-	-	-	-
9-29-77	-	2.7	2.6	2.7	1.8	2.5	2.4	2.4	2.4	2.0	2.4	2.4	-	-	-	-	-	-	-
10-13-77	-	2.8	2.7	2.8	2.0	2.6	2.5	2.5	2.5	2.2	2.5	2.5	-	-	-	-	-	-	-
10-27-77	-	2.9	2.8	2.8	2.0	2.7	2.6	2.6	2.6	2.2	2.6	2.5	-	-	-	-	-	-	-
11-10-77	-	2.9	2.8	2.8	2.0	2.7	2.6	2.6	2.6	2.2	2.5	2.5	-	-	-	-	-	-	-
11-24-77	-	3.0	2.8	2.8	2.0	2.7	2.6	2.6	2.6	2.2	2.6	2.6	-	-	-	-	-	-	-
12-15-77	-	3.0	2.8	2.8	2.0	2.7	2.6	2.6	2.6	2.2	2.6	2.6	-	-	-	-	-	-	-
12-23-77	-	3.0	2.8	2.8	2.1	2.7	2.7	2.6	2.6	2.2	2.6	2.6	-	-	-	-	-	-	-

Appendix F

WATER QUALITY SAMPLE SITE WELLS

Table F-1. Water quality samples taken from observation well No. 1.

Well	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
1	3/20/76	2.06	8.23	25.21	24.69	8.27	4.28	12.36	0.30	6.04	0.0	6.46	11.50	43.08
1	4/ 3/76	2.15	8.43	25.92	25.58	8.38	4.26	12.97	0.31	6.31	0.0	6.50	11.62	71.28
1	4/10/76	2.08	8.18	25.02	25.53	7.91	4.08	13.00	0.03	6.24	0.0	5.30	13.20	48.96
1	5/ 1/76	2.20	8.11	25.34	25.37	6.58	4.54	13.96	0.26	6.48	0.0	4.70	13.20	61.60
1	5/15/76	2.16	8.44	25.76	25.22	8.86	4.56	12.05	0.29	6.42	0.0	4.88	13.15	48.00
1	5/28/76	2.22	7.65	24.20	24.75	7.83	4.01	12.02	0.34	6.46	0.0	4.42	13.12	46.50
1	6/28/76	2.15	8.19	22.66	22.45	5.94	4.34	12.03	0.35	6.41	0.0	3.80	11.84	24.60
1	7/13/76	2.03	8.25	22.88	22.50	6.45	4.49	11.91	0.03	6.23	0.0	4.28	11.64	21.78
1	7/26/76	1.93	8.18	24.38	23.74	7.09	4.72	12.25	0.32	6.01	0.0	3.88	13.30	34.00
1	8/11/76	1.86	8.14	22.94	21.73	6.04	4.45	12.13	0.32	6.02	0.0	3.58	11.60	33.10
1	8/25/76	1.85	8.43	22.52	21.75	6.11	4.55	11.53	0.33	5.76	0.53	2.56	12.44	28.70
1	9/ 7/76	1.84	8.29	20.49	21.65	5.20	4.15	10.82	0.32	5.61	0.0	3.02	12.56	28.70
1	9/23/76	1.98	8.47	22.21	21.98	7.17	4.19	10.55	0.30	5.27	0.40	4.70	11.44	10.78
1	10/ 5/76	2.00	7.81	21.55	23.29	7.45	4.01	9.80	0.29	5.11	0.0	6.02	11.40	46.90
1	10/21/76	1.81	8.41	21.68	22.55	6.06	4.61	10.68	0.33	5.08	0.48	3.38	13.16	28.00
1	12/14/76	1.84	7.90	24.14	23.16	8.57	4.08	11.20	0.29	4.94	0.0	6.28	11.36	36.00
1	12/28/76	1.85	7.96	24.07	23.17	8.93	4.44	10.38	0.32	5.24	0.24	5.34	11.72	39.00
Mean		2.00	8.18	23.59	23.48	7.23	4.34	11.74	0.28	5.86	0.10	4.65	12.25	38.29
Std. Dev.		0.14	0.24	1.61	1.44	1.16	0.23	1.07	0.10	0.54	0.19	1.21	0.78	14.92

Table F-1. Water quality samples taken from observation well No. 1 (continued)

Well	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
1	1/11/77	2.03	7.74	22.82	23.62	8.30	4.12	10.08	0.32	4.90	0.36	5.30	12.32	46.00
1	2/23/77	2.15	8.20	23.05	22.55	7.34	4.46	10.94	0.31	5.33	0.48	4.98	11.32	27.50
1	3/ 9/77	2.13	7.98	23.58	24.15	8.93	4.55	9.77	0.33	5.43	0.0	5.72	12.48	32.00
1	3/23/77	2.20	7.69	24.29	24.04	8.95	4.47	10.54	0.33	5.54	0.0	5.82	12.21	29.00
1	4/ 6/77	2.10	8.71	23.01	23.51	8.40	4.22	10.08	0.31	5.27	1.56	4.34	12.05	18.00
1	4/20/77	2.05	8.27	23.84	24.09	9.00	4.60	9.92	0.32	5.52	0.28	4.42	13.32	34.00
1	5/ 4/77	2.27	8.26	23.73	23.96	8.33	4.63	10.43	0.34	5.44	0.0	4.94	13.58	--
1	6/ 1/77	2.24	7.73	24.24	24.34	9.19	4.67	10.08	0.30	5.43	0.0	5.56	12.44	56.50
1	8/ 3/77	2.25	7.97	22.72	24.64	9.09	4.42	8.93	0.28	5.39	0.0	5.76	12.64	53.00
1	9/15/77	2.24	7.22	23.28	24.68	8.60	3.97	10.40	0.31	5.67	0.0	5.50	12.80	44.00
1	10/ 6/77	2.35	7.36	24.42	24.14	9.45	4.61	10.06	0.30	5.71	0.0	5.48	12.12	51.50
Mean		2.18	7.92	23.54	23.97	8.69	4.43	10.11	0.31	5.42	0.24	5.26	12.48	39.15
Std. Dev.		0.10	0.43	0.61	0.59	0.58	0.23	0.51	0.02	0.22	0.47	0.52	0.62	12.82

Table F-2. Water quality samples taken from observation well No. 2.

Well	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
								(meq/l)						(ppm)
2	3/20/76	2.50	8.09	31.82	30.31	10.72	5.48	15.30	0.32	9.59	0.0	6.02	14.70	0.05
2	4/ 3/76	2.67	8.17	33.88	32.31	12.34	5.37	15.86	0.31	10.14	0.0	6.26	15.90	0.50
2	4/10/76	2.66	8.04	33.06	31.57	11.30	5.21	16.52	0.03	10.06	0.0	5.50	16.00	0.52
2	5/ 1/76	2.73	8.15	31.58	30.31	9.17	5.37	16.72	0.32	9.80	0.0	5.50	15.00	0.52
2	5/15/76	2.75	8.41	32.48	31.28	12.20	5.25	14.72	0.31	10.04	0.0	5.42	15.81	0.39
2	5/28/76	2.65	7.71	28.50	29.12	10.33	4.58	13.24	0.35	9.30	0.0	3.84	15.84	8.52
2	6/28/76	2.62	8.32	28.76	27.79	8.90	4.97	14.53	0.36	9.55	0.0	4.14	14.10	0.0
2	7/13/76	2.56	8.17	29.14	28.22	10.14	4.93	14.04	0.03	9.36	0.0	4.42	14.44	0.30
2	7/26/76	2.40	8.08	30.13	29.01	10.40	5.13	14.28	0.32	9.11	0.0	3.96	15.90	2.79
2	8/11/76	2.41	8.16	27.89	26.32	8.82	4.95	13.80	0.32	9.17	0.0	3.14	13.96	3.19
2	8/25/76	2.31	8.19	28.05	27.73	9.20	4.97	13.53	0.35	9.03	0.36	2.08	16.24	1.05
2	9/ 7/76	2.33	8.06	27.85	28.10	8.92	4.99	13.61	0.33	9.05	0.0	2.74	16.28	1.71
2	9/23/76	2.49	8.19	27.31	27.75	10.27	4.82	11.92	0.30	8.68	0.52	3.68	14.84	2.10
2	10/ 5/76	2.52	8.06	28.45	28.66	11.35	4.87	11.94	0.29	8.48	0.0	5.42	14.76	0.01
2	10/21/76	2.15	8.38	27.32	27.42	9.04	5.05	12.91	0.32	7.69	0.44	2.96	16.24	5.45
2	12/14/76	2.36	7.77	30.89	29.80	12.38	5.00	13.22	0.29	8.24	0.0	5.58	15.92	3.65
2	12/28/76	2.31	7.62	30.05	28.75	12.03	4.81	12.91	0.30	8.11	0.0	5.56	15.08	0.15
Mean		2.50	8.09	29.83	29.09	10.44	5.04	14.06	0.29	9.14	0.08	4.48	15.35	1.82
Std. Dev.		0.17	0.22	2.11	1.63	1.30	0.23	1.42	0.10	0.71	0.18	1.28	0.78	2.33

Table F-2. Water quality samples taken from observation well No. 2 (continued).

Well	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
								(meq/l)						(ppm)
2	1/11/77	2.48	7.78	28.04	29.13	11.99	4.67	11.07	0.31	7.89	0.68	4.72	15.84	0.25
2	1/26/77	2.63	7.62	29.30	30.12	10.85	5.28	12.91	0.26	8.20	0.0	5.36	16.56	0.10
2	2/23/77	2.69	8.17	28.97	28.44	10.86	4.73	13.07	0.31	8.44	0.28	5.02	14.67	1.75
2	3/ 9/77	2.53	7.93	26.81	27.78	10.49	4.53	11.47	0.32	7.84	0.0	5.18	14.63	8.35
2	3/23/77	2.50	7.77	26.84	27.10	10.57	4.43	11.52	0.32	7.67	0.0	5.14	14.20	5.60
2	4/ 6/77	2.45	8.71	27.26	26.34	10.54	4.42	11.97	0.33	7.56	1.40	3.68	13.65	3.30
2	4/20/77	2.25	8.26	23.78	24.56	7.62	4.36	11.50	0.30	7.34	0.0	3.76	13.38	5.20
2	5/ 4/77	2.51	8.20	28.09	26.81	11.36	4.67	11.74	0.32	7.32	0.0	4.20	15.29	--
2	6/ 1/77	2.64	7.90	29.23	29.35	11.85	4.70	12.36	0.32	7.80	0.0	5.66	15.88	0.50
2	8/ 3/77	2.57	8.10	26.51	27.41	10.26	4.35	11.60	0.30	7.15	0.0	5.66	14.60	0.20
2	9/15/77	2.47	7.58	27.59	27.02	11.40	4.67	11.23	0.29	6.85	0.0	5.46	14.70	0.90
2	10/ 6/77	2.52	7.53	26.66	26.36	10.70	4.25	11.42	0.29	6.92	0.0	5.52	13.92	0.20
Mean		2.52	7.96	27.42	27.54	10.71	4.59	11.82	0.31	7.58	0.20	4.95	14.78	2.39
Std. Dev.		0.11	0.34	1.52	1.54	1.12	0.27	0.64	0.02	0.49	0.43	0.71	0.96	2.83

Table F-3. Water quality samples taken from observation well No. 3.

Well	Date	$EC \times 10^3$	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
3	3/20/76	2.59	8.16	32.59	31.15	9.01	3.91	19.33	0.34	9.47	0.0	6.78	14.90	0.0
3	4/ 3/76	2.62	8.20	33.01	32.30	10.48	3.57	18.66	0.30	9.23	0.0	6.56	16.50	0.55
3	5/ 1/76	2.61	8.07	26.71	27.53	6.99	3.49	15.91	0.32	8.62	0.0	5.71	13.20	0.21
3	5/15/76	2.72	8.37	30.01	30.84	10.45	3.85	15.37	0.34	9.36	0.0	5.42	16.05	0.69
3	5/28/76	2.71	7.48	31.04	31.21	10.07	3.73	16.87	0.37	9.06	1.69	4.46	16.00	0.10
3	6/28/76	2.56	8.51	26.88	27.11	6.10	3.33	17.06	0.39	8.87	0.44	3.56	14.24	0.10
3	7/13/76	2.61	8.32	29.12	27.77	7.51	3.72	17.85	0.04	9.25	0.0	4.28	14.24	0.05
3	7/26/76	2.41	8.10	31.71	30.33	9.21	3.57	18.58	0.35	8.86	0.0	4.04	17.40	2.11
3	8/11/76	2.69	8.08	30.04	28.30	7.27	3.70	18.70	0.37	9.53	0.0	4.32	14.44	0.85
3	8/25/76	2.59	8.21	30.65	30.35	7.62	3.85	18.79	0.39	9.90	0.0	2.98	17.44	1.99
3	9/ 7/76	2.65	8.16	28.56	29.97	7.26	3.80	17.04	0.46	10.25	0.0	3.02	16.70	0.0
3	9/23/76	2.96	8.15	31.47	32.21	9.40	3.85	17.86	0.36	10.08	0.36	4.50	17.24	1.92
3	10/ 5/76	2.97	7.74	33.82	34.06	10.77	3.96	18.74	0.35	9.98	0.0	6.96	17.12	0.02
3	10/21/76	2.72	8.39	33.83	32.43	9.74	4.58	19.13	0.38	9.45	0.52	3.94	18.52	0.20
3	12/14/76	2.75	7.72	36.48	34.56	12.85	4.34	18.95	0.34	9.64	0.0	6.76	18.16	0.30
3	12/28/76	2.76	7.43	36.69	34.81	12.54	4.10	19.67	0.38	9.93	0.0	6.84	18.04	0.05
Mean		2.68	8.07	31.41	30.93	9.20	3.83	18.03	0.34	9.47	0.19	5.01	16.26	0.57
Std. Dev.		0.14	0.32	2.94	2.43	1.98	0.31	1.25	0.09	0.48	0.44	1.42	1.62	0.76

Table F-3. Water quality samples taken from observation well No. 3 (continued).

Well	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
								(meq/l)						(ppm)
3	1/11/77	3.06	7.55	33.84	36.35	12.92	4.09	16.45	0.38	10.13	0.68	6.18	19.36	0.05
3	1/26/77	3.20	7.61	35.23	35.90	11.08	4.41	19.39	0.35	10.12	0.0	6.64	19.14	0.15
3	2/23/77	3.21	8.02	34.25	34.12	12.58	4.11	17.18	0.38	10.29	0.0	6.70	17.10	1.70
3	3/ 9/77	2.80	8.06	29.34	30.50	9.65	3.20	16.09	0.40	8.92	0.0	5.76	15.80	1.55
3	3/23/77	2.86	7.92	29.12	30.39	10.10	3.43	15.20	0.39	8.97	0.0	5.94	15.48	0.07
3	4/ 6/77	2.73	8.18	30.28	29.30	9.58	3.72	16.60	0.38	8.94	0.0	4.84	15.52	0.15
3	4/20/77	2.48	8.18	26.20	26.63	6.90	3.46	15.50	0.34	8.38	0.0	3.86	14.39	0.10
3	5/ 4/77	2.78	8.24	30.85	31.19	10.69	3.67	16.13	0.36	8.86	0.0	5.88	16.45	—
3	6/ 1/77	3.10	7.69	34.93	33.72	12.18	4.01	18.36	0.38	9.68	0.0	6.80	17.24	0.05
3	8/ 3/77	3.23	8.19	32.81	33.82	11.56	3.92	16.97	0.36	9.62	0.0	7.10	17.10	0.08
3	9/15/77	3.20	7.75	33.43	33.12	13.04	4.28	15.77	0.34	9.69	0.0	6.40	17.00	1.60
3	10/ 6/77	3.25	7.55	34.05	32.94	12.32	3.90	17.49	0.34	9.56	0.0	6.38	17.00	0.20
Mean		2.99	7.91	32.03	32.33	11.05	3.85	16.76[6]	0.37	9.43	0.06	6.04	16.80	0.52
Std. Dev.		0.25	0.27	2.82	2.82	1.79	0.36	1.21	0.02	0.61	0.20	0.91	1.44	0.71

Appendix G

WATER QUALITY OF THE TRICKLE IRRIGATION WELL

Table G-1. Water quality of the trickle irrigation well.

Well	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
I	3/20/76	0.52	8.42	6.68	6.39	1.47	0.70	4.41	0.10	1.27	0.16	3.44	1.52	0.0
I	4/ 3/76	0.54	8.50	6.65	6.35	1.47	0.69	4.38	0.11	1.34	0.0	3.44	1.56	0.48
I	4/10/76	0.55	8.18	6.59	6.41	1.79	0.66	4.02	0.12	1.35	0.0	3.62	1.43	0.40
I	5/ 1/76	0.55	8.09	6.63	6.41	1.75	0.75	4.02	0.11	1.27	0.0	3.78	1.36	0.27
I	5/15/76	0.55	8.41	6.71	6.39	1.61	0.75	4.24	0.11	1.28	0.0	3.44	1.67	0.20
I	5/28/76	0.62	7.94	7.08	6.82	1.33	0.70	4.93	0.12	1.32	0.0	4.04	1.46	0.10
Mean		0.55	8.26	6.72	6.46	1.57	0.71	4.33	0.11	1.30	0.03	3.63	1.50	0.24
Std. Dev.		0.03	0.22	0.18	0.18	0.18	0.04	0.34	0.01	0.04	0.07	0.24	0.11	0.18

Table G-1. Water quality of the trickle irrigation well (continued).

Well	Date	ECx10^3	pH	Cations	Anions	Ca	Mg	Na	K	Cl	CO_3	HCO_3	SO_4	NO_3
						(meq/l)								(ppm)
I	1/11/77	1.19	7.74	14.40	15.11	6.38	1.70	6.14	0.18	2.73	0.0	5.74	6.64	0.05
I	2/ 9/77	1.26	8.45	13.29	13.28	6.14	1.51	5.48	0.16	2.79	0.0	5.06	5.43	0.15
I	2/23/77	1.24	8.25	12.83	12.93	5.90	1.56	5.22	0.15	2.85	0.40	4.44	5.24	0.10
I	3/ 9/77	1.08	8.15	11.67	11.31	5.09	1.47	4.95	0.16	2.75	0.0	3.92	4.64	0.15
I	3/23/77	1.25	7.72	13.08	13.46	6.26	1.63	5.00	0.19	2.67	0.0	5.40	5.38	0.85
I	4/ 6/77	1.24	7.99	14.60	14.75	6.99	1.86	5.58	0.17	2.74	0.0	6.00	6.01	0.05
I	4/20/77	1.18	8.16	13.27	12.83	6.32	1.70	5.09	0.16	2.55	0.0	4.70	5.58	0.08
I	7/13/77	1.49	7.42	14.96	15.25	7.01	1.92	5.85	0.18	2.83	0.0	5.50	6.92	--
I	8/ 3/77	1.43	7.59	14.93	14.94	7.18	1.87	5.70	0.18	2.76	0.0	5.86	6.32	0.0
I	10/ 5/77	1.40	8.08	14.55	15.07	6.73	1.93	5.71	0.18	2.98	0.0	5.76	6.28	3.35
Mean		1.28	7.95	13.76	13.89	6.40	1.71	5.47	0.17	2.76	0.04	5.24	5.84	0.53
Std. Dev.		0.13	0.32	1.09	1.33	0.62	0.17	0.40	0.01	0.11	0.13	0.69	0.71	1.09