IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Water Control Center

One of the provisions called for in the 1989 water conservation agreement between the Imperial Irrigation District (IID) and the Metropolitan Water District of Southern California (MWD) was the construction of a modern automated Water Control Center. This centralized facility has greatly improved control of water delivery along IID's 1,675 miles of canals and laterals.

Background

Operation of IID's main canal system has evolved extensively over the years. Initially, the system was controlled manually by field personnel, who routed water on-site by electric powered gates or manual gate lifts. Beginning in the late 1950s, remote-control equipment was installed through telephone lines, which provided better control of large sites along main canals. Water delivery equipment for the All-American Canal and the upstream half of Imperial Valley main canals is now controlled from IID Headquarters.

System Automation

Beginning in the late 1980s, IID began to replace approximately half of the old remote-controlled systems in the field and at the control office with computerized equipment. Telephone communication links to the sites were also replaced with a radio/microwave communication network. This type of radio communication network provides automated operation of field sites along with monitoring and control capabilities directly from the control room. In 1988, the IID's first automated site was completed along with the construction of the Carter Reservoir. Since then, the Water Control Center has electronically controlled all water delivery, including delivery gate systems extending along the IID's main canals and lateral canals.

Construction

After almost one year of construction, the new $3 million Water Control Center became fully operational in September of 1993. The 10,000 square-foot building constructed at IID Headquarters now houses all the hardware and software used to regulate automated gates for water delivery as well as collect information needed to verify water savings. In addition, the building is equipped with a backup generator that ensures uninterrupted power service to the control system. Prefabricated electrical control equipment, in cargo containers at each control site, are solar powered or equipped with generators.

Other innovative technology was also implemented and includes earthquake disaster recovery features, computer-generated screens displaying control room information, acoustical velocity flow measurement devices and the implementation of unique changeover procedures to allow for continuous 24-hour service at the control center and at canal sites.

The command center provides a controlled environment for water dispatchers, engineers and operations personnel. The center is equipped with a visitor's lobby where guests can observe water control operations through a large window. On display are IID artifacts from the '30s, '40s and '50s that include the very first system automation equipment. The center also houses a large conference room, small kitchen and several administrative offices.

Awards

In early 1998, IID was awarded the International Award of Excellence for Innovation Technology of its System Automation Program, which provides improved water management utilizing modern control technology. This System Automation Program technology includes the Water Control Center as well as remote flow monitoring sites and automation used for other water conservation programs.

- February 2001

State Water Resources Control Board
Hearing Name IID Transfer - Phase 1
Exhibit: 35
For Ident: ____ In Evidence: ____

IID uses recycled paper

Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • Fax (760) 339-9191 • www.iid.com

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Weather Summary

Imperial Valley 2000

The climate of Imperial Valley is definitely a desert product. Home heating may be necessary from late October until mid-April, but one can work or play comfortably out-of-doors from about 9 a.m. to 5 p.m. during winter, a period of relatively mild temperature and abundant sunshine. Overnight frosts are to be expected occasionally.

In the period from the first of November through March – the "rainy" season – there are, on the average, 16 hours with rain, a little more than three hours a month. There are places in the world where more rain has fallen in a single year than has fallen in Imperial Valley during the past 87 years.

The sun does not shine all of every day, but it comes nearer doing so in Imperial Valley than in any other place in the United States. Even in December and January, this desert area averages more than eight hours of sunshine a day.

Temperatures

Lowest minimum temperature ever recorded was 16 degrees. This occurred on January 22, 1937.

Highest maximum temperature ever recorded was 121 degrees on July 29, 1995.

Lowest maximum temperature was 42 degrees, recorded on January 24, 1949. The highest minimum temperature was 92 degrees, recorded on June 30, 1946.

Highest monthly mean temperature was 95.9 degrees, recorded in August 1969. Month of lowest mean temperature was February 1939 with 42.3 degrees.

Rainfall

The 87-year average annual rainfall is 2.87 inches.

June is the driest month of the year. Since 1914, only three times was there measurable rainfall during that month – 0.04 of an inch on June 2, 1948, 0.01 of an inch on June 18, 1988, and 0.01 of an inch on June 7, 1997 – and only "traces" were recorded in 1918, 1922, 1924, 1929, 1930, 1932 and 1972.

The highest rainfall in one day was recorded on September 6, 1939, when 4.08 inches was measured. The total for the month, 7.06 inches, made September 1939 the month with the highest rainfall of record. The year 1939 was also the highest year on record, with 8.52 inches. Year of lowest rainfall was 1956, with 0.16 of an inch.

Snow

The only recorded snowfall of consequence occurred in 1932. On December 12 of that year, snow began falling at 8:45 p.m. and, by 5 a.m. of the following day, 2½ inches had been recorded. In the southeast portion of Imperial Valley, four inches of snow was reported that day. This was the only snowfall of record to cover the entire valley.

– March 2001

IID uses recycled paper

Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • FAX (760) 339-9191 • www.iid.com

JANUARY 2000

Maximum Temperature: 82 Degrees, 20th
Minimum Temperature: 35 Degrees, 8th
Average Maximum: 71.9 Degrees
Average Minimum: 46.3 Degrees
Mean Temperature: 59.1 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	66	49	56	31%	West	Clear
02	66	47	47	36%	West	Clear
03	65	39	41	27%	Calm	Clear
04	66	37	43	9%	Calm	Clear
05	70	37	51	27%	Calm	Clear
06	66	42	42	21%	Calm	Clear
07	66	36	43	5%	Calm	Clear
08	68	35	45	20%	Calm	Clear
09	68	36	45	36%	Calm	Partly Cloudy
10	69	38	45	28%	Calm	Clear
11	70	38	47	30%	Calm	Clear
12	74	40	49	37%	Calm	Clear
13	74	43	51	45%	Calm	Clear
14	76	49	53	46%	Calm	Clear
15	75	46	50	33%	Calm	Clear
16	67	47	59	42%	Calm	Cloudy
17	74	55	59	51%	Calm	Cloudy
18	79	55	66	53%	Calm	Clear
19	81	56	65	50%	Calm	Clear
20	82	59	68	35%	Calm	Clear
21	77	60	64	34%	West	Cloudy
22	74	52	53	42%	Calm	Cloudy
23	75	46	60	40%	Calm	Partly Cloudy
24	76	56	59	40%	Calm	Partly Cloudy
25	77	53	64	43%	West	Partly Cloudy
26	75	56	56	33%	Calm	Clear
27	72	45	52	27%	Calm	Clear
28	71	43	52	30%	Calm	Clear
29	69	42	53	26%	Calm	Cloudy
30	71	43	61	39%	Calm	Partly Cloudy
31	71	54	55	38%	Calm	Clear

Average Relative Humidity: 34%
Date of Last Recorded Rain: None
Total Inches of Rain During Month: 0.00
Total Rain Year - to - Date: 0.00
Rainfall During Month: 0.00

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

FEBUARY 2000

Maximum Temperature:	80 Degrees, 7th, 9th
Minimum Temperature:	41 Degrees, 4th
Average Maximum:	73.5 Degrees
Average Minimum:	49.8 Degrees
Mean Temperature:	61.6 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	75	48	51	33%	West	Clear
02	76	44	52	25%	Calm	Clear
03	75	43	50	31%	Calm	Clear
04	75	41	42	18%	Calm	Clear
05	72	51	51	45%	Calm	Partly Cloudy
06	77	46	53	42%	Calm	Clear
07	80	47	58	32%	Calm	Clear
08	73	56	56	44%	West	Cloudy
09	80	49	64	37%	West	Clear
10	77	59	61	35%	West	Clear
11	73	53	56	43%	West	Clear
12	75	60	60	44%	West	Clear
13	71	55	60	43%	West	Clear
14	79	54	60	46%	West	Partly Cloudy
15	78	51	58	39%	Calm	Clear
16	77	54	59	51%	West	Cloudy
17	70	51	51	31%	West	Clear
18	68	44	54	40%	Calm	Cloudy
19	73	49	58	33%	Calm	Partly cloudy
20	64	53	54	64%	Calm	Cloudy
21	70	53	54	49%	West	Cloudy
22	71	45	54	48%	Calm	Clear
23	70	51	55	56%	North West	Clear
24	68	49	51	37%	North West	Clear
25	70	47	55	47%	Calm	Clear
26	73	43	55	32%	Calm	Clear
27	79	47	58	38%	North West	Clear
28	71	52	58	34%	North West	Clear
29	72	48	63	41%	West	Clear

Average Relative Humidity:	39%
Date of Last Recorded Rain:	2/21/00
Total Inches of Rain During Month:	0.19
Total Rain Year - to - Date:	0.19
Rainfall During Month:	0.15 20th, 0.04 21st

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

MARCH 2000

Maximum Temperature:	89 Degrees, 14th, 15th
Minimum Temperature:	43 Degrees, 6th
Average Maximum:	77.9 Degrees
Average Minimum:	51.3 Degrees
Mean Temperature:	64.6 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	73	54	55	35%	West	Clear
02	75	47	59	31%	Calm	Clear
03	73	49	57	64%	West	Partly Cloudy
04	71	53	53	42%	West	Cloudy
05	61	48	49	72%	West	Partly Cloudy
06	64	43	48	36%	Calm	Clear
07	68	44	54	48%	Calm	Clear
08	68	48	54	44%	West	Partly Cloudy
09	70	44	53	43%	Calm	Clear
10	75	48	53	35%	Calm	Clear
11	81	49	58	26%	Calm	Clear
12	84	49	63	30%	Calm	Clear
13	85	55	64	25%	Calm	Clear
14	89	56	67	23%	Calm	Clear
15	89	59	67	28%	Calm	Clear
16	85	54	64	22%	Calm	Clear
17	85	54	63	32%	Calm	Clear
18	88	54	62	18%	Calm	Clear
19	88	53	70	28%	South West	Clear
20	69	55	56	27%	West	Clear
21	73	51	56	21%	Calm	Partly Cloudy
22	78	47	56	22%	Calm	Clear
23	79	47	57	37%	South West	Clear
24	80	50	61	42%	Calm	Clear
25	82	52	61	32%	Calm	Clear
26	84	53	68	31%	Calm	Clear
27	79	57	59	31%	South West	Cloudy
28	79	57	59	38%	West	Clear
29	78	51	60	39%	Calm	Clear
30	84	56	68	32%	Calm	Clear
31	78	53	60	18%	Calm	Clear

Average Relative Humidity:	33%
Date of Last Recorded Rain:	3/27/00
Total Inches of Rain During Month:	0.09
Total Rain Year - to - Date:	0.28
Rainfall During Month:	0.05 5th, 0.04 27th

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

APRIL 2000

Maximum Temperature: 101 Degrees, 26th
Minimum Temperature: 50 Degrees, 2nd
Average Maximum: 89.7 Degrees
Average Minimum: 59.8 Degrees
Mean Temperature: 74.8 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	82	54	63	38%	South West	Clear
02	84	50	65	31%	Calm	Clear
03	88	52	61	38%	Calm	Clear
04	94	56	70	30%	Calm	Clear
05	98	60	71	16%	West	Clear
06	93	57	73	15%	West	Clear
07	94	60	73	23%	Calm	Clear
08	99	66	73	16%	West	Clear
09	95	64	70	15%	West	Clear
10	90	65	69	18%	Calm	Clear
11	93	61	68	20%	Calm	Clear
12	94	60	72	21%	Calm	Clear
13	95	69	73	18%	Calm	Clear
14	78	61	61	27%	West	Clear
15	80	55	64	38%	West	Clear
16	84	54	67	35%	Calm	Clear
17	84	62	62	31%	Calm	Clear
18	76	59	59	35%	West	Clear
19	80	53	60	27%	West	Clear
20	88	54	56	22%	Calm	Clear
21	81	62	62	30%	West	Clear
22	86	63	65	33%	Calm	Clear
23	86	55	72	35%	Calm	Clear
24	91	59	70	29%	Calm	Clear
25	98	69	70	18%	Calm	Clear
26	101	69	70	20%	Calm	Clear
27	100	67	68	25%	Calm	Clear
28	97	62	63	11%	South West	Clear
29	88	58	70	18%	Calm	Clear
30	93	59	73	17%	Calm	Clear

Average Relative Humidity: 25%
Date of Last Recorded Rain: 3/27/00
Total Inches of Rain During Month: 0.00
Total Rain Year - to - Date: 0.28
Rainfall During Month: None

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

MAY 2000

Maximum Temperature:	112 Degrees, 29^{th}
Minimum Temperature:	55 Degrees, 12^{th}
Average Maximum:	97.1 Degrees
Average Minimum:	66.6 Degrees
Mean Temperature:	81.9 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	97	65	77	18%	Calm	Clear
02	99	68	72	16%	Calm	Clear
03	97	64	69	25%	Calm	Clear
04	96	62	72	36%	Calm	Clear
05	97	67	77	27%	West	Clear
06	96	73	75	24%	West	Clear
07	97	70	76	27%	West	Clear
08	93	70	72	33%	Calm	Clear
09	98	66	81	28%	Calm	Clear
10	96	65	65	22%	West	Clear
11	82	59	67	30%	West	Clear
12	86	55	62	15%	Calm	Clear
13	92	58	75	19%	Calm	Clear
14	96	59	75	15%	Calm	Clear
15	93	66	69	18%	West	Clear
16	80	60	61	27%	West	Clear
17	85	57	68	29%	Calm	Clear
18	93	62	75	23%	Calm	Clear
19	99	68	78	18%	Calm	Clear
20	103	74	82	19%	Calm	Clear
21	107	74	86	18%	Calm	Clear
22	108	76	75	20%	Calm	Clear
23	104	67	75	36%	Calm	Clear
24	97	68	75	35%	Calm	Clear
25	93	70	70	40%	West	Clear
26	92	66	74	33%	Calm	Clear
27	101	67	80	44%	Calm	Clear
28	109	71	84	14%	South East	Clear
29	112	74	86	21%	South West	Clear
30	108	74	82	19%	South West	Clear
31	104	71	82	19%	South West	Clear

Average Relative Humidity:	24%
Date of Last Recorded Rain:	3/27/00
Total Inches of Rain During Month:	0.00
Total Rain Year - to - Date:	0.28
Rainfall During Month:	None

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

JUNE 2000

Maximum Temperature:	111 Degrees, 25th
Minimum Temperature:	61 Degrees, 9th
Average Maximum:	102.6 Degrees
Average Minimum:	74.1 Degrees
Mean Temperature:	88.4 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	102	67	82	20%	South West	Clear
02	105	68	76	30%	South West	Clear
03	106	70	80	12%	Calm	Clear
04	108	73	83	12%	West	Clear
05	108	80	83	14%	West	Clear
06	105	75	82	13%	Calm	Clear
07	106	74	84	13%	West	Clear
08	91	66	74	24%	West	Clear
09	91	61	73	27%	Calm	Clear
10	94	66	77	34%	Calm	Clear
11	97	67	77	29%	Calm	Clear
12	102	69	84	23%	Calm	Clear
13	106	76	85	16%	Calm	Clear
14	109	76	77	19%	Calm	Clear
15	111	74	87	26%	West	Clear
16	103	77	80	32%	South West	Clear
17	98	75	80	32%	South West	Clear
18	100	74	81	38%	Calm	Clear
19	101	76	81	35%	Calm	Clear
20	101	76	87	40%	Calm	Clear
21	105	78	87	30%	Calm	Clear
22	106	77	87	29%	North East	Clear
23	103	76	83	26%	Calm	Clear
24	103	78	81	36%	Calm	Clear
25	91	79	83	44%	West	Cloudy
26	107	75	89	26%	Calm	Clear
27	105	82	86	26%	Calm	Partly Cloudy
28	101	82	86	44%	South West	Partly Cloudy
29	106	79	87	28%	Calm	Clear
30	107	78	85	36%	Calm	Clear

Average Relative Humidity:	26%
Date of Last Recorded Rain:	03/27/00
Total Inches of Rain During Month:	0.00
Total Rain Year - to - Date:	0.28
Rainfall During Month:	0.00

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

JULY 2000

Maximum Temperature: 113 Degrees, 18th, 19th, 24th, 25th
Minimum Temperature: 66 Degrees, 7th
Average Maximum: 106.1 Degrees
Average Minimum: 77.2 Degrees
Mean Temperature: 91.6 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	106	77	84	22%	West	Clear
02	106	78	84	18%	West	Clear
03	103	78	79	17%	West	Clear
04	103	70	79	12%	West	Clear
05	103	69	82	15%	West	Clear
06	102	69	80	18%	West	Clear
07	101	66	80	36%	Calm	Clear
08	99	77	83	26%	Calm	Clear
09	100	72	83	25%	Calm	Clear
10	100	75	81	22%	Calm	Clear
11	101	72	75	26%	Calm	Clear
12	103	73	80	30%	Calm	Clear
13	102	76	86	24%	Calm	Partly Cloudy
14	107	72	89	19%	Calm	Clear
15	109	82	87	14%	West	Clear
16	108	87	87	16%	Calm	Clear
17	108	75	89	13%	Calm	Clear
18	113	78	92	12%	Calm	Clear
19	113	85	94	14%	Calm	Clear
20	110	80	87	14%	Calm	Clear
21	105	78	85	39%	North West	Clear
22	106	82	88	43%	Calm	Clear
23	109	80	92	22%	Calm	Clear
24	113	83	92	12%	Calm	Clear
25	113	81	93	23%	Calm	Clear
26	110	83	94	26%	South East	Clear
27	109	78	89	31%	South East	Clear
28	104	71	89	38%	Calm	Clear
29	110	82	88	28%	Calm	Clear
30	107	80	83	41%	South East	Clear
31	105	84	85	38%	Calm	Clear

Average Relative Humidity: 24%
Date of Last Recorded Rain: 3/27/00
Total Inches of Rain During Month: 0.00
Total Rain Year - to - Date: 0.28
Rainfall During Month: 0.00

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

AUGUST 2000

Maximum Temperature:	112 Degrees, 5th
Minimum Temperature:	72 Degrees, 21st
Average Maximum:	104.5 Degrees
Average Minimum:	80.9 Degrees
Mean Temperature:	92.7 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	106	82	82	32%	Calm	Clear
02	107	82	89	36%	Calm	Clear
03	108	82	92	29%	Calm	Clear
04	110	82	93	28%	Calm	Clear
05	112	87	90	18%	South East	Clear
06	107	83	85	33%	South East	Clear
07	104	81	85	34%	Calm	Clear
08	103	81	87	44%	Calm	Clear
09	108	77	92	22%	Calm	Clear
10	109	88	92	13%	Calm	Clear
11	109	80	87	19%	South East	Clear
12	104	83	88	39%	South West	Clear
13	106	82	93	28%	South West	Clear
14	109	85	86	32%	Calm	Clear
15	106	82	88	40%	South West	Clear
16	109	83	93	36%	Calm	Clear
17	105	84	85	40%	Calm	Clear
18	105	82	86	39%	West	Clear
19	105	81	88	30%	Calm	Clear
20	109	77	84	22%	West	Clear
21	104	72	85	30%	Calm	Clear
22	103	76	85	59%	South East	Clear
23	101	81	84	51%	South East	Clear
24	101	82	85	46%	South East	Clear
25	103	80	89	46%	Calm	Clear
26	105	83	91	28%	Calm	Clear
27	102	82	85	32%	East	Partly Cloudy
28	98	82	83	40%	Calm	Partly Cloudy
29	93	78	78	41%	West	Cloudy
30	95	74	79	42%	Calm	Partly Cloudy
31	95	73	77	42%	Calm	Clear

Average Relative Humidity:	35%
Date of Last Recorded Rain:	8/29/00
Total Inches of Rain During Month:	0.08
Total Rain Year - to - Date:	0.36
Rainfall During Month:	Trace 24th, 0.08 29th

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

SEPTEMBER 2000

Maximum Temperature:	111 Degrees, 15th
Minimum Temperature:	62 Degrees, 25th
Average Maximum:	100.3 Degrees
Average Minimum:	72.7 Degrees
Mean Temperature:	86.5 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	92	70	73	29%	West	Clear
02	91	64	77	26%	West	Clear
03	96	68	79	20%	Calm	Clear
04	100	68	78	21%	Calm	Clear
05	103	70	85	15%	Calm	Clear
06	103	77	83	12%	Calm	Clear
07	103	78	82	28%	North	Partly Cloudy
08	106	75	79	22%	West	Clear
09	103	68	82	16%	Calm	Clear
10	101	70	84	15%	Calm	Clear
11	100	78	87	46%	Calm	Clear
12	106	80	88	29%	Calm	Clear
13	109	80	91	26%	Calm	Clear
14	110	82	94	26%	Calm	Clear
15	111	80	84	26%	Calm	Clear
16	105	79	90	41%	Calm	Clear
17	105	81	84	39%	Calm	Clear
18	104	75	87	45%	Calm	Clear
19	109	79	87	20%	Calm	Clear
20	103	78	81	48%	Calm	Clear
21	100	75	75	28%	West	Clear
22	87	70	74	42%	West	Clear
23	88	71	72	37%	West	Clear
24	92	65	68	20%	Calm	Clear
25	95	62	75	17%	Calm	Clear
26	99	71	78	12%	Calm	Clear
27	98	68	75	26%	Calm	Clear
28	97	68	78	32%	Calm	Clear
29	96	65	75	19%	Calm	Clear
30	96	66	76	24%	Calm	Clear

Average Relative Humidity:	28%
Date of Last Recorded Rain:	9/7/00
Total Inches of Rain During Month:	0.04
Total Rain Year - to - Date:	0.40
Rainfall During Month:	0.04 7th

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

OCTOBER 2000

Maximum Temperature:	100 Degrees, 1st, 2nd
Minimum Temperature:	51 Degrees, 31st
Average Maximum:	85.0 Degrees
Average Minimum:	62.2 Degrees
Mean Temperature:	73.6 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	100	69	84	31%	Calm	Clear
02	100	74	85	28%	Calm	Clear
03	98	77	80	32%	Calm	Clear
04	93	74	75	48%	Calm	Clear
05	91	68	75	46%	Calm	Clear
06	92	66	75	40%	Calm	Clear
07	93	69	74	30%	Calm	Clear
08	93	64	75	23%	Calm	Clear
09	91	71	73	43%	West	Clear
10	80	61	61	60%	West	Clear
11	77	56	60	35%	West	Clear
12	79	54	61	34%	West	Clear
13	82	56	62	33%	Calm	Clear
14	86	56	63	32%	Calm	Clear
15	88	57	66	24%	Calm	Clear
16	90	57	66	26%	Calm	Clear
17	92	60	70	26%	Calm	Clear
18	88	68	69	39%	Calm	Partly Cloudy
19	90	63	71	32%	Calm	Clear
20	89	64	72	38%	Calm	Clear
21	86	65	66	38%	West	Clear
22	71	63	64	60%	West	Cloudy
23	72	59	64	63%	Calm	Cloudy
24	76	62	62	61%	Calm	Clear
25	79	58	66	74%	Calm	Clear
26	79	58	65	31%	West	Clear
27	76	59	59	42%	West	Clear
28	78	58	61	42%	West	Clear
29	76	54	62	45%	Calm	Clear
30	75	57	58	32%	West	Clear
31	74	51	56	45%	Calm	Clear

Average Relative Humidity:	41%
Date of Last Recorded Rain:	10/27/00
Total Inches of Rain During Month:	0.52
Total Rain Year - to - Date:	0.92
Rainfall During Month:	0.29 9th, Trace 18th, 0.10 22nd, 0.11 23rd, 0.02 27th

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

NOVEMBER 2000

Maximum Temperature:	79 Degrees, 27th
Minimum Temperature:	37 Degrees, 14th
Average Maximum:	73.1 Degrees
Average Minimum:	44.6 Degrees
Mean Temperature:	58.9 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	76	50	57	29%	Calm	Clear
02	77	50	52	31%	Calm	Clear
03	75	47	64	25%	West	Partly Cloudy
04	76	62	58	32%	West	Partly Cloudy
05	77	48	62	30%	West	Clear
06	77	55	55	46%	West	Partly Cloudy
07	70	49	51	22%	Calm	Clear
08	71	44	48	22%	Calm	Clear
09	75	42	57	19%	West	Clear
10	67	49	52	62%	West	Cloudy
11	70	43	50	65%	Calm	Partly Cloudy
12	65	40	45	26%	Calm	Clear
13	66	38	42	25%	Calm	Clear
14	67	37	51	33%	Calm	Clear
15	69	41	47	22%	Calm	Clear
16	68	40	44	33%	Calm	Clear
17	68	39	45	25%	Calm	Clear
18	69	39	44	18%	Calm	Clear
19	73	39	44	21%	Calm	Clear
20	75	40	48	27%	Calm	Clear
21	73	47	47	25%	Calm	Clear
22	74	38	54	35%	Calm	Clear
23	78	47	50	24%	West	Clear
24	75	42	48	37%	Calm	Clear
25	77	44	52	29%	Calm	Clear
26	77	44	52	19%	Calm	Clear
27	79	46	52	33%	Calm	Clear
28	78	47	54	31%	Calm	Clear
29	76	46	53	36%	Calm	Clear
30	76	45	52	46%	Calm	Clear

Average Relative Humidity:	31%
Date of Last Recorded Rain:	11/10/00
Total Inches of Rain During Month:	0.03
Total Rain Year - to - Date:	0.95
Rainfall During Month:	0.03 10th

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

DECEMBER 2000

Maximum Temperature:	81 Degrees, 5th
Minimum Temperature:	37 Degrees, 28th
Average Maximum:	73.2 Degrees
Average Minimum:	44.2 Degrees
Mean Temperature:	58.7 Degrees

Date	Maximum	Minimum	12:00 Midnight	Relative Humidity 12 Noon	Wind Direction	Character of the day and Misc. Data
01	72	47	55	33%	North	Clear
02	78	52	52	15%	Calm	Clear
03	77	47	51	31%	Calm	Clear
04	78	48	59	31%	Calm	Clear
05	81	53	53	13%	North West	Clear
06	77	50	58	39%	Calm	Cloudy
07	77	52	55	22%	Calm	Partly Cloudy
08	79	48	59	42%	Calm	Partly Cloudy
09	70	49	57	48%	Calm	Clear
10	75	54	54	51%	West	Clear
11	72	46	51	61%	Calm	Clear
12	71	48	50	53%	West	Clear
13	68	42	48	46%	Calm	Clear
14	69	42	49	47%	North East	Clear
15	70	44	49	50%	Calm	Clear
16	73	43	47	41%	West	Clear
17	74	43	46	34%	Calm	Clear
18	70	41	42	25%	Calm	Clear
19	70	40	40	37%	Calm	Clear
20	69	37	39	36%	Calm	Clear
21	73	39	40	27%	Calm	Clear
22	71	40	44	31%	Calm	Clear
23	73	38	48	44%	Calm	Clear
24	71	39	48	38%	North East	Clear
25	68	41	53	30%	North West	Clear
26	70	44	45	26%	North West	Clear
27	72	40	45	27%	Calm	Clear
28	74	37	45	31%	Calm	Clear
29	76	42	47	38%	Calm	Clear
30	75	42	49	28%	Calm	Clear
31	75	42	49	34%	Calm	Clear

Average Relative Humidity:	37%
Date of Last Recorded Rain:	11/10/00
Total Inches of Rain During Month:	0.00
Total Rain Year - to - Date:	0.95
Rainfall During Month:	0.00

Temperature and rainfall observation are recorded at 12:00 Midnight, Pacific Standard Time

MONTHLY HIGH, LOW AND MEAN TEMPERATURES

and

RAINFALL IN INCHES

1914 - 2000

IMPERIAL IRRIGATION DISTRICT

MAXIMUM, MINIMUM AND MEAN TEMPERATURES BY MONTHS FOR YEARS 1914-2000, INCLUSIVE

	JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE			JULY		
Year	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean
1914	No records for these months												100	51	75.4	112	58	84.4	110	70	89.8
1915	73	30	53.5	79	40	59.2	92	41	63.4	96	48	69.0	103	41	73.3	109	57	85.1	110	62	88.9
1916	75	25	52.3	88	29	61.8	100	42	67.8	100	44	71.8	105	50	75.9	116	55	85.4	111	62	89.9
1917	76	30	50.4	82	32	57.4	93	32	58.8	98	41	66.7	99	48	71.0	117	56	85.5	113	70	91.3
1918	85	26	53.7	88	28	57.1	95	40	64.7	96	44	69.5	98	50	73.0	113	59	88.7	110	59	89.6
1919	82	24	51.6	82	32	56.1	89	35	60.4	100	48	71.8	101	55	77.0	114	57	85.4	111	73	90.7
1920	81	33	55.6	82	41	60.5	85	38	61.1	96	44	68.0	106	41	76.2	108	58	82.8	115	63	91.3
1921	79	28	52.2	93	32	54.2	93	41	66.3	102	40	66.9	104	46	72.5	110	57	84.2	111	63	91.0
1922	75	23	49.5	90	28	55.7	89	32	58.8	96	40	65.1	106	46	77.1	114	62	86.5	111	69	90.3
1923	85	28	56.1	87	30	56.7	89	34	60.4	95	42	67.8	107	52	78.1	114	54	79.5	113	67	88.6
1924	81	27	53.6	91	37	64.2	92	38	66.0	95	39	70.4	107	53	79.8	113	60	88.9	111	65	89.8
1925	82	27	52.6	85	35	61.2	94	39	64.4	100	44	70.7	103	54	78.6	114	55	84.3	115	64	90.6
1926	85	29	53.9	88	33	61.5	91	42	66.9	105	50	73.0	104	55	78.6	113	62	86.9	112	62	90.3
1927	76	32	55.3	87	34	59.6	92	38	62.2	102	41	70.8	110	53	78.7	111	54	84.0	114	68	91.7
1928	86	29	56.2	84	33	57.6	91	42	66.0	96	39	69.6	105	53	77.9	112	57	85.2	114	62	90.3
1929	79	25	50.7	88	24	55.0	95	36	61.9	98	36	66.0	102	49	77.7	117	54	83.9	111	69	90.7
1930	77	28	52.7	89	34	61.0	92	34	62.4	99	45	71.9	104	43	71.7	112	57	83.4	112	68	90.2
1931	85	29	54.8	76	38	58.5	95	37	64.5	97	51	72.5	108	55	80.0	111	58	84.7	116	75	95.2
1932	75	25	49.7	87	28	57.2	94	40	64.1	98	47	69.2	102	52	76.9	110	58	84.2	111	63	89.9
1933	76	29	50.2	78	23	51.1	87	39	63.4	96	45	66.2	106	44	73.4	111	57	84.0	117	65	92.9
1934	81	30	56.5	82	40	62.9	101	42	72.6	102	42	75.5	112	54	82.2	106	52	80.5	118	66	93.7
1935	84	29	55.4	84	36	60.1	89	36	60.1	95	43	69.7	102	51	75.0	113	58	88.6	113	61	90.2
1936	78	31	54.9	83	35	59.3	93	41	67.2	101	43	73.3	106	51	80.6	117	54	88.0	119	63	92.4
1937	68	16	43.8	82	31	55.7	88	41	61.2	98	46	69.0	108	53	77.2	110	58	84.7	117	72	94.6
1938	80	33	56.8	82	34	57.1	88	38	61.4	105	40	69.7	111	50	77.9	112	58	85.7	115	62	91.7
1939	78	35	53.6	81	32	42.3	95	32	63.4	102	48	73.2	108	55	79.2	114	59	85.1	118	66	92.2
1940	83	32	57.8	83	35	58.5	91	39	66.8	103	52	72.3	108	61	82.7	117	62	88.4	116	61	90.8
1941	74	38	56.5	78	44	61.0	87	43	63.8	95	45	67.3	105	48	79.6	108	58	83.4	114	66	91.6
1942	80	27	56.4	78	33	56.3	93	38	62.5	94	45	69.1	110	46	76.7	113	58	85.6	118	71	94.5
1943	85	25	55.6	85	32	60.5	95	44	67.0	100	45	72.1	106	55	79.0	110	53	81.5	119	62	89.9
1944	80	31	53.9	78	32	54.5	88	39	61.3	99	47	69.3	100	50	76.3	110	57	79.9	112	64	87.9
1945	81	33	55.9	82	36	58.5	88	37	60.3	100	35	68.5	100	54	76.1	114	58	83.5	113	72	91.9
1946	78	31	54.9	86	31	56.3	87	40	62.3	101	44	73.1	103	56	77.0	111	60	87.6	111	67	91.5
1947	83	28	52.9	85	39	61.7	88	42	64.8	104	45	72.9	116	52	79.7	110	61	84.7	113	67	92.3
1948	84	25	54.8	85	26	56.9	85	35	59.0	100	41	70.5	104	50	77.3	114	54	83.7	113	65	89.8
1949	71	21	45.3	82	28	53.8	85	41	61.6	102	45	73.3	106	53	77.0	110	57	86.1	115	66	90.7
1950	82	21	51.7	85	34	61.0	95	36	64.9	101	45	73.6	103	49	75.5	118	57	83.6	117	65	89.8
1951	84	32	54.4	88	31	57.5	88	33	62.4	98	46	69.7	111	47	77.4	110	56	83.2	113	63	91.4
1952	75	26	51.4	81	35	58.0	87	37	59.4	95	50	69.5	105	56	81.6	110	55	82.7	111	67	90.5
1953	86	34	59.9	85	30	58.3	91	35	63.5	97	44	68.4	99	49	72.4	113	53	83.6	114	72	93.6
1954	84	31	56.0	92	41	64.4	90	37	61.9	103	45	74.5	102	50	78.0	112	53	83.5	116	71	92.9
1955	77	35	51.9	83	29	55.2	92	35	63.6	88	50	69.0	103	48	74.9	113	55	84.1	113	64	88.7
1956	80	35	58.1	80	29	54.3	93	33	64.9	98	41	68.9	104	52	76.8	113	59	87.1	110	64	90.2
1957	74	30	54.6	89	34	63.7	91	40	64.9	94	45	69.8	102	55	73.8	117	62	88.7	116	71	93.1
1958	80	35	57.5	81	40	61.6	80	38	60.7	102	42	70.4	109	54	82.6	112	61	86.1	117	67	91.2
1959	85	33	58.3	83	37	57.3	91	41	66.9	102	49	74.3	99	51	76.1	116	62	88.8	113	73	94.3
1960	79	27	52.1	81	31	56.9	92	43	67.8	97	47	73.1	109	52	77.8	113	65	89.6	115	69	93.1
1961	83	34	58.0	82	38	60.9	89	43	64.3	103	50	72.3	102	50	76.0	116	56	88.1	114	64	91.2

IMPERIAL IRRIGATION DISTRICT

MAXIMUM, MINIMUM AND MEAN TEMPERATURES BY MONTHS FOR YEARS 1914-2000, INCLUSIVE

Year	JANUARY Max.	Min.	Mean	FEBRUARY Max.	Min.	Mean	MARCH Max.	Min.	Mean	APRIL Max.	Min.	Mean	MAY Max.	Min.	Mean	JUNE Max.	Min.	Mean	JULY Max.	Min.	Mean
1962	87	25	55.4	81	28	59.1	89	32	59.7	101	50	74.5	101	48	73.5	111	57	84.4	110	68	90.4
1963	73	24	52.0	90	42	65.3	88	39	62.6	95	43	67.5	104	52	79.2	110	51	82.0	114	69	91.1
1964	77	30	52.0	80	32	56.2	91	36	61.5	99	47	68.4	102	45	76.2	112	60	84.0	116	72	92.1
1965	82	33	57.2	88	31	59.5	84	36	62.1	101	44	70.1	105	52	76.9	105	57	80.6	113	69	90.6
1966	77	30	52.8	77	32	55.9	97	34	65.7	98	49	73.6	103	58	80.4	110	62	86.3	115	71	92.3
1967	81	30	55.4	85	38	60.3	91	42	66.0	88	45	63.3	107	48	76.5	111	57	82.7	113	75	93.3
1968	79	33	55.7	90	44	65.4	92	44	66.0	98	46	69.5	108	55	78.7	115	60	86.6	114	68	91.4
1969	82	33	59.5	76	36	57.5	96	38	63.3	95	49	71.1	107	54	80.1	109	62	82.9	115	67	92.8
1970	79	29	55.3	83	39	61.6	90	43	63.9	94	43	66.9	109	53	78.8	119	58	86.8	113	71	93.1
1971	90	23	55.3	89	31	59.2	98	32	64.8	94	44	68.5	99	54	73.8	112	54	84.2	113	67	92.3
1972	75	24	52.9	86	30	61.8	94	46	70.8	96	42	71.7	102	54	78.3	114	66	86.0	116	73	94.0
1973	77	30	53.3	77	40	59.5	80	43	60.7	97	46	68.5	107	54	80.1	117	57	87.9	115	70	91.2
1974	81	28	56.0	81	38	58.3	90	40	65.6	96	47	70.5	111	51	78.7	116	59	89.4	112	69	91.2
1975	83	31	55.1	83	34	57.6	86	40	61.5	88	42	63.7	105	50	75.8	110	59	85.1	115	71	91.7
1976	86	29	57.2	84	40	60.9	89	42	63.0	99	45	67.7	106	55	79.3	115	50	86.8	115	66	90.6
1977	80	33	56.7	91	39	63.3	87	39	60.8	98	43	72.2	105	53	72.6	115	66	88.3	113	72	93.0
1978	76	37	57.4	82	39	60.6	95	47	67.6	93	48	69.3	107	54	78.7	115	62	90.9	116	68	93.6
1979	74	31	52.6	79	35	58.9	89	42	64.1	97	46	71.9	102	52	77.2	115	61	87.6	115	68	91.9
1980	77	38	60.1	85	39	63.2	86	46	63.3	101	46	70.7	101	52	73.9	114	59	87.4	116	73	94.9
1981	83	42	60.9	90	39	61.8	91	44	64.4	97	47	72.9	103	56	78.4	114	65	90.5	112	73	93.2
1982	76	33	55.8	86	37	61.7	83	41	63.5	94	44	76.7	101	52	70.9	108	59	82.8	113	61	90.5
1983	82	35	59.0	85	42	60.5	90	46	65.2	90	45	66.7	114	52	78.9	108	57	84.3	114	67	92.0
1984	82	35	58.7	83	38	60.3	95	40	66.7	101	48	70.2	111	58	83.0	111	61	85.7	112	75	91.9
1985	73	36	54.8	85	28	57.6	86	39	63.8	101	54	74.3	101	57	79.2	114	61	88.6	116	72	93.3
1986	85	38	61.4	96	34	63.4	99	44	69.5	102	51	72.6	106	53	79.7	114	64	89.2	115	70	91.2
1987	83	31	55.1	82	39	60.0	85	41	64.0	101	50	75.9	104	56	78.8	114	65	88.1	112	64	89.8
1988	79	32	55.5	84	37	61.9	99	40	66.4	101	45	70.7	108	50	77.4	108	54	85.1	111	69	91.6
1989	78	32	54.1	93	30	59.9	96	42	68.8	105	51	76.8	106	54	79.4	111	62	86.9	114	69	92.7
1990	78	31	54.9	86	29	57.9	93	41	66.4	99	53	73.6	102	54	76.9	117	59	87.3	114	69	92.2
1991	77	31	54.9	85	39	64.3	82	38	60.2	98	45	70.1	102	51	75.0	106	60	82.0	112	69	88.8
1992	80	35	55.8	83	44	62.4	85	45	63.9	101	51	74.3	99	60	79.8	108	62	84.6	114	65	89.5
1993	74	29	54.0	78	40	58.6	90	44	67.5	101	50	73.3	100	52	79.1	114	57	86.9	113	67	89.4
1994	82	34	57.5	80	33	56.9	92	44	67.1	100	48	71.3	105	51	75.9	115	63	88.7	112	67	92.3
1995	78	37	55.4	87	42	64.3	90	40	64.7	97	41	68.8	102	52	73.1	111	54	82.8	121	68	91.5
1996	82	34	57.8	87	35	62.7	91	43	66.2	103	52	72.7	108	57	80.7	110	53	86.1	115	61	91.1
1997	78	37	57.0	83	34	58.0	94	37	66.6	97	41	69.7	107	59	82.5	107	57	83.4	113	63	88.4
1998	79	34	56.5	75	40	57.4	91	41	62.6	98	44	67.0	95	51	72.9	114	55	81.9	116	68	91.7
1999	77	36	56.7	84	36	59.0	90	42	61.8	100	41	65.0	105	48	76.3	110	52	83.6	111	69	89.7
2000	82	35	59.1	80	41	61.6	89	43	64.6	101	50	74.8	112	55	81.9	111	61	88.4	113	66	91.6
Average	79.7	30.5	54.9	84.1	34.7	59.1	90.6	39.5	64.0	98.4	45.4	70.5	104.8	51.9	77.4	112.3	58.1	85.4	113.8	67.3	91.4

IMPERIAL IRRIGATION DISTRICT

MAXIMUM, MINIMUM AND MEAN TEMPERATURES BY MONTHS FOR YEARS 1914-2000, INCLUSIVE

	AUGUST			SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			FOR YEAR				MEAN FOR
Year	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Date	Min.	Date	YEAR
1914	113	64	88.7	108	60	84.1	100	52	73.4	91	41	65.6	No Record			113	8-3	Incomplete		
1915	117	64	90.6	109	52	81.2	104	50	75.5	91	30	60.8	82	28	54.1	117	8-10	28	12-17	71.2
1916	111	56	87.7	110	57	83.1	95	43	68.2	90	30	58.5	79	25	51.2	116	6-15	25	1-12	71.1
1917	109	62	88.9	108	53	85.3	106	44	76.2	90	38	63.7	89	31	58.3	117	6-16	30	1-5	71.0
1918	114	55	86.7	105	56	83.1	110	44	74.7	86	32	59.4	82	28	50.5	114	8-2	26	1-11	70.9
1919	113	67	90.3	107	60	83.7	94	36	68.3	88	31	59.7	82	31	55.6	114	6-26	24	1-1	70.9
1920	111	58	87.8	108	53	81.8	102	41	65.7	86	34	58.2	78	29	52.9	115	7-8	29	12-14	70.1
1921	110	68	88.5	107	57	82.6	103	43	75.1	93	32	62.2	81	33	53.4	111	7-22	28	1-12	70.8
1922	110	67	88.8	113	59	87.2	100	42	73.3	85	34	58.2	79	34	56.6	114	6-29	23	1-23	70.6
1923	107	67	87.6	109	51	80.7	97	44	69.7	83	35	62.1	78	32	52.8	114	6-28	28	1-3	70.2
1924	113	61	89.0	108	48	84.2	100	44	69.4	93	34	61.6	83	23	53.1	113	6-28	23	12-26	72.5
1925	109	67	88.0	104	52	80.7	101	46	70.4	90	33	60.4	80	31	56.0	115	7-16	27	1-11	71.1
1926	110	63	89.4	106	53	82.6	100	44	73.1	92	39	63.4	78	27	52.1	113	6-26	27	12-27	72.6
1927	115	72	90.9	106	56	82.8	101	43	73.8	98	37	63.9	85	31	53.4	115	8-10	31	12-8	72.3
1928	113	60	88.5	113	54	85.5	102	45	72.2	88	31	61.2	79	29	53.0	114	7-24	29	1-18 & 12-17/21	71.9
1929	111	73	90.5	112	54	80.8	104	40	73.8	88	30	59.2	84	31	58.0	117	6-24	24	2-8/9	70.8
1930	110	63	87.6	110	51	79.7	100	46	70.2	92	31	61.0	77	26	51.5	112	6-7 & 7-2, 11, 15	26	12-22	70.3
1931	112	70	89.9	111	58	83.0	98	51	73.1	93	27	58.0	75	28	51.1	116	7-2	27	11-23/25	72.2
1932	114	62	89.9	112	60	85.6	102	45	71.8	87	40	63.2	80	30	50.8	114	8-5	25	1-27	71.0
1933	118	67	91.5	109	59	84.9	105	50	77.9	91	37	63.5	82	29	55.8	118	8-11	23	2-8	71.2
1934	117	71	94.0	114	53	86.5	109	49	77.5	94	38	65.6	81	31	57.2	118	7-26/27, 7-30/31	30	1-9	75.5
1935	115	70	90.6	109	63	87.4	99	42	72.9	81	36	59.5	78	33	56.1	115	8-11	29	1-22	72.2
1936	112	67	91.8	108	52	83.7	103	47	74.2	90	36	62.3	76	32	54.8	119	7-14/16	31	1-19	73.6
1937	115	65	93.6	112	61	88.3	99	54	75.9	91	40	64.3	82	33	58.7	117	7-2	16	1-22	72.4
1938	114	65	90.7	108	64	87.2	101	46	72.5	84	29	57.2	88	35	57.3	115	7-19	29	11-25/28	72.2
1939	111	75	92.7	112	58	82.1	95	44	72.4	91	44	64.7	85	32	59.7	118	7-13	32	2-3/10 3-1; 12-28	72.7
1940	117	66	92.3	110	62	84.3	101	48	75.1	86	38	61.1	85	30	58.6	117	6-13	30	12-15	74.1
1941	109	65	87.2	104	53	79.1	100	47	69.5	91	30	64.2	82	37	56.6	114	7-10/20	30	11-20	71.7
1942	113	62	91.8	109	60	84.1	101	45	73.9	88	36	63.3	81	32	57.1	118	7-24/25	27	1-7	72.6
1943	110	67	88.9	113	64	87.7	105	45	74.8	86	36	62.3	74	35	54.7	119	7-25	25	1-19	73.0
1944	115	65	91.5	111	57	85.7	101	55	76.1	85	35	60.9	77	33	55.9	115	8-11	31	1-9/10	71.2
1945	110	68	90.2	114	56	86.7	101	49	76.2	91	39	61.7	80	31	54.1	114	6-19 & 9-5	31	12-14/16	72.1
1946	113	68	92.0	111	63	86.6	96	46	70.1	81	38	59.0	82	35	57.3	113	8-2	31	1-11/31; 2-3	72.4
1947	113	60	89.2	113	64	87.5	105	49	74.5	89	30	57.9	74	28	51.6	116	5-3	28	1-4 & 12/14	72.4
1948	115	65	91.3	118	54	87.0	103	46	75.5	83	34	58.9	76	31	52.1	118	9-3	25	1-1	71.4
1949	114	61	89.8	112	64	89.7	102	41	71.5	93	43	67.8	87	26	52.8	115	7-14	21	1-4	71.6
1950	116	66	90.5	118	58	82.8	106	54	78.7	98	34	67.2	84	35	60.6	118	6-30 & 9-1	21	1-4	73.3
1951	111	66	89.6	109	62	86.8	105	50	75.6	85	38	60.7	78	30	54.6	113	7-31	30	12-9	71.9
1952	112	72	92.2	112	51	87.6	108	57	81.6	88	34	58.9	84	32	55.1	112	8-3 & 9-1/2	26	1-4	72.4
1953	111	61	90.6	111	61	86.4	101	48	75.2	90	37	64.6	82	26	54.6	114	7-2	26	12-25	72.7
1954	113	66	88.9	108	54	86.5	101	46	76.5	89	43	66.9	79	27	55.7	116	7-28	27	12-29	73.8
1955	110	72	90.9	113	60	86.5	104	52	77.7	89	40	63.4	84	37	57.8	113	6-9/22	29	2-20	72.0

IMPERIAL IRRIGATION DISTRICT

MAXIMUM, MINIMUM AND MEAN TEMPERATURES BY MONTHS FOR YEARS 1914-2000, INCLUSIVE

	AUGUST			SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			FOR YEAR				MEAN FOR
Year	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Date	Min.	Date	YEAR
1956	111	60	88.3	113	64	90.5	100	44	73.5	92	33	62.0	81	29	56.7	113	6-12, 9-2	29	2-3, 12-9	72.7
1957	114	63	90.3	110	61	86.3	101	51	71.9	82	37	60.3	82	36	57.9	117	6-24	30	1-27	73.0
1958	111	77	92.9	109	60	87.7	103	50	78.3	90	32	63.3	90	36	59.6	117	7-9	32	11-17	74.4
1959	112	66	90.6	111	60	83.7	101	45	76.5	88	36	64.6	83	36	56.1	116	6-22	33	1-5	73.9
1960	115	69	91.5	111	64	88.5	103	50	75.2	90	39	62.7	78	28	54.9	115	7-16 & 8-13	27	1-3	73.6
1961	111	64	90.7	105	59	82.6	103	43	73.5	83	37	60.5	77	33	55.2	116	6-25	33	12-12	72.8
1962	113	69	93.6	110	61	87.1	102	55	76.0	93	42	66.3	83	34	58.0	113	8-25	25	1-12	73.2
1963	110	72	90.3	111	66	87.3	102	58	78.1	89	42	64.5	80	33	56.0	114	7-14	24	1-13, 14	73.0
1964	111	68	90.5	107	61	83.7	105	55	79.3	86	33	60.7	85	32	56.8	116	7-12	30	1-9, 10	71.9
1965	111	70	91.2	110	58	82.0	105	53	78.4	90	41	66.0	80	36	55.2	113	7-4	31	2-12	72.6
1966	111	70	92.6	109	62	86.1	95	49	74.6	94	43	65.1	82	32	57.4	115	7-6	30	1-4, 22	73.7
'67	113	74	93.5	104	65	85.5	97	54	77.7	94	44	67.9	78	33	53.2	113	7-1,2, & 8-29	30	1-7	73.0
'68	108	65	88.6	113	58	85.5	98	53	76.0	88	42	65.9	75	27	52.4	115	6-22	27	12-22	73.5
1969	117	75	95.9	113	65	88.7	102	51	72.5	89	42	64.7	77	33	57.7	117	8-4	33	1-30	74.0
1970	114	72	93.5	111	57	84.5	98	42	72.9	87	43	63.8	78	37	55.2	119	6-25	29	1-3	73.1
1971	110	71	91.3	115	56	85.6	102	36	69.9	87	39	61.7	72	31	52.5	115	9-12	23	1-5, 7	71.7
1972	116	68	89.5	107	61	84.2	104	52	72.0	84	41	60.5	78	28	54.2	116	7-31 & 8-1	24	1-5	73.0
1973	111	64	91.0	110	60	83.8	99	50	75.4	92	40	63.9	80	37	57.5	117	6-27	30	1-6, 7	72.8
1974	112	68	90.7	110	67	88.6	102	49	75.8	88	40	64.2	79	30	53.7	116	6-27	28	1-3	73.6
1975	115	69	91.8	109	66	87.7	103	43	73.3	92	37	63.3	85	32	57.2	115	7-11 & 8-4	31	1-2, 4	72.1
1976	111	64	89.1	105	66	82.6	98	47	75.0	92	33	65.9	79	33	56.5	115	6-27 & 7-6,7	29	1-1,2,3	72.9
1977	112	72	91.6	111	60	85.6	99	51	78.3	89	41	66.3	83	41	59.6	115	6-28 & 6-29	33	1-10	74.1
1978	111	65	91.6	107	60	84.7	105	57	79.9	89	42	63.0	75	29	53.0	116	7-19, 20	29	12-8, 9	74.3
1979	112	69	88.7	111	70	90.0	103	47	78.0	84	34	62.3	85	37	59.0	115	6-13,27&7-10,24	31	1-2	73.6
1980	113	65	91.1	110	63	86.6	110	48	76.6	94	38	64.9	85	40	61.4	116	7-27	38	1-5 & 11-18	74.5
1981	116	69	93.9	107	66	88.5	96	48	73.0	90	44	66.5	81	36	59.8	116	8-27	36	12-23	75.3
1982	113	73	92.4	116	56	84.5	95	50	73.8	84	43	61.9	75	35	55.4	116	9-2	33	1-4	72.6
1983	111	69	89.8	112	64	89.4	96	61	77.5	90	39	64.9	76	36	58.8	114	7-12 & 13	35	1-1, 2 & 4	74.0
1984	116	76	91.8	112	67	89.9	102	49	72.8	89	38	63.3	71	34	54.6	116	8-30	34	12-15	74.1
1985	117	68	92.1	107	58	80.9	100	54	74.3	88	36	61.2	80	33	57.1	117	8-24	28	2-1	73.2
1986	112	74	93.7	112	58	82.0	97	54	73.5	87	42	65.0	77	33	57.0	115	7-31	33	12-12	74.9
1987	115	66	91.2	110	62	86.7	106	56	79.4	84	41	63.6	77	28	53.4	115	8-31	28	12-27	73.9
'988	109	67	90.7	109	58	85.1	105	59	80.1	96	40	64.7	83	30	55.9	111	7-25	30	12-27,30,31	73.8
'89	110	67	89.4	111	56	85.9	99	46	74.5	90	37	64.3	81	34	56.4	114	7-4	30	2-7	74.2
1990	109	67	89.0	112	65	86.5	99	50	75.4	87	36	63.5	77	21	51.5	117	6-26	21	12-23	73.0
1991	109	71	90.9	108	63	87.1	107	43	79.8	93	39	63.8	75	33	56.0	112	7-28	31	1-30	72.8
1992	113	64	92.0	107	68	88.0	103	57	76.6	87	36	60.3	70	31	51.4	114	7-18	31	12-21	73.2
1993	118	66	90.3	112	57	85.7	105	53	76.8	87	36	61.1	76	33	54.9	118	8-1	29	1-4	73.2
1994	112	77	93.7	109	61	87.7	97	47	74.4	89	33	56.7	76	31	53.4	115	6-25	31	12-11	73.1
1995	114	69	94.0	112	62	90.3	101	50	76.3	91	45	68.4	80	37	57.7	121	7-28	37	01-18; 12-22,24	74.0
1996	112	68	91.8	107	63	84.2	106	41	74.0	87	41	63.3	78	30	56.0	115	7-31	30	12-20	73.9
1997	114	75	92.6	110	65	87.8	103	47	73.4	94	43	64.9	76	32	53.2	114	8-05	32	12-25,26,27	73.2
1998	115	67	92.6	107	59	84.8	97	45	72.1	83	40	61.6	81	28	54.4	116	7-27	28	12-23	71.4
1999	111	66	89.9	109	62	86.0	104	50	77.1	90	41	66.5	78	37	56.9	111	7-1 & 8-25	36	1-13,29 & 2-11,13	72.4
2000	112	72	92.7	111	62	86.5	100	51	73.6	79	37	58.9	81	37	58.7	113	7-18,19,24,25	35	1-8	74.4
Average	112.5	67.2	90.8	110.0	59.5	85.4	101.5	48.2	74.6	88.8	37.3	62.7	79.9	31.8	55.5	115.2		28.8		72.7

IMPERIAL IRRIGATION DISTRICT
RECORD OF RAINFALL IN INCHES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1914	0.06	0.62	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.25	0.90	0.93	2.83
1915	2.30	0.02	0.10	0.28	0.00	0.00	0.00	0.60	0.02	0.00	0.00	0.00	3.32
1916	1.09	0.00	1.41	0.25	0.00	0.00	0.00	1.25	0.40	0.00	0.00	0.40	4.80
1917	1.32	0.00	0.00	0.10	0.00	0.00	0.20	0.00	0.02	Trace	0.00	0.00	1.64
1918	0.63	0.06	0.72	0.00	0.00	Trace	Trace	0.00	0.00	Trace	0.09	0.35	1.85
1919	0.08	0.40	0.26	0.00	0.02	0.00	0.08	0.00	0.89	0.28	0.84	Trace	2.85
1920	0.88	1.52	0.06	0.00	Trace	0.00	Trace	1.05	1.30	0.10	0.00	0.00	4.91
1921	0.47	0.00	0.03	0.00	0.12	0.00	0.06	2.84	0.85	0.00	0.00	1.66	6.03
1922	0.68	0.75	Trace	0.00	Trace	Trace	0.78	Trace	0.11	0.00	0.22	0.03	2.57
1923	0.09	0.10	0.40	0.20	0.00	0.00	0.02	0.02	0.59	0.02	1.29	0.78	3.51
1924	0.00	0.00	0.17	Trace	0.14	Trace	Trace	0.00	0.02	0.00	0.00	0.33	0.66
1925	Trace	0.03	0.24	0.09	0.00	0.00	Trace	0.16	Trace	1.62	0.30	0.50	2.94
1926	0.17	0.00	0.02	1.11	0.00	0.00	0.00	0.05	1.30	0.00	0.00	3.87	6.52
1927	0.12	0.64	0.11	0.02	0.00	0.00	Trace	Trace	0.00	0.89	0.00	2.92	4.70
1928	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	Trace	Trace	0.28
1929	0.15	Trace	0.00	Trace	Trace	Trace	Trace	0.26	1.23	0.00	Trace	Trace	1.64
1930	0.35	Trace	0.38	0.03	0.41	Trace	Trace	Trace	0.73	0.00	Trace	0.00	1.90
1931	0.06	1.90	0.00	0.93	0.00	0.00	0.05	0.51	0.57	0.10	0.33	0.30	4.75
1932	0.00	1.14	0.00	0.00	0.00	Trace	0.00	0.00	0.00	2.86	0.00	0.62	4.62
1933	0.47	Trace	0.00	0.79	0.02	0.00	0.10	0.63	0.01	0.30	0.06	Trace	2.38
1934	0.01	0.18	0.08	0.00	0.00	0.00	0.01	0.08	0.00	Trace	0.01	0.25	0.62
1935	0.62	2.12	0.12	Trace	Trace	0.00	0.12	1.14	0.50	0.00	Trace	0.70	5.32
1936	0.25	0.57	0.00	0.00	0.00	0.00	0.25	Trace	0.00	0.10	0.21	0.21	1.59
1937	0.19	0.10	0.61	0.00	Trace	0.00	0.35	0.00	0.15	0.00	0.00	0.09	1.49
1938	Trace	1.19	0.59	0.00	0.00	0.00	0.47	0.23	0.00	0.00	0.00	1.36	3.84
1939	0.73	0.45	Trace	0.00	0.00	0.00	0.00	0.00	7.06	Trace	0.28	Trace	8.52
1940	0.05	0.77	0.01	0.01	0.00	0.00	0.00	0.00	1.73	0.07	0.05	2.38	5.07
1941	0.85	0.30	1.10	0.46	0.01	0.00	0.06	1.08	0.28	1.04	0.10	1.34	6.62
1942	0.13	0.74	0.55	0.41	0.00	0.00	0.00	0.65	0.00	0.01	0.00	0.00	2.49
1943	0.44	0.04	0.24	Trace	0.00	0.00	0.00	0.90	0.38	0.00	0.00	2.46	4.46
1944	0.01	1.31	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.04	0.90	1.15	3.59
1945	0.57	0.07	0.03	0.03	0.00	0.00	Trace	1.44	Trace	Trace	0.00	0.67	2.81
1946	0.01	0.00	Trace	Trace	0.00	0.00	0.01	2.16	0.05	0.21	0.14	0.57	3.15
1947	0.00	0.00	0.02	0.06	0.00	0.00	0.00	0.06	0.08	0.03	0.10	0.14	0.49
1948	0.00	0.15	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.81	0.00	0.29	1.33
1949	1.77	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.04	0.20	0.03	0.19	2.29
1950	0.00	0.19	0.00	0.00	Trace	0.00	0.17	0.00	0.06	0.00	0.00	0.03	0.45
1951	0.38	0.01	0.01	0.13	0.00	0.00	0.18	1.79	0.00	Trace	0.26	0.36	3.12
1952	0.63	0.05	0.40	0.42	0.00	0.00	0.03	0.28	0.00	0.00	0.64	0.19	2.64
1953	0.00	0.02	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20
1954	0.53	0.00	0.18	0.00	0.00	0.00	0.06	0.00	0.03	0.00	0.00	0.03	0.83
1955	1.60	0.00	0.06	0.00	0.00	0.00	0.29	0.53	0.00	0.00	0.00	0.05	2.53
1956	0.13	0.01	0.00	Trace	0.01	0.00	Trace	0.00	Trace	0.00	0.00	0.01	0.16
1957	0.63	0.04	0.07	0.03	0.00	0.00	0.00	0.45	0.00	2.04	0.02	0.07	3.35
1958	0.08	1.24	0.64	0.61	0.13	0.00	0.00	0.00	0.00	0.00	0.01	0.00	2.71
1959	0.15	0.23	Trace	Trace	0.00	0.00	0.02	0.02	0.11	0.40	0.01	1.03	1.97
1960	0.50	0.15	0.30	0.00	0.01	0.00	0.03	0.01	0.53	Trace	0.14	0.07	1.74

IMPERIAL IRRIGATION DISTRICT
RECORD OF RAINFALL IN INCHES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1961	0.20	0.00	0.00	0.00	0.00	0.00	0.04	0.75	0.00	0.00	0.05	0.83	1.87
1962	0.77	0.23	0.05	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.78	1.85
1963	0.06	0.14	0.18	0.00	0.00	0.00	0.00	0.30	1.06	0.23	0.46	0.00	2.43
1964	0.01	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.29	0.01	0.93
1965	0.04	0.22	0.10	0.72	0.00	0.00	Trace	0.00	0.00	0.00	0.24	1.89	3.21
1966	0.32	0.10	0.18	0.00	0.00	0.00	0.00	0.00	0.47	0.48	0.06	0.00	1.61
1967	0.34	0.00	0.12	Trace	0.00	0.00	0.00	0.21	1.31	0.00	1.50	0.77	4.25
1968	0.00	0.06	0.58	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.04	1.99
1969	0.92	0.08	0.02	0.00	0.00	0.00	0.00	0.01	0.82	0.02	1.51	0.12	3.50
1970	0.00	0.69	0.83	0.00	0.00	0.00	0.00	0.02	0.03	Trace	0.02	0.09	1.68
1971	0.10	0.01	0.00	0.13	0.00	0.00	0.00	0.32	0.44	0.18	0.00	0.11	1.29
1972	0.00	0.00	0.00	0.00	0.00	Trace	0.00	0.00	Trace	1.71	0.45	0.00	2.16
1973	0.03	0.58	0.31	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.09	0.00	1.28
1974	1.11	0.00	0.18	0.00	0.00	0.00	0.04	0.00	0.09	0.12	0.00	0.44	1.98
1975	0.07	0.00	0.16	0.47	0.00	0.00	0.20	0.00	0.17	0.00	0.00	0.12	1.19
1976	0.00	0.84	0.00	0.36	0.02	0.00	0.29	0.00	2.84	0.00	0.58	0.15	5.08
1977	0.05	0.02	0.04	0.00	0.00	0.00	0.01	3.87	0.00	0.29	0.00	0.93	5.21
1978	1.15	0.46	0.39	0.09	0.00	0.00	0.47	0.00	0.00	0.65	0.57	0.59	4.37
1979	1.09	0.09	0.60	0.00	0.09	0.00	0.07	0.40	0.01	0.00	0.00	0.00	2.35
1980	1.59	1.41	1.06	0.23	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	4.35
1981	0.88	0.36	0.60	0.00	0.05	0.00	0.00	0.36	Trace	0.00	0.27	0.00	2.52
1982	0.31	0.09	0.82	0.00	0.00	0.00	0.00	0.49	0.63	0.00	0.10	2.40	4.84
1983	0.23	1.25	1.64	Trace	0.00	0.00	0.00	1.21	0.79	0.00	0.00	0.60	5.72
1984	0.20	0.00	0.00	0.00	0.00	0.00	0.76	0.81	0.03	0.00	0.20	1.43	3.43
1985	0.03	0.12	0.00	0.00	0.00	0.00	0.02	0.15	1.40	0.36	0.90	0.76	3.74
1986	0.14	0.50	0.12	0.00	0.00	0.00	0.06	0.05	0.04	2.59	0.19	0.04	3.73
1987	0.05	0.22	Trace	0.00	Trace	0.00	0.00	0.14	0.01	1.12	0.72	0.32	2.58
1988	0.11	0.90	0.00	0.07	0.00	0.01	0.04	0.12	0.00	0.00	0.07	0.00	1.32
1989	0.65	0.00	0.01	0.00	0.00	0.00	0.00	0.09	0.00	Trace	0.00	0.00	0.75
1990	0.14	0.02	0.06	0.05	0.00	0.00	0.00	0.89	0.09	0.21	0.00	0.00	1.46
1991	0.54	0.62	0.72	0.00	0.00	0.00	0.47	Trace	0.59	0.02	0.35	1.26	4.57
1992	0.37	0.95	1.85	0.08	0.17	0.00	0.00	0.02	0.00	0.45	0.00	1.36	5.25
1993	3.45	0.84	0.15	0.00	0.03	0.00	0.00	0.03	0.00	0.03	0.80	0.01	5.34
1994	0.06	0.49	0.64	0.00	0.72	0.00	0.00	0.08	0.02	0.00	0.26	0.78	3.05
1995	1.50	0.21	0.07	0.29	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.05	2.16
1996	0.00	0.15	0.04	0.00	0.00	0.00	0.57	0.01	0.00	0.00	0.03	0.02	0.82
1997	0.49	0.01	0.00	0.02	0.08	0.01	0.00	0.00	2.11	0.00	0.01	0.91	3.64
1998	0.15	1.08	0.73	0.00	0.00	0.00	0.00	0.06	1.08	0.00	0.04	0.12	3.26
1999	0.00	0.29	0.00	0.47	0.00	0.00	0.73	0.18	0.34	0.00	0.00	0.00	2.01
2000	0.00	0.19	0.09	0.00	0.00	0.00	0.00	0.08	0.04	0.52	0.03	0.00	0.95
2000 Total to Date	0.00	0.19	0.28	0.28	0.28	0.28	0.28	0.36	0.40	0.92	0.95	0.95	0.95
87 Year Average	0.42	0.36	0.25	0.10	0.02	0.00	0.10	0.33	0.38	0.24	0.19	0.50	2.89
Total to Date	0.42	0.78	1.03	1.13	1.15	1.15	1.25	1.58	1.96	2.20	2.39	2.89	2.89

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Imperial Dam

Located about 20 miles northeast of Yuma, Arizona, Imperial Dam is the diversion point for water flowing from the Colorado River to the All-American Canal, which serves Imperial and Coachella valleys. Imperial Dam was a first for the world of irrigation, where river water would be held and then diverted into a giant desilting plant before being released into the All-American Canal.

Background

Construction of Imperial Dam and its desilting works began in 1935 and was completed in 1938 under the authorization of the Boulder Canyon Project Act of 1928. Imperial Dam's main function is diversion of Colorado River water to the All-American Canal, the Coachella Canal, the Yuma Project and the Gila Gravity Canal.

The need for Imperial Dam as a diversion point dates back to the mid-1850s when settlers began searching for the means and the location to divert Colorado River water to the Imperial Valley.

Colorado River water was first delivered to the Imperial Valley through the Imperial (Alamo) Canal in June 1901. George Chaffey, president of the California Development Company, constructed headworks and a canal to take water from the Colorado River at a point in California immediately above the international boundary. The river headgate, known as the Chaffey Gate, was constructed as a temporary wooden gate on the intake canal about 500 feet north of the international boundary to control inflow of water into the canal.

A more permanent headgate, known as Hanlon Heading, was constructed in 1906 to replace Chaffey Gate. The following year, Southern Pacific Company assumed ownership of the bankrupt California Development Company. The Imperial Irrigation District (IID) was formed in 1911 and by 1916 had acquired all California Development assets.

There was a growing realization that an All-American Canal, located entirely within the United States, was needed. The first field survey for the canal was conducted in 1913. However, the Bureau of Reclamation reported that such a canal would be impractical without a dam to control flooding.

In the meantime, the IID found it increasingly difficult to control the amount of bedload silt brought into the canal system from the Alamo River. So, in 1918, the Rockwood Heading was built one and one-fourth miles upstream from Hanlon Heading to serve as a diversion point and a desilting works.

As part of a 1918 contract with the federal government, the IID received the right to use Laguna Dam (completed in 1909 under the federal Reclamation Act) as a diversion for the All-American Canal. But that right was never exercised. In 1919, the bureau issued its recommendation for an All-American Canal and the government construction of a storage reservoir on the Colorado River.

The final result of the negotiations with the Bureau of Reclamation was the Boulder Canyon Project Act in 1928, which authorized construction of Boulder (Hoover) Dam, Imperial Dam and the All-American Canal.

Today, the storage capacity of the reservoir above Imperial Dam is minor. Due to its shallow depth, the original storage space was soon filled with silt and sand. The reservoir area now consists of a shallow lake with well-defined channels to the All-American Canal and Gila Headworks.

Structures

Imperial Dam straddles the California-Arizona border. The All-American Canal trashrack and headgates are located adjacent to the California abutment of the dam. Three desilting basins (design capacity 4,000 cubic feet per second [c.f.s.] each) remove the sand and silt from the river water before it passes to the All-American Canal. The sand and silt removed are continuously returned to the river through the California Sluiceway Channel.

Continued on back

Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • Fax (760) 339-9191

Structures (continued)

The Gila Canal Headgates are located adjacent to the Arizona abutment of the dam. One desilting basin removes the sand from the water before it enters the Gila Gravity Main Canal, which serves the Yuma area. The sediment removed is returned to the river when necessary by opening the sluiceway gates located on the bottom and downstream end of the basin. The basin will handle a flow of 2,200 c.f.s.

Operation

The Imperial Dam, Gila Headworks, All-American Canal Works and the All-American Canal are operated and maintained by the IID with costs shared by the Bureau of Reclamation, Coachella Valley Water District, Yuma County Water Users and other water users.

- March 2000

Dimensions:

Overall length .... **3,485 feet**

(Including a 490-foot dike at the Arizona end)

Overflow Weir Section:

Length .... **1,197 feet**

Height .... **31 feet (from base to crest at 181 feet elevation)**

Operating Bridges over Non-Overflow Section:

Elevation .... **197 feet**

Freeboard above crest of maximum calculated flood .... **6 feet**

Maximum calculated flood over weir .... **10 feet**

Maximum Diversion Capacities:

All-American Canal .... **15,155 c.f.s.**

Gila Canal .... **2,200 c.f.s.**

Type Construction:

Reinforced concrete slab and buttress type

Desilting:

Three desilting basins:

Length .... **770 feet**

Width .... **540 feet**

72 scrapers .... **125 feet in diameter**

Flow capacity .... **4,000 c.f.s. each**

Sediment removal capacity .... **70,000 tons/day**

Costs:

Imperial Dam .... **(approx.) $3,000,000**

(Includes Arizona and California abutments, California sluiceway and overflow weir.)

All-American Canal Headworks **$1,300,000**

All-American Canal Desilting Basins **$4,000,000**

Gila Headworks and Desilting Basin **$2,000,000**

Total cost of works .... **$10 to $11,000,000**

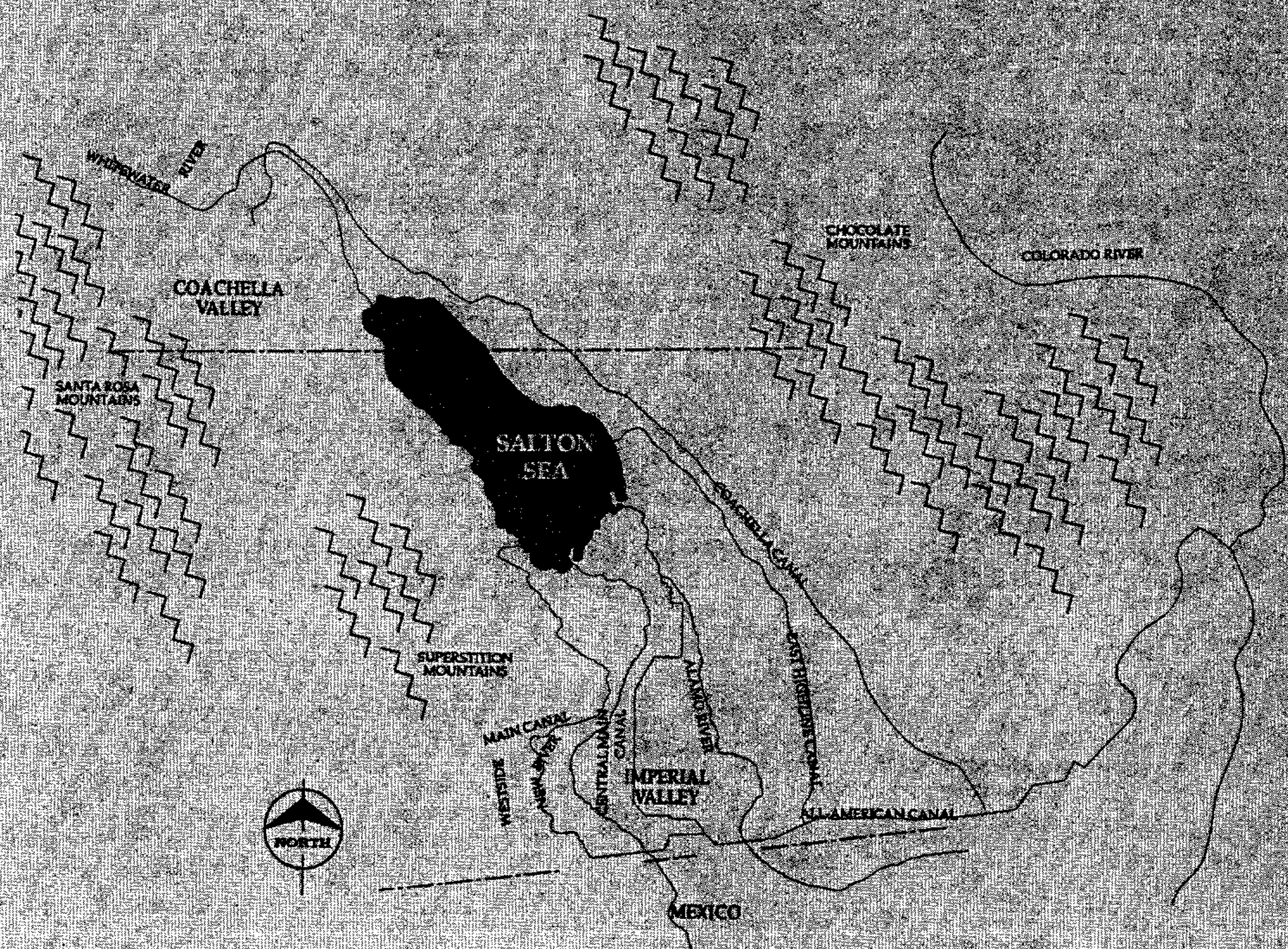
IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Salton Sea

The Salton Sea is 35 miles long, 15 miles wide and is situated within a closed basin (no outlet to the ocean) below sea level. It is located in the lowest portion of a desert valley within Imperial and Riverside counties. The sea is designated as an agricultural drainage sink (executive order signed March 10, 1924, by President Calvin Coolidge). Agricultural irrigation drainage of 1.36 million acre-feet per year is the primary source of maintaining the sea. The sea's average depth is 29.9 feet, with the deepest point measuring 51 feet.

Since the Colorado River carries one ton of salt per acre foot of water, salinity is an ongoing concern at the sea. Algal bloom and the subsequent by-products of decomposition (botulism) have led to recent fish and bird die-offs. These problems have gained the attention of local, state and federal officials who are now looking into solutions to clean up the sea. Even with these fish and bird die offs, the sea still continues to provide a vital link in the Pacific Flyway by offering vast aquatic and wetland habitats in a region where water is scarce and where historic wetlands have been developed.

(Continued inside)



Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • Fax (760) 339-9191 • www.iid.com

Background

Imperial Valley's history reveals that the Salton Sink, which is largely below sea level, was once the bottom of a prehistoric sea. The Gulf of California originally extended north into what is now the Imperial and Coachella valleys. Evidence of marine life and shells high on the sides of the local mountains indicates that the entire region experienced a tremendous up-thrust resulting in the birth of the region's mountain ranges.

Gradually over time, vast quantities of silt deposited by the Colorado River formed a delta closing off the northern arm of the basin from the gulf. Periodically, the river overflowed its natural levees and filled the valley between the mountain ranges to form a vast lake, Lake Cahuilla (about 30 feet above sea level). Traces of Lake Cahuilla, named after the ancient tribe of Indians who inhabited the shoreline, can still be seen along the mountains to the west of the northerly end of the sea and in the sand dunes toward Glamis.

When construction of the Imperial Canal was completed in 1901, the sink was dry and the canal diverted water for irrigation from the Colorado River just upstream from the Mexican border. After about four years, silt deposits led to attempts to relocate the diversion a short distance downstream from the Mexican border. However, unusual winter floods breached the diversion structure in 1905 and, for 15 months following, the entire flow of the Colorado River poured through Mexicali, Imperial Valley and into the Salton Sink, threatening destruction of farming and thousands of homestead families. After many months and high costs, the river break was finally closed in the spring of 1907 and the reestablished lake was named Salton Sea.

Water Conservation

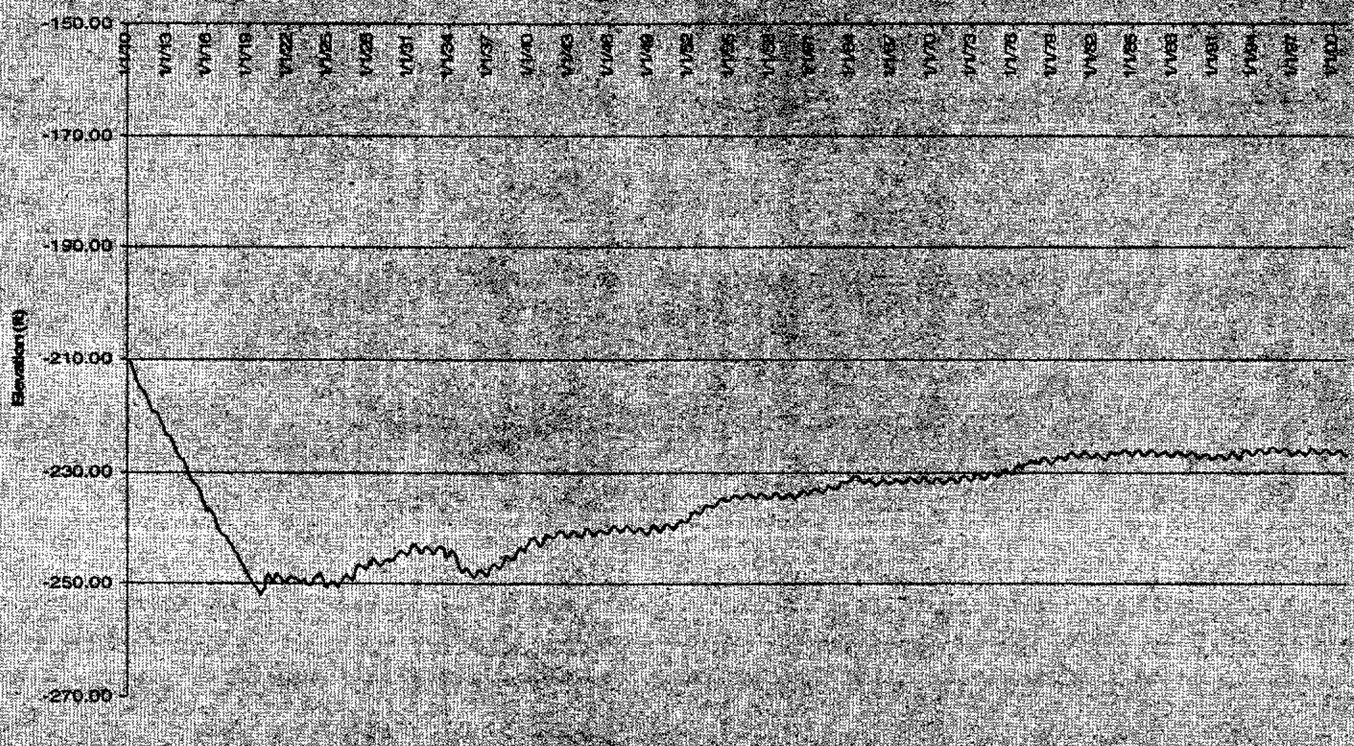
It was the rising level of the Salton Sea that focused public attention on water use practices at the Imperial Irrigation District. Although IID began water conservation programs initially in the mid-1950s, the effects of these water conservation programs were not readily recognized as stabilizing the level of the sea until 1980. Despite savings of more than 100,000 acre-feet annually with these early conservation programs, state, federal agencies and several court decisions prompted a more aggressive plan to conserve water and lower the elevation of the sea. In 1989, IID and the Metropolitan Water District of Los Angeles signed a landmark conservation agreement that would conserve an additional 106,000 acre-feet of water each year.

Elevation

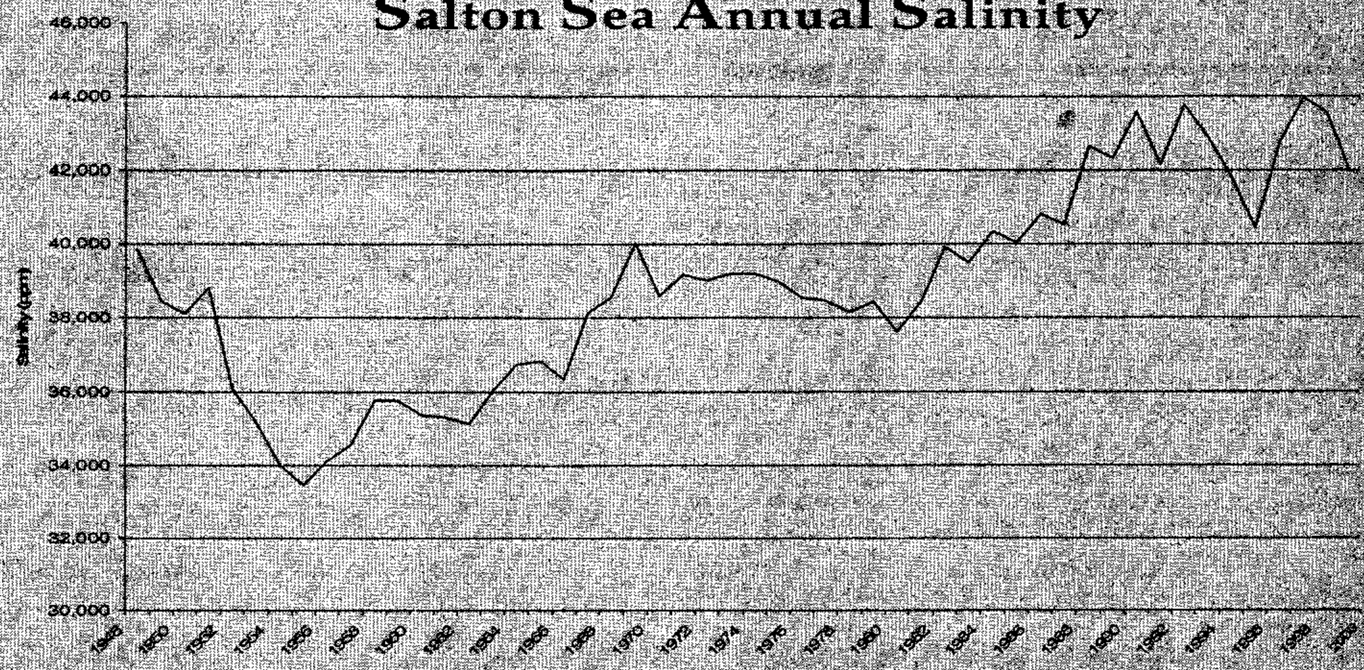
The Salton Sea's average elevation in 2000 was 227 feet below sea level. This is only five feet higher than the lowest point in Death Valley. In 1907, the Colorado River stopped flowing into the sea, and evaporation greatly exceeded inflow, resulting in a rapidly declining water level until 1924. Today, evaporation remains the only outlet as the sea exists in a closed basin. Increased irrigation development, improved agricultural drainage systems and several major rainstorms caused inflow to exceed evaporation which resulted in a gradual rise in the sea until 1980. Decades of increased elevations have caused damage to agricultural, recreational and residential properties along the sea's shore.

After 1980, the elevation stabilized somewhat due largely in part to IID's water conservation programs. Today the sea's surface covers about 250,000 acres and contains about 7.5 million acre-feet of water, evaporating at a rate of 1.36 million acre-feet each year.

Salton Sea Peak Elevations



Salton Sea Annual Salinity



Pollution

New River pollution from Mexico, although an issue at the border, is not significant as the river enters the Salton Sea. In fact, by the time the river reaches the sea, the water quality has improved due to the addition of agricultural drain water and through natural cleansing occurring in the intervening 60 miles.

The sea is considered a Rec I swimmable water body by the California Regional Water Quality Control Board. The primary water quality problem currently facing the sea is the salinity level. Agricultural pesticides have not been detected in the sea at levels to cause a public health concern.

Salinity

The salinity concentration of the Salton Sea is 25 percent higher than ocean water and Salton Sea wildlife as well as the sport fishing industry is threatened by these rising salinity levels. All salts that drain from the surrounding agricultural lands of the lower Colorado River and Mexico are deposited there. The high evaporation rate of the desert climate removes water from the sea each year, but leaves salt behind that becomes more and more concentrated. The annual water inflow is currently 1.36 million acre-feet with an annual salt loading of 4.5 million tons.

Selenium

Selenium, a sulfur-like element, is to blame for waterfowl deformities at the Kesterson Reservoir in Merced County, California, and has been detected in Salton Sea fish in concentrations exceeding state advisory levels. As a result, the public has been cautioned about consuming large quantities of fish from the sea (currently under reevaluation). However, abnormalities in Salton Sea wildlife have not been detected. Studies on the impacts of selenium at the sea are now underway. Selenium found in the Imperial Valley is imported with Colorado River water used for irrigation and does not naturally occur in the Imperial Valley.

Stabilizing the Sea

In 1986, at the direction of the governor of California and the California Resources Agency, the IID joined a group of 20 interested agencies and formed the Salton Sea Task Force. Their goal is to find workable solutions in stabilizing the elevation and salinity of the Salton Sea. The statewide group studied solar pond technology, pump-out facilities and diked impoundments, among other options, along with possible funding sources.

In 1993, the Salton Sea Authority was formed under a joint powers agreement between the counties of Imperial and Riverside, IID and the Coachella Valley Water District. The group was organized to work with the State of California, the federal government and the Republic of Mexico to develop programs that will ensure continued beneficial use of the Salton Sea. In addition, IID is working with the U.S. Fish & Wildlife Service to develop marshlands for water quality improvement and to provide habitat for endangered species along the Salton Sea.

The sea has evolved over the years from human induced changes and natural processes. Local, state and federal officials will continue to play active roles in efforts dealing with the restoration and preservation of the sea. This intervention will be expensive, but is necessary to save the sea's economic, environmental and recreational values.

(Continued on back)

Pacific Flyway

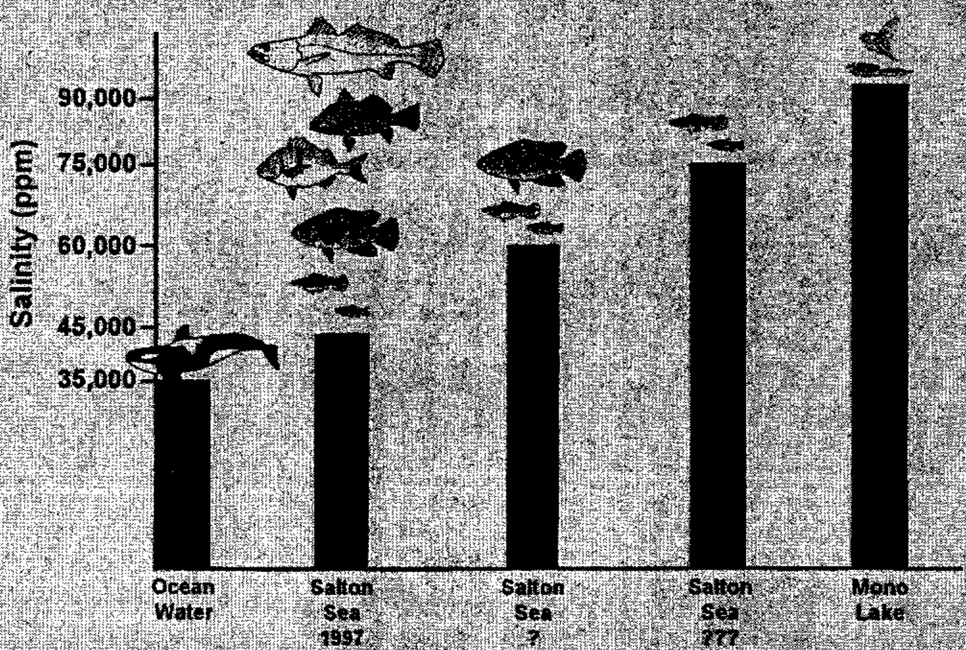
The Salton Sea is a critical component of the habitat base that currently sustains migratory birds of the Pacific Flyway. Wetland losses within the state of California exceed 90 percent of the acreage present at the time of statehood and is one of the reasons why the sea has become an important wintering and staging area for migratory birds. Populations of up to 1.5 million eared grebes have been documented at the sea during recent years along with up to one-half of California's wintering white-faced ibis, tens of thousands of shorebirds, waterfowl and white pelicans. Nearly 40 percent of the nesting black skimmers in California are found at the sea along with significant breeding colonies of double-crested cormorants and Caspian terns and the largest breeding population of gull-billed terns in western North America. In total, more than 380 species of birds have been recorded at the Sonny Bono Salton Sea National Wildlife Refuge, the largest number of species found on any national wildlife refuge in the West. Endangered species are also prominent at the sea. A significant portion of the Yuma clapper rail population is dependent upon the sea and the drains that feed the sea. Desert pupfish are another prominent species present as are endangered California brown pelicans.

Salton Sea Facts

- Over 200,000 visitors each year visit the sea's recreation areas and wildlife refuge.
- The state park has 1,400 campsites, five campgrounds, hundreds of picnic sites, trails, playgrounds, boat ramps and a visitor center.
- Activities at the sea include boating, water-skiing, fishing, jet skiing, hiking, birdwatching and sailboarding.
- The lake is known as the fastest boat racing lake in the nation because its high salt content causes vessels to be more buoyant.
- Four-million birds are estimated to use the sea daily in the winter, more than any other resource in the nation.
- The sea is also a vital link for waterfowl and shore birds on the Pacific Flyway.
- Nearly 400 species of birds have been observed at the sea – almost half of the 900 species known to exist on the North American continent.
- IID maintains 17 miles of dikes which protect adjacent farmlands and other property from flooding.
- Imperial County has seven geothermal power plants generating 380 megawatts of installed geothermal generating capacity around the Salton Sea and is currently the second largest producer of geothermal-generated electricity and mineral recovery in the U.S.
- The Salton Sea geothermal system is the hottest water-dominated system in the world.

– January 2001

Probable Influence of Elevated Salinity on the Fish Fauna of the Salton Sea



(Chart provided by Coachella Valley Water District)

IID uses recycled paper

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Imperial Valley Agriculture 2000

The Imperial Valley's fertile soil and mild climate allow farmers to enjoy year-round planting, cultivation and harvest. In 2000, over 580,000 acres of Imperial Valley land was farmed to produce over $900 million in field, vegetable and permanent crops.

Background

The feasibility of irrigating the barren Imperial Valley with water from the Colorado River was recognized as early as the 1850s. It wasn't until 1901 that the California Development Company started diverting water to the Imperial Valley through a canal, called the Alamo, which had its heading in the United States but ran most of its course through Mexico.

In 1905, a winter flood caused the Colorado River to jump its banks and flow freely into the Imperial Valley creating the Salton Sea. The sea is still used as a drainage basin for irrigation and storm runoff in the Imperial, Coachella and Mexicali valleys.

The Imperial Irrigation District was formed in 1911 to acquire properties of the bankrupt California Development Company. By 1922, the district had also acquired the 13 mutual water companies which had developed and operated the distribution canals.

Since 1942, the Imperial Valley has received its water through the All-American Canal, which runs its entire length in the United States. The 82-mile-long All-American Canal carries water from the Imperial Dam on the Colorado River west to agriculture and cities in the Imperial Valley.

Colorado River

The Colorado River is the lifeline of the Imperial Valley. Its course runs a 1,400-mile distance and its watershed covers 157 million acres of land. The river produces approximately 14 million acre-feet of water per year. One acre-foot is equal to 325,900 gallons – enough to sustain the water needs of a family of five for one year.

The river makes it possible to irrigate nearly 500,000 acres in the Imperial Valley, in addition to farmland in the Palo Verde and Coachella valleys in California and the Yuma Project in Arizona. Water from the river is also diverted to the Metropolitan Water District for use in Southern California urban areas and to other agriculture and urban interests along its course.

A naturally salty river, the Colorado carries salinity from saline springs and agriculture return flows along its way. Salinity is responsible for millions of dollars in damages to agriculture, municipal and industrial users in the lower basin states.

The Colorado is also an extremely silty river. Six desilting basins remove silt from the water at the Imperial Dam before it is diverted into the All-American Canal.

Soils

In the Imperial Valley, irrigated farmlands flourish on layers of soil deposited over centuries by the Colorado River. The soils are formed in two principle landscapes. One landscape is the lower Colorado River flood plain and the dry lake basin of old Lake Cahuilla. The other landscape is the nearly level to gently sloping plain of the Imperial East and West mesas which lie above the beachline of the old lake.

There is no "top soil" in the usual sense. The valley is a large bowl filled with a conglomerate of elements transported by Colorado River flood waters. The soils are up to a full mile or more deep. Beneath the soil surface is a maze of passages of aquifers and aquicludes of clay barriers and sand lenses. In general, there is no gravel and sand water-bearing stratum. Stratum of any one type of soil does not extend over a large area, but occurs more as a lens or pocket.

Imperial Valley soil is naturally salty. As river floods left alluvial soils, they also left salt. Saline soils are often recognized by a white crust on the surface.

continued inside

Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • Fax (760) 339-9191 • www.iid.com

Water

The Colorado River is highly saline and carries about one ton of salt per acre-foot of water applied to fields, posing problems for growers. Imperial Valley farmers battle salinity by leaching salts through the root zone into subsurface tile drainage systems. This saline water is then carried through the district's drainage canals into the Salton Sea. Adequate drainage in the Imperial Valley makes the difference between barren land and highly productive soil. To date, there are 230 miles of main canals, 1,438 miles of canals and laterals of which 1,109 miles are concrete lined or pipelined, and 1,406 miles of drainage ditches in the Imperial Valley.

Weather

Imperial Valley enjoys a year-round climate characterized by a temperate fall, winter and spring and a harsh summer. Humidity often combines with the Imperial Valley's normal high temperatures to produce a moist, tropical atmosphere that frequently seems hotter than the thermometer suggests. The highest temperature on record, 121 degrees, was recorded on July 29, 1995. The lowest temperature ever recorded was 16 degrees on January 22, 1937.

The sun shines, on the average, more in the Imperial Valley than anywhere else in the United States. Even in December and January, the sun shines an average of more than eight hours a day.

The 87-year average rainfall for the Imperial Valley is 2.87 inches. June is the driest month of the year. Since 1914, there has been measurable rainfall three times during that month – 0.04 of an inch on June 2, 1948 and 0.01 of an inch on June 18, 1988, and June 7, 1997. The period from November through March is considered the "rainy" season. On the average there are 16 hours of rainfall during that period, a little more than three hours a month.

Cool winter nights occasionally produce overnight and morning frosts. The only recorded snowfall of consequence occurred in 1932. Up to four inches of snow was reported in the southeast portion of the Imperial Valley on December 13 of that year.

Allowing for year-round crops, the moderate desert climate is a factor in making the Imperial Valley's farmland among the most productive in the world.

Crop Report

The availability of Colorado River water and a considerate climate make the Imperial Valley one of the most productive agricultural regions in the world. The Imperial Valley has an agriculturally-based economy, producing over $900 million in crops annually. Roughly one out of every three jobs is directly related to agriculture.

There are 1,061,637 total acres within district boundaries. In 2000, 414,208 acres were used for field crops, 98,434 for vegetable crops and 24,434 for permanent crops.

Top 10 Crops For 2000

Cattle	$158,606,000
Alfalfa	121,524,000
Lettuce	78,899,000
Carrots	55,650,000
Sugar Beets	45,062,000
Misc. Livestock	43,224,000
Leaf Lettuce	41,629,000
Broccoli	30,719,000
Cantaloupes	30,714,000
Onions	28,486,000

Harvest Schedule

January–March	July–September
Asparagus • Broccoli Carrots • Lettuce Cabbage • Romaine Dehydrator Onions Bunching Onions Summer Squash Alfalfa • Citrus	Seed Onions • Tomatoes Watermelon • Casaba Okra • Banana Squash Alfalfa • Wheat Flax • Sesbania Forage Sorghums Grain Sorghums Sugar Beets
April–June	**October–December**
Asparagus • Okra Garlic • Cantaloupe Fresh Market Onions Seed Onions Tomatoes • Honeydew Watermelon • Flax Sweet Corn Summer Squash Banana Squash Alfalfa • Wheat Sudan Grass Sugar Beets	Broccoli • Cantaloupe Carrots • Lettuce Cabbage • Cucumbers Casaba • Honeydew Persian • Rapini Okra • Romaine Bunching Onions Summer Squash Alfalfa Cotton • Sesbania Forage Sorghums Grain Sorghums

2000 Summary

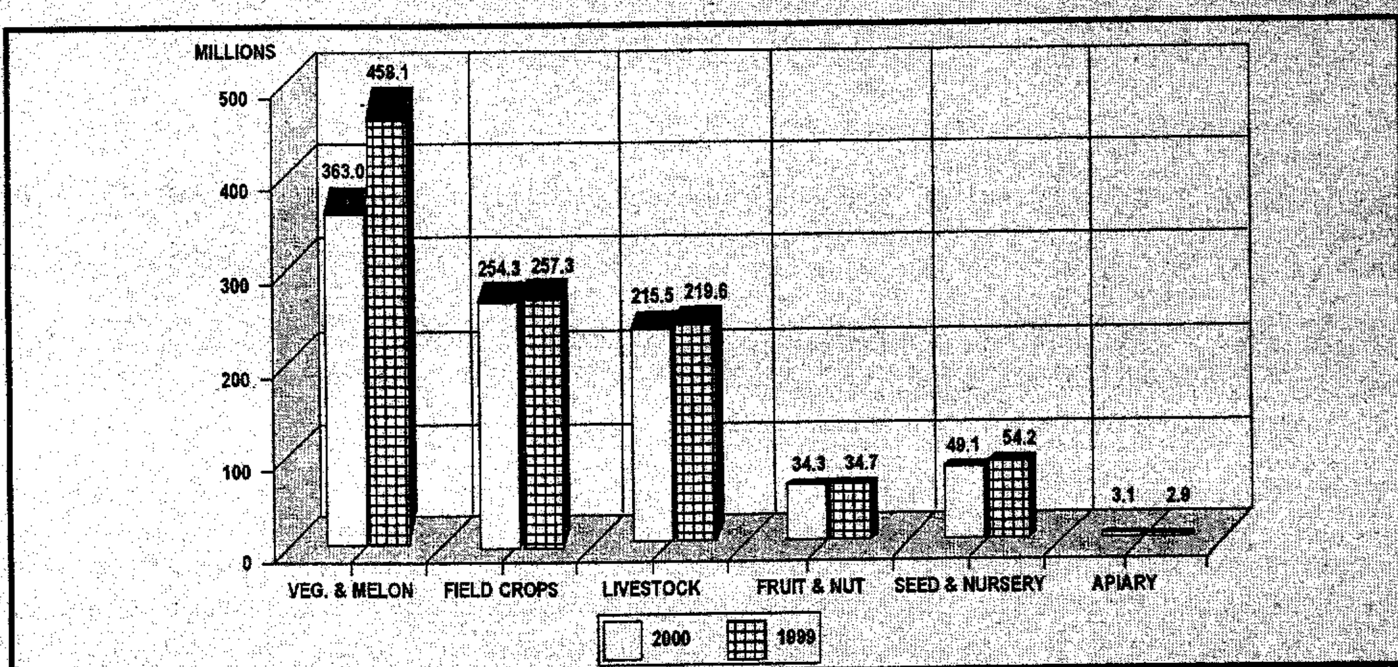
Commodity	Year	Harvested Acreage	Value
Vegetable and Melon Crops	2000	103,550	363,096,000
	1999	122,063	458,114,000
Field Crops	2000	389,628	254,357,000
	1999	368,517	257,341,000
Livestock	2000		215,515,000
	1999		219,609,000
Fruit and Nut Crops	2000	5,959	34,392,000
	1999	5,812	34,743,000
Seed and Nursery Crops	2000	81,564	49,104,000
	**1999	75,623	54,250,000
Apiary Products	2000		3,146,000
	1999		2,981,000
Totals	2000	580,701	919,610,000
Totals	1999	572,015	1,027,038,000

**-1999 revised

Gross Value

2000-1999 Comparison

(Value = Millions of Dollars)



Acreage Survey

	Acres		
	2000	**1999**	**1998**
Field Crops	414,208	406,258	449,640
Garden Crops	98,434	111,543	94,088
Permanent Crops	24,434	23,851	22,806
Total Acres of Crops	537,076	541,652	566,534
Total Multiple Cropped Acres	75,562	82,090	105,473
Total Net Acres in Crops	461,514	459,562	461,061
Area Being Reclaimed: Leached	623	2,640	190
Net Area Irrigated	462,137	462,202	461,251
Area Farmable but not Farmed During Year (Fallowed Land)	16,863	17,125	18,076
Total Area Farmable	479,000	479,327	479,327
Area of Farms in Homes, Feedlots, Corrals, Cotton Gins, Experimental Farms and Industrial Areas	16,346	16,019	16,019
Area in Cities, Towns, Airports, Cemeteries, Fairgrounds, Golf Courses, Recreational, Parks, Lakes & Rural Schools	26,013	26,013	26,013
Total Area Receiving Water	521,359	521,359	521,359
Area in Drains, Canals, Reservoirs, Rivers, Railroads and Roads	73,650	73,650	73,650
Area below -230 Salton Sea Reserve Boundary & Area Covered by Salton Sea, Less Area Receiving Water	40,150	40,150	40,150
Area in Imperial Unit not Entitled to Water	63,933	63,933	63,933
Undeveloped Area of Imperial, West Mesa, East Mesa and Pilot Knob Units	277,629	277,629	277,629
Total Acreage Included — All Units	976,721	976,721	976,721
*Acreage Not Included — All Units	84,916	84,916	84,916
Total Gross Acreage within District Boundaries	1,061,637	1,061,637	1,061,637

*Acreage within District boundaries that is not included in District.

Summary

	2000		1999		1998	
Number of Farm Accounts		6,002		6,257		6,290
Number of Owner-Operated Farm Accounts	(42.0%)	2,519	(44.7%)	2,799	(43.9%)	2,760
Number of Tenant-Operated Farm Accounts	(58.0%)	3,483	(55.3%)	3,458	(56.1%)	3,530
Average Acreage of Farm Account		79.81		76.61		76.20

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Reservoirs

The Imperial Irrigation District has constructed ten regulating reservoirs as part of its ongoing water conservation program. The reservoirs receive water that would normally be surplus and store the water for beneficial use when needed. Together, the district's reservoirs have a storage capacity of more than 3,300 acre-feet (AF) of water.

Kakoo Singh

The Kakoo Singh Reservoir, the first reservoir constructed by the district, regulates water from the East Highline Canal. The water is diverted into the Vail Supply Canal via gravity flow and back into the East Highline via pump flow. This reservoir, which was named after a local farmer, is located next to the East Highline, near the Vail Supply Heading and above the Nectarine Check.

Area	**32 Acres**
Capacity	**323 Acre-Feet**
Maximum Depth	**11 Feet**
Inlet-Outlet Flow Capacity	**100 cfs**
Date of Diversion	**January 20, 1976**

J. M. Sheldon

The Sheldon Reservoir, located on the Westside Main Canal off Forrester Road, northwest of Imperial, takes surplus water from the Westside Main. This reservoir was named for a long-time district employee, J. Melvin Sheldon, who was manager of the water department from 1966 to 1976.

Area	**50 Acres** (surface area @ capacity)
Capacity	**476 Acre-Feet**
Maximum Depth	**10 Feet**
Inlet-Outlet Flow Capacity	**100 cfs**
Date of Diversion	**March 29, 1977**

Oscar Fudge

The Fudge Reservoir is on the Central Main Canal near Brawley. O. L. "Oscar" Fudge was a water department manager who retired in 1966.

Area	**37.5 Acres**
Capacity	**300 Acre-Feet**
Maximum Depth	**10 Feet**
Inlet-Outlet Flow Capacity	**100 cfs**
Date of Diversion	**February 26, 1982**

H. "Red" Sperber

The Sperber is located west of Holtville on Meloland Road. Water from the Rositas Canal is held and released when needed into the Rose and Rubber canals. The reservoir was named after Herman "Red" Sperber, a local farmer and long-time member of the Imperial County Board of Supervisors.

Area	**64.6 Acres**
Capacity	**470 Acre-Feet**
Maximum Depth	**9 Feet**
Inlet Flow Capacity	**100 cfs**
Outlet Flow Capacity	**2 outlets @ 100 cfs each**
Date of Diversion	**May 1, 1983**

Robert F. Carter

The Carter Reservoir is designed to conserve operational discharge from the end of the Westside Main Canal. Located adjacent to Highway 86, six miles north of Westmorland, the reservoir also features a computerized control system and a specially designed area for recreational fishing. A five-foot dike impounds water within the fish habitat area. The dike is 1,000 feet by 110 feet with a sandy beach for fishing access. Robert F. Carter served as the district's general manager from 1959 to 1977.

Area	**32 Acres** (surface area @ capacity)
Capacity	**350 Acre-Feet**
Maximum Depth	**11.3 Feet**
Inlet Flow Capacity	**150 cfs**
Outlet Flow Capacity	**50 cfs** (pump outlet only)
Date of Diversion	**September 19, 1988**

continued on back

Public Affairs Department • P. O. Box 937 • 333 E. Barioni Blvd. • Imperial, CA 92251-0937 • (760) 339-9426 • Fax (760) 339-9191 • www.iid.com

Bernard Galleano

The Bernard Galleano Reservoir is located at the terminus of the East Highline Canal just north of Niland. Farmland beyond this point is supplied water via the Niland Lateral Canal Extension. The location of the reservoir, and the fact that it is totally automated and self-controlled, allows the IID to balance water shortfalls and overages in the East Highline Canal, thus providing more uniform water deliveries to all downstream users. The reservoir was designed with an enhanced fisheries habitat and test site for waterfowl habitat development. The reservoir was named after Bernard Galleano, former Calipatria area farmer and member of the IID's Board of Directors.

Area	**40 Acres**
Capacity	**425 Acre-Feet**
Maximum Depth	**21 Feet**
Inlet Flow Capacity	**150 cfs**
Outlet Flow Capacity	**75 cfs** (pump outlet only)
Date of Diversion	**October 9, 1991**

Carl C. Bevins

The Carl C. Bevins Reservoir stores operational discharge from the eight lateral canals in the Plum-Oasis Lateral Interceptor system. Two 25-cfs pumps draw water out of the reservoir for downstream users and have a backflow ability to draw excess water out of the downstream canal for storage in the reservoir. The Bevins Reservoir, located east of Imperial, is part of a project that provides farmers a virtual demand delivery system where they can shut off or receive water whenever they want.

Area	**37.36 Acres**
Capacity	**253 Acre-Feet**
Maximum Depth	**12.9 Feet**
Inlet Flow Capacity	**165 cfs**
Outlet Flow Capacity	**50 cfs** (pump outlet only)
Date of Diversion	**November 12, 1992**

Young

The 275 acre-foot Young Reservoir was constructed as part of the Mulberry-D Lateral Interceptor Project under the 1989 IID/MWD Water Conservation Program Agreement. The Mulberry-D Lateral Interceptor is approximately 8.25 miles long and catches operational discharge at the ends of 11 lateral canals serving 31,000 acres of farmland. The reservoir is located near Calipatria at the end of the interceptor canal to store water for downstream users. The Mulberry-D Lateral Interceptor Project conserves about 7,650 acre-feet of water annually. The Young family name was chosen in recognition of their dedication and contributions to the Imperial Valley during their three generations of farming.

Area	**47 Acres**
Capacity	**275 Acre-Feet**
Maximum Depth	**9 Feet**
Inlet Flow Capacity	**100 cfs**
Outlet Flow Capacity	**100 cfs** (pump outlet only)
Date of Diversion	**February 9, 1996**

Milas Russell, Sr.

The 200 acre-foot Russell Reservoir is part of the Mulberry-D Lateral Interceptor Project, a 1989 IID/MWD Water Conservation Program Agreement. The Mulberry-D catches operational discharge at the ends of 11 lateral canals which serve 31,000 acres of farmland near Calipatria. It is approximately 8.25 miles long. This lateral interceptor project will conserve about 7,650 acre-feet of water annually. The Russell Reservoir will store water for downstream users and is located on the Vail Canal. The reservoir was named after Milas Russell Sr., a dedicated farmer who transformed marginal land into productive farm ground and was a leader in community service.

Area	**29 Acres**
Capacity	**200 Acre-Feet**
Maximum Depth	**8.3 Feet**
Inlet Flow Capacity	**100 cfs**
Outlet Flow Capacity	**50 cfs** (pump outlet only)
Date of Diversion	**December 5, 1996**

Louise K. Willey

The 300 acre-foot Willey Reservoir was constructed as part of the Trifolium Lateral Interceptor Project under the 1989 IID/MWD Water Conservation Program Agreement. The Trifolium Lateral Interceptor is approximately 10.9 miles long and catches operational discharge at the ends of 15 lateral canals serving 30,000 acres of farmland. The reservoir is located on the south side of the New River opposite the end of the Vail Canal. This reservoir stores the operational discharge from the interceptor and pumps the water through a 45-inch diameter pipeline 3.5 miles long upstream on the Vail Canal. The water is then discharged into the Vail Canal at the Vail Lateral No. 3 Heading for downstream users. The Trifolium Lateral Interceptor Project conserves about 10,700 acre-feet of water annually. The reservoir was named for Louise K. Willey for her outstanding contribution to the local agricultural industry and to the people of the Imperial Valley.

Area	**51.2 Acres**
Capacity	**300 Acre-Feet**
Maximum Depth	**7 Feet**
Inlet Flow Capacity	**190 cfs**
Outlet Flow Capacity	**51 cfs** (pump outlet only)
Date of Diversion	**January 22, 1998**

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: All-American Canal

The All-American Canal is the Imperial Valley's lifeline from the Colorado River. Approximately 3.1 million acre-feet of Colorado River water is delivered annually through the All-American Canal to nine cities and 500,000 acres of agricultural lands throughout the Imperial Valley.

Considered an engineering marvel, even by today's standards, the 82-mile gravity-flow All-American Canal begins at Imperial Dam on the Colorado River about 20 miles northeast of Yuma, Arizona. Dropping a total of 175 feet between Imperial Dam and the Westside Main Canal, the All-American Canal extends south and then west, following the Mexican/American border much of the way. Crossing 14 miles of sand dunes on the east side of the Imperial Valley, the All-American Canal ends in the southwest corner of the Imperial Irrigation District's delivery area.

Background

Survival and development in the Imperial Valley has always been dependent on water and its availability. The quest to bring water from the Colorado River to irrigate land in Imperial Valley began in the 1850s. However, it was not until 1901 that the California Development Company contracted to build a canal (the Alamo Canal) to deliver water by gravity-flow from the river to the southern end of the valley. The Alamo Canal's diversion point was a short distance north of the Mexican border near Pilot Knob and most of its length ran through Mexico before it recrossed the border into the Imperial Valley.

The Imperial Irrigation District (IID) was formed in 1911 under a state charter and acquired certain rights of the California Development Company and its Mexican subsidiary. Because its main canal and levees were located in Mexico, giving Imperial Valley little security in its water supply or against flooding, the IID realized the need for an "All-American Canal" north of the international border.

The concept of an all American canal was not new. In 1912, Mark Rose, a pioneer farmer, went to Washington, D.C., seeking funding for a canal on his land in Imperial Valley's East Mesa. In 1917, IID's chief counsel, Phil Swing (who later became a U.S. Congressman), successfully negotiated an agreement between the United States Bureau of Reclamation (USBR) and the IID to investigate the Imperial Valley's need for an all American canal. The early pioneers' efforts paid off and, in 1928, the Boulder Canyon Project Act authorized the construction of the All-American Canal, Hoover Dam and Imperial Dam. The All-American Canal was constructed by the USBR during the 1930s and in 1940 the first water was delivered to Imperial Valley. In 1942, the All-American Canal became the sole water source for Imperial Valley residents and area farmlands.

Distribution System

Through this gravity-flow canal, Colorado River water is conveyed to the head of the IID system at Drop 1. Several main canals branch off the All-American: the East Highline, Central Main and Westside Main canals. Service to Imperial Valley is provided from these three main canals or from the tributary lateral canals that they supply.

Continued inside

Public Information Department • 1284 Main Street • El Centro, CA 92243 • (760) 482-9600 • Fax (760) 482-9611 • www.iid.com

In total, IID controls and maintains 1,675 miles of irrigation canals in the Imperial Valley. In addition, IID's distribution system also includes 10 reservoirs, with a total storage capacity of more than 3,000 acre-feet.

Structures

The All-American Canal trashrack and headgates are located adjacent to the California abutment of Imperial Dam. Three desilting basins (design capacity 4,000 c.f.s. each) remove sediment from the river's water before it passes to the All-American Canal. The sediment is returned to the river by means of six sludge return pipes that deposit the sediment into the California Sluiceway.

Hydroelectric Power

The passage of the Boulder Canyon Project Act in 1928 served as a springboard for hydroelectric power in the valley. Part of the act required the secretary of the interior to obtain local guarantees for repayment of the construction costs for the All-American Canal, among other projects. The IID recognized that the people of the Imperial Valley could repay their share of the construction loans as long as they were given the right to use the power generated on the All-American Canal.

The first hydroelectric plants on the All-American Canal were completed at Drops 3 and 4 in 1941 and a Drop 2 hydropower facility was installed in 1953. The Pilot Knob Hydro plant was built on a bypass channel between the All-American Canal and the Colorado River and went into operation in 1957. The Drop 5 installation was completed in 1982 and the Drop 1 and East Highline Turnout hydro plants were commissioned in 1984.

Operations

The All-American Canal, All-American Canal Works, Imperial Dam and Gila Headworks are operated and maintained by the IID with costs shared by the USBR, Coachella Valley Water District, Yuma County water users and other water users.

Future Improvements

The USBR has concluded that an estimated 70,000 acre-feet per year of water is lost due to seepage along a 23-mile section of the All-American Canal, running through the sand dunes from Pilot Knob to Drop 3. Until recently, the cost associated with seepage recovery was considered prohibitive.

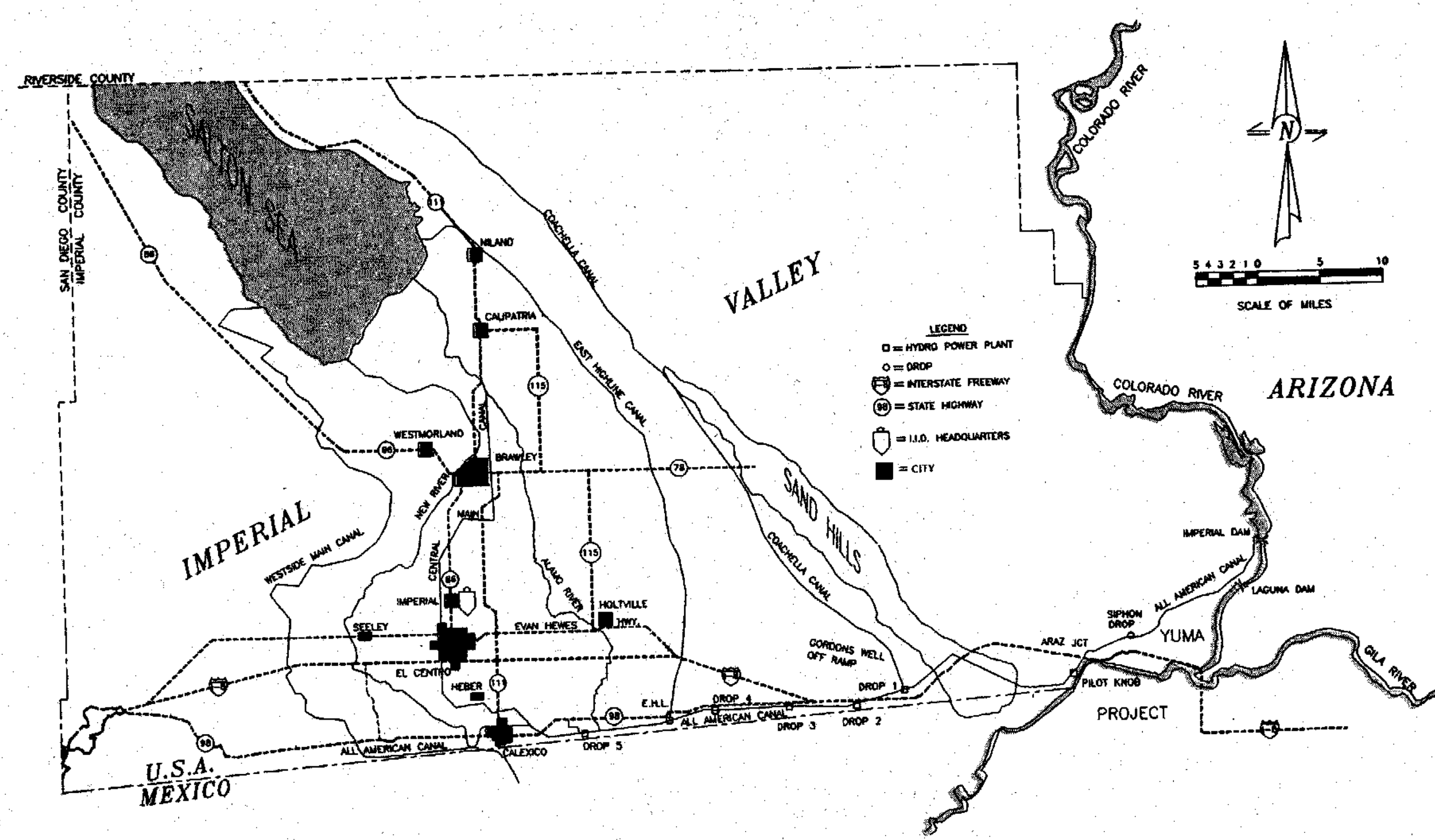
In 1988, Public Law 100-675 was enacted. It authorizes the secretary of the interior to line the All-American Canal or to recover seepage from it. The IID is currently developing a water conservation project that will fulfill the requirements mandated by this law.

In August 1998, the state legislation was approved and $235 million was appropriated for a water project that ensures continued flows from the Colorado River. Of the appropriation, $200 million will be used to concrete line part of the All-American Canal and its Coachella branch. The remaining $35 million will increase underground water storage along the Colorado River aqueduct.

The interior department notified IID in November 1999 that the 1994 Environmental Impact Statement/Environmental Impact Report and Record of Decision on the lining of the canal continues to meet the requirements of the National Environmental Policy Act and the California Environmental Quality Act and should be valid until construction is complete in 2006.

No firm dates have been set as to when construction will begin.

Continued on back


RIVERSIDE COUNTY
SAN DIEGO COUNTY
IMPERIAL COUNTY
SALTON SEA
IMPERIAL
VALLEY
NILAND
CALIPATRIA
WESTMORLAND
BRAWLEY
NEW RIVER
CENTRAL
MAIN
CANAL
IMPERIAL
SEELEY
EL CENTRO
HEBER
CALEXICO
HOLTVILLE
HWY.
EVAN HEWES
ALAMO RIVER
WESTSIDE MAIN CANAL
EAST HIGHLINE CANAL
COACHELLA CANAL
SAND HILLS
GORDONS WELL
OFF RAMP
DROP 1
DROP 2
DROP 3
DROP 4
DROP 5
E.H.L.
ALL AMERICAN CANAL
U.S.A.
MEXICO
ARAZ JCT
PILOT KNOB
PROJECT
SIPHON
DROP
YUMA
IMPERIAL DAM
LAGUNA DAM
GILA RIVER
COLORADO RIVER
ARIZONA
LEGEND
= HYDRO POWER PLANT
= DROP
= INTERSTATE FREEWAY
= STATE HIGHWAY
= I.I.D. HEADQUARTERS
= CITY
SCALE OF MILES
5 4 3 2 1 0 5 10
N
11
78
86
98
115

All-American Canal Specifications

Overall length .... 82 miles
Width .... 150 to 200 feet
Depth .... 7 to 20 feet
Total Drop .... 175 feet
Capacity:

- From Imperial Dam to Siphon Drop Power Plant .... 15,155 c.f.s.*
- From Siphon Drop Power Plant to Pilot Knob .... 13,155 c.f.s.
- From Pilot Knob to Drop No. 1 .... 10,155 c.f.s.

Diversion points:

- Yuma Project: Diverts 2,000 c.f.s. through Siphon Drop Power Plant and other turnouts on the canal upstream from Siphon Drop.
- Coachella Main Canal: Diverts 2,500 c.f.s. at Drop No. 1, 20 miles west of Yuma.

Cost (in mid-1930 dollars) $25,020,000
Financing:

The All-American Canal was built by the United States Bureau of Reclamation. The IID made semi-annual payments, as part of a 50-year contract ending in 1994, to the U.S. Government to repay the construction loan on the All-American Canal.

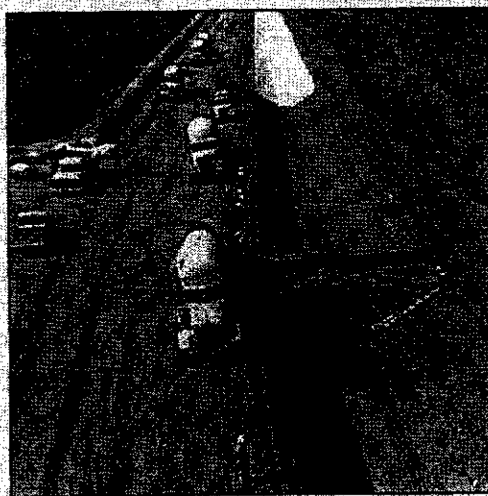
*c.f.s. = cubic feet per second

– February 2001

IMPERIAL IRRIGATION DISTRICT

FACT SHEET: Water Conservation

Over the past 50 years, the Imperial Irrigation District (IID), its conservation partners and member farms have invested $613 million (1996 dollars) to improve water use efficiency. Water conservation measures have included concrete lining of canals and laterals, construction of reservoirs and interceptor canals, implementing canal seepage recovery programs and additional irrigation management measures.



Concrete lining of canal.

In December 1988, the IID and the Metropolitan Water District of Southern California (MWD) entered into a water conservation agreement that allowed MWD to invest in water conversation measures in the Imperial Valley in exchange for use of the conserved water. This historic water conservation and transfer agreement between the IID and MWD has been praised as a model of cooperation between agriculture and urban centers in stretching California's limited water resources.

Solar-powered drop-leaf gate on interceptor canal.

MWD financed the construction, operation and maintenance of the selected projects at a total project cost of $233 million (1988 dollars). The program included structural and nonstructural conservation measures which can be grouped into seven categories: canal concrete lining, regulatory reservoirs, 12-hour deliveries, nonleak gates, system automation, lateral interceptors and on-farm irrigation water management. These conservation projects in Imperial Valley will save approximately 106,000 acre-feet of water annually. This water is now available to MWD.

In 1998, continuing its leadership in water conservation, the IID signed a historic water conservation and transfer agreement with the San Diego County Water Authority (SDCWA). The IID/SDCWA agreement will benefit California, Imperial and San Diego counties, as well as advance Western water policy. This agreement is the largest water conservation and transfer program in United States history, and will allow the SDCWA to receive up to 200,000 acre-feet annually of water conserved by the IID. IID expects to invest $295 million from the SDCWA in water conservation programs through the year 2011. Water conservation projects will enable farmers to maintain current

Reservoir construction.

Continued

agricultural production, while transferring conserved supplies to SDCWA. Imperial Valley farmers produce more than $1 billion annually in agricultural products from 460,000 cultivated acres.

In October 1999, IID, Coachella Valley Water District (CVWD), MWD, SDCWA, the state of California and the U. S. Bureau of Reclamation issued key terms for a quantification of Colorado River water use issues. The key terms represent a major advance in Colorado River water use by seeking to maximize the beneficial use of California's basic apportionment through conservation and improved water management water transfers. When implemented, the key terms will shift the use of over 500,000 acre-feet per year of California's Colorado River water supply.

Data from the United States Bureau of Reclamation shows that IID's conveyance and distrubution system efficiency along the lower Colorado River is now about 90 percent. The California Department of Water Resources rates Imperial Valley farm efficiency at approximately 79 percent as compared to the statewide goal of 73 percent.

Chronology of Events

1911 – IID organized.

1929 – IID, in cooperation with the U. S. Department of Agriculture's Soil Conservation Service, designed tile drainage systems suited to the valley's conditions.

1951 – Seepage recovery program, All-American Canal. Approximately 24,000 acre-feet (AF) of water returned to canals.

1954 – IID began concrete lining of canals and laterals (1954-1989: 910 miles completed with an estimated water savings of about 58,000 AF per year).

– Started carryover system for farm water orders to match more closely water delivery to water user.

1967 – Seepage recovery program, East Highline Canal.

1976 – First water regulating reservoir (Kakoo Singh) located on East Highline Canal placed in service to better manage canal operation.

– 13-Point Water Conservation Program, focusing on reducing tailwater, canal seepage and operational water loss, adopted by IID Board.

1977 – Second water regulating reservoir (J. M. Sheldon) added to system.

1979 – IID Board of Directors appointed farmers to a Water Conservation Advisory Board.

1980 – 21-Point Water Conservation Program adopted. The program included policies and procedures for ordering water, operating the delivery system and assessing extra charges for excessive water use.

1981 – Third water regulating reservoir (Oscar Fudge) completed.

– Began irrigation scheduling program to assist water user to more accurately match crop water needs.

1983 – Fourth water regulating reservoir (H. "Red" Sperber) went into operation.

1984 – Resolution to develop water conservation opportunities in the Imperial Valley.

1985 – An IID Water Conservation Plan was drafted and distributed. (First agricultural conservation plan in state.)

– Five-Year Tailwater Recovery Demonstration Program, five systems.

1987 – 15-Point Water Conservation Program. Replaced 13- and 21-Point programs. Contained aggressive policies to promote on-farm conservation, including a tailwater triple charge program.

1988 – IID and farmer funded conservation (1951-1988) – estimated 523,000 AF/yr. conserved. (primarily canal lining)

– Fifth water regulating reservoir (R. F. Carter) opened.

1989 – IID/MWD Water Conservation and Transfer Agreement – 106,110 AF/yr. by 1995; 35 years; $233 million. (107,160 AF saved in 1998.)

1990 – Resolution No. 24-90 – Offer to meet and discuss conservation possibilities to assist the state with its water crisis.

– Resolution No. 38-90 – IID's best interest is to make conserved water temporarily available for use by others; offered to meet and discuss.

– Construction started on IID/MWD projects.

1991 – Drought assistance letter to Director David Kennedy, Department of Water Resources (DWR), encouraging DWR to investigate the technical, economic and political feasibility of using wells to recover lost seepage water from the All-American Canal as a drought emergency water source.

– Non-Crop Irrigation Demand Reduction Program – Regulation No. 53 – Limit on the length of time water may be applied to flood lands not seeded for crop.

– Pilot Program – Crop Specific Modified Irrigation Program – Evaluate removal of irrigation water from alfalfa during the period August 1 through October 15, 1991; total of 420 acres ± in 12 locations.

– Transfer of 26,700 AF available to MWD.

– USBR issues draft "Regulations for Administering Entitlements in the Lower Colorado River Basin," suggesting a limit of 2.88 million acre-feet (MAF) per year for IID.

– Sixth regulating reservoir (Bernard Galleano) opened.

1995 – April: Seeking financial partners for an additional conservation and transfer program, IID contacts MWD.

– September: IID and SDCWA sign Memorandum of Understanding (MOU) to pursue a conservation and transfer agreement.

1996 – July: IID/SDCWA release Summary of Draft Terms.

1997 – February: IID offers proposal to resolve disputes with Coachella Valley Water District (CVWD).

– December 11: Draft Final Agreement between IID and SDCWA released for public review.

1998 – April 29: IID/SDCWA sign a landmark Water Conservation and Transfer Agreement.

– IID/MWD water conservation projects completed; 35-year water transfer period begins.

1999 – October 15: IID, CVWD, MWD, SDCWA, the state of California and the U. S. Bureau of Reclamation issued key terms for a quantification settlement of Colorado River water supply issues.

Continued

Summary

IID has long recognized the importance of water conservation at each step of the delivery and recovery process - transport, distribution, on-farm and tailwater capture. Because of Imperial Valley's challenging physical conditions, IID's efforts have been equally innovative. Despite difficult soil and climate conditions, Imperial Valley farmers are consistently ranked among the most efficient California irrigators.

Conservation has occurred along every step of the water delivery process. The IID and its partners have funded canal lining projects, regulating reservoirs for in-valley distribution and tailwater recovery programs to recycle irrigation water on the farm. Perhaps more than any other agency, IID has continuously participated in collaborative and independent conservation studies to refine its programs and technology.

Given the high salt content of Colorado River water delivered to the Imperial Valley, the extremely hot climate in the below-sea-level valley and the complexity of the water distribution system, IID's conservation record is all the more impressive.

– April 2001

Power

IID entered the power industry in 1936 when it recognized its potential for low-cost hydroelectric energy from its five water drops along the All-American Canal. IID's first power customers, however, were served electricity produced at its diesel generation plant in Brawley.

IID expanded its power system to the Coachella Valley with the 1943 purchase of the Nevada-California Electric Company. By that time, Drops 3 and 4 of the All-American Canal were generating hydroelectric power.

IID now ranks as the sixth largest power utility in California, based on power consumption. With the repowering of Unit 2 at the El Centro Generating Station, IID became the first utility in California to build new power plant capacity in the 1990s.

Service Area

Area served by IID	6,471 square miles

Peak Load

2000 peak demand (July 19)	705 MW

Miles of Line

	Miles
Transmission lines	1,317
Subtransmission lines	325
Distribution lines	
Overhead & underground	3,648

Customers (As of September 2000)

	Meters
Residential	80,938
Commercial & Industrial	13,165
Agricultural (pumping)	2,199
Other	2,690
Total customers	98,992

IID-Owned Generating Units

	MW
El Centro Combined Cycle Unit	115
El Centro Steam Units	118
Yucca Steam Unit	80
Gas Turbine Units	172
Hydroelectric Units (at minimum flow)	24
Total IID-Owned	509

Firm Power Purchases

	MW
El Paso Electric	150
So. Calif. Public Power Authority	
Palo Verde	15
San Juan	103
Western Area Power Admin. (summer)	32
Off-System Losses	(13)
Total firm purchases	287
Total all sources	796

Utility Industry Deregulation

Deregulation and the resulting competition for customers is a significant milestone for the electric utility industry. IID believes that deregulation will offer many challenges for its employees and new opportunities for its customers. IID is well positioned to retain and strengthen its relationships with existing customers while providing service to new customers.

Deregulation will challenge us to hone our operational skills and become a more customer-oriented service provider. We are working to change our rate structure to reduce the cost of electricity for commercial and industrial customers. At the same time, we intend to hold the line on residential rates, even though these rates are already below the actual cost of service.

IID's ability to reduce its costs will be an important factor in the transition to the competitive marketplace. The district has already taken a number of steps in this direction, deferring major generation and transmission projects, paying down debts, reducing capital expenditures, exploring ways to reduce overhead, retaining key customers and seeking means to attract new commercial or industrial customers.

With input and initiative, we will transform IID into the kind of utility envisioned by deregulation: a customer-oriented, market-driven organization that provides the best for its customers at the lowest possible cost — and does it locally.

IID uses recycled paper

FACTS & FIGURES 2000

Water

Established in 1911, IID's Water Department delivers water to 500,000 acres of Imperial Valley farmland, through a 1,675-mile network of laterals and canals.

Power

IID entered the power business in 1936. Today, IID serves electricity to more than 94,000 customers in the Imperial County and parts of Riverside and San Diego counties.

IMPERIAL IRRIGATION DISTRICT

General Facts About IID

The Imperial Irrigation District (IID), a consumer-owned utility, provides electricity and irrigation water to the southeastern portion of California's desert. Established in 1911 under the California Irrigation District Act, IID is governed by a five-member board elected by the public.

IID was formed by acquiring the properties of the bankrupt California Development Company and its Mexican subsidiary. By 1922 IID had also acquired the 13 mutual water companies which had developed and operated the distribution canals.

Water

IID is the largest irrigation district in the nation. The Imperial Valley receives its Colorado River water through the 82-mile-long All-American Canal. The agricultural production of Imperial County ranks it among the top ten agricultural counties in the nation.

Area Served	2000 Acres
Gross acreage	1,061,637
Irrigated area	462,202

Water Customers	
Farm Accounts	6,257
Owner-operated farm accounts	2,799
Tenant-operated farm accounts	3,458
Average acreage of farm accounts	76.11

Canals & Drains	Miles
Main canals	230
Canals and laterals	1,438
Concrete lined or pipelined canals	1,109
Drainage ditches	1,406

Irrigation Structures	
Delivery gates	5,591
Lateral headings	493
Lateral checks	3,426

Flow Into IID System Below Pilot Knob	Acre-feet
2000	3,108,446
1999	3,084,172
1998	3,097,829
1997	3,158,989
1996	3,154,973
1995	3,065,503
1994	3,043,050
1993	2,766,973
1992	2,567,621
1991	2,894,111
1990	3,050,608

Water Distribution

Of the water IID transports, 98 percent is used for agriculture. The remaining 2 percent is delivered to nine Imperial Valley cities which treat it to safe drinking water standards and sell it to their residents.

Water Conservation

IID has a long history of using its water as efficiently as possible. IID, and the farmers it serves, have invested more than $625 million in the last 50 years to improve the system resulting in an annual water savings of more than 600,000 acre-feet.

That investment includes the 1988 water conservation and transfer agreement with Metropolitan Water District (MWD), which was the most aggressive water conservation program ever undertaken by a single irrigation district. Under the agreement, MWD invested $100 million in various water conservation projects, which now results in an annual water savings of 109,460 acre-feet. Projects completed under the agreement include regulating reservoirs, lateral interceptors, canal lining, 12-hour deliveries, nonleak gates, system automation and on-farm irrigation management.

In 1998, IID signed a water conservation and transfer agreement with San Diego County Water Authority that is projected to save up to 200,000 acre-feet of water per year.