

## **E-14 Reference Crop Evapotranspiration Eto**

Table 14.1 Summary of Crop Reference Evapotranspiration (ETo)

Table 14.1 Summary of Crop Reference Evapotranspiration (ETo)

Agro-ecological Zone	Region	Province	Project	Crop Reference Evapotranspiration ETo, mm												Remarks	
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Total
Marmara	Istanbul	Kirklareli	K. Kanlıran	0.60	0.90	1.47	2.51	3.60	4.67	5.09	4.47	3.01	1.67	0.85	0.56	898	
	Bursa	Yalova	Ilyaskoy	0.90	0.96	1.57	2.32	3.33	4.36	4.59	4.17	2.93	1.74	1.08	0.96	883	
Aegean	Izmir	Izmir	Aslanlar	1.19	1.65	2.23	3.18	4.51	5.89	6.28	5.38	4.00	2.32	1.43	1.13	1195	
	Adana	Adana	Kalesekisi	0.53	0.79	1.43	2.57	3.53	5.03	5.87	5.12	3.57	1.95	0.96	0.56	975	
Mediterranean Black Sea	Kastamonu	Kastamonu	Kuskara	0.44	0.73	1.27	2.11	3.09	3.79	4.15	3.56	2.30	1.24	0.64	0.41	725	
	Samsun	Samsun	Kozlukusca	1.08	1.24	1.49	2.06	2.85	3.91	4.07	3.69	2.69	1.70	1.26	1.13	829	
Central Northern	Ankara	Kirikkale	Hacilar	0.65	0.93	1.65	2.66	3.76	5.06	5.88	5.30	3.63	2.00	1.00	0.64	1013	
	Eskisehir	Eskisehir	Ozdenk	0.66	1.01	1.71	2.73	3.73	4.72	5.40	4.73	3.20	1.76	1.01	0.66	956	
Central Southern	Konya	Konya	Ununlu	0.51	0.82	1.42	2.46	3.41	4.32	4.77	3.97	2.67	1.46	0.75	0.47	825	
	Sivas	Tokat	Camlibel	0.94	1.37	2.17	3.17	3.85	4.72	5.01	4.83	3.61	2.06	1.20	0.90	1032	

**E-15 Total and Effective Rainfalls with Probability of 50, 80, 90%**

Table 15.1 Effective Rainfall with Probability P50%

Table 15.2 Effective Rainfall with Probability P80%

Table 15.3 Effective Rainfall with Probability P90%

Table 15.1 Effective Rainfall with Probability P50%

Agro-ecological Zone	Region	Province	Project	Precipitation (mm)												Total	Effective Precipitation (mm) by USBR Method												Remarks		
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Marmara	Istanbul	Kirklareli	K. Karşıbiran	64	49	50	43	45	46	25	15	26	53	76	74	57	58	44	45	40	41	23	15	24	47	65	63	505			
	Bursa	Yalova	İlsvaskoy	87	72	65	49	39	36	24	24	48	77	79	110	742	72	62	56	44	36	34	22	22	44	65	67	86	610		
Aegean	Izmir	Adana	Aslanlar	130	88	71	45	31	9	3	1	11	40	84	145	665	96	72	61	41	29	9	3	1	11	37	70	103	533		
	Adana	Kalesekisi	Kalesekisi	125	99	108	112	84	35	6	12	20	51	83	138	877	94	79	84	87	70	32	6	11	19	46	69	100	699		
Mediterranean	Kastamonu	Kastamonu	Kuskara	30	29	32	49	71	65	29	26	24	34	30	32	451	28	27	30	44	61	57	27	25	23	32	28	30	412		
	Black Sea	Samsun	Kozlukusca	101	92	86	69	51	65	67	92	81	125	135	129	1099	80	75	71	60	46	57	58	75	68	94	98	96	877		
Central Northern	Ankara	Kirikkale	Haciilar	45	38	37	49	49	28	9	6	15	28	36	53	390	41	35	34	44	45	26	9	6	15	26	33	47	360		
	Eskisehir	Eskisehir	Ozdenk	43	34	38	39	40	24	11	11	12	30	32	46	363	39	32	35	36	37	22	11	11	12	28	30	42	334		
Central Southern	Konya	Konya	Unulu	32	28	28	28	33	33	17	4	2	6	24	27	34	275	30	27	26	31	31	17	4	2	6	22	25	32	253	
	Central Eastern	Sivas	Camibel	39	34	42	54	59	42	5	4	16	23	31	47	392	36	32	39	48	52	39	5	4	15	22	29	43	363		

Table 15.2 Effective Rainfall with Probability P80%

Agro-ecological Zone	Region	Province	Project	Precipitation (mm)												Total	Effective Precipitation (mm) by USBR Method												Remarks	
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Marmara	Istanbul	Kirklareli	K. Karşıbiran	53	41	42	36	35	38	21	13	21	44	64	62	476	48	38	38	33	35	35	20	12	21	40	55	54	430	
	Bursa	Yalova	İlsvaskoy	74	61	55	42	34	31	20	20	41	65	68	94	606	63	54	49	38	31	29	19	19	38	57	58	76	582	
Aegean	Izmir	Adana	Aslanlar	106	72	58	37	26	8	2	1	9	33	69	119	535	84	61	51	34	24	7	2	1	9	31	59	90	454	
	Adana	Kalesekisi	Kalesekisi	101	80	87	91	69	28	5	9	16	42	67	112	712	81	68	72	74	59	27	5	9	16	38	58	87	594	
Mediterranean	Kastamonu	Kastamonu	Kuskara	25	24	27	42	60	55	25	22	20	29	25	27	383	24	23	25	38	53	49	24	21	19	27	24	26	355	
	Black Sea	Samsun	Kozlukusca	86	79	73	59	44	56	57	79	69	106	115	110	940	71	66	63	52	40	50	50	66	60	84	89	86	777	
Central Northern	Ankara	Kirikkale	Haciilar	39	32	32	42	43	24	8	5	13	24	31	46	387	36	30	30	38	39	23	8	5	13	23	29	41	315	
	Eskisehir	Eskisehir	Ozdenk	37	29	32	33	34	20	9	9	10	26	27	39	310	34	27	30	31	32	19	9	9	10	24	26	36	288	
Central Southern	Konya	Konya	Unulu	26	23	22	27	26	14	3	2	5	19	22	27	221	24	22	21	25	25	14	3	2	5	18	21	26	205	
	Central Eastern	Sivas	Camibel	32	29	36	45	49	35	4	3	13	19	26	39	328	30	27	33	41	45	33	4	3	13	18	24	36	308	

Table 15.3 Effective Rainfall with Probability P90%

Agro-ecological Zone	Region	Province	Project	Precipitation (mm)												Total	Effective Precipitation (mm) by USBR Method												Remarks	
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Marmara	Istanbul	Kirklareli	K. Karşıbiran	49	38	38	33	35	35	19	12	20	40	58	57	435	44	35	35	31	32	32	18	11	19	37	51	50	396	
	Bursa	Yalova	İlsvaskoy	68	57	51	39	31	29	19	19	38	60	62	87	561	59	50	46	36	29	27	18	18	35	53	55	72	497	
Aegean	Izmir	Adana	Aslanlar	96	65	52	33	23	7	2	1	8	30	62	107	484	77	56	47	31	22	7	2	1	8	28	54	84	418	
	Adana	Kalesekisi	Kalesekisi	90	72	78	81	61	25	5	8	14	37	60	100	633	74	61	66	68	54	24	5	8	14	34	53	80	540	
Mediterranean	Kastamonu	Kastamonu	Kuskara	23	22	25	38	55	51	23	21	19	27	23	25	353	22	21	23	35	49	46	22	20	18	25	22	24	329	
	Black Sea	Samsun	Kozlukusca	79	73	68	55	40	51	52	72	64	98	106	101	865	67	62	58	49	37	46	47	62	56	79	83	81	726	
Central Northern	Ankara	Kirikkale	Haciilar	36	30	30	39	40	22	7	5	12	22	29	42	315	33	28	28	36	37	21	7	5	12	21	27	39	295	
	Eskisehir	Eskisehir	Ozdenk	34	27	29	31	31	18	8	8	9	24	25	36	285	31	25	28	29	29	16	8	8	9	22	24	34	266	
Central Southern	Konya	Konya	Unulu	24	21	20	24	24	13	3	2	4	17	20	25	202	22	20	20	20	23	12	3	2	4	17	19	24	188	
	Central Eastern	Sivas	Camibel	29	26	32	41	44	32	4	3	12	17	23	35	295	27	25	30	37	40	30	4	3	11	16	22	33	219	

## **E-16 Annual Water Requirement with Probability 90%**

Table 16.1	Crop Water Requirement on Hacilar Project
Table 16.2	Crop Water Requirement on Hacilar Project (wit dry onion irrigated)
Table 16.3	Crop Water Requirement on Urunlu Project
Table 16.4	Crop Water Requirement on Urunlu Project (modified cropping pattern)
Table 16.5	Crop Water Requirement on Kalesekisi Project
Table 16.6	Crop Water Requirement on Camlibel Project
Table 16.7	Crop Water Requirement on Kozluk Project
Table 16.8	Crop Water Requirement on Kuskara Project
Table 16.9	Crop Water Requirement on Ozdenk Project (Original Area given by GDRS)
Table 16.10	Crop Water Requirement on Ozdenk Project without Effective Rainfall (Original Area given by GDRS)
Table 16.11	Crop Water Requirement on Ozdenk Project (Net Area=126ha, Final Case with P90% Rainfall)
Table 16.12	Crop Water Requirement on Aslanlar Project
Table 16.13	Crop Water Requirement on Ilyaskoy Project (Original Area given by GDRS)
Table 16.14	Crop Water Requirement on Ilyaskoy Project without Effective Rainfall (Original Area given by GDRS)
Table 16.15	Crop Water Requirement on Ilyaskoy Project (Net Area=108ha, Final Case with P90% Rainfall)
Table 16.16	Crop Water Requirement on K. Karistiran Project

Table 16.1 Crop Water Requirement on MacLellan Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.66	0.93	1.65	2.66	3.78	5.06	5.88	5.30	3.63	2.00	1.00	0.64	1013	
Crop Evapotranspiration, mm/day														
Wheat	0.78	1.13	2.06	3.67	5.45	5.31	2.12	6.63	4.43	0.74	0.85	0.60		
Sugar Beet				1.17	1.80	6.83	7.35			2.00				
Sunflower				0.80	1.17	1.92	7.00	2.28	1.16					
Tomato				0.72	4.36	6.27	7.00	5.19						
Dry Onion														
80% Effective Rainfall, mm/day	1.08	1.02	0.90	1.20	1.19	0.71	0.24	0.15	0.40	0.69	0.91	1.25	296	
Net Water Requirement, mm														
Wheat		0.11	1.16	2.47	4.27	4.60	1.88	6.47	4.03	0.05				
Sugar Beet				0.62	6.12	7.11	1.31							
Sunflower				1.21	6.76	2.12			0.76					
Tomato				3.18	5.56	6.76								
Dry Onion														
Gross Water Requirement, mm/day														
Wheat		0.16	1.71	3.63	6.27	6.77	2.77	9.52	5.92	0.09			0.69	
Sugar Beet				0.91	9.00	10.46	1.93						0.68	
Sunflower				1.78	9.94	3.12			1.12				0.68	
Tomato				4.67	8.94	7.41							0.68	
Dry Onion														
Gross Water Requirement, cum/day														
Wheat		336	3684	7626	13176	14208	5810	15225	9478	159			210	
Sugar Beet					1467	16740	16740						160	
Sunflower					1371	7657	2406		863				77	
Tomato					1168	2045	2486						25	
Dry Onion													50	
Gross Water Requirement, 1000cum/month														
Wheat		9	111	229	408	426	90	472	284	2			210	
Sugar Beet					45	432	519			96			160	
Sunflower					36	41	237	75	26				77	
Tomato						61	77	29					25	
Dry Onion													50	
Total, cum/day		336	3684	7626	15800	32021	32653	19484	10342	3245			522	
Total, 1000cum/month		9	111	229	480	961	923	575	310	97			3706	Annual in 1000cum
Total, liter/sec		4	41	88	183	371	378	226	120	38			378	Max
Total, liter/sec/(gross area)		0.007	0.072	0.152	0.315	0.638	0.652	0.389	0.206	0.065			0.652	Max per gross ha
Total, liter/sec/(net area)		0.007	0.079	0.169	0.350	0.710	0.725	0.432	0.229	0.072			0.725	Max per net ha

Conversion Factor from gross area to net= 0.90

Table 16.2. Crop Water Requirement on Hacilar Project (with dry onion irrigated)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.65	0.93	1.65	2.66	3.76	5.06	5.88	5.30	3.63	2.00	1.00	0.64	1013	
Crop Evapotranspiration, mm/day														
Wheat	0.78	1.13	2.06	3.67	5.45	5.31	2.12	6.63	4.43	0.74	0.85	0.60		
Sugar Beet				1.17	1.80	6.83	7.35			2.00				
Sunflower				0.80	1.17	1.92	7.00	2.28	1.16					
Tomato				0.72	4.36	6.27	7.00	5.19						
Dry Onion			0.76	2.05	3.08	4.40	4.47							
P90% Effective Rainfall, mm/day	1.08	1.02	0.90	1.20	1.19	0.71	0.24	0.15	0.40	0.69	0.91	1.25	295	
Net Water Requirement, mm														
Wheat		0.11	1.16	2.47	4.27	4.60	1.88	6.47	4.03	0.05				
Sugar Beet				0.62	6.12	1.21	6.76	2.12	0.76	1.31				
Sunflower				3.18	5.56	3.69	6.76	5.04						
Tomato			0.85	1.90	3.69	4.23								
Dry Onion														
Gross Water Requirement, mm/day														
Wheat		0.16	1.71	3.63	6.27	6.77	2.77	9.52	5.92	0.08			0.68	
Sugar Beet				0.91	9.00	1.78	10.46	3.12	1.12	1.93			0.68	
Sunflower				4.67	8.18	9.94	9.94	7.41					0.68	
Tomato			1.25	2.79	5.43	6.23							0.68	
Dry Onion														
Gross Water Requirement, cum/day														
Wheat		336	3584	7626	13176	14208	5810	15225	9479	159			210	
Sugar Beet				1457	14397	16740	16740	2406	863	3086			160	
Sunflower				1168	2045	2486	2486	1853					77	
Tomato			623	2713	3113								25	
Dry Onion													50	
Gross Water Requirement, '000cum/month														
Wheat		9	111	229	408	426	90	472	284	2			210	
Sugar Beet				45	432	519	519	75	26	96			160	
Sunflower				36	61	77	77	29					77	
Tomato			19	81	81	96							25	
Dry Onion													50	
Total, cum/day		336	3584	8248	17196	34735	35806	19484	10342	3245			522	
Total, '000cum/month		9	111	247	533	1042	1020	575	310	97			3946	Annual in '000cum
Total, liter/sec		4	41	95	199	402	414	226	120	38			414	Max
Total, liter/sec/(gross area)		0.007	0.072	0.165	0.343	0.693	0.715	0.389	0.206	0.065			0.715	Max per gross ha
Total, liter/sec/(net area)		0.007	0.079	0.183	0.381	0.770	0.794	0.432	0.229	0.072			0.794	Max per net ha

Conversion Factor from gross area to net 0.90

Table 16.3. Crop Water Requirement on Urutiu Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.51	0.82	1.42	2.46	3.41	4.32	4.77	3.97	2.67	1.46	0.75	0.47	825	
Crop Evapotranspiration, mm/day														
Wheat	0.61	0.99	1.78	3.39	4.94	4.54	1.72	4.96	3.28	0.54	0.64	0.44		
Sugar Beet				1.08	1.64	5.83	5.96	4.96	3.28	1.46				
Dry Pea				0.66	2.32	4.71	4.48	2.78	1.63					
Vegetables			0.53	1.50	3.96	5.36	5.88	3.89						
Potato					3.10	3.97	4.29	2.78						
95% Effective Rainfall, mm/day	0.72	0.71	0.63	0.77	0.74	0.41	0.09	0.05	0.14	0.54	0.63	0.76	183	
Net Water Requirement, mm														
Wheat	0.28		1.15	2.62	4.21	4.12	1.62	4.91	3.12	0.00	0.01			
Sugar Beet				0.31	0.90	5.42	5.87	4.91	3.12	0.92				
Dry Pea				1.58	4.39	4.39	4.39	2.73	1.49					
Vegetables				0.73	3.22	4.94	5.58	3.84						
Potato					2.36	3.56	4.20	2.73						
Gross Water Requirement, mm/day														
Wheat	0.40		1.61	3.69	5.92	5.80	2.29	6.92	4.39	0.00	0.01			
Sugar Beet				0.44	1.27	7.63	8.27	6.92	4.39	1.30				
Dry Pea					2.23	6.06	6.18	3.84	2.10					
Vegetables				1.02	4.53	6.96	7.86	5.41						
Potato					3.33	5.01	5.92	3.84						
Gross Water Requirement, cum/day														
Wheat	569		2258	5169	8293	8127	3203	9688	6150	5	15			
Sugar Beet				609	1771	10682	11574	9688	6150	1819				
Dry Pea					2070	5625	5752	3674	1952					
Vegetables				717	997	1531	1730	1190						
Potato					2331	3510	4141	2690						
Gross Water Requirement, '000cum/month														
Wheat	16		70	155	257	244	66	300	185	0	0			
Sugar Beet				18	55	320	369	300	185	56				
Dry Pea					64	169	178	111	20					
Vegetables				22	31	46	54	37						
Potato					72	105	128	83						
Total, cum/day	568		2258	6465	15463	29475	28401	17141	8102	1824	15		465	
Total, '000cum/month	16		70	195	479	884	785	531	204	56	0		3222	Annual in '000cum Max
Total, liter/sec	6		26	75	179	341	306	198	94	21	0		341	Max
Total, liter/sec/(gross area)	0.013		0.053	0.153	0.365	0.695	0.624	0.405	0.191	0.043	0.000		0.696	Max per gross ha
Total, liter/sec/(net area)	0.014		0.056	0.162	0.385	0.734	0.667	0.427	0.202	0.045	0.000		0.734	Max per net ha

Conversion Factor from gross area to net= 0.95



Table 16.4 Crop Water Requirement on Urulnu Project (modified cropping pattern)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.51	0.82	1.42	2.46	3.41	4.32	4.77	3.97	2.67	1.46	0.75	0.47	825	
Crop Evapotranspiration, mm/day														
Wheat	0.61	0.99	1.78	3.39	4.94	4.54	1.72	4.96	3.26	0.54	0.64	0.44		
Sugar Beet				1.08	1.64	5.93	5.96	4.96	3.26	1.46				
Dry Pea				0.66	2.32	4.71	4.48	2.78	1.63					
Vegetables			0.53	1.50	3.96	5.36	5.68	3.89						
Potato					3.10	3.97	4.29	2.78						
P90% Effective Rainfall, mm/day	0.72	0.71	0.63	0.77	0.74	0.41	0.03	0.05	0.14	0.54	0.63	0.76	188	
Net Water Requirement, mm														
Wheat		0.28	1.15	2.62	4.21	4.12	1.62	4.91	3.12	0.00	0.01			
Sugar Beet				0.31	0.90	5.42	5.87	4.91	3.12	0.92				
Dry Pea					1.58	4.29	4.39	2.73	1.49					
Vegetables				0.73	3.22	4.94	5.58	3.84						
Potato					2.36	3.56	4.20	2.73						
Gross Water Requirement, mm/day														
Wheat		0.40	1.61	3.69	5.92	5.80	2.29	6.92	4.39	0.00	0.01			
Sugar Beet				0.44	1.27	7.63	8.27	6.92	4.39	1.30				
Dry Pea					2.23	6.05	6.18	3.84	2.10					
Vegetables				1.02	4.53	6.96	7.86	5.41						
Potato					3.33	5.01	5.92	3.84						
Gross Water Requirement, cum/day														
Wheat		370	1500	3434	5509	5398	2128	9686	6150	3	10			
Sugar Beet				609	1771	10682	11574	9686	6150	1819				
Dry Pea					2070	5625	5752	3574	1952					
Vegetables				717	3126	4803	5426	3732						
Potato					2331	3510	4141	2690						
Gross Water Requirement, '000cum/month														
Wheat		10	46	103	171	162	44	300	185	0	0			
Sugar Beet				18	55	320	359	300	20	56				
Dry Pea					64	169	178	111	20					
Vegetables				22	97	144	168	116						
Potato					72	105	128	83						
Total, cum/day		370	1500	4760	14808	30018	29022	19684	8102	1822	10			
Total, '000cum/month		10	46	143	459	901	878	610	204	56	0			Annual in '000cum
Total, liter/sec		4	17	55	171	347	336	228	94	21	0			Max
Total, liter/sec/(gross area)		0.009	0.035	0.112	0.350	0.709	0.686	0.465	0.191	0.043	0.000			Max per gross ha
Total, liter/sec/(net area)		0.009	0.037	0.118	0.369	0.747	0.722	0.490	0.202	0.045	0.000			Max per net ha

Conversion Factor from gross area to net = 0.95

Table 16.5 Crop Water Requirement on Katesekisi Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.53	0.78	1.43	2.57	3.53	5.03	5.67	5.12	3.57	1.95	0.98	0.58	9.75	
Crop Evapotranspiration, mm/day														
Vegetables				0.89	4.09	6.24	6.99	5.02						
Cherry				1.54	2.37	3.97	4.70	4.10	1.82	0.56				
Grape			0.43	1.41	2.65	4.53	4.40	3.58	1.43					
80% Effective Rainfall, mm/day	2.38	2.19	2.12	2.26	1.73	0.80	0.15	0.28	0.47	1.11	1.76	2.58	5.40	
Net Water Requirement, mm														
Vegetables					2.37	5.44	6.84	4.75						
Cherry				0.64	3.18	4.55	4.55	3.83	1.35					
Grape				0.92	3.73	4.25	4.25	3.32	0.96					
Gross Water Requirement, mm/day														
Vegetables					3.24	7.46	9.36	6.51						Effl.
Cherry				0.87	4.36	6.23	6.23	5.25	1.85					0.73
Grape				1.28	5.11	5.83	5.83	4.56	1.31					0.73
Gross Water Requirement, cum/day														
Vegetables					324	745	936	651						Net, ha
Cherry					1399	6962	9966	8396	2963					10
Grape					504	2044	2330	1819	525					160
Gross Water Requirement, '000cum/month														40
Vegetables					10	22	29	20						Net, ha
Cherry					43	209	309	260	89					10
Grape					16	61	72	56	16					160
Total, cum/day					2228	9751	13232	10668	3488					210
Total, '000cum/month					69	293	410	337	105					1213
Total, liter/sec					26	113	153	128	40					153
Total, liter/sec/(gross area)					0.111	0.484	0.657	0.540	0.173					0.657
Total, liter/sec/(net area)					0.123	0.537	0.729	0.599	0.192					0.729

Conversion Factor from gross area to net= 0.900

Table 16.6. Crop Water Requirement on Camilibel Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Remarks
Reference Crop Evapotranspiration	1.34	1.37	2.17	3.17	3.85	4.72	5.01	4.83	3.61	2.05	1.20	0.90	10.92	
Crop Evapotranspiration	1.13	1.66	2.71	4.37	5.58	4.96	1.80	3.38	2.20	0.76	1.02	0.85		
Wheat					5.14	5.14	4.71	6.04	4.40					
Drv bean					1.85	6.37	6.26	3.78						
Sugar Beet			0.80	1.39	2.82	4.34	4.31	3.78						
Potato				0.86	4.47	5.85	5.96	4.94	2.82	1.28				
Tomato					3.35	4.53	4.81	4.26	3.07	0.99				
Alfalfa					3.77	4.63	6.41	3.96	1.34	0.56				
Apple					3.33	4.53	6.41	3.96	1.34	0.56				
Peach					2.69	3.78	4.21	3.96	1.34	0.56				
Bariev. Oats						4.01	3.76	4.40	3.32					Second Crop
Maize						3.76		4.54	2.31					Second Crop
Cow Vetch														
Drv Onion														
Poplar														
Net Water Requirement, mm/day	0.88	0.88	0.96	1.25	1.31	0.99	0.13	0.10	0.48	0.54	0.73	0.06	2.78	
Wheat	0.25	0.78	1.75	3.13	4.28	3.97	1.67	3.28	1.82	0.23	0.29			
Drv bean					1.31	4.16	4.58	5.94	4.02					
Sugar Beet				0.15	0.54	5.38	6.13	3.28	1.53					
Potato				0.69	2.20	3.87	4.38	4.64						
Tomato					3.16	4.87	5.83	4.44	2.43	0.75				
Alfalfa					2.04	3.54	4.68	4.17	0.95	0.45				
Apple				2.08	2.47	4.68	6.28	3.86	0.95	0.03				
Peach				1.45	1.77	2.79	4.08	3.86						
Bariev. Oats							3.88	4.30	2.94					Second Crop
Maize							3.63	4.44	1.93					Second Crop
Cow Vetch														
Drv Onion														
Poplar														
Gross Water Requirement, mm/day	0.47	1.47	3.30	5.90	8.07	7.49	3.16	6.20	3.43	0.44	0.55			
Wheat					2.47	7.84	8.64	11.21	7.59					
Drv bean					1.02	10.16	11.57	16.21						
Sugar Beet				0.28	0.15	6.33	8.26	8.73						
Potato				1.29	5.96	9.18	11.01	8.39	4.59	1.41				
Tomato					3.86	6.69	8.83	9.75	5.07	0.87				
Alfalfa					4.65	6.86	11.86	7.29	1.80	0.05				
Apple				3.93	3.35	5.26	7.70							
Peach				2.73				8.11	5.55					
Bariev. Oats							7.32	8.38	3.64					Second Crop
Maize							6.85							Second Crop
Cow Vetch														
Drv Onion														
Poplar														
Gross Water Requirement, cum/dav	1214	3834	8576	15341	20978	19467	5476	4213	2335	761	1421			
Wheat					1683	5334	5876	39790	26942					
Drv bean				987	3629	41081	5081	5949						
Sugar Beet				1062	5190	67483	7483	5949	5006	1538				
Potato					4054	6242	9138	2925	1521	260				
Tomato					4202	7285	9626	2925	1422	40				
Alfalfa					1396	2039	3557	5759						
Apple				1178	1396	2039	3557	5759						
Peach				2157	2644	4156	6060	729						
Bariev. Oats							659	2190	1497					Second Crop
Maize							3332	12240	5312					Second Crop
Cow Vetch														
Drv Onion														
Poplar														
Gross Water Requirement, '000cum/month	38	107	266	450	650	584	170	131	70	24	43			
Wheat					52	160	182	131						
Drv bean				30	112	1082	1274	1233	808					
Sugar Beet				32	105	156	158	158						
Potato					126	187	232	184	150	48				
Tomato					130	219	298	283	46	8				
Alfalfa					43	62	91	179	43	1				
Apple				35	82	125	188	179						
Peach				65			20	68	45					Second Crop
Bariev. Oats							103	379	159					Second Crop
Maize														
Cow Vetch														
Drv Onion														
Poplar														
Total, cum/dav	1214	3834	8576	20724	41985	85801	89947	67285	44035	12849	1421			Annual in '000cum
Total, '000cum/month	38	107	266	672	1302	2574	2788	2706	1321	398	43			Max
Total, liter/sec	14	44	99	240	486	993	1041	1010	510	149	16			Max per gross ha
Total, liter/sec/(gross area)	0.010	0.031	0.069	0.157	0.338	0.691	0.724	0.703	0.354	0.103	0.011			Max per net ha
Total, liter/sec/(net area)	0.010	0.032	0.073	0.176	0.358	0.727	0.762	0.740	0.373	0.109	0.012			

Conversion Factor from gross area to net= 0.950

Table 16.7 Crop Water Requirement on Kozluk Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	1.08	1.24	1.40	2.06	2.85	3.91	4.07	3.69	2.69	1.70	1.26	1.13	829	
Crop Evapotranspiration, mm/day														
Dry Bean					1.94	4.26	3.83	2.58	1.64					
Paddy					6.01	9.19	11.68	9.63	5.76					
Maize			0.55		1.60	3.13	3.70	3.39	1.83					
Potato				1.26	2.59	3.60	3.66	2.58						
Tomato + Pepper				0.56	3.31	4.85	4.84	3.62						
Hazelnut				0.87	2.00	3.71	4.40	2.40	1.61					
80% Effective Rainfall, mm/day	2.15	2.22	1.89	1.62	1.19	1.54	1.51	2.00	1.85	2.54	2.78	2.61	726	
Net Water Requirement, mm														
Dry Bean					0.74	2.72	2.31	0.59						
Paddy					4.82	7.65	10.17	7.64	3.91					
Maize					1.40	1.59	2.19	1.40						
Potato					1.40	2.06	2.15	0.59						
Tomato + Pepper					2.11	3.31	3.33	1.62						
Hazelnut					0.80	2.18	2.88	0.40						
Gross Water Requirement, mm/day														
Dry Bean					1.40	5.14	4.37	1.11						Eff.
Paddy					9.84	15.62	20.75	15.58	7.97					0.53
Maize					0.76	3.00	4.13	2.64						0.49
Potato					2.64	3.89	4.06	1.11						0.53
Tomato + Pepper					3.99	6.25	6.28	3.06						0.53
Hazelnut					1.51	4.11	5.44	0.76						0.53
Gross Water Requirement, cum/day														
Dry Bean					759	2776	2357	598						Net, ha
Paddy					5312	8432	11206	8414	4304					54
Maize					630	2491	3432	2191						54
Potato					2192	3226	3368	920						83
Tomato + Pepper					4984	6873	6913	3363						83
Hazelnut					2510	6820	9031	1261						110
														166
Gross Water Requirement, '000cum/month														
Dry Bean					24	83	73	19						Net, ha
Paddy					165	253	347	261	129					54
Maize					20	75	106	68						54
Potato					68	97	104	29						83
Tomato + Pepper					136	206	214	104						83
Hazelnut					78	205	280	39						110
														166
Total, cum/day					15788	30619	36307	16747	4304					550
Total, '000cum/month					489	919	1126	519	129					3182
Total, liter/sec					183	354	420	194	50					420
Total, liter/sec/(gross area)					0.300	0.591	0.689	0.318	0.092					0.689
Total, liter/sec/(net area)					0.332	0.644	0.784	0.352	0.091					0.784
Conversion Factor from gross area to net=														0.900
Annual in '000cum														610
Max														Max
Max per gross ha														Max per gross ha
Max per net ha														Max per net ha

Table 16.8 Crop Water Requirement on Kuskara Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.44	0.73	1.27	2.11	3.09	3.79	4.15	3.56	2.30	1.24	0.64	0.41	725	
Crop Evapotranspiration, mm/day														
Wheat	0.53	0.88	1.59	2.91	4.48	3.98	1.49	3.28	1.56	0.46	0.54	0.39		Second crop
Maize					1.73	3.03	3.78	3.28	1.56					
Sugar Beet			0.47	0.93	1.48	5.12	3.74	2.49	2.81	1.24				
Potato				1.29	2.81	3.49	3.74	2.49	1.79	0.77				
Alfalfa			0.58	1.62	2.53	3.30	3.15	3.35	1.79	0.81				
Garlic							2.49	3.49	1.84	0.81				
Soy Bean														
PS90% Effective Rainfall, mm/day	0.71	0.77	0.76	1.18	1.59	1.53	0.70	0.64	0.60	0.82	0.75	0.77	329	
Net Water Requirement, mm														
Wheat		0.12	0.83	1.73	2.89	2.45	0.79	2.64	0.96					
Maize					0.14	3.59	4.49	3.81	2.21	0.42				
Sugar Beet				0.11	1.23	1.96	3.03	1.85	1.19					
Potato					1.10	2.11	3.28	2.71	1.19					
Alfalfa			0.45	0.95	1.77	2.45	2.45	2.85	1.24					Second crop
Garlic						1.79	1.79							
Soy Bean														
Gross Water Requirement, mm/day														
Wheat		0.22	1.56	3.27	5.46	4.63	1.49	4.97	1.82					
Maize					0.27	2.84	5.80	4.97	1.82					
Sugar Beet				0.21	2.31	3.70	5.72	3.50	2.25	0.80				
Potato					2.08	3.98	6.19	5.11	2.25					
Alfalfa			0.84	0.84	1.79	3.34	4.63	5.38	2.34					Second crop
Garlic							3.37							
Soy Bean														
Gross Water Requirement, cum/day														
Wheat		66	469	982	1638	1388	448	497	182					
Maize					27	284	560	497	182					
Sugar Beet				21	231	370	572	2876	1665	320				
Potato					62	120	186	153	68					
Alfalfa			203	203	429	802	555	1291	561					
Garlic							405							
Soy Bean														
Gross Water Requirement, '000cum/month														
Wheat		2	15	29	51	42	9	15	5					
Maize					1	9	18	89	50	10				
Sugar Beet				1	7	11	18	11	2					
Potato					2	4	6	5	2					
Alfalfa			6	6	13	24	9	40	17					
Garlic							13							
Soy Bean														
Total, cum/day		66	469	1205	2389	5672	6131	5167	2476	320				
Total, '000cum/month		2	15	36	74	170	177	160	74	10				Annual in '000cum
Total, liter/sec		1	5	14	28	66	71	60	29	4				Max
Total, liter/sec/(gross area)		0.006	0.042	0.107	0.213	0.506	0.546	0.460	0.220	0.028				Max per gross ha
Total, liter/sec/(net area)		0.007	0.046	0.119	0.236	0.561	0.607	0.511	0.245	0.032				Max per net ha

Conversion Factor from gross area to net= 0.900

Table 16.9 Crop Water Requirement on Ozdenk Project (Original Area given by GPRS)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.66	1.01	1.71	2.73	3.73	4.72	5.40	4.73	3.20	1.78	1.01	0.66	956	
Crop Evapotranspiration, mm/day														
Wheat	0.79	1.22	2.14	3.77	5.41	4.96	1.94	5.91	3.90	0.65	0.86	0.62		
Sugar Beet				1.20	1.79	6.37	6.75	5.91	3.90	1.76				
Potato			0.63	1.67	3.39	4.34	4.86	3.31	2.50	1.09				
Alfalfa				0.74	3.25	4.53	5.18	4.45	2.50	1.09				
Vegetables					4.33	5.85	6.43	4.84	1.95					
Dry Bean					2.54	5.14	5.08	3.31	1.95					
95% Effective Rainfall, mm/day	1.02	0.91	0.90	0.96	0.60	0.60	0.27	0.27	0.31	0.73	0.81	1.09	268	
Net Water Requirement, mm														
Wheat		0.31	1.24	2.80	4.46	4.36	1.67	5.64	3.59	1.03	0.05			
Sugar Beet				0.24	0.84	5.77	6.48	5.64	3.59	1.03				
Potato				0.70	2.44	3.74	4.59	3.04	2.18	0.36				
Alfalfa					2.30	3.93	4.91	4.18	2.18	0.36				
Vegetables					3.38	5.25	6.15	4.37	1.64					
Dry Bean					1.59	4.55	4.80	3.04	1.64					
Gross Water Requirement, mm/day														
Wheat		0.47	1.87	4.25	6.76	6.60	2.53	8.55	5.44	1.56	0.06			
Sugar Beet				0.36	1.27	8.75	9.82	8.55	5.44	1.56				
Potato				1.06	3.70	5.67	6.96	4.61	3.31	0.55				
Alfalfa					3.48	5.96	7.44	6.33	3.31	0.55				
Vegetables					5.12	7.96	9.32	6.61	2.48					
Dry Bean					2.40	6.89	7.28	4.61	2.48					
Gross Water Requirement, cum/day														
Wheat		176	708	1606	2554	2485	968	3232	2057	590	30			
Sugar Beet				136	482	3306	3710	3232	2057	590				
Potato				239	833	1276	1564	1037	536	89				
Alfalfa					563	965	1206	1025	536	89				
Vegetables					829	1290	1511	1072	559					
Dry Bean					541	1550	1638	1037	559					
Gross Water Requirement, '000cum/month														
Wheat		5	22	48	79	75	20	100	62	18	1			
Sugar Beet				4	15	99	115	32	62	18				
Potato				7	26	38	48	32	16	3				
Alfalfa					17	29	37	32	16	3				
Vegetables					26	39	47	33	17					
Dry Bean					17	46	51	32	17					
Total, cum/day		176	708	1980	5802	10882	10586	7402	3152	678	30			
Total, '000cum/month		5	22	59	180	326	318	228	96	21	1			
Total, liter/sec		2	8	23	67	126	123	86	36	8	0			
Total, liter/sec/(gross area)		0.012	0.048	0.135	0.395	0.741	0.721	0.504	0.215	0.046	0.002			
Total, liter/sec/(net area)		0.013	0.054	0.150	0.439	0.823	0.801	0.590	0.238	0.051	0.002			
Conversion Factor from gross area to net=														0.900
Annual in '000cum													1257	
Max													126	
Max per gross ha													0.741	
Max per net ha													0.823	

Table 16.10 Crop Water Requirement on Ozdenk Project without Effective Rainfall (Original Area given by GDRS)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.66	1.01	1.71	2.73	3.73	4.72	5.40	4.73	3.20	1.78	1.01	0.66	956	
Crop Evapotranspiration, mm/day														
Wheat	0.79	1.22	2.14	3.77	5.41	4.96	1.94	5.91	3.90	0.65	0.86	0.62		
Sugar Beet				1.20	1.79	6.37	6.75	5.91		1.76				
Potato			0.63	1.67	3.39	4.34	4.86	3.31	2.50	1.09				
Alfalfa				0.74	3.25	4.53	5.18	4.45	1.95					
Vegetables					4.33	5.85	6.43	4.64						
Dry Bean					2.54	5.14	5.08	3.31						
No Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Net Water Requirement, mm														
Wheat	0.79	1.22	2.14	3.77	5.41	4.96	1.94	5.91	3.90	0.65	0.86	0.62		
Sugar Beet				1.20	1.79	6.37	6.75	5.91		1.76				
Potato			0.63	1.67	3.39	4.34	4.86	3.31	2.50	1.09				
Alfalfa				0.74	3.25	4.53	5.18	4.45	1.95					
Vegetables					4.33	5.85	6.43	4.64						
Dry Bean					2.54	5.14	5.08	3.31						
Gross Water Requirement, mm/day														
Wheat	1.20	1.85	3.24	5.71	8.19	7.51	2.95	8.96	5.92	0.99	1.30	0.94		
Sugar Beet				1.82	2.71	9.65	10.23	8.96		2.67				
Potato			0.96	2.52	5.14	6.58	7.36	5.02	3.78	1.65				
Alfalfa				1.12	4.92	6.87	7.85	6.74	2.96					
Vegetables					6.56	8.87	9.74	7.02						
Dry Bean					3.84	7.80	7.69	5.02						
Gross Water Requirement, cum/day														
Wheat	454	700	1224	2158	3098	2838	1113	3386	2236	373	492	355		Gross Area, ha
Sugar Beet				688	1025	3649	3866			1008				42
Potato			216	568	1157	1480	1657	1129	613	268				25
Alfalfa				181	797	1112	1272	1091	613					18
Vegetables					1062	1437	1577	1138	665					18
Dry Bean					865	1754	1730	1129						25
Gross Water Requirement, '000cum/month														
Wheat	14	20	38	65	96	85	23	105	67	12	15	11		Gross Area, ha
Sugar Beet				21	32	109	120	105		31				42
Potato			7	17	36	44	51	35	18	8				25
Alfalfa					25	33	39	34	18					18
Vegetables					33	43	49	35	20					18
Dry Bean					27	53	54	35						25
Total, cum/day	454	700	1440	3594	8003	12271	11216	7873	3514	1649	492	355		170
Total, '000cum/month	14	20	45	108	248	368	336	244	105	51	15	11		1565
Total, liter/sec	5	8	17	42	93	142	130	91	41	19	6	4		142
Total, liter/sec/(gross area)	0.031	0.048	0.098	0.245	0.545	0.835	0.764	0.536	0.239	0.112	0.033	0.024		0.835
Total, liter/sec/(net area)	0.034	0.053	0.109	0.272	0.605	0.928	0.848	0.596	0.266	0.125	0.037	0.027		0.928
Gross W. Req. per ha, cum/month	83	115	263	634	1459	2165	1978	1436	620	301	87	65		9205
Gross W. Req. in, mm	8.27	11.53	26.26	63.43	145.94	216.55	197.77	143.56	62.01	30.07	8.68	6.43		921





Table 16.12 Crop Water Requirement on Arianlar Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	1.19	1.65	2.23	3.18	4.51	5.89	6.28	5.38	4.00	2.32	1.43	1.13	1195	
Crop Evapotranspiration, mm/day														
Wheat			0.67	0.86	5.23	7.30	7.47	5.27		0.00				
Vegetables				1.75	3.38	5.30	4.71	3.77	1.60					
Grape														
90% Effective Rainfall, mm/day	2.50	2.01	1.51	1.04	0.71	0.22	0.07	0.03	0.26	0.91	1.81	2.72	418	
Net Water Requirement, mm														
Wheat					4.52	7.08	7.41	5.25						
Vegetables				0.71	2.67	5.08	4.64	3.74	1.34					
Grape														
Gross Water Requirement, mm/day														
Wheat					5.58	8.74	9.15	6.48						
Vegetables				0.88	3.29	6.27	5.73	4.62	1.65					
Grape														
Gross Water Requirement, cum/day														
Wheat					5577	8740	9145	6477						
Vegetables				1094	4117	7835	7167	5772	2062					
Grape														
Gross Water Requirement, '000cum/month														
Wheat					173	262	263	201						
Vegetables				33	128	235	222	179	62					
Grape														
Total, cum/day				1084	9684	15575	16312	12249	2062				250	263
Total, '000cum/month				33	301	497	506	380	62				1778	Annual in '000cum
Total, liter/sec				13	112	192	189	142	24				192	Max
Total, liter/sec/(gross area)				0.048	0.427	0.729	0.718	0.539	0.091				0.729	Max per gross ha
Total, liter/sec/(net area)				0.051	0.449	0.767	0.755	0.567	0.095				0.767	Max per net ha
Conversion Factor from gross area to net=														0.950

Table 16.13 Crop Water Requirement on Ilyaskoy Project (Original Area given by GDRS)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.90	0.96	1.57	2.32	3.33	4.36	4.59	4.17	2.93	1.74	1.06	0.86	883	
Crop Evapotranspiration, mm/day														
Wheat	1.08	1.16	1.96	3.20	4.83	4.58	1.85	1.79	0.94	0.64	0.92	0.80		
Sunflower				0.70	1.03	1.66	5.46	3.42	1.08	0.00				
Peach				1.97	2.66	3.49	3.86	4.55	2.49	0.47				
Apple				2.44	3.26	4.27	5.88			0.84				
PSO% Effective Rainfall, mm/day	1.90	1.80	1.48	1.19	0.94	0.90	0.59	0.59	1.17	1.71	1.82	2.32	497	
Net Water Requirement, mm														
Wheat			0.48	2.01	3.89	3.88	1.07	1.22						
Sunflower				0.78	1.73	2.59	3.28	2.84						
Peach				1.24	2.32	3.37	5.30	3.97	1.32					
Apple														
Gross Water Requirement, mm/day														
Wheat			0.71	2.96	5.72	5.41	1.59	1.79						
Sunflower				1.01	2.24	3.36	4.26	3.69						
Peach				1.62	3.02	4.38	6.88	5.15	1.71					
Apple														
Gross Water Requirement, cum/day														
Wheat			90	372	721	682	189	225						
Sunflower				502	1109	1665	2107	1827						
Peach				800	1496	2169	3405	2551	848					
Apple														
Gross Water Requirement, '000cum/month														
Wheat			3	11	22	20	3	7						
Sunflower				15	34	50	65	57						
Peach				24	46	66	106	79	25					
Apple														
Total, cum/day			90	1674	3342	4656	6617	4604	848					
Total, '000cum/month			3	50	104	140	202	143	25					
Total, liter/sec			1	19	39	54	77	53	10					
Total, liter/sec/(gross area)			0.008	0.140	0.280	0.391	0.555	0.388	0.071					
Total, liter/sec/(net area)			0.008	0.156	0.311	0.434	0.617	0.423	0.079					
Conversion Factor from gross area to net=													0.900	
													124	
													688	Annual in '000cum
													77	Max
													0.555	Max per gross ha
													0.617	Max per net ha
														138

Table 16.14 Crop Water Requirement on Irvasky Project without Effective Rainfall (Original Area given by GDRS)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.90	0.96	1.57	2.32	3.33	4.36	4.59	4.17	2.93	1.74	1.08	0.96	853	
Crop Evapotranspiration, mm/day														
Wheat	1.08	1.16	1.96	3.20	4.83	4.58	1.65	1.79	0.94	0.64	0.92	0.90		
Sunflower				0.70	1.03	1.66	5.46	1.79	0.94	0.00				
Peach				1.97	2.66	3.49	3.86	3.42	1.08	0.47				
Apple				2.44	3.26	4.27	5.88	4.55	2.49	0.84				
No Rainfall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
Net Water Requirement, mm														
Wheat	1.08	1.16	1.96	3.20	4.83	4.58	1.65	1.79	0.94	0.64	0.92	0.90		
Sunflower				0.70	1.03	1.66	5.46	1.79	0.94	0.00				
Peach				1.97	2.66	3.49	3.86	3.42	1.08	0.47				
Apple				2.44	3.26	4.27	5.88	4.55	2.49	0.84				
Gross Water Requirement, mm/day														
Wheat	1.59	1.71	2.89	4.71	7.10	6.73	2.43	2.64	1.38	0.95	1.35	1.33	Eff.	
Sunflower				1.02	1.52	2.44	8.03	2.64	1.38	0.00			0.68	
Peach				2.56	3.46	4.53	5.01	4.44	1.41	0.61			0.77	
Apple				3.16	4.24	5.55	7.63	5.90	3.23	1.08			0.77	
Gross Water Requirement, cum/day														
Wheat	200	215	364	593	895	848	306	332	174	119	170	167	Net, ha	Gross Area, ha
Sunflower				129	191	307	1012	332	174	0			13	14
Peach				1268	1713	2242	2479	2198	697	302			50	55
Apple				1566	2098	2747	3777	2922	1601	537			50	55
Gross Water Requirement, '000cum/month														
Wheat	6	6	11	18	28	25	5	10	5	4	5	5	Net, ha	Gross Area, ha
Sunflower				4	6	9	31	10	5	0			13	14
Peach				38	53	67	77	68	21	9			50	55
Apple				47	65	82	117	91	48	17			50	55
Total, cum/day	200	215	364	3556	4896	6144	7574	5452	2472	958	170	167	124	Annual in '000cum
Total, '000cum/month	6	6	11	107	152	184	230	169	74	30	5	5	980	Max
Total, liter/sec	2	2	4	41	57	71	88	63	29	11	2	2	88	Max per gross ha
Total, liter/sec/(gross area)	0.017	0.018	0.030	0.298	0.411	0.515	0.635	0.457	0.207	0.080	0.014	0.014	0.635	Max per net ha
Total, liter/sec/(net area)	0.019	0.020	0.034	0.331	0.456	0.573	0.706	0.508	0.230	0.089	0.016	0.016	0.706	
Gross W. Req. per ha, cum/month	45	44	82	773	1100	1336	1667	1225	537	215	37	38	7098	
Gross W. Req. in mm	4.50	4.37	8.17	77.30	109.99	133.57	166.70	122.48	53.73	21.53	3.70	3.76	710	

Table 16.15 Crop Water Requirement on Ilyaskoy Project (Net Area=108ha, Final Case with P90% Rainfall)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.90	0.96	1.57	2.32	3.33	4.36	4.59	4.17	2.93	1.74	1.08	0.96	883	
Crop Evapotranspiration, mm/day	1.08	1.16	1.96	3.20	4.83	4.58	1.65	1.79	0.94	0.64	0.92	0.90		
Wheat				0.70	1.03	1.66	5.46	1.79	0.94	0.00				
Sunflower				1.97	2.86	3.49	3.86	3.42	1.08	0.47				
Peach				2.44	3.26	4.27	5.88	4.56	2.49	0.84				
Apple														
P90% Effective Rainfall, mm/day	1.90	1.80	1.48	1.19	0.94	0.90	0.58	0.58	1.17	1.71	1.82	2.32	497	
Net Water Requirement, mm			0.48	2.01	3.89	3.68	1.07	1.22						
Wheat				0.78	1.73	2.59	3.28	2.84						
Sunflower				1.24	2.32	3.37	5.30	3.97	1.32					
Peach														
Apple														
Gross Water Requirement, mm/day			0.71	2.96	5.72	5.41	1.58	1.79						
Wheat				1.01	2.24	3.36	4.26	3.69						
Sunflower				1.62	3.02	4.38	6.88	5.15	1.71					
Peach														
Apple														
Gross Water Requirement, cum/day			78	325	629	595	174	197						
Wheat				436	15	123	790	197						
Sunflower				695	964	1446	1830	1587						
Peach					1298	1884	2958	2216	737					
Apple														
Gross Water Requirement, '000cum/month			2	10	20	18	3	6						
Wheat				13	0	4	24	49						
Sunflower				21	30	43	57	49	22					
Peach					40	57	92	69						
Apple														
Total, cum/day			78	1456	2906	4048	5753	4000	737				108	Annual in '000cum
Total, '000cum/month			2	44	90	121	176	124	22				579	Max
Total, liter/sec			1	17	34	47	67	46	9				67	Max per gross ha
Total, liter/sec/(gross area)			0.007	0.130	0.259	0.360	0.512	0.356	0.066				0.512	Max per net ha
Total, liter/sec/(net area)			0.008	0.156	0.311	0.434	0.616	0.429	0.079				0.616	

Table 16.16 Crop Water Requirement on K. Karistiran Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.60	0.90	1.47	2.51	3.60	4.67	5.09	4.47	3.01	1.67	0.85	0.56	898	
Crop Evapotranspiration, mm/day														
Wheat	0.72	1.09	1.84	3.46	5.22	4.90	1.83	5.59	3.67	0.62	0.72	0.53		
Sugar Beet				1.10	1.73	6.30	6.36			1.67				
Sunflower				0.75	1.12	1.77	6.06	1.92	0.96					
Vegetables				0.68	4.18	5.79	6.06	4.38		1.04				
Alfalfa					3.13	4.48	4.89	4.20	2.35					
90% Effective Rainfall, mm/day	1.42	1.24	1.13	1.03	1.04	1.08	0.98	0.96	0.83	1.20	1.71	1.62	398	
Net Water Requirement, mm														
Wheat			0.71	2.44	4.18	3.82	1.25	5.23	3.04	0.47				
Sugar Beet				0.08	0.69	5.23	5.78							
Sunflower					0.08	0.70	5.47	1.56	0.33					
Vegetables					3.14	4.71	5.47	4.02		1.72				
Alfalfa					2.10	3.40	4.30	3.84	1.72					
Gross Water Requirement, mm/day														
Wheat			0.99	3.43	5.89	5.36	1.76	7.36	4.29	0.66				Effi.
Sugar Beet				0.11	0.97	7.36	8.14							0.71
Sunflower					0.11	0.98	7.71	2.20	0.47					0.71
Vegetables					4.42	6.64	7.71	5.66						0.71
Alfalfa					2.96	4.79	6.06	5.41	2.42					0.71
Gross Water Requirement, cum/day														
Wheat			179	618	1080	970	316	2649	1543	239				Net, ha
Sugar Beet				39	360	2848	2890							18
Sunflower					13	118	925	264	56					12
Vegetables					2122	3185	3700	2716						48
Alfalfa					177	288	364	324	145					6
Gross Water Requirement, '000cum/month														
Wheat			6	19	33	29	5	82	46	7				Net, ha
Sugar Beet				1	11	79	91							18
Sunflower					0	4	29	8	2					36
Vegetables					66	96	115	84						12
Alfalfa					5	9	11	10	4					48
Total, cum/day			179	656	3723	7208	8235	5954	1745	239				
Total, '000cum/month			6	20	115	216	250	185	52	7				Annual in '000cum
Total, liter/sec			2	8	43	83	95	69	20	3				Max
Total, liter/sec/(gross area)			0.016	0.090	0.342	0.662	0.756	0.547	0.160	0.022				Max per gross ha
Total, liter/sec/(net area)			0.017	0.093	0.359	0.695	0.794	0.574	0.168	0.023				Max per net ha

Conversion Factor from gross area to net= 0.950

## **E-17 Annual Water Requirement with Probability 50%**

Table 17.1	Annual Water Requirement with P50% Effective Rainfall on Hacilar Project
Table 17.2	Annual Water Requirement with P50% Effective Rainfall on Urunlu Project
Table 17.3	Annual Water Requirement with P50% Effective Rainfall on Urunlu Project (modified cropping pattern)
Table 17.4	Annual Water Requirement with P50% Effective Rainfall on Kalesekisi Project
Table 17.5	Annual Water Requirement with P50% Effective Rainfall on Camlibel Project
Table 17.6	Annual Water Requirement with P50% Effective Rainfall on Kozluk Project
Table 17.7	Annual Water Requirement with P50% Effective Rainfall on Kuskara project
Table 17.8	Crop Water Requirement on Ozdenk Project (Net Area=126ha, Final Case with P50% Rainfall)
Table 17.9	Annual Water Requirement with P50% Effective Rainfall on Aslanlar Project
Table 17.10	Crop Water Requirement on Ilyaskoy Project (Net Area=108ha, Final Case with P50% Rainfall)
Table 17.11	Annual water Requirement with P50% Effective Rainfall on K. Karistiran Project

Table 17.1 Annual Water Requirement with P50% Effective Rainfall on Hascllar Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.63	0.93	1.65	2.66	3.76	5.06	5.88	5.30	3.63	2.00	1.00	0.64	1013	
Crop Evapotranspiration, mm/day														
Wheat	0.78	1.13	2.06	3.67	5.45	5.31	2.12	6.63	4.43	0.74	0.85	0.60		
Sugar Beet				1.17	1.80	6.63	7.35							
Sunflower				0.80	1.17	1.92	7.00	2.28	1.16	2.00				
Tomato				0.72	4.36	6.27	7.00	5.19						
Dry Onion														
P50% Effective Rainfall, mm/day	1.31	1.24	1.10	1.46	1.44	0.87	0.29	0.19	0.49	0.84	1.11	1.52	360	
Net Water Requirement, mm														
Wheat			0.96	2.21	4.01	4.44	1.83	6.43	3.94	1.16				
Sugar Beet				0.37	5.96	7.06		2.09	0.67					
Sunflower				1.06	6.71	6.71		5.00						
Tomato				2.92	5.40	6.71								
Dry Onion														
Gross Water Requirement, mm/day														
Wheat			1.41	3.25	5.90	6.53	2.69	9.46	5.79	1.70				
Sugar Beet				0.54	8.76	10.38		3.07	0.98					
Sunflower				1.54	9.86	9.86		7.36						
Tomato				7.94	9.86	9.86								
Dry Onion				4.30										
Gross Water Requirement, cum/day														
Wheat			2970	6832	12394	13713	5640	15140	9262	2721				
Sugar Beet				862	14020	16610		2365	758					
Sunflower				1189	7594	7594		1839						
Tomato				1075	1986	2466								
Dry Onion														
Gross Water Requirement, '000cum/month														
Wheat			92	205	384	411	87	469	278	84				
Sugar Beet				27	421	515		73	23					
Sunflower				36	236	236		29						
Tomato				33	60	76								
Dry Onion														
Total, cum/day			2970	6832	14331	30908	32310	19344	10019	2721				
Total, '000cum/month			92	205	444	927	914	571	301	84				Annual in '000cum Max
Total, liter/sec			34	79	166	368	374	224	116	31				Max per gross ha
Total, liter/sec/(gross area)			0.059	0.136	0.286	0.617	0.645	0.366	0.200	0.054				Max per net ha
Total, liter/sec/(net area)			0.066	0.151	0.318	0.685	0.716	0.429	0.222	0.060				Max per net ha
Conversion Factor from gross area to net=														0.90

Table 17.2 Annual Water Requirement with P60% Effective Rainfall on Urunlu Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
	0.51	0.82	1.42	2.46	3.41	4.32	4.77	3.97	2.67	1.46	0.75	0.47	825	
Crop Evapotranspiration														
Wheat	0.61	0.99	1.78	3.39	4.94	4.54	1.72	4.96	3.26	0.54	0.64	0.44		
Sugar Beet				1.08	1.64	5.83	5.96	2.78	1.63	1.46				
Dry Pea				0.66	2.32	4.71	4.48	3.89						
Vegetables			0.53	1.50	3.96	5.36	5.68	2.78						
Potato				3.10	3.97	3.97	4.29							
P50% Effective Rainfall, mm/day	0.97	0.96	0.85	1.04	0.99	0.56	0.13	0.07	0.19	0.72	0.85	1.02	253	
Net Water Requirement, mm														
Wheat		0.04	0.93	2.96	3.96	3.98	1.59	4.89	3.07	0.74				
Sugar Beet				0.05	0.65	5.27	5.84		1.44					
Dry Pea				1.33	1.33	4.15	4.36							
Vegetables				2.97	2.97	4.80	5.55	3.82						
Potato				0.46	2.11	3.41	4.17							
Gross Water Requirement, mm/day														
Wheat		0.06	1.31	3.32	5.57	5.60	2.24	6.89	4.32	1.04				Effi.
Sugar Beet				0.07	0.91	7.42	8.22		2.03					0.71
Dry Pea					1.87	5.84	6.14							0.71
Vegetables					4.18	6.76	7.82	5.38						0.71
Potato				0.65	2.98	4.81	5.87							0.71
Gross Water Requirement, cum/day														
Wheat		78	1831	4652	7799	7839	3137	9651	6062	1451				Net, ha
Sugar Beet				92	1277	10395	11508		1887					140
Dry Pea					1742	5434	5708							93
Vegetables					919	1486	1720	1184						22
Potato				466	2084	3366	4108	2673						70
Gross Water Requirement, '000cum/month														
Wheat		2	57	140	242	296	65	299	182	45				Net, ha
Sugar Beet				3	40	312	357		19					140
Dry Pea					54	163	177	110						93
Vegetables					28	45	53	37						22
Potato				14	66	101	127	83						70
Total, cum/day		78	1831	5203	13821	28520	28182	17058	7939	1451				465
Total, '000cum/month		2	57	156	428	856	779	529	200	45				3052
Total, litter/sec		1	21	60	160	300	303	197	92	17				330
Total, litter/sec/(gross area)		0.002	0.043	0.123	0.326	0.674	0.618	0.403	0.188	0.034				0.674
Total, litter/sec/(net area)		0.002	0.046	0.129	0.344	0.710	0.652	0.425	0.198	0.036				0.710
Conversion Factor from gross area to net=														0.96
Annual in '000cum														490
Max														3052
Max per gross ha														0.674
Max per net ha														0.710



Table 17.3 Annual Water Requirement with P50% Effective Rainfall on Urunjy Project (modified cropping pattern)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.51	0.82	1.42	2.45	3.41	4.32	4.77	3.97	2.67	1.46	0.75	0.47	825	
Crop Evapotranspiration, mm/day														
Wheat	0.61	0.99	1.78	3.39	4.94	4.54	1.72	4.96	3.26	0.54	0.64	0.44		
Sugar Beet				1.08	1.64	5.83	5.96	4.48	2.78	1.46				
Dry Pea				0.66	3.96	4.71	4.48	3.89	1.63					
Vegetables			0.53	1.50	3.10	3.97	4.29	2.78						
Potato														
P50% Effective Rainfall, mm/day	0.97	0.95	0.65	1.04	0.99	0.56	0.13	0.07	0.19	0.72	0.85	1.02	253	
Net Water Requirement, mm														
Wheat		0.04	0.93	2.36	3.96	3.98	1.59	4.89	3.07	0.74				
Sugar Beet				0.05	0.65	5.27	5.84	2.71	1.44					
Dry Pea				1.33	4.15	4.36	4.15	3.82						
Vegetables				2.97	4.80	5.55	5.55	3.82						
Potato				0.46	2.11	3.41	4.17	2.71						
Gross Water Requirement, mm/day														
Wheat		0.06	1.31	3.32	5.57	5.60	2.24	6.89	4.32	1.04			0.71	
Sugar Beet				0.07	0.91	7.42	8.22	3.82	2.03				0.71	
Dry Pea				1.87	6.14	6.14	6.14	5.38					0.71	
Vegetables				4.18	7.82	7.82	7.82	3.82					0.71	
Potato				0.65	2.98	4.81	5.87	3.82					0.71	
Gross Water Requirement, cum/day														
Wheat		52	1217	3090	5181	5208	2084	9651	6052	1451			93	
Sugar Beet				92	1277	10395	11508	3551	1897				140	
Dry Pea				458	1742	5434	5708	3715					93	
Vegetables				458	2883	4661	5394	2673					69	
Potato					2084	3366	4108						70	
Gross Water Requirement, '000cum/month														
Wheat		1	38	93	161	156	43	299	182	45			93	
Sugar Beet				3	40	312	357	110	19				140	
Dry Pea				14	54	163	177	115					93	
Vegetables				14	89	140	167	83					69	
Potato					65	101	127						70	
Total, cum/day		52	1217	3641	13166	29063	28602	19588	7939	1451			465	490
Total, '000cum/month		1	38	109	408	872	871	607	200	45			3152	Annual in '000cum
Total, liter/sec		1	14	42	152	336	333	227	92	17			336	Max
Total, liter/sec/(gross area)		0.001	0.029	0.086	0.311	0.686	0.680	0.463	0.188	0.034			0.686	Max per gross ha
Total, liter/sec/(net area)		0.001	0.030	0.091	0.328	0.723	0.717	0.488	0.198	0.036			0.723	Max per net ha

Conversion Factor from gross area to net= 0.95

Table 17.4 Annual Water Requirement with P50% Effective Rainfall on Kalesnikol Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.53	0.79	1.43	2.57	3.53	5.03	5.87	5.12	3.57	1.95	0.96	0.56	9.75	
Crop Evapotranspiration, mm/day														
Vegetables				0.69	4.09	6.24	6.99	5.02						
Cherry				1.54	2.37	3.97	4.70	4.10	1.82	0.55				
Grape			0.43	1.41	2.66	4.53	4.40	3.58	1.43					
P50% Effective Rainfall, mm/day	3.02	2.84	2.72	2.90	2.28	1.08	0.21	0.36	0.64	1.49	2.31	3.23	699	
Net Water Requirement, mm														
Vegetables					1.83	5.16	6.78	4.65						
Cherry					0.10	2.89	4.49	3.73	1.18					
Grape					0.36	3.46	4.20	3.22	0.79					
Gross Water Requirement, mm/day														
Vegetables					2.51	7.06	9.29	6.37						
Cherry					0.14	3.96	6.15	5.11	1.61					0.73
Grape					0.52	4.72	5.75	4.41	1.08					0.73
Gross Water Requirement, cum/day														
Vegetables					251	706	929	637						
Cherry					221	6338	9840	8179	2593					
Grape					210	1888	2299	1764	430					
Gross Water Requirement, '000cum/month														
Vegetables					8	21	29	20						
Cherry					7	190	306	254	77					
Grape					7	57	71	55	19					
Total, cum/day					681	8332	13058	10581	3013					
Total, '000cum/month					21	268	405	328	90					233
Total, liter/sec					8	103	151	122	35					
Total, liter/sec/(gross area)					0.034	0.444	0.649	0.526	0.150					
Total, liter/sec/(net area)					0.039	0.492	0.720	0.593	0.168					
Conversion Factor from gross area to net=														0.900

Table 17.5 Annual Water Requirement with P50% Effective Rainfall on Camilbel Project

Month	Annual Water Requirement with P50% Effective Rainfall on Camilbel Project												Remarks	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		Total
Reference Crop Evapotranspiration	0.94	0.94	1.17	1.17	1.35	1.72	4.72	5.01	4.83	3.13	2.08	1.40	0.90	
Crop Evapotranspiration, mm/day	1.13	1.66	2.71	4.37	5.58	4.96	4.71	3.38	2.20	0.76	1.02	0.85		
Wheat					2.62	5.14	6.26	6.04	4.40					
Sugar Beet			0.80	1.39	1.85	3.37	4.51	4.38	2.38					
Potato				0.86	3.50	4.34	4.73	4.54	2.82					
Tomato					4.47	5.35	4.81	5.26	3.07					
Alfalfa					3.35	4.63	4.81	5.26	3.07					
Apple					3.77	4.63	4.81	5.26	3.07					
Peach					3.33	3.77	4.21	3.96	1.94					
Barley, Oats					2.69	3.78	4.21	3.96	1.94					
Maize							4.01	4.40	3.32					
Cow Vetch							3.75	4.54	2.31					
Driv Onion														
Poplar														
Net Water Requirement, mm	1.15	1.14	2.51	1.61	1.88	2.81	0.13	0.13	0.50	0.70	0.95	0.83	3.53	
Net Water Requirement, mm														
Wheat					3.90	3.67	1.63	3.25	1.70					
Driv bean			1.46	2.76	0.94	3.86	6.09	5.91	3.90					
Sugar Beet					0.17	5.09	4.34	4.60	2.31					
Potato				0.32	2.76	4.57	4.41	4.41	0.58					
Tomato					2.67	3.25	4.64	5.14	2.56					
Alfalfa					2.09	3.34	5.24	5.83	0.83					
Apple					1.40	2.49	3.84	4.27	2.82					
Barley, Oats							3.59	4.41	1.81					
Maize														
Cow Vetch														
Driv Onion														
Poplar														
Gross Water Requirement, mm/day														
Wheat					7.36	6.93	3.08	6.14	3.20					
Driv bean			2.75	5.22	1.77	7.28	11.49	11.15	7.36					
Sugar Beet					0.32	9.60	8.56	8.56	4.35					
Potato				0.61	3.44	5.77	8.18	8.09	4.84					
Tomato					5.26	8.62	10.93	8.32	4.84					
Alfalfa					3.15	6.13	8.75	9.69	1.57					
Apple					3.95	6.31	11.78	9.69	1.57					
Peach					2.64	4.70	7.62	7.23	1.57					
Barley, Oats							7.24	8.05	5.32					
Maize							6.77	8.32	3.41					
Cow Vetch														
Driv Onion														
Poplar														
Gross Water Requirement, cum/day														
Wheat					19141	18014	5338	4173	2179					
Driv bean			7159	13563	1202	4954	5622	39578	26126					
Sugar Beet					1120	34081	40799	5032	9137					
Potato				501	2820	4732	6711	5908	1195					
Tomato					3573	5862	7429	9073	4755					
Alfalfa					3432	6676	9539	9073	1452					
Apple					1184	1892	3533	2907	1240					
Peach					184	1892	6018	5712	1240					
Barley, Oats					2086	3715	6018	5712	1240					
Maize							652	2174	1435					
Cow Vetch							3293	12153	4977					
Driv Onion														
Poplar														
Gross Water Requirement, '000cum/month														
Wheat					592	540	165	129	65					
Driv bean			222	407	37	149	180	1227	784					
Sugar Beet					35	1022	1265	156	283					
Potato				15	87	142	208	183	37					
Tomato					111	176	230	281	143					
Alfalfa					106	200	296	90	44					
Apple					37	57	110	90	37					
Peach					65	111	187	177	5					
Barley, Oats							20	67	43					
Maize							102	377	149					
Cow Vetch														
Driv Onion														
Poplar														
Total, cum/day			7159	16653	34558	79228	89135	95708	42164	10715	316	1356	1438	
Total, '000cum/month			232	500	1071	2398	2763	2688	1265	322	9	43	45	
Total, liter/sec			83	193	400	925	1032	1004	488	104	0.003	0.003	0.003	
Total, liter/sec/(gross area)			0.020	0.134	0.278	0.643	0.717	0.698	0.339	0.086	0.003	0.003	0.003	
Total, liter/sec/(net area)			0.021	0.141	0.293	0.677	0.755	0.735	0.357	0.091	0.003	0.003	0.003	

Conversion Factor from gross area to net= 0.950

Table 17.6 Annual Water Requirement with P50% Effective Rainfall on Kozluk Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	1.03	1.24	1.49	2.06	2.85	3.91	4.07	3.69	2.69	1.70	1.26	1.13	8.23	
Crop Evapotranspiration, mm/day														
Dry Bean					1.94	4.26	3.83	2.58	1.64					
Paddy					6.01	9.19	11.68	9.63	5.76					
Maize					1.60	3.13	3.70	3.39	1.83					
Potato			0.55	1.26	2.59	3.60	3.66	2.58						
Tomato + Pepper				0.56	3.31	4.85	4.84	3.62						
Hazelnut				0.87	2.00	3.71	4.40	2.40	1.61					
P50% Effective Rainfall, mm/day	2.59	2.63	2.29	1.99	1.48	1.89	1.86	2.42	2.26	3.02	3.28	3.09	8.77	
Net Water Requirement, mm														
Dry Bean					0.46	2.37	1.96	0.16						
Paddy					4.53	7.30	9.82	7.21	3.50					
Maize					0.12	1.24	1.84	0.97						
Potato					1.11	1.70	1.80	0.16						
Tomato + Pepper					1.83	2.96	2.96	1.20						
Hazelnut					0.51	1.82	2.53							
Gross Water Requirement, mm/day														
Dry Bean					0.86	4.47	3.71	0.31						Effi.
Paddy					9.25	14.89	20.04	14.72	7.14					0.53
Maize					0.22	2.33	3.48	1.84						0.49
Potato					2.10	3.22	3.40	0.31						0.53
Tomato + Pepper					3.44	5.58	5.63	2.26						0.53
Hazelnut					0.97	3.44	4.78							0.53
Gross Water Requirement, cum/day														Net, ha
Dry Bean					466	2414	2002	166						54
Paddy					4695	8040	10522	7946	3854					54
Maize					180	1934	2885	1526						83
Potato					1742	2669	2822	255						83
Tomato + Pepper					3788	6134	6189	2482						110
Hazelnut					1610	5705	7938							166
Gross Water Requirement, '000cum/month														Net, ha
Dry Bean					14	72	62	5						54
Paddy					155	241	336	246	116					54
Maize					6	58	89	47						83
Potato					54	80	87	8						83
Tomato + Pepper					117	184	192	77						110
Hazelnut					50	171	246							166
Total, cum/day					12782	26667	32658	12375	3854					550
Total, '000cum/month					396	807	1012	384	116					2715
Total, liter/sec					148	311	378	143	45					378
Total, liter/sec/(gross area)					0.243	0.510	0.620	0.235	0.073					0.620
Total, liter/sec/(net area)					0.269	0.566	0.687	0.280	0.081					0.687
Conversion Factor from gross area to net=														0.900

Table 17.7 Annual Water Requirement with P50% Effective Rainfall on Kuskara Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.44	0.73	1.27	2.11	3.09	3.79	4.15	3.56	2.30	1.24	0.64	0.41	725	
Crop Evapotranspiration, mm/day														
Wheat	0.53	0.88	1.59	2.91	4.48	3.98	1.49	3.28	1.56	0.46	0.54	0.39		
Maize					1.73	3.03	3.78	4.45	2.81	1.24				
Sugar Beet			0.47	0.93	1.48	5.12	5.19	4.45	2.49	0.77				
Potato				1.29	2.81	3.49	3.74	2.49	1.79	0.77				
Alfalfa			0.58	1.62	2.69	3.64	3.98	3.35	1.79	0.81				Second crop
Garlic					2.53	3.30	3.15	3.49	1.84	0.81				
Soy Bean						2.49	2.49	3.49	1.84	0.81				
P50% Effective Rainfall, mm/day	0.90	0.97	0.96	1.47	1.96	1.89	0.89	0.81	0.78	1.03	0.94	0.98	412	
Net Water Requirement, mm														
Wheat			0.63	1.44	2.52	2.09	0.61	2.47	0.80					
Maize						1.14	2.89	2.47	0.80					
Sugar Beet					0.85	3.22	4.30	3.64	2.05	0.21				
Potato					0.73	1.59	2.85	1.68	1.03					
Alfalfa					0.57	1.75	3.10	2.54	1.03					
Garlic				0.15		1.40	2.27	2.68	1.08					Second crop
Soy Bean						1.60	1.60	2.68	1.08					
Gross Water Requirement, mm/day														
Wheat			1.19	2.72	4.75	3.94	1.15	4.66	1.52					
Maize						2.15	5.45	4.66	1.52					
Sugar Beet					1.61	6.08	8.11	6.87	3.86	0.40				
Potato					1.38	3.01	5.37	3.18	1.95					
Alfalfa					1.08	3.29	5.84	4.79	1.95					
Garlic				0.29		2.65	4.28	4.28	2.04					
Soy Bean						3.02	3.02	5.06	2.04					
Gross Water Requirement, cum/day														
Wheat			357	815	1427	1181	344	466	152					
Maize						215	545	466	152					
Sugar Beet						2433	3246	2749	1544	160				
Potato						301	537	318	59					
Alfalfa						99	175	144	59					
Garlic				69		636	513	489	489					
Soy Bean							363	1214	489					
Gross Water Requirement, '000cum/month														
Wheat			11	24	44	35	7	14	5					
Maize						6	17	14	5					
Sugar Beet						73	101	85	46	5				
Potato						9	17	10	2					
Alfalfa						3	5	4	2					
Garlic				2		19	8	8	15					
Soy Bean						11	11	38	15					
Total, cum/day			357	884	1889	4865	5724	4890	2244	160			117	130
Total, '000cum/month			11	27	59	146	166	152	67	5			632	Annual in '000cum
Total, liter/sec			4	10	22	56	66	57	26	2			66	Max
Total, liter/sec/(gross area)			0.032	0.079	0.168	0.433	0.510	0.435	0.200	0.014			0.510	Max per gross ha
Total, liter/sec/(net area)			0.035	0.087	0.187	0.481	0.566	0.484	0.222	0.016			0.566	Max per net ha

Conversion Factor from gross area to net= 0.900

Table 17.3 Crop Water Requirement on Ozdenk Project (Net Area=126ha, Final Case with P.50% Rainfall)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.66	1.01	1.71	2.73	3.73	4.72	5.40	4.73	3.20	1.76	1.01	0.66	956	
Crop Evapotranspiration, mm/day														
Wheat	0.79	1.22	2.14	3.77	5.41	4.96	1.94	5.91	3.90	0.65	0.86	0.62		
Sugar Beet			0.63	1.20	1.79	6.37	6.75	3.31		1.76				
Potato				1.67	3.39	4.34	4.86	3.31						
Alfalfa				0.74	3.25	4.53	5.18	4.45		1.09				
Vegetables					4.33	5.85	6.43	4.64						
Dry Bean					2.54	5.14	5.08	3.31		1.95				
P50% Effective Rainfall, mm/day	1.27	1.14	1.12	1.20	1.18	0.75	0.34	0.34	0.39	0.91	1.01	1.36	335	
Net Water Requirement, mm														
Wheat		0.08	1.01	2.57	4.23	4.20	1.60	5.57	3.51	0.85				
Sugar Beet				0.46	2.21	3.59	4.52	2.97						
Potato					2.06	3.78	4.84	4.11		0.18				
Alfalfa					3.14	5.10	6.08	4.29						
Vegetables					1.35	4.39	4.73	2.97						
Dry Bean														
Gross Water Requirement, mm/day														
Wheat		0.12	1.54	3.89	6.40	6.37	2.43	8.44	5.32	1.28			0.66	
Sugar Beet				0.70	0.92	8.51	9.71	8.44					0.66	
Potato					3.35	5.44	6.84	4.50					0.66	
Alfalfa					3.12	5.73	7.33	6.22		0.27			0.66	
Vegetables					4.76	7.73	9.22	6.51					0.66	
Dry Bean					2.05	6.66	7.17	4.50					0.66	
Gross Water Requirement, cum/day														
Wheat		37	476	1205	1985	1974	752	2617	1649	397			31	
Sugar Beet				134	285	2640	3009	855					31	
Potato					637	1034	1300	855					19	
Alfalfa					406	744	953	809		35			13	
Vegetables					619	1005	1198	846					13	
Dry Bean					390	1265	1362	855		449			19	
Gross Water Requirement, '000cum/month														
Wheat		1	15	36	62	59	16	81	49	12			31	
Sugar Beet				4	9	78	93	81					31	
Potato					20	31	40	27					19	
Alfalfa					13	22	30	25		1			13	
Vegetables					19	30	37	26					13	
Dry Bean					12	38	42	27					19	
Total, cum/day		37	476	1339	4322	8661	8575	5982	2511	432			126	
Total, '000cum/month		1	15	40	134	260	256	185	75	13			982	Annual in '000cum
Total, liter/sec		0	6	15	50	100	99	69	29	5			100	Max
Total, liter/sec/(gross area)		0.003	0.039	0.111	0.357	0.716	0.709	0.495	0.208	0.036			0.716	Max per gross ha
Total, liter/sec/(net area)		0.003	0.044	0.123	0.397	0.795	0.788	0.549	0.231	0.040			0.796	Max per net ha

Table 17.9 Annual Water Requirement with P60% Effective Rainfall on Aslanlar Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	1.19	1.65	2.23	3.18	4.51	5.89	6.28	5.38	4.00	2.32	1.43	1.13	1195	
Crop Evapotranspiration, mm/day										0.00				
Wheat				0.86	5.23	7.30	7.47	5.27						
Vegetables			0.67	1.75	3.38	5.30	4.71	3.77	1.60					
Grape														
P50% Effective Rainfall, mm/day	3.10	2.58	1.96	1.37	0.95	0.30	0.09	0.03	0.36	1.20	2.33	3.32	533	
Net Water Requirement, mm														
Wheat				4.28	7.00	7.38	5.24							
Vegetables			0.38	2.43	5.00	4.62	3.73	1.24						
Grape														
Gross Water Requirement, mm/day														
Wheat				5.29	8.64	9.12	6.47							
Vegetables			0.47	3.00	6.17	5.71	4.61	1.54						
Grape														
Gross Water Requirement, cum/day														
Wheat				5285	8644	9117	6466							
Vegetables			582	3753	7715	7132	5758	1921						
Grape														
Gross Water Requirement, '000cum/month														
Wheat				164	259	283	200							
Vegetables				17	231	221	178	58						
Grape														
Total, cum/day				592	9036	16359	16248	12224	1921				250	263
Total, '000cum/month				17	280	491	504	379	58				1729	Annual in '000cum
Total, liter/sec				7	105	189	188	141	22				189	Max
Total, liter/sec/(gross area)				0.026	0.368	0.720	0.715	0.538	0.085				0.720	Max per gross ha
Total, liter/sec/(net area)				0.027	0.418	0.757	0.752	0.566	0.089				0.757	Max per net ha

Conversion Factor from gross area to net= 0.950

Table 17.10 Crop Water Requirement on Iyaskoy Project (Net Area=108ha, Final Case with P50% Rainfall)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.90	0.96	1.57	2.32	3.33	4.36	4.59	4.17	2.93	1.74	1.08	0.96	883	
Crop Evapotranspiration, mm/day														
Wheat	1.08	1.16	1.96	3.20	4.83	4.58	1.65	1.79	0.94	0.64	0.92	0.90		
Sunflower				0.70	1.03	1.66	5.46	3.42	1.08	0.00				
Peach				1.97	2.66	3.49	3.86	4.55	2.49	0.47				
Apple				2.44	3.26	4.27	5.88			0.84				
P50% Effective Rainfall, mm/day	2.31	2.20	1.82	1.48	1.17	1.12	0.73	0.72	1.45	2.09	2.22	2.77	610	
Net Water Requirement, mm														
Wheat			0.14	1.72	3.66	3.46	0.93	1.07						
Sunflower				0.49	1.49	2.37	3.13	2.69	1.04					
Peach				0.96	2.09	3.15	5.15	3.82						
Apple														
Gross Water Requirement, mm/day														
Wheat			0.21	2.54	5.38	5.08	1.36	1.57					Eff.	
Sunflower				0.64	1.94	3.07	6.97	3.50	1.35				0.68	
Peach				1.24	2.72	4.09	4.06	4.96					0.77	
Apple							6.69						0.77	
Gross Water Requirement, cum/day														
Wheat			23	279	592	559	150	173					Net, ha	Gross Area, ha
Sunflower				276	835	1322	1748	1505	580				11	
Peach				535	1169	1760	2876	2134					11	
Apple													43	
Gross Water Requirement, '000cum/month														
Wheat			1	8	18	17	2	5					Net, ha	Gross Area, ha
Sunflower				8	26	40	54	47	17				11	
Peach				16	36	53	89	66					43	
Apple													43	
Total, cum/day			23	1090	2596	3727	5540	3811	580				108	130
Total, '000cum/month			1	33	80	112	169	118	17				531	Annual in '000cum
Total, liter/sec			0	13	30	43	64	44	7				64	Max
Total, liter/sec/(gross area)			0.002	0.097	0.231	0.332	0.493	0.339	0.052				0.493	Max per gross ha
Total, liter/sec/(net area)			0.002	0.117	0.278	0.399	0.594	0.408	0.062				0.594	Max per net ha



Table 17.11 Annual Water Requirement with P60% Effective Rainfall on K. Karistiran Project

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Remarks
Reference Crop Evapotranspiration	0.60	0.90	1.47	2.51	3.60	4.67	5.09	4.47	3.01	1.67	0.85	0.56	898	
Crop Evapotranspiration, mm/day														
Wheat	0.72	1.09	1.84	3.46	5.22	4.90	1.83	5.59	3.67	0.62	0.72	0.53		
Sugar Beet				1.10	1.73	6.30	6.36	1.92	0.96	1.67				
Sunflower				0.75	1.12	1.77	6.06	1.92	0.96					
Vegetables				0.68	4.18	5.79	6.06	4.38		1.04				
Alfalfa					3.13	4.48	4.89	4.20	2.35					
P50% Effective Rainfall, mm/day	1.80	1.59	1.45	1.32	1.33	1.38	0.76	0.47	0.81	1.53	2.15	2.04	505	
Net Water Requirement, mm														
Wheat			0.39	2.15	3.89	3.52	1.06	5.12	2.86	0.14				
Sugar Beet				0.40	0.99	4.92	5.61	1.45	0.15					
Sunflower				2.85	4.41	5.30	5.30	3.91	1.53					
Vegetables				1.80	3.10	4.13	4.13	3.73						
Alfalfa														
Gross Water Requirement, mm/day			0.55	3.02	5.48	4.96	1.51	7.20	4.02	0.20				
Wheat					0.56	6.93	7.89	2.04	0.21					
Sugar Beet					4.01	6.21	7.46	5.51	2.16					
Sunflower					2.54	4.37	5.82	5.25						
Vegetables														
Alfalfa														
Gross Water Requirement, cum/day			99	544	966	893	273	2594	1449	72				
Wheat					202	2466	2842	2594						
Sugar Beet					66	66	896	245	25					
Sunflower					1925	2980	3683	2642	130					
Vegetables					152	262	349	315						
Alfalfa														
Gross Water Requirement, '000cum/month			3	16	31	27	4	80	43	2				
Wheat					6	75	88	8	1					
Sugar Beet					60	89	111	82	4					
Sunflower					5	8	11	10						
Vegetables														
Alfalfa														
Total, cum/day			99	544	3266	6696	7942	5796	1604	72			120	
Total, '000cum/month			3	16	101	201	242	180	48	2			794	Annual in '000cum
Total, liter/sec			1	6	38	78	92	67	19	1			92	Max
Total, liter/sec/(gross area)			0.009	0.050	0.300	0.615	0.730	0.532	0.147	0.007			0.730	Max per gross ha
Total, liter/sec/(net area)			0.010	0.052	0.315	0.646	0.766	0.559	0.155	0.007			0.766	Max per net ha
Conversion Factor from gross area to net=														0.960

## **E-18 Ozdenk Dam Reservoir Operation Study**

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|------------|---|
| Table 18.1 | Monthly Rainfall, Station: Mihaliccik, Station No.: 1369 (for Ozdenk)                   |
| Table 18.2 | Monthly Effective Rainfall, Station: Mihaliccik, Station No.: 1369 (for Ozdenk)         |
| Table 18.3 | Monthly Crop Water Requirement in mm for Ozdenk Project                                 |
| Table 18.4 | Monthly Runoff Discharge in mm for Ozdenk Project                                       |
| Table 18.5 | Monthly Runoff Discharge in '000cum for Ozdenk Project                                  |
| Table 18.6 | Ozdenk Dam Operation (Mihaliccik Station, Dam Volume=Maximum, Irrigation Area=170ha)    |
| Table 18.7 | Ozdenk Dam Operation (Mihaliccik Station, Dam Volume=800,000cum, Irrigation Area=140ha) |
| Table 18.8 | Elevation and Reservoir Volume Calculation  |

Table 18.1 Monthly Rainfall, Station: Mihaliccik, Station No.: 1369 (for Ozdenk)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	31.9	53.1	42.8	22.9	108.8	103.5	18.2	4.7	49.1	22.7	32.9	75.3	565.9
1958	122.3	31.9	132.3	54.8	33.1	33.7	9.6	4.3	40.4	22.4	5.4	56.9	547.1
1959	130.1	29.5	13.4	29.4	42.6	60.8	39.3	12.2	2.0	18.8	35.6	60.3	474.0
1960	85.9	61.6	124.0	42.0	56.8	78.2	11.0	6.2	14.7	16.0	12.6	102.0	611.0
1961	57.4	85.5	19.8	36.4	32.6	58.1	5.0	5.3	32.0	51.4	14.1	59.2	456.8
1962	36.5	80.6	97.2	32.4	41.4	26.4	0.0	0.0	44.5	23.7	26.0	178.9	587.6
1963	131.0	144.9	58.6	62.7	143.9	40.4	24.2	0.3	26.0	50.4	23.4	90.3	796.1
1964	9.0	80.9	86.7	22.9	38.9	90.0	8.8	5.4	36.2	0.0	41.0	75.1	494.9
1965	46.9	113.3	58.8	95.9	79.6	11.4	10.4	21.9	0.0	10.6	86.1	107.9	642.8
1966	148.0	13.8	79.0	77.8	54.7	26.5	9.1	7.3	4.8	17.5	32.5	113.3	584.3
1967	44.9	47.5	44.4	78.5	52.8	10.4	13.4	3.2	13.0	13.1	32.0	77.8	431.0
1968	92.1	47.1	147.1	46.2	25.1	36.2	2.3	27.7	46.7	45.7	70.0	107.3	693.5
1969	81.7	88.8	63.5	47.6	82.2	30.3	7.1	0.0	2.3	16.7	36.4	139.0	595.6
1970	69.9	113.3	61.0	20.4	10.4	62.4	5.1	0.0	8.8	27.8	26.6	77.2	482.9
1971	40.7	41.3	95.8	57.0	96.2	47.8	5.3	18.0	23.9	23.2	62.2	53.7	565.1
1972	21.8	23.2	32.5	55.1	9.9	96.8	28.7	20.4	26.1	81.9	18.5	3.5	418.4
1973	25.0	52.6	31.1	55.0	50.5	22.6	32.2	11.9	13.7	35.8	27.7	57.5	416.6
1974	19.8	59.6	77.6	69.3	82.8	52.5	3.4	22.9	19.2	25.5	20.9	62.7	516.2
1975	67.3	36.5	69.4	64.6	136.2	74.7	5.7	7.9	1.2	5.5	47.3	65.2	581.5
1976	57.4	26.6	24.0	67.6	57.5	33.4	13.7	6.3	10.3	48.6	26.0	68.0	439.4
1977	65.1	22.2	29.5	68.3	27.6	17.0	21.7	6.3	46.4	40.7	31.1	48.7	424.6
1978	77.1	110.5	43.0	90.5	39.3	0.9	1.8	0.0	54.9	65.5	9.3	69.5	562.3
1979	121.6	39.9	27.8	24.6	122.7	28.1	5.3	0.0	12.3	73.1	91.7	80.7	627.8
1980	75.1	33.1	63.5	52.4	81.0	53.4	12.4	15.8	16.7	6.8	64.2	65.4	539.8
1981	117.9	75.9	66.2	37.8	47.6	5.1	16.7	12.4	0.9	31.0	63.3	173.9	648.7
1982	73.9	19.0	41.7	135.1	31.4	22.1	24.5	28.8	0.3	24.8	7.6	44.3	453.5
1983	35.9	50.2	24.5	47.3	41.6	54.0	46.6	3.7	16.9	12.9	142.0	72.9	548.5
1984	63.6	39.2	91.7	136.1	20.8	5.3	63.8	31.0	0.3	0.2	35.8	11.5	499.3
1985	109.8	68.7	44.7	34.7	69.6	6.9	0.0	0.5	0.0	63.3	65.7	43.9	507.8
1986	107.1	94.9	14.9	23.6	36.7	46.7	6.1	7.5	34.9	7.0	14.4	92.0	485.8
1987	152.2	22.0	63.3	55.3	51.9	41.6	30.0	23.3	2.5	18.7	26.6	102.7	590.1
1988	17.6	44.4	109.9	85.3	28.4	60.7	10.0	0.7	1.4	62.6	109.5	56.1	586.6
1989	7.1	11.8	16.4	5.2	35.8	9.6	30.9	2.8	0.0	71.5	96.6	65.6	353.3
1990	22.8	17.4	24.3	103.2	50.5	46.6	45.3	10.9	44.2	31.4	15.5	65.9	478.0
1991	32.1	48.6	6.4	70.1	69.9	29.2	36.6	32.0	23.5	73.4	31.2	105.8	558.8
1992	4.2	7.4	74.2	71.0	1.6	38.9	36.7	1.0	0.0	58.0	35.2	54.8	383.0
Mean	66.7	53.8	58.4	57.8	55.3	40.6	17.8	10.1	18.6	33.3	42.1	77.4	531.9

Table 18.2 Monthly Effective Rainfall, Station: Mihaliccik, Station No.: 1369 (for Ozdenk)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	29.9	47.5	39.1	21.9	85.1	82.1	17.5	4.7	44.3	21.7	30.7	64.0	486.3
1958	92.4	29.9	97.3	48.8	30.9	31.4	9.4	4.3	37.1	21.4	5.3	50.4	458.7
1959	96.2	27.8	13.0	27.7	39.0	53.4	36.2	11.9	2.0	18.1	33.1	53.0	411.4
1960	71.1	54.0	93.2	38.5	50.3	66.0	10.8	6.1	14.3	15.5	12.3	81.2	513.3
1961	50.8	70.9	19.0	33.8	30.5	51.3	5.0	5.2	30.0	46.1	13.7	52.2	408.4
1962	33.8	67.6	78.3	30.3	38.0	25.0	0.0	0.0	40.5	22.6	24.6	114.9	475.7
1963	96.7	102.9	51.7	54.8	102.5	37.1	23.0	0.3	24.6	45.3	22.3	74.0	635.4
1964	8.8	67.8	71.7	21.9	35.9	73.8	8.6	5.3	33.6	0.0	37.6	63.8	428.9
1965	42.5	87.6	51.9	77.5	66.9	11.1	10.2	20.9	0.0	10.4	71.3	84.6	535.0
1966	104.2	13.4	66.5	65.7	48.7	25.1	8.9	7.2	4.8	16.9	30.4	87.6	479.4
1967	40.9	43.0	40.5	66.2	47.2	10.2	13.0	3.2	12.7	12.8	30.0	65.7	385.2
1968	75.1	42.7	103.8	41.9	23.8	33.6	2.3	26.2	42.3	41.5	60.2	84.3	577.8
1969	68.4	73.0	55.4	43.1	68.7	28.5	7.0	0.0	2.3	16.1	33.8	100.4	496.6
1970	60.1	87.6	53.6	19.6	10.2	54.6	5.0	0.0	8.6	26.3	25.2	65.3	416.1
1971	37.4	37.9	77.4	50.5	77.7	43.2	5.2	17.4	22.8	22.1	54.5	47.9	494.0
1972	20.8	22.1	30.4	49.0	9.7	78.1	27.1	19.6	24.7	68.5	17.8	3.5	371.3
1973	23.8	47.1	29.2	49.0	45.4	21.6	30.1	11.6	13.3	34.1	26.2	50.9	382.1
1974	19.0	52.5	65.6	59.7	69.1	47.0	3.4	21.9	18.5	24.2	20.0	54.8	455.6
1975	58.2	33.8	59.8	56.3	99.1	63.5	5.6	7.8	1.2	5.4	42.8	56.7	490.3
1976	50.8	25.2	22.8	58.5	50.9	31.2	13.3	6.2	10.1	43.9	24.6	58.8	396.3
1977	56.6	21.2	27.8	59.0	26.1	16.4	20.8	6.2	42.1	37.4	29.2	44.0	386.6
1978	65.2	86.1	39.3	74.1	36.2	0.9	1.8	0.0	48.9	56.9	9.1	59.8	478.4
1979	92.0	36.7	26.3	23.4	92.6	26.5	5.2	0.0	12.0	62.4	74.9	67.7	519.7
1980	63.8	30.9	55.4	46.9	67.9	47.7	12.1	15.3	16.1	6.7	56.0	56.8	475.7
1981	90.1	64.4	57.4	34.9	43.1	5.0	16.1	12.1	0.9	29.1	55.3	113.4	521.9
1982	63.0	18.3	38.2	96.6	29.4	21.1	23.3	27.1	0.3	23.6	7.5	40.4	390.8
1983	33.3	45.2	23.3	42.8	38.1	48.2	42.3	3.7	16.3	12.6	101.7	62.3	469.7
1984	55.5	36.1	74.9	99.1	19.9	5.2	55.7	29.1	0.3	0.2	33.2	11.2	420.5
1985	85.7	59.3	40.7	32.3	59.9	6.8	0.0	0.5	0.0	55.3	57.1	40.0	437.6
1986	84.2	76.9	14.5	22.5	34.0	42.3	6.0	7.4	32.5	6.9	14.0	75.1	416.2
1987	105.9	21.0	55.3	49.2	46.5	38.1	28.2	22.2	2.5	18.0	25.2	81.6	493.7
1988	17.0	40.5	85.7	70.7	26.8	53.3	9.8	0.7	1.4	54.8	85.5	49.8	496.0
1989	7.0	11.5	15.9	5.1	33.2	9.4	29.0	2.8	0.0	61.3	77.9	57.0	310.2
1990	21.8	16.8	23.1	81.9	45.4	42.3	41.2	10.7	40.3	29.4	15.0	57.2	425.0
1991	30.0	43.9	6.3	60.3	60.1	27.5	33.9	30.0	22.4	62.6	29.3	83.4	489.7
1992	4.2	7.3	63.2	60.9	1.6	35.9	34.0	1.0	0.0	51.3	32.7	48.6	340.8
Mean	54.3	45.8	49.1	49.3	47.0	36.0	16.7	9.7	17.3	30.0	36.7	62.8	454.8
Crop	8.27	11.53	26.26	63.43	145.94	216.55	197.77	143.56	62.01	30.07	8.68	6.48	920.54

Table 18.3 Monthly Crop Water Requirement in mm for Ozdenk Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957				41.6	60.8	134.5	180.2	138.9	17.7	8.4			582.1
1958				14.6	115.0	185.1	188.3	139.3	24.9	8.7	3.3		679.3
1959			13.2	35.8	107.0	163.1	161.6	131.7	60.0	12.0			684.3
1960				25.0	95.6	150.6	187.0	137.4	47.7	14.6			657.9
1961			7.2	29.7	115.5	165.2	192.8	138.3	32.1				680.8
1962				33.1	108.0	191.5	197.8	143.6	21.5	7.5			702.9
1963				8.6	43.5	179.4	174.7	143.3	37.4				586.8
1964				41.6	110.1	142.7	189.1	138.2	28.4	30.1			680.2
1965					79.0	205.4	187.6	122.6	62.0	19.7			676.3
1966					97.2	191.5	188.8	136.4	57.3	13.2			684.3
1967					98.7	206.4	184.7	140.4	48.4	17.3			696.9
1968				21.5	122.1	183.0	195.5	117.4	19.7				659.1
1969				20.4	77.3	188.1	190.8	143.6	59.7	13.9			693.7
1970				43.9	135.8	161.9	192.7	143.6	53.4	3.8			735.0
1971				12.9	68.3	173.3	192.5	126.2	39.3	7.9			620.4
1972				14.4	136.2	138.5	170.7	124.0	37.3			3.0	624.1
1973				14.5	100.5	195.0	167.6	131.9	48.7				658.3
1974				3.7	76.9	169.6	194.4	121.7	43.5	5.9			615.7
1975				7.2	46.8	153.0	192.1	135.8	60.8	24.6			620.4
1976			3.4	5.0	95.1	185.4	184.4	137.3	51.9				662.5
1977				4.5	119.9	200.1	177.0	137.3	19.9				658.7
1978					109.7	215.6	196.0	143.6	13.1				678.1
1979			0.0	40.0	53.4	190.0	192.5	143.6	50.0				669.5
1980				16.5	78.1	168.8	185.7	128.3	45.9	23.4			646.6
1981				28.5	102.9	211.5	181.6	131.5	61.1	1.0			718.1
1982					116.5	195.4	174.5	116.4	61.7	6.5	1.2		672.2
1983			3.0	20.6	107.8	168.4	155.5	139.9	45.7	17.5			658.3
1984					126.0	211.3	142.1	114.5	61.7	29.9			685.5
1985				31.1	86.0	209.7	197.8	143.1	62.0				729.8
1986			11.8	40.9	111.9	174.2	191.7	136.2	29.5	23.2			719.5
1987				14.2	99.4	178.4	169.6	121.3	59.5	12.1			654.6
1988					119.2	163.2	188.0	142.9	60.6				673.8
1989	1.3	0.0	10.4	58.3	112.7	207.1	168.8	140.8	62.0				761.4
1990			3.1		100.5	174.3	156.6	132.9	21.7	0.6			589.8
1991			19.9	3.2	85.8	189.1	163.8	113.6	39.6				615.0
1992	4.1	4.2		2.5	144.3	180.7	163.8	142.6	62.0				704.2
Mean	2.7	2.1	8.0	22.6	99.0	180.6	181.1	133.9	44.7	13.7	2.3	3.0	667.7

Table 18.4 Monthly Runoff Discharge in mm for Ozdenk Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	10.2	17.0	13.7	7.3	34.8	33.1	5.8	1.5	15.7	7.3	10.5	24.1	180.9
1958	37.5	9.8	40.5	16.8	10.1	103	2.9	1.3	12.4	6.9	1.7	17.4	167.6
1959	32.7	7.4	3.4	7.4	10.7	15.3	9.9	3.1	0.5	4.7	8.9	15.2	119.1
1960	30.1	21.6	43.4	14.7	19.9	27.4	3.9	2.2	5.1	5.6	4.4	35.7	214.0
1961	13.6	20.3	4.7	8.7	7.8	13.8	1.2	1.3	7.6	12.2	3.4	14.1	108.6
1962	12.2	27.0	32.5	10.8	13.9	8.8	0.0	0.0	14.9	7.9	8.7	59.9	196.6
1963	59.9	66.2	26.8	28.7	65.8	18.5	11.1	0.1	11.9	23.0	10.7	41.3	364.0
1964	2.4	21.6	23.2	6.1	10.4	24.1	2.4	1.4	9.7	0.0	11.0	20.1	132.4
1965	17.4	42.0	21.8	35.6	29.5	4.2	3.9	8.1	0.0	3.9	31.9	40.0	238.4
1966	49.2	4.6	26.3	25.9	18.2	8.8	3.0	2.4	1.6	5.8	10.8	37.7	194.2
1967	9.7	10.3	9.6	17.0	11.5	2.3	2.9	0.7	2.8	2.8	6.9	16.9	93.5
1968	37.0	18.9	59.1	18.6	10.1	14.5	0.9	11.1	18.8	18.4	28.1	43.1	278.5
1969	27.8	30.2	21.6	16.2	28.0	10.3	2.4	0.0	0.8	5.7	12.4	47.3	202.5
1970	18.1	29.3	15.8	5.3	2.7	16.1	1.3	0.0	2.3	7.2	6.9	19.9	124.7
1971	13.0	13.2	30.6	18.2	30.7	15.3	1.7	5.7	7.6	7.4	19.8	17.1	180.3
1972	4.5	4.8	6.7	11.4	2.0	20.0	5.9	4.2	5.4	16.9	3.8	0.7	86.5
1973	5.1	10.8	6.4	11.3	10.4	4.6	6.6	2.4	2.8	7.6	5.7	11.8	85.5
1974	5.6	16.9	22.0	19.7	23.5	14.9	1.0	6.5	5.4	7.2	5.9	17.8	146.4
1975	22.2	12.1	22.9	21.3	45.0	24.7	1.9	2.6	0.4	1.8	15.6	21.5	192.2
1976	12.8	6.0	5.4	15.1	12.9	7.5	3.1	1.4	2.3	10.9	5.8	15.2	98.3
1977	13.8	4.7	6.2	14.5	5.8	3.6	4.6	1.3	9.8	8.6	6.6	10.3	89.9
1978	24.4	35.0	13.6	28.7	12.5	0.3	0.6	0.0	17.4	20.8	2.9	22.0	178.3
1979	43.9	14.4	10.0	8.9	44.3	10.2	1.9	0.0	4.4	26.4	33.1	29.2	226.8
1980	22.6	10.0	19.1	15.8	24.4	16.1	3.7	4.8	5.0	2.0	19.3	19.7	162.5
1981	44.2	28.4	24.8	14.2	17.8	1.9	6.3	4.6	0.3	11.6	23.7	65.1	242.9
1982	17.4	4.5	9.8	31.8	7.4	5.2	5.8	6.8	0.1	5.8	1.8	10.4	106.6
1983	11.0	15.4	7.5	14.5	12.8	16.6	14.3	1.1	5.2	4.0	43.6	22.4	168.5
1984	17.2	10.6	24.8	36.9	5.6	1.4	17.3	8.4	0.1	0.1	9.7	3.1	135.2
1985	30.4	19.1	12.4	9.6	19.3	1.9	0.0	0.1	0.0	17.6	18.2	12.2	140.8
1986	27.9	24.7	3.9	6.1	9.6	12.2	1.6	2.0	9.1	1.8	3.8	24.0	126.6
1987	51.2	7.4	21.3	18.6	17.5	14.0	10.1	7.8	0.8	6.3	8.9	34.5	198.5
1988	5.9	14.8	36.7	28.5	9.5	20.3	3.3	0.2	0.5	20.9	36.6	18.7	195.9
1989	1.1	1.8	2.5	0.8	5.4	1.5	4.7	0.4	0.0	10.9	14.7	10.0	53.8
1990	5.8	4.4	6.2	26.3	12.9	11.9	11.5	2.8	11.2	8.0	3.9	16.8	121.6
1991	10.1	15.3	2.0	22.1	22.0	9.2	11.5	10.1	7.4	23.1	9.8	33.3	175.8
1992	0.7	1.3	13.2	12.6	0.3	6.9	6.5	0.2	0.0	10.3	6.2	9.7	67.9
Mean	20.2	16.3	17.7	17.5	16.8	12.3	5.4	3.0	5.6	10.1	12.8	23.4	161.0

Table 18.5 Monthly Runoff Discharge in '000cum for Ozdenk Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	87.8	146.2	117.8	63.0	299.5	284.9	50.1	12.9	136.2	62.5	90.6	207.3	1558
1958	322.6	64.1	349.0	144.5	87.3	88.9	25.3	11.3	106.6	59.1	14.2	150.1	1443
1959	281.6	63.9	29.0	63.6	92.2	131.6	65.1	26.4	4.3	40.7	77.1	130.5	1026
1960	259.1	165.8	374.1	126.7	171.4	236.9	33.2	16.7	44.3	48.3	38.0	307.7	1643
1961	117.5	175.1	40.5	74.5	66.8	119.0	10.2	10.9	65.5	105.2	28.9	121.2	936
1962	105.2	232.3	280.1	93.4	119.3	76.1	0.0	0.0	128.2	68.3	74.9	515.5	1693
1963	515.8	570.5	230.7	246.9	566.6	159.1	95.3	1.2	102.4	198.4	92.1	355.5	3135
1964	20.7	166.4	199.7	52.8	69.6	207.3	20.3	12.4	83.4	0.0	94.5	173.0	1140
1965	149.8	361.8	187.8	306.2	254.2	36.4	33.2	69.9	0.0	33.8	275.0	344.6	2053
1966	423.6	39.5	226.1	222.7	156.6	75.9	26.0	20.9	13.7	50.1	93.0	324.3	1672
1967	83.9	88.8	83.0	146.7	98.7	19.4	25.0	6.0	24.3	24.5	59.8	145.4	805
1968	318.5	162.9	508.8	159.8	86.8	125.2	8.0	95.8	161.5	158.1	242.1	371.1	2398
1969	239.3	260.0	186.0	139.4	240.7	88.7	20.8	0.0	6.7	48.9	106.6	407.1	1744
1970	155.5	252.0	135.7	45.4	23.1	138.8	11.3	0.0	19.6	61.8	59.2	171.7	1074
1971	111.8	113.5	263.2	156.6	264.3	131.3	14.6	49.5	65.7	63.7	170.9	147.6	1553
1972	38.8	41.3	57.8	96.1	17.6	172.3	51.1	36.3	46.5	145.8	32.9	6.2	745
1973	44.2	92.9	55.0	97.2	89.2	39.9	56.9	21.0	24.2	65.0	48.9	101.6	736
1974	48.4	145.6	189.5	169.3	202.2	128.2	8.3	55.9	46.9	62.3	51.0	153.1	1261
1975	191.5	103.9	197.5	183.6	387.6	212.6	16.2	22.5	3.4	15.7	134.6	185.5	1655
1976	110.6	51.3	46.3	130.3	110.8	64.4	26.4	12.1	19.9	93.7	50.1	131.1	847
1977	118.7	40.5	53.8	124.6	50.3	31.0	39.6	11.5	84.6	74.2	56.7	88.8	774
1978	210.5	301.8	117.4	247.1	107.3	2.5	4.9	0.0	149.9	178.9	25.4	189.6	1536
1979	378.3	124.1	86.5	76.5	361.7	87.4	16.5	0.0	38.3	227.4	285.3	251.1	1953
1980	194.7	85.8	164.6	135.8	210.0	138.4	32.1	41.0	43.3	17.6	166.4	169.5	1399
1981	380.3	244.8	213.5	121.9	153.5	16.4	53.9	40.0	2.9	100.0	204.2	560.9	2092
1982	149.6	38.5	64.4	273.6	63.6	44.8	49.6	58.3	0.6	50.2	15.4	89.7	918
1983	95.0	132.8	64.8	125.2	110.1	142.9	123.3	9.8	44.7	34.1	375.8	192.9	1451
1984	148.4	91.4	213.9	317.5	48.5	12.4	148.8	72.3	0.7	0.5	83.5	26.8	1165
1985	262.2	164.1	106.8	82.9	166.2	16.5	0.0	1.2	0.0	151.2	156.9	104.8	1213
1986	240.3	212.9	33.4	52.9	82.3	104.8	13.7	16.8	78.3	15.7	32.3	206.4	1090
1987	440.8	63.7	183.3	160.2	150.3	120.5	86.9	67.5	7.2	54.2	77.0	297.5	1709
1988	50.6	127.7	316.1	245.3	81.7	174.6	28.8	2.0	4.0	180.0	314.9	161.3	1687
1989	9.3	15.5	21.5	6.8	46.9	12.6	40.5	3.7	0.0	93.7	126.6	86.0	463
1990	50.0	38.1	53.3	226.2	110.7	102.1	99.3	23.9	96.9	68.8	34.0	144.4	1048
1991	87.0	131.7	17.3	189.9	189.4	79.1	99.2	86.7	63.7	198.9	84.5	286.7	1514
1992	6.4	11.3	113.3	108.4	2.4	59.4	56.0	1.5	0.0	88.5	53.7	83.6	565
Mean	179.1	144.0	155.6	144.9	149.4	102.3	42.0	25.6	47.7	81.7	109.1	205.3	1366

Table 18.6 Ozdenk Dam Operation (Mihaliccik Sation, Dam Volume=Maximum, Irrigation Area=170ha)

5,000

Year	Month	W. R. mm	W. R. Kcum 170	Runoff, Kcum	Dam, Kcum Actual	Dam, Kcum	Loss Kcum	Dam, Kcum 0	Spill Kcum	Spill Total	Remarks
1957	Jan		0.0	87.8	88	88	1	87			
	Feb		0.0	146.2	233	233	2	231			
	Mar		0.0	117.8	349	349	3	346			
	Apr	41.6	70.7	63.0	339	339	3	336			
	May	60.8	103.4	299.5	532	532	4	527			
	Jun	134.5	228.6	284.9	584	584	5	579			
	Jul	180.2	306.4	50.1	323	323	3	320			
	Aug	138.9	236.1	12.9	97	97	1	96			
	Sep	17.7	30.1	135.2	201	201	2	199			
	Oct	8.4	14.3	62.5	247	247	2	245			
	Nov		0.0	90.6	336	336	3	333			
	Dec		0.0	207.3	540	540	5	536			0
1958	Jan		0.0	322.6	858	858	7	851			
	Feb		0.0	84.1	935	935	8	928			
	Mar		0.0	349.0	1277	1277	11	1266			
	Apr	14.6	24.9	144.5	1386	1386	12	1374			
	May	115.0	195.6	87.3	1266	1266	11	1255			
	Jun	185.1	314.7	88.9	1029	1029	9	1021			
	Jul	188.3	320.2	25.3	726	726	6	720			
	Aug	139.3	236.8	11.3	494	494	4	490			
	Sep	24.9	42.3	106.6	555	555	5	550			
	Oct	8.7	14.7	59.1	594	594	5	589			
	Nov	3.3	5.7	14.2	598	598	5	593			
	Dec		0.0	150.1	743	743	6	737			0
1959	Jan		0.0	281.6	1018	1018	8	1010			
	Feb		0.0	63.9	1074	1074	9	1065			
	Mar	13.2	22.5	29.0	1071	1071	9	1062			
	Apr	35.8	60.8	63.6	1065	1065	9	1056			
	May	107.0	181.9	92.2	967	967	8	959			
	Jun	163.1	277.3	131.6	813	813	7	806			
	Jul	161.6	274.6	85.1	617	617	5	612			
	Aug	131.7	223.8	26.4	414	414	3	411			
	Sep	60.0	102.0	4.3	313	313	3	310			
	Oct	12.0	20.4	40.7	331	331	3	328			
	Nov		0.0	77.1	405	405	3	402			
	Dec		0.0	130.5	532	532	4	528			0
1960	Jan		0.0	259.1	787	787	7	780			
	Feb		0.0	185.8	966	966	8	958			
	Mar		0.0	374.1	1332	1332	11	1321			
	Apr	25.0	42.4	126.7	1405	1405	12	1394			
	May	95.6	162.5	171.4	1402	1402	12	1391			
	Jun	150.6	256.0	235.9	1371	1371	11	1359			
	Jul	187.0	317.9	33.2	1075	1075	9	1066			
	Aug	137.4	233.6	18.7	851	851	7	844			
	Sep	47.7	81.2	44.3	807	807	7	800			
	Oct	14.6	24.8	48.3	824	824	7	817			
	Nov		0.0	38.0	855	855	7	848			
	Dec		0.0	307.7	1155	1155	10	1146			0
1961	Jan		0.0	117.5	1263	1263	11	1253			
	Feb		0.0	175.1	1428	1428	12	1416			
	Mar	7.2	12.3	40.5	1444	1444	12	1432			
	Apr	29.7	50.5	74.5	1456	1456	12	1444			
	May	115.5	196.3	66.8	1314	1314	11	1303			
	Jun	165.2	280.8	119.0	1142	1142	10	1132			
	Jul	192.8	327.8	10.2	815	815	7	808			
	Aug	138.3	235.1	10.9	583	583	5	579			
	Sep	32.1	54.5	65.5	590	590	5	585			
	Oct		0.0	105.2	690	690	6	684			
	Nov		0.0	28.9	713	713	6	707			
	Dec		0.0	121.2	828	828	7	821			0
1962	Jan		0.0	105.2	927	927	8	919			
	Feb		0.0	232.3	1151	1151	10	1142			
	Mar		0.0	280.1	1422	1422	12	1410			
	Apr	33.1	56.3	93.4	1447	1447	12	1435			
	May	108.0	183.6	119.3	1371	1371	11	1359			
	Jun	191.5	325.6	76.1	1110	1110	9	1100			
	Jul	197.8	336.2	0.0	764	764	6	758			
	Aug	143.6	244.1	0.0	514	514	4	509			
	Sep	21.5	36.5	128.2	601	601	5	596			
	Oct	7.5	12.7	68.3	652	652	5	646			
	Nov		0.0	74.9	721	721	6	715			



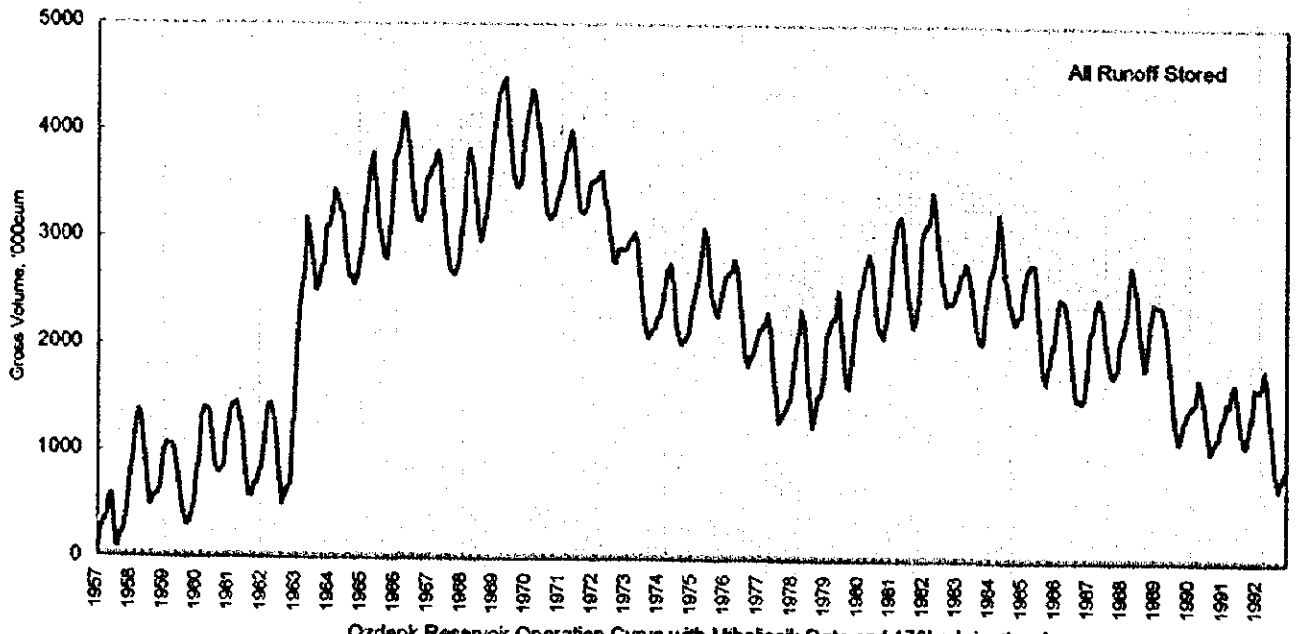
	Dec			0.0	515.5	1231	1231	10	1221		0
1963	Jan			0.0	515.8	1736	1736	14	1722		
	Feb			0.0	570.5	2292	2292	19	2273		
	Mar			0.0	230.7	2504	2504	21	2483		
	Apr	8.6		14.6	246.9	2715	2715	23	2693		
	May	43.5		73.9	566.6	3185	3185	27	3159		
	Jun	179.4		305.0	159.1	3013	3013	25	2988		
	Jul	174.7		297.1	95.3	2786	2786	23	2763		
	Aug	143.3		243.5	1.2	2521	2521	21	2500		
	Sep	37.4		63.5	102.4	2538	2538	21	2517		
	Oct			0.0	198.4	2716	2716	23	2693		
	Nov			0.0	92.1	2785	2785	23	2762		
	Dec			0.0	355.5	3118	3118	26	3092		0
1964	Jan			0.0	20.7	3112	3112	26	3086		
	Feb			0.0	186.4	3273	3273	27	3245		
	Mar			0.0	199.7	3445	3445	29	3416		
	Apr	41.6		70.7	52.8	3399	3399	28	3370		
	May	110.1		187.1	89.6	3273	3273	27	3245		
	Jun	142.7		242.7	207.3	3210	3210	27	3183		
	Jul	189.1		321.5	20.3	2882	2882	24	2858		
	Aug	138.2		235.0	12.4	2636	2636	22	2614		
	Sep	28.4		48.3	83.4	2649	2649	22	2627		
	Oct	30.1		51.1	0.0	2576	2576	21	2554		
	Nov			0.0	94.5	2649	2649	22	2626		
	Dec			0.0	173.0	2799	2799	23	2776		0
1965	Jan			0.0	149.8	2926	2926	24	2902		
	Feb			0.0	361.8	3263	3263	27	3236		
	Mar			0.0	187.8	3424	3424	29	3395		
	Apr			0.0	306.2	3702	3702	31	3671		
	May	79.0		134.3	254.2	3791	3791	32	3759		
	Jun	205.4		349.2	36.4	3446	3446	29	3418		
	Jul	187.6		318.9	33.2	3132	3132	26	3106		
	Aug	122.6		208.5	69.9	2967	2967	25	2943		
	Sep	62.0		105.4	0.0	2837	2837	24	2813		
	Oct	19.7		33.5	33.8	2814	2814	23	2790		
	Nov			0.0	275.0	3065	3065	26	3040		
	Dec			0.0	344.6	3384	3384	28	3356		0
1966	Jan			0.0	423.6	3780	3780	31	3748		
	Feb			0.0	39.5	3788	3788	32	3756		
	Mar			0.0	226.1	3982	3982	33	3949		
	Apr			0.0	222.7	4172	4172	35	4137		
	May	97.2		165.3	156.6	4128	4128	34	4094		
	Jun	191.5		325.5	75.9	3844	3844	32	3812		
	Jul	188.8		321.0	26.0	3517	3517	29	3488		
	Aug	136.4		231.8	20.9	3277	3277	27	3250		
	Sep	57.3		97.3	13.7	3166	3166	26	3140		
	Oct	13.2		22.4	50.1	3168	3168	26	3141		
	Nov			0.0	93.0	3234	3234	27	3207		
	Dec			0.0	324.3	3531	3531	29	3502		0
1967	Jan			0.0	83.9	3586	3586	30	3556		
	Feb			0.0	88.8	3645	3645	30	3614		
	Mar			0.0	83.0	3697	3697	31	3667		
	Apr			0.0	146.7	3813	3813	32	3782		
	May	98.7		167.8	98.7	3712	3712	31	3681		
	Jun	206.4		350.8	19.4	3350	3350	28	3322		
	Jul	184.7		314.0	25.0	3033	3033	25	3008		
	Aug	140.4		238.7	6.0	2775	2775	23	2752		
	Sep	49.4		83.9	24.3	2692	2692	22	2670		
	Oct	17.3		29.4	24.5	2665	2665	22	2643		
	Nov			0.0	59.8	2703	2703	23	2680		
	Dec			0.0	145.4	2826	2826	24	2802		0
1968	Jan			0.0	318.5	3121	3121	26	3095		
	Feb			0.0	162.9	3257	3257	27	3230		
	Mar			0.0	508.8	3739	3739	31	3708		
	Apr	21.5		36.5	159.8	3831	3831	32	3799		
	May	122.1		207.6	86.8	3678	3678	31	3648		
	Jun	183.0		311.0	125.2	3462	3462	29	3433		
	Jul	195.5		332.3	8.0	3109	3109	26	3083		
	Aug	117.4		199.6	95.8	2979	2979	25	2954		
	Sep	19.7		33.4	161.5	3082	3082	26	3057		
	Oct			0.0	158.1	3215	3215	27	3188		
	Nov			0.0	242.1	3430	3430	29	3401		
	Dec			0.0	371.1	3772	3772	31	3741		0
1969	Jan			0.0	239.3	3980	3980	33	3947		

	Feb		0.0	260.0	4207	4207	35	4172		
	Mar		0.0	186.0	4358	4358	36	4322		
	Apr	20.4	34.6	139.4	4427	4427	37	4390		
	May	77.3	131.3	240.7	4499	4499	37	4462		
	Jun	188.1	319.7	88.7	4230	4230	35	4195		
	Jul	190.8	324.3	20.8	3892	3892	32	3859		
	Aug	143.6	244.1	0.0	3615	3615	30	3585		
	Sep	59.7	101.5	6.7	3490	3490	29	3461		
	Oct	13.9	23.7	48.9	3486	3486	29	3457		
	Nov		0.0	106.6	3564	3564	30	3534		
	Dec		0.0	407.1	3941	3941	33	3909		0
1970	Jan		0.0	155.5	4064	4064	34	4030		
	Feb		0.0	252.0	4282	4282	36	4246		
	Mar		0.0	135.7	4382	4382	37	4346		
	Apr	43.9	74.6	45.4	4316	4316	36	4280		
	May	135.8	230.8	23.1	4073	4073	34	4039		
	Jun	161.9	275.3	138.8	3902	3902	33	3870		
	Jul	192.7	327.6	11.3	3554	3554	30	3524		
	Aug	143.6	244.1	0.0	3280	3280	27	3253		
	Sep	53.4	90.7	19.6	3181	3181	27	3155		
	Oct	3.8	6.5	61.6	3210	3210	27	3183		
	Nov		0.0	59.2	3243	3243	27	3216		
	Dec		0.0	171.7	3387	3387	28	3359		0
1971	Jan		0.0	111.8	3471	3471	29	3442		
	Feb		0.0	113.5	3556	3556	30	3526		
	Mar		0.0	263.2	3789	3789	32	3758		
	Apr	12.9	22.0	156.8	3892	3892	32	3860		
	May	68.3	116.0	264.3	4008	4008	33	3975		
	Jun	173.3	294.6	131.3	3811	3811	32	3780		
	Jul	192.5	327.3	14.6	3467	3467	29	3438		
	Aug	126.2	214.6	49.5	3273	3273	27	3246		
	Sep	39.3	66.7	65.7	3245	3245	27	3218		
	Oct	7.9	13.5	63.7	3268	3268	27	3241		
	Nov		0.0	170.9	3411	3411	28	3383		
	Dec		0.0	147.6	3531	3531	29	3501		0
1972	Jan		0.0	38.8	3540	3540	29	3510		
	Feb		0.0	41.3	3552	3552	30	3522		
	Mar		0.0	57.8	3580	3580	30	3550		
	Apr	14.4	24.5	98.1	3624	3624	30	3584		
	May	136.2	231.8	17.6	3380	3380	28	3351		
	Jun	138.5	235.4	172.3	3288	3288	27	3261		
	Jul	170.7	290.2	51.1	3022	3022	25	2997		
	Aug	124.0	210.8	36.3	2822	2822	24	2799		
	Sep	37.3	63.4	46.5	2782	2782	23	2758		
	Oct		0.0	145.8	2904	2904	24	2880		
	Nov		0.0	32.9	2913	2913	24	2889		
	Dec	3.0	5.1	6.2	2890	2890	24	2866		0
1973	Jan		0.0	44.2	2910	2910	24	2886		
	Feb		0.0	92.9	2979	2979	25	2954		
	Mar		0.0	55.0	3009	3009	25	2984		
	Apr	14.5	24.6	97.2	3056	3056	25	3031		
	May	100.5	170.9	89.2	2949	2949	25	2924		
	Jun	195.0	331.4	39.9	2633	2633	22	2611		
	Jul	167.6	285.0	56.9	2383	2383	20	2363		
	Aug	131.9	224.3	21.0	2160	2160	18	2142		
	Sep	48.7	82.8	24.2	2083	2083	17	2066		
	Oct		0.0	65.0	2131	2131	18	2113		
	Nov		0.0	48.9	2162	2162	18	2144		
	Dec		0.0	101.6	2246	2246	19	2227		0
1974	Jan		0.0	46.4	2275	2275	19	2256		
	Feb		0.0	145.6	2402	2402	20	2382		
	Mar		0.0	189.5	2571	2571	21	2550		
	Apr	3.7	6.3	169.3	2713	2713	23	2690		
	May	76.9	130.7	202.2	2762	2762	23	2739		
	Jun	169.6	288.2	128.2	2579	2579	21	2557		
	Jul	194.4	330.5	8.3	2235	2235	19	2217		
	Aug	121.7	206.9	55.9	2066	2066	17	2048		
	Sep	43.5	74.0	46.9	2021	2021	17	2004		
	Oct	5.9	10.0	62.3	2057	2057	17	2040		
	Nov		0.0	51.0	2091	2091	17	2073		
	Dec		0.0	153.1	2226	2226	19	2208		0
1975	Jan		0.0	191.5	2399	2399	20	2379		
	Feb		0.0	103.9	2483	2483	21	2463		
	Mar		0.0	197.5	2660	2660	22	2638		

	Apr	7.2	12.2	183.8	2810	2810	23	2786		
	May	46.8	79.6	387.6	3094	3094	26	3068		
	Jun	153.0	260.1	212.6	3021	3021	25	2996		
	Jul	192.1	328.6	16.2	2685	2685	22	2663		
	Aug	135.8	230.8	22.5	2455	2455	20	2434		
	Sep	60.8	103.4	3.4	2334	2334	19	2315		
	Oct	24.6	41.9	15.7	2288	2288	19	2269		
	Nov		0.0	134.6	2404	2404	20	2384		
	Dec		0.0	185.5	2569	2569	21	2548		0
1976	Jan		0.0	110.6	2659	2659	22	2637		
	Feb		0.0	51.3	2688	2688	22	2665		
	Mar	3.4	5.8	46.3	2706	2706	23	2683		
	Apr	5.0	8.4	130.3	2805	2805	23	2782		
	May	95.1	161.6	110.8	2731	2731	23	2708		
	Jun	185.4	315.1	64.4	2457	2457	20	2437		
	Jul	184.4	313.5	26.4	2150	2150	18	2132		
	Aug	137.3	233.5	12.1	1911	1911	16	1895		
	Sep	51.9	88.3	19.9	1826	1826	15	1811		
	Oct		0.0	93.7	1905	1905	16	1889		
	Nov		0.0	50.1	1939	1939	16	1923		
	Dec		0.0	131.1	2054	2054	17	2037		0
1977	Jan		0.0	118.7	2155	2155	18	2137		
	Feb		0.0	40.5	2178	2178	18	2160		
	Mar		0.0	53.8	2214	2214	18	2195		
	Apr	4.5	7.6	124.6	2312	2312	19	2293		
	May	119.9	203.8	50.3	2139	2139	18	2122		
	Jun	200.1	340.2	31.0	1812	1812	15	1797		
	Jul	177.0	300.9	39.6	1536	1536	13	1523		
	Aug	137.3	233.5	11.5	1301	1301	11	1290		
	Sep	19.9	33.9	84.6	1341	1341	11	1330		
	Oct		0.0	74.2	1404	1404	12	1392		
	Nov		0.0	56.7	1449	1449	12	1437		
	Dec		0.0	88.8	1526	1526	13	1513		0
1978	Jan		0.0	210.5	1724	1724	14	1709		
	Feb		0.0	301.8	2011	2011	17	1994		
	Mar		0.0	117.4	2112	2112	18	2094		
	Apr		0.0	247.1	2341	2341	20	2322		
	May	109.7	186.5	107.3	2243	2243	19	2224		
	Jun	215.6	366.6	2.5	1860	1860	15	1844		
	Jul	196.0	333.2	4.9	1516	1516	13	1503		
	Aug	143.6	244.1	0.0	1259	1259	10	1249		
	Sep	13.1	22.3	149.9	1376	1376	11	1365		
	Oct		0.0	178.9	1544	1544	13	1531		
	Nov		0.0	25.4	1556	1556	13	1543		
	Dec		0.0	189.8	1733	1733	14	1719		0
1979	Jan		0.0	378.3	2097	2097	17	2080		
	Feb		0.0	124.1	2204	2204	18	2185		
	Mar	0.0	0.0	86.5	2272	2272	19	2253		
	Apr	40.0	68.1	76.5	2261	2261	19	2242		
	May	53.4	90.7	381.7	2533	2533	21	2512		
	Jun	190.0	323.0	87.4	2277	2277	19	2258		
	Jul	192.5	327.3	16.5	1947	1947	16	1931		
	Aug	143.6	244.1	0.0	1687	1687	14	1673		
	Sep	50.0	85.0	38.3	1626	1626	14	1612		
	Oct		0.0	227.4	1840	1840	15	1824		
	Nov		0.0	285.3	2110	2110	18	2092		
	Dec		0.0	251.1	2343	2343	20	2324		0
1980	Jan		0.0	194.7	2518	2518	21	2497		
	Feb		0.0	85.8	2583	2583	22	2562		
	Mar		0.0	164.6	2726	2726	23	2704		
	Apr	16.5	28.1	135.8	2811	2811	23	2788		
	May	78.1	132.7	210.0	2865	2865	24	2841		
	Jun	168.8	287.0	138.4	2693	2693	22	2670		
	Jul	185.7	315.8	32.1	2387	2387	20	2367		
	Aug	128.3	218.0	41.0	2190	2190	18	2171		
	Sep	45.9	78.0	43.3	2137	2137	18	2119		
	Oct	23.4	39.7	17.8	2097	2097	17	2079		
	Nov		0.0	166.4	2246	2246	19	2227		
	Dec		0.0	189.5	2397	2397	20	2377		0
1981	Jan		0.0	380.3	2757	2757	23	2734		
	Feb		0.0	244.8	2979	2979	25	2954		
	Mar		0.0	213.5	3167	3167	28	3141		
	Apr	28.5	48.4	121.9	3215	3215	27	3188		
	May	102.9	174.9	153.5	3166	3166	26	3140		

	Jun	211.5	359.5	16.4	2797	2797	23	2774			
	Jul	181.6	308.8	53.9	2519	2519	21	2498			
	Aug	131.5	223.5	40.0	2314	2314	19	2295			
	Sep	61.1	103.9	2.9	2194	2194	18	2176			
	Oct	1.0	1.7	100.0	2274	2274	19	2255			
	Nov		0.0	204.2	2459	2459	20	2439			
	Dec		0.0	560.9	3000	3000	25	2975			0
1982	Jan		0.0	149.6	3124	3124	26	3098			
	Feb		0.0	38.5	3137	3137	26	3110			
	Mar		0.0	84.4	3195	3195	27	3168			
	Apr		0.0	273.6	3442	3442	29	3413			
	May	116.5	198.1	63.6	3279	3279	27	3251			
	Jun	195.4	332.2	44.8	2964	2964	25	2939			
	Jul	174.5	296.6	49.6	2692	2692	22	2670			
	Aug	116.4	197.9	58.3	2530	2530	21	2509			
	Sep	61.7	104.9	0.6	2405	2405	20	2385			
	Oct	6.5	11.0	50.2	2424	2424	20	2404			
	Nov	1.2	2.0	15.4	2417	2417	20	2397			
	Dec		0.0	89.7	2487	2487	21	2466			0
1983	Jan		0.0	95.0	2561	2561	21	2540			
	Feb		0.0	132.8	2672	2672	22	2650			
	Mar	3.0	5.0	64.8	2710	2710	23	2687			
	Apr	20.6	35.0	125.2	2777	2777	23	2754			
	May	107.8	183.3	110.1	2681	2681	22	2659			
	Jun	168.4	286.2	142.9	2515	2515	21	2494			
	Jul	155.5	264.4	123.3	2353	2353	20	2334			
	Aug	139.9	237.8	9.8	2106	2106	18	2088			
	Sep	45.7	77.7	44.7	2055	2055	17	2038			
	Oct	17.5	29.7	34.1	2043	2043	17	2026			
	Nov		0.0	375.8	2401	2401	20	2381			
	Dec		0.0	192.9	2574	2574	21	2553			0
1984	Jan		0.0	148.4	2701	2701	23	2679			
	Feb		0.0	91.4	2770	2770	23	2747			
	Mar		0.0	213.9	2961	2961	25	2936			
	Apr		0.0	317.5	3254	3254	27	3227			
	May	126.0	214.2	48.5	3061	3061	26	3035			
	Jun	211.3	359.2	12.4	2689	2689	22	2666			
	Jul	142.1	241.6	148.8	2573	2573	21	2552			
	Aug	114.5	194.6	72.3	2430	2430	20	2409			
	Sep	61.7	104.9	0.7	2305	2305	19	2286			
	Oct	29.9	50.8	0.5	2236	2236	19	2217			
	Nov		0.0	83.5	2301	2301	19	2281			
	Dec		0.0	26.8	2308	2308	19	2289			0
1985	Jan		0.0	262.2	2551	2551	21	2530			
	Feb		0.0	164.1	2694	2694	22	2672			
	Mar		0.0	106.8	2778	2778	23	2755			
	Apr	31.1	52.9	82.9	2785	2785	23	2762			
	May	86.0	146.3	166.2	2782	2782	23	2759			
	Jun	209.7	356.6	16.5	2419	2419	20	2398			
	Jul	197.8	336.2	0.0	2062	2062	17	2045			
	Aug	143.1	243.2	1.2	1803	1803	15	1788			
	Sep	62.0	105.4	0.0	1683	1683	14	1669			
	Oct		0.0	151.2	1820	1820	15	1805			
	Nov		0.0	156.9	1962	1962	16	1945			
	Dec		0.0	104.8	2050	2050	17	2033			0
1986	Jan		0.0	240.3	2273	2273	19	2254			
	Feb		0.0	212.9	2467	2467	21	2447			
	Mar	11.8	20.1	33.4	2460	2460	20	2439			
	Apr	40.9	69.6	52.9	2423	2423	20	2403			
	May	111.9	190.3	82.3	2295	2295	19	2276			
	Jun	174.2	296.2	104.8	2084	2084	17	2067			
	Jul	191.7	326.0	13.7	1755	1755	15	1740			
	Aug	136.2	231.5	16.8	1525	1525	13	1513			
	Sep	29.5	50.2	78.3	1541	1541	13	1528			
	Oct	23.2	39.4	15.7	1504	1504	13	1492			
	Nov		0.0	32.3	1524	1524	13	1511			
	Dec		0.0	206.4	1718	1718	14	1703			0
1987	Jan		0.0	440.8	2144	2144	18	2126			
	Feb		0.0	63.7	2190	2190	18	2172			
	Mar		0.0	183.3	2355	2355	20	2335			
	Apr	14.2	24.2	160.2	2471	2471	21	2451			
	May	99.4	169.0	150.3	2432	2432	20	2412			
	Jun	178.4	303.3	120.5	2229	2229	19	2210			
	Jul	169.6	288.3	86.9	2009	2009	17	1992			

	Aug	121.3	206.3	67.5	1854	1854	15	1838			
	Sep	59.5	101.2	7.2	1744	1744	15	1730			
	Oct	12.1	20.5	54.2	1763	1763	15	1749			
	Nov		0.0	77.0	1826	1826	15	1810			
	Dec		0.0	297.5	2108	2108	18	2090			0
1988	Jan		0.0	50.6	2141	2141	18	2123			
	Feb		0.0	127.7	2251	2251	19	2232			
	Mar		0.0	316.1	2548	2548	21	2527			
	Apr		0.0	245.3	2772	2772	23	2749			
	May	119.2	202.6	81.7	2628	2628	22	2606			
	Jun	163.2	277.5	174.6	2503	2503	21	2482			
	Jul	188.0	319.5	28.8	2192	2192	18	2173			
	Aug	142.9	242.9	2.0	1933	1933	16	1916			
	Sep	60.6	103.0	4.0	1817	1817	15	1802			
	Oct		0.0	180.0	1982	1982	17	1966			
	Nov		0.0	314.9	2281	2281	19	2262			
	Dec		0.0	161.3	2423	2423	20	2403			0
1989	Jan	1.3	2.2	9.3	2410	2410	20	2390			
	Feb	0.0	0.0	15.5	2405	2405	20	2385			
	Mar	10.4	17.7	21.5	2389	2389	20	2369			
	Apr	58.3	99.1	6.8	2277	2277	19	2258			
	May	112.7	191.6	46.9	2113	2113	18	2096			
	Jun	207.1	352.1	12.6	1756	1756	15	1742			
	Jul	168.8	286.9	40.5	1495	1495	12	1483			
	Aug	140.8	239.3	3.7	1247	1247	10	1237			
	Sep	62.0	105.4	0.0	1131	1131	9	1122			
	Oct		0.0	93.7	1215	1215	10	1205			
	Nov		0.0	126.6	1332	1332	11	1321			
	Dec		0.0	86.0	1407	1407	12	1395			0
1990	Jan		0.0	50.0	1445	1445	12	1433			
	Feb		0.0	38.1	1471	1471	12	1459			
	Mar	3.1	5.3	53.3	1507	1507	13	1494			
	Apr		0.0	226.2	1720	1720	14	1706			
	May	100.5	170.9	110.7	1646	1646	14	1632			
	Jun	174.3	296.3	102.1	1438	1438	12	1426			
	Jul	156.6	266.2	99.3	1259	1259	10	1249			
	Aug	132.9	225.9	23.9	1046	1046	9	1038			
	Sep	21.7	36.9	96.9	1098	1098	9	1089			
	Oct	0.6	1.1	68.8	1156	1156	10	1147			
	Nov		0.0	34.0	1181	1181	10	1171			
	Dec		0.0	144.4	1315	1315	11	1304			0
1991	Jan		0.0	87.0	1391	1391	12	1380			
	Feb		0.0	131.7	1511	1511	13	1499			
	Mar	19.9	33.9	17.3	1482	1482	12	1470			
	Apr	3.2	5.4	189.9	1654	1654	14	1641			
	May	85.8	145.9	189.4	1684	1684	14	1670			
	Jun	189.1	321.4	79.1	1428	1428	12	1416			
	Jul	163.8	278.5	99.2	1237	1237	10	1226			
	Aug	113.6	193.1	86.7	1120	1120	9	1110			
	Sep	39.6	67.3	63.7	1107	1107	9	1098			
	Oct		0.0	198.9	1296	1296	11	1286			
	Nov		0.0	84.5	1370	1370	11	1359			
	Dec		0.0	286.7	1645	1645	14	1632			0
1992	Jan	4.1	7.0	6.4	1631	1631	14	1618			
	Feb	4.2	7.2	11.3	1622	1622	14	1608			
	Mar		0.0	113.3	1721	1721	14	1707			
	Apr	2.5	4.3	108.4	1811	1811	15	1796			
	May	144.3	245.4	2.4	1553	1553	13	1540			
	Jun	180.7	307.1	59.4	1292	1292	11	1282			
	Jul	163.8	278.4	56.0	1059	1059	9	1050			
	Aug	142.6	242.4	1.5	810	810	7	803			
	Sep	62.0	105.4	0.0	697	697	6	692			
	Oct		0.0	68.5	780	780	7	774			
	Nov		0.0	53.7	827	827	7	820			
	Dec		0.0	83.6	904	904	8	897			0



Ozdenk Reservoir Operation Curve with Mihalicik Data and 170ha Irrigation Area

Table 18.7 Ozdenk Dam Operation (Mihalıcçik Satlon, Dam Volume=800,000cum, Irrigation Area=140ha)

Year	Month	W. R. mm	W. R. Kcum 140	Runoff, Kcum	Dam, Kcum Actual	Dam, Kcum	Loss Kcum	Dam, Kcum O	Spill Kcum	Spill Total	Remarks
1957	Jan			0.0	87.8	88	88	1	87		
	Feb			0.0	146.2	233	233	2	231		
	Mar			0.0	117.8	349	349	3	346		
	Apr	41.6	58.2	63.0	351	351	3	348			
	May	60.8	85.1	299.5	562	562	5	558			
	Jun	134.5	188.3	284.9	654	654	5	649	43		
	Jul	180.2	252.3	50.1	447	447	4	443			
	Aug	139.9	194.5	12.9	261	261	2	259			
	Sep	17.7	24.8	135.2	370	370	3	367			
	Oct	8.4	11.8	62.5	417	417	3	414			
	Nov			0.0	90.6	504	504	4	500		
	Dec			0.0	207.3	707	707	6	701		43
1958	Jan			0.0	322.6	800	800	7	793	224	
	Feb			0.0	84.1	800	800	7	793	77	
	Mar			0.0	349.0	800	800	7	793	342	
	Apr	14.6	20.5	144.5	800	800	7	793	138		
	May	115.0	161.0	87.3	720	720	6	714	81		
	Jun	185.1	259.2	88.9	543	543	5	539	2		
	Jul	188.3	263.7	25.3	300	300	3	298			
	Aug	139.3	195.0	11.3	114	114	1	113			
	Sep	24.9	34.8	106.6	185	185	2	183			
	Oct	8.7	12.1	59.1	230	230	2	228			
	Nov	3.3	4.7	14.2	238	238	2	236			
	Dec			0.0	150.1	366	366	3	363		665
1959	Jan			0.0	281.6	665	665	6	659		
	Feb			0.0	63.9	723	723	6	717		
	Mar	13.2	18.5	29.0	727	727	6	721			
	Apr	35.8	50.1	63.6	735	735	6	729			
	May	107.0	149.8	92.2	671	671	6	666	21		
	Jun	163.1	228.4	131.6	569	569	5	564			
	Jul	161.6	226.2	85.1	423	423	4	419			
	Aug	131.7	184.3	26.4	262	262	2	259			
	Sep	60.0	84.0	4.3	180	180	1	178			
	Oct	12.0	16.8	40.7	202	202	2	200			
	Nov			0.0	77.1	277	277	2	275		
	Dec			0.0	130.5	406	406	3	402		21
1960	Jan			0.0	259.1	661	661	6	656		
	Feb			0.0	185.8	800	800	7	793	42	
	Mar			0.0	374.1	800	800	7	793	367	
	Apr	25.0	34.9	126.7	800	800	7	793	120		
	May	95.6	133.8	171.4	800	800	7	793	165		
	Jun	150.6	210.8	235.9	800	800	7	793	229		
	Jul	187.0	261.8	33.2	565	565	5	560	27		
	Aug	137.4	192.4	18.7	366	366	3	363			
	Sep	47.7	66.8	44.3	361	361	3	358			
	Oct	14.6	20.4	48.3	385	385	3	382			
	Nov			0.0	38.0	420	420	4	417		
	Dec			0.0	307.7	724	724	6	718		950
1961	Jan			0.0	117.5	800	800	7	793	36	
	Feb			0.0	175.1	800	800	7	793	168	
	Mar	7.2	10.1	40.5	800	800	7	793	34		
	Apr	29.7	41.6	74.5	800	800	7	793	68		
	May	115.5	161.7	66.8	698	698	6	693	60		
	Jun	165.2	231.3	119.0	580	580	5	575	12		
	Jul	192.8	269.9	10.2	316	316	3	313			
	Aug	138.3	193.6	10.9	130	130	1	129			
	Sep	32.1	44.9	65.5	150	150	1	149			
	Oct			0.0	105.2	254	254	2	252		
	Nov			0.0	28.9	281	281	2	278		
	Dec			0.0	121.2	400	400	3	396		378
1962	Jan			0.0	105.2	501	501	4	497		
	Feb			0.0	232.3	729	729	6	723		
	Mar			0.0	280.1	800	800	7	793	203	
	Apr	33.1	46.4	93.4	800	800	7	793	87		
	May	108.0	151.2	119.3	761	761	6	755	113		
	Jun	191.5	268.2	76.1	563	563	5	558	31		
	Jul	197.8	276.9	0.0	281	281	2	279			
	Aug	143.6	201.0	0.0	78	78	1	78			
	Sep	21.5	30.1	128.2	176	176	1	174			
	Oct	7.5	10.5	68.3	232	232	2	230			

	Nov			0.0	74.9	305	305	3	302		
	Dec			0.0	515.5	800	800	7	793	18	452
1963	Jan			0.0	515.8	800	800	7	793		
	Feb			0.0	570.5	800	800	7	793	509	
	Mar			0.0	230.7	800	800	7	793	564	
	Apr	8.6		12.0	246.9	800	800	7	793	224	
	May	43.5		60.8	566.6	800	800	7	793	560	
	Jun	179.4		251.2	159.1	701	701	6	695	152	
	Jul	174.7		244.6	95.3	546	546	5	541		
	Aug	143.3		200.6	1.2	342	342	3	339		
	Sep	37.4		52.3	102.4	389	389	3	386		
	Oct			0.0	198.4	585	585	5	580		
	Nov			0.0	92.1	672	672	6	666		
	Dec			0.0	355.5	800	800	7	793	222	2471
1964	Jan			0.0	20.7	800	800	7	793	14	
	Feb			0.0	186.4	800	800	7	793	180	
	Mar			0.0	199.7	800	800	7	793	193	
	Apr	41.6		58.2	52.8	788	788	7	781	46	
	May	110.1		154.1	89.6	717	717	6	711	71	
	Jun	142.7		199.8	207.3	718	718	6	712	118	
	Jul	189.1		264.8	20.3	468	468	4	464		
	Aug	138.2		193.5	12.4	283	283	2	281		
	Sep	28.4		39.8	83.4	324	324	3	321		
	Oct	30.1		42.1	0.0	279	279	2	277		
	Nov			0.0	94.5	371	371	3	368		
	Dec			0.0	173.0	541	541	5	537		622
1965	Jan			0.0	149.8	687	687	6	681		
	Feb			0.0	361.8	800	800	7	793	243	
	Mar			0.0	187.8	800	800	7	793	181	
	Apr			0.0	306.2	800	800	7	793	300	
	May	79.0		110.6	254.2	800	800	7	793	248	
	Jun	205.4		287.6	36.4	542	542	5	538	30	
	Jul	187.6		262.6	33.2	308	308	3	306		
	Aug	122.6		171.7	69.9	204	204	2	202		
	Sep	62.0		86.8	0.0	115	115	1	114		
	Oct	19.7		27.6	33.8	121	121	1	120		
	Nov			0.0	275.0	395	395	3	391		
	Dec			0.0	344.6	736	736	6	730		1001
1966	Jan			0.0	423.6	800	800	7	793	353	
	Feb			0.0	39.5	800	800	7	793	33	
	Mar			0.0	226.1	800	800	7	793	219	
	Apr			0.0	222.7	800	800	7	793	216	
	May	97.2		136.1	156.6	800	800	7	793	150	
	Jun	191.5		268.0	75.9	601	601	5	596	69	
	Jul	188.8		264.4	26.0	358	358	3	355		
	Aug	136.4		190.9	20.9	185	185	2	183		
	Sep	57.3		80.2	13.7	117	117	1	116		
	Oct	13.2		18.5	50.1	148	148	1	146		
	Nov			0.0	93.0	239	239	2	237		
	Dec			0.0	324.3	562	562	5	557		1041
1967	Jan			0.0	83.9	641	641	5	636		
	Feb			0.0	88.8	724	724	6	718		
	Mar			0.0	83.0	800	800	7	793	1	
	Apr			0.0	146.7	800	800	7	793	140	
	May	98.7		138.2	98.7	754	754	6	748	92	
	Jun	206.4		288.9	19.4	478	478	4	474		
	Jul	184.7		258.6	25.0	240	240	2	238		
	Aug	140.4		196.5	6.0	48	48	0	48		
	Sep	49.4		89.1	24.3	3	3	0	3		
	Oct	17.3		24.2	24.5	3	3	0	3		
	Nov			0.0	59.8	63	63	1	62		
	Dec			0.0	145.4	208	208	2	206		233
1968	Jan			0.0	318.5	524	524	4	520		
	Feb			0.0	162.9	683	683	6	677		
	Mar			0.0	508.8	800	800	7	793	386	
	Apr	21.5		30.1	159.8	800	800	7	793	153	
	May	122.1		170.9	86.6	709	709	6	703	80	
	Jun	183.0		256.2	125.2	572	572	5	568	28	
	Jul	195.5		273.7	8.0	302	302	3	299		
	Aug	117.4		164.4	95.8	231	231	2	229		
	Sep	19.7		27.5	161.5	363	363	3	360		
	Oct			0.0	158.1	518	518	4	514		
	Nov			0.0	242.1	756	756	6	749		

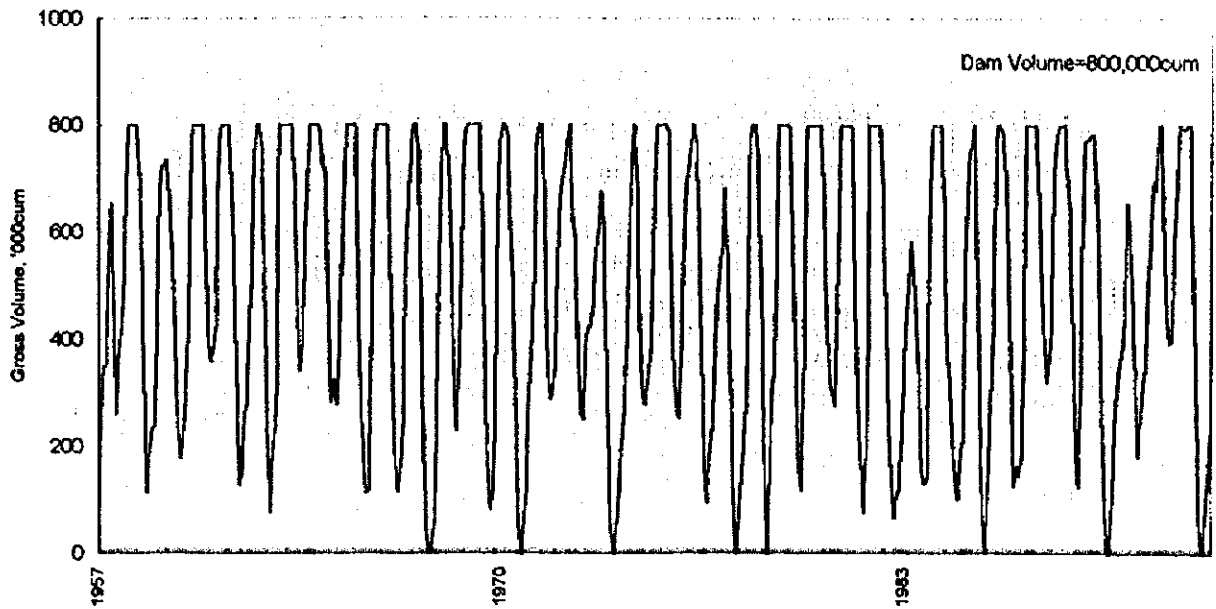


1969	Dec		0.0	371.1	800	800	7	793	320	968	
	Jan		0.0	239.3	800	800	7	793	233		
	Feb		0.0	260.0	800	800	7	793	253		
	Mar		0.0	186.0	800	800	7	793	179		
	Apr	20.4	28.5	139.4	800	800	7	793	133		
	May	77.3	108.2	240.7	800	800	7	793	234		
	Jun	188.1	263.3	88.7	619	619	5	614	82		
	Jul	190.8	267.1	20.8	367	367	3	364			
	Aug	143.6	201.0	0.0	163	163	1	162			
	Sep	59.7	83.6	6.7	85	85	1	84			
	Oct	13.9	19.5	48.9	114	114	1	113			
	Nov		0.0	106.6	219	219	2	218			
	Dec		0.0	407.1	625	625	5	619		1114	
1970	Jan		0.0	155.5	775	775	6	768			
	Feb		0.0	252.0	800	800	7	793	220		
	Mar		0.0	135.7	800	800	7	793	129		
	Apr	43.9	61.4	45.4	777	777	6	771	39		
	May	136.8	190.1	23.1	604	604	5	599			
	Jun	181.9	228.7	138.8	511	511	4	507			
	Jul	192.7	269.8	11.3	248	248	2	246			
	Aug	143.6	201.0	0.0	45	45	0	45			
	Sep	53.4	74.7	19.6	-10	0	0	0			Empty
	Oct	3.8	5.3	61.8	56	56	0	56			
	Nov		0.0	59.2	115	115	1	114			
	Dec		0.0	171.7	286	286	2	284		388	
	1971	Jan		0.0	111.8	385	385	3	382		
Feb			0.0	113.5	506	506	4	501			
Mar			0.0	263.2	765	765	6	758			
Apr		12.9	18.1	156.6	800	800	7	793	115		
May		68.3	95.6	264.3	800	800	7	793	258		
Jun		173.3	242.6	131.3	682	682	6	676	125		
Jul		192.5	269.5	14.6	421	421	4	418			
Aug		126.2	176.7	49.5	291	291	2	288			
Sep		39.3	55.0	65.7	299	299	2	296			
Oct		7.9	11.1	63.7	349	349	3	346			
Nov			0.0	170.9	517	517	4	513			
Dec			0.0	147.6	660	660	6	655		497	
1972		Jan		0.0	38.8	694	694	6	688		
	Feb		0.0	41.3	729	729	6	723			
	Mar		0.0	57.8	781	781	7	774			
	Apr	14.4	20.2	98.1	800	800	7	793	72		
	May	136.2	190.7	17.6	620	620	5	615	11		
	Jun	138.5	193.9	172.3	583	583	5	580			
	Jul	170.7	239.0	51.1	401	401	3	397			
	Aug	124.0	173.6	36.3	280	280	2	258			
	Sep	37.3	52.2	46.5	252	252	2	250			
	Oct		0.0	145.8	396	396	3	392			
	Nov		0.0	32.9	425	425	4	422			
	Dec	3.0	4.2	6.2	424	424	4	420		83	
	1973	Jan		0.0	44.2	464	464	4	461		
Feb			0.0	92.9	554	554	5	549			
Mar			0.0	55.0	604	604	5	599			
Apr		14.5	20.3	97.2	676	676	6	670			
May		100.5	140.8	89.2	619	619	5	613			
Jun		195.0	273.0	39.9	380	380	3	377			
Jul		167.6	234.7	56.9	200	200	2	198			
Aug		131.9	184.7	21.0	34	34	0	34			
Sep		48.7	68.2	24.2	-10	0	0	0			Empty
Oct			0.0	65.0	65	65	1	64			
Nov			0.0	48.9	113	113	1	112			
Dec			0.0	101.6	214	214	2	212		0	
1974		Jan		0.0	48.4	261	261	2	259		
	Feb		0.0	145.6	404	404	3	401			
	Mar		0.0	189.5	590	590	5	585			
	Apr	3.7	5.2	189.3	749	749	6	743			
	May	76.9	107.6	202.2	800	800	7	793	145		
	Jun	189.6	237.4	128.2	684	684	6	678	122		
	Jul	194.4	272.1	8.3	415	415	3	411			
	Aug	121.7	170.4	55.9	297	297	2	294			
	Sep	43.5	61.0	46.9	280	280	2	278			
	Oct	5.9	8.2	62.3	332	332	3	329			
	Nov		0.0	51.0	380	380	3	377			
	Dec		0.0	153.1	530	530	4	526		267	

1975	Jan		0.0	191.5	717	717	6	711		
	Feb		0.0	103.9	800	800	7	793	15	
	Mar		0.0	197.5	800	800	7	793	191	
	Apr	7.2	10.0	183.8	800	800	7	793	177	
	May	46.8	65.6	387.6	800	800	7	793	381	
	Jun	153.0	214.2	212.6	792	792	7	785	206	
	Jul	192.1	269.0	16.2	532	532	4	528	1	
	Aug	136.8	190.1	22.5	360	360	3	357		
	Sep	60.8	85.1	3.4	276	276	2	273		
	Oct	24.6	34.5	15.7	254	254	2	252		
	Nov		0.0	134.6	367	367	3	384		
	Dec		0.0	186.5	569	569	5	565		971
1976	Jan		0.0	110.6	675	675	6	670		
	Feb		0.0	51.3	721	721	6	715		
	Mar	3.4	4.8	46.3	756	756	6	750		
	Apr	5.0	7.0	130.3	800	800	7	793	80	
	May	95.1	133.1	110.8	771	771	6	765	104	
	Jun	185.4	259.5	64.4	569	569	5	565	29	
	Jul	184.4	258.2	26.4	333	333	3	330		
	Aug	137.3	192.3	12.1	150	150	1	149		
	Sep	51.9	72.7	19.9	96	96	1	95		
	Oct		0.0	93.7	189	189	2	187		
	Nov		0.0	50.1	237	237	2	235		
	Dec		0.0	131.1	366	366	3	363		213
1977	Jan		0.0	118.7	482	482	4	478		
	Feb		0.0	40.5	519	519	4	514		
	Mar		0.0	53.8	568	568	5	563		
	Apr	4.5	6.2	124.6	682	682	6	676		
	May	119.9	167.8	50.3	558	558	5	554		
	Jun	200.1	280.2	31.0	305	305	3	302		
	Jul	177.0	247.8	39.6	94	94	1	93		
	Aug	137.3	192.3	11.5	-88	0	0	0		Empty
	Sep	19.9	27.9	84.6	57	57	0	56		
	Oct		0.0	74.2	130	130	1	129		
	Nov		0.0	56.7	186	186	2	185		
	Dec		0.0	88.8	273	273	2	271		0
1978	Jan		0.0	210.5	482	482	4	478		
	Feb		0.0	301.8	779	779	6	773		
	Mar		0.0	117.4	800	800	7	793	90	
	Apr		0.0	247.1	800	800	7	793	240	
	May	108.7	153.6	107.3	747	747	6	741	101	
	Jun	215.6	301.9	2.5	441	441	4	438		
	Jul	196.0	274.4	4.9	168	168	1	167		
	Aug	143.6	201.0	0.0	-34	0	0	0		Empty
	Sep	13.1	18.4	149.9	132	132	1	130		
	Oct		0.0	178.9	309	309	3	307		
	Nov		0.0	25.4	332	332	3	329		
	Dec		0.0	189.8	519	519	4	515		431
1979	Jan		0.0	378.3	800	800	7	793	93	
	Feb		0.0	124.1	800	800	7	793	117	
	Mar	0.0	0.0	86.5	800	800	7	793	80	
	Apr	40.0	56.1	76.5	800	800	7	793	70	
	May	53.4	74.7	381.7	800	800	7	793	375	
	Jun	190.0	266.0	87.4	615	615	5	610	81	
	Jul	192.5	269.5	16.5	357	357	3	354		
	Aug	143.6	201.0	0.0	153	153	1	151		
	Sep	50.0	70.0	38.3	120	120	1	119		
	Oct		0.0	227.4	346	346	3	343		
	Nov		0.0	285.3	628	628	5	623		
	Dec		0.0	251.1	800	800	7	793	74	890
1980	Jan		0.0	194.7	800	800	7	793	186	
	Feb		0.0	85.8	800	800	7	793	79	
	Mar		0.0	184.6	800	800	7	793	158	
	Apr	16.5	23.1	135.8	800	800	7	793	129	
	May	78.1	109.3	210.0	800	800	7	793	203	
	Jun	168.8	236.4	138.4	695	695	6	690	132	
	Jul	185.7	259.9	32.1	462	462	4	458		
	Aug	128.3	179.6	41.0	319	319	3	317		
	Sep	45.9	64.2	43.3	296	296	2	293		
	Oct	23.4	32.7	17.6	278	278	2	276		
	Nov		0.0	166.4	442	442	4	439		
	Dec		0.0	169.5	608	608	5	603		889
1981	Jan		0.0	380.3	800	800	7	793	183	

	Feb		0.0	244.8	800	800	7	793	238		
	Mar		0.0	213.5	800	800	7	793	207		
	Apr	28.5	39.9	121.9	800	800	7	793	115		
	May	102.9	144.0	153.5	800	800	7	793	147		
	Jun	211.5	296.1	16.4	514	514	4	509	10		
	Jul	181.6	254.3	53.9	309	309	3	306			
	Aug	131.5	184.1	40.0	162	162	1	161			
	Sep	61.1	85.6	2.9	78	78	1	78			
	Oct	1.0	1.4	100.0	176	176	1	175			
	Nov		0.0	204.2	379	379	3	376			
	Dec		0.0	560.9	800	800	7	793	137	1037	
1982	Jan		0.0	149.6	800	800	7	793	143		
	Feb		0.0	38.5	800	800	7	793	32		
	Mar		0.0	84.4	800	800	7	793	78		
	Apr		0.0	273.6	800	800	7	793	267		
	May	116.5	163.1	63.6	694	694	6	688	57		
	Jun	195.4	273.6	44.8	459	459	4	455			
	Jul	174.5	244.3	49.6	261	261	2	259			
	Aug	116.4	163.0	58.3	154	154	1	153			
	Sep	61.7	86.4	0.6	67	67	1	66			
	Oct	6.5	9.1	50.2	107	107	1	108			
	Nov	1.2	1.7	15.4	120	120	1	119			
	Dec		0.0	89.7	209	209	2	207		576	
1983	Jan		0.0	95.0	302	302	3	300			
	Feb		0.0	132.8	432	432	4	429			
	Mar	3.0	4.1	64.8	490	490	4	485			
	Apr	20.6	28.8	125.2	582	582	5	577			
	May	107.8	150.9	110.1	536	536	4	532			
	Jun	168.4	235.7	142.9	439	439	4	435			
	Jul	155.5	217.7	123.3	341	341	3	338			
	Aug	139.9	195.8	9.8	152	152	1	151			
	Sep	45.7	64.0	44.7	131	131	1	130			
	Oct	17.5	24.5	34.1	140	140	1	139			
	Nov		0.0	375.8	514	514	4	510			
	Dec		0.0	192.9	703	703	6	697		0	
1984	Jan		0.0	148.4	800	800	7	793	46		
	Feb		0.0	91.4	800	800	7	793	85		
	Mar		0.0	213.9	800	800	7	793	207		
	Apr		0.0	317.5	800	800	7	793	311		
	May	126.0	176.4	48.5	665	665	6	660	42		
	Jun	211.3	295.8	12.4	376	376	3	373			
	Jul	142.1	198.9	148.8	323	323	3	320			
	Aug	114.5	160.3	72.3	233	233	2	231			
	Sep	61.7	86.4	0.7	145	145	1	144			
	Oct	29.9	41.8	0.5	102	102	1	101			
	Nov		0.0	63.5	185	185	2	183			
	Dec		0.0	26.8	210	210	2	209		690	
1985	Jan		0.0	262.2	471	471	4	467			
	Feb		0.0	164.1	631	631	5	626			
	Mar		0.0	106.8	732	732	6	726			
	Apr	31.1	43.6	82.9	766	766	6	759	9		
	May	86.0	120.4	166.2	800	800	7	793	125		
	Jun	209.7	293.6	16.5	516	516	4	512	10		
	Jul	197.8	276.9	0.0	235	235	2	233			
	Aug	143.1	200.3	1.2	34	34	0	34			
	Sep	62.0	86.8	0.0	-53	0	0	0			Empty
	Oct		0.0	151.2	151	151	1	150			
	Nov		0.0	156.9	307	307	3	304			
	Dec		0.0	104.8	409	409	3	406		144	
1986	Jan		0.0	240.3	646	646	5	641			
	Feb		0.0	212.9	800	800	7	793	54		
	Mar	11.8	16.5	33.4	800	800	7	793	27		
	Apr	40.9	57.3	52.9	789	789	7	782	46		
	May	111.9	156.7	82.3	708	708	6	702	65		
	Jun	174.2	243.9	104.8	563	563	5	558	7		
	Jul	191.7	268.4	13.7	304	304	3	301			
	Aug	136.2	190.6	16.8	127	127	1	126			
	Sep	29.5	41.4	78.3	163	163	1	162			
	Oct	23.2	32.4	15.7	145	145	1	144			
	Nov		0.0	32.3	176	176	1	175			
	Dec		0.0	206.4	381	381	3	378		196	
1987	Jan		0.0	440.8	800	800	7	793	19		
	Feb		0.0	63.7	800	800	7	793	57		

	Mar		0.0	183.3	800	800	7	793	177		
	Apr	14.2	19.9	160.2	800	800	7	793	154		
	May	99.4	139.2	150.3	800	800	7	793	144		
	Jun	178.4	249.8	120.5	664	664	6	659	114		
	Jul	169.6	237.4	86.9	508	508	4	504			
	Aug	121.3	169.9	67.5	401	401	3	398			
	Sep	59.5	83.3	7.2	322	322	3	319			
	Oct	12.1	16.9	54.2	357	357	3	354			
	Nov		0.0	77.0	431	431	4	427			
	Dec		0.0	297.5	724	724	6	718		663	
1988	Jan		0.0	50.6	769	769	6	763			
	Feb		0.0	127.7	800	800	7	793	90		
	Mar		0.0	316.1	800	800	7	793	309		
	Apr		0.0	245.3	800	800	7	793	239		
	May	119.2	166.8	81.7	708	708	6	702	75		
	Jun	163.2	228.5	174.6	648	648	5	643	77		
	Jul	188.0	263.2	28.8	409	409	3	405			
	Aug	142.9	200.0	2.0	207	207	2	205			
	Sep	60.6	84.9	4.0	125	125	1	124			
	Oct		0.0	180.0	304	304	3	301			
	Nov		0.0	314.9	616	616	5	611			
	Dec		0.0	161.3	772	772	6	766		790	
1989	Jan	1.3	1.8	9.3	773	773	6	767			
	Feb	0.0	0.0	15.5	782	782	7	776			
	Mar	10.4	14.6	21.5	783	783	7	776			
	Apr	58.3	81.6	6.8	701	701	6	696			
	May	112.7	157.8	46.9	585	585	5	580			
	Jun	207.1	290.0	12.6	302	302	3	300			
	Jul	168.8	236.3	40.5	104	104	1	103			
	Aug	140.8	197.1	3.7	-90	0	0	0			Empty
	Sep	62.0	86.8	0.0	-87	0	0	0			Empty
	Oct		0.0	93.7	94	94	1	93			
	Nov		0.0	126.6	220	220	2	218			
	Dec		0.0	86.0	304	304	3	301		0	
1990	Jan		0.0	50.0	351	351	3	348			
	Feb		0.0	38.1	386	386	3	383			
	Mar	3.1	4.4	53.3	432	432	4	428			
	Apr		0.0	226.2	654	654	5	649			
	May	100.5	140.8	110.7	619	619	5	614			
	Jun	174.3	244.0	102.1	472	472	4	468			
	Jul	156.6	219.2	99.3	348	348	3	345			
	Aug	132.9	186.1	23.9	183	183	2	181			
	Sep	21.7	30.4	96.9	248	248	2	246			
	Oct	0.6	0.9	68.8	314	314	3	311			
	Nov		0.0	34.0	345	345	3	342			
	Dec		0.0	144.4	487	487	4	483		0	
1991	Jan		0.0	87.0	570	570	5	565			
	Feb		0.0	131.7	697	697	6	691			
	Mar	19.9	27.9	17.3	680	680	6	674			
	Apr	3.2	4.4	189.9	800	800	7	793	64		
	May	85.8	120.1	189.4	800	800	7	793	183		
	Jun	189.1	264.7	79.1	608	608	5	603	72		
	Jul	163.8	229.4	99.2	472	472	4	469			
	Aug	113.6	159.1	86.7	396	396	3	393			
	Sep	39.6	55.5	63.7	401	401	3	399			
	Oct		0.0	198.9	597	597	5	592			
	Nov		0.0	84.5	676	676	6	671			
	Dec		0.0	286.7	800	800	7	793	157	477	
1992	Jan	4.1	5.7	6.4	794	794	7	787			
	Feb	4.2	5.9	11.3	793	793	7	786			
	Mar		0.0	113.3	800	800	7	793	99		
	Apr	2.5	3.5	108.4	800	800	7	793	102		
	May	144.3	202.1	2.4	594	594	5	589			
	Jun	180.7	252.9	59.4	395	395	3	392			
	Jul	163.8	229.3	56.0	219	219	2	217			
	Aug	142.6	199.6	1.5	19	19	0	19			
	Sep	62.0	86.8	0.0	-68	0	0	0			Empty
	Oct		0.0	88.5	89	89	1	88			
	Nov		0.0	53.7	142	142	1	140			
	Dec		0.0	83.6	224	224	2	222		201	
Required, '000cum			33650.7	Total	213771	214212					
Provided, '000cum			33210.0	Not Provided	-441						
Per-year-provided, '000cum			922.5								



Ozdenk Reservoir Operation Curve with Mihaliccik Data and 140ha Irrigation Area

Table 18.8 Elevation and Reservoir Volume Calculation

Depth m	Elevation m	Area m <sup>2</sup>	Average m <sup>2</sup>	Interval m	Volume m <sup>3</sup>	Accu. Volume m <sup>3</sup>
0	978	0	0	0	0	0
1	979	1,880	940	1	940	940
2	980	5,430	3,655	1	3,655	4,595
3	981	6,830	6,130	1	6,130	10,725
4	982	8,720	7,775	1	7,775	18,500
5	983	11,570	10,145	1	10,145	28,645
6	984	14,320	12,945	1	12,945	41,590
7	985	16,570	15,445	1	15,445	57,035
8	986	20,600	18,585	1	18,585	75,620
9	987	25,620	23,110	1	23,110	98,730
10	988	30,190	27,905	1	27,905	126,635
11	989	34,620	32,405	1	32,405	159,040
12	990	39,670	37,145	1	37,145	196,185
13	991	43,960	41,815	1	41,815	238,000
14	992	49,040	46,500	1	46,500	284,500
15	993	54,370	51,705	1	51,705	336,205
16	994	59,930	57,150	1	57,150	393,355
17	995	65,900	62,915	1	62,915	456,270
18	996	71,850	68,875	1	68,875	525,145
19	997	78,880	75,365	1	75,365	600,510
20	998	85,700	82,290	1	82,290	682,800
21	999	92,630	89,165	1	89,165	771,965
22	1,000	99,260	95,945	1	95,945	867,910
23	1,001	106,320	102,790	1	102,790	970,700
24	1,002	113,320	109,820	1	109,820	1,080,520
25	1,003	119,720	116,520	1	116,520	1,197,040
26	1,004	126,310	123,015	1	123,015	1,320,055
27	1,005	133,110	129,710	1	129,710	1,449,765

## **E-19 Ilyaskoy Dam Reservoir Operation Study**

- Table 19.1 Monthly Rainfall, Station: Yaloba, Station No.: 660 (for Ilyaskoy Project)
- Table 19.2 Monthly Effective Rainfall, Station: Yaloba, Station No.: 660 (for Ilyaskoy Project)
- Table 19.3 Monthly Crop Water Requirement in mm for Ilyaskoy Project
- Table 19.4 Monthly Runoff Discharge in mm for Ilyaskoy Project
- Table 19.5 Monthly Runoff Discharge in '000cum for Ilyaskoy Project
- Table 19.6 Ilyaskoy Dam Operation (Yaloba Station, Dam Volume=560,000cum, Irrigation Area=120ha)
- Table 19.7 Elevation and Reservoir Volume Calculation

Table 19.1 Monthly Rainfall, Station: Yaloba, Station No.: 660 (for Ilyaskoy Project)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	12.7	28.2	43.6	37.5	55.8	3.4	1.9	13.6	24.6	38.8	50.9	162.3	473.3
1958	64.9	51.3	164.2	56.4	19.4	34.5	3.4	40.4	106.2	77.5	56.9	97.0	772.1
1959	175.5	49.4	59.9	11.7	90.6	67.5	110.5	2.8	49.7	36.7	75.2	96.0	825.5
1960	117.1	53.0	67.6	42.9	40.0	50.5	36.1	18.6	26.6	32.3	36.2	132.3	653.2
1961	117.4	102.5	64.2	34.9	62.6	55.4	22.2	6.3	50.7	116.1	61.0	84.2	777.5
1962	62.5	129.3	124.3	75.0	0.7	11.6	39.1	0.0	54.4	125.0	79.0	251.7	952.6
1963	192.9	77.0	107.5	39.1	20.1	2.4	20.5	0.8	34.6	93.4	33.4	286.4	908.1
1964	29.5	159.0	100.1	35.7	43.1	7.7	4.4	37.1	132.7	5.3	94.6	118.3	767.5
1965	41.4	210.8	80.2	149.1	47.1	1.5	48.5	6.8	0.0	48.8	62.4	73.8	770.4
1966	148.7	14.6	134.3	36.3	15.6	18.3	0.1	48.7	6.7	4.4	36.2	137.9	601.8
1967	134.7	70.7	56.7	39.3	39.9	20.1	11.1	0.5	25.6	119.0	45.2	135.2	698.0
1968	173.6	72.1	102.8	46.9	21.3	22.4	0.7	44.2	219.5	62.3	95.7	149.0	1010.5
1969	114.0	92.0	59.9	92.6	29.3	45.2	24.6	0.3	0.7	22.0	66.6	133.7	680.9
1970	108.7	121.6	89.4	68.4	43.5	14.1	2.1	9.7	127.1	124.6	48.7	192.1	950.0
1971	59.6	70.9	176.1	13.4	18.9	29.1	13.5	8.0	24.5	74.5	113.8	118.6	720.9
1972	44.8	23.6	30.2	56.7	23.3	29.6	42.0	54.2	103.9	90.1	93.3	18.1	609.8
1973	44.3	56.9	78.6	80.9	11.5	27.5	0.0	27.3	9.8	226.6	90.5	122.2	776.1
1974	76.3	56.4	53.9	34.2	73.4	138.1	10.9	81.5	15.9	27.1	75.1	120.2	763.0
1975	111.7	102.8	86.4	39.2	55.2	82.0	6.5	77.6	16.6	80.3	66.4	131.4	856.1
1976	65.5	27.9	21.7	41.0	13.5	45.4	59.5	122.1	53.1	61.8	55.0	138.2	704.7
1977	56.4	39.4	72.2	82.3	6.6	8.3	8.5	0.2	123.9	41.3	72.3	137.8	649.2
1978	121.8	79.0	58.0	59.3	21.4	2.2	2.2	49.1	103.9	55.6	34.0	114.3	700.8
1979	83.4	43.2	9.7	55.5	17.8	2.1	15.6	66.1	47.8	36.2	66.5	61.1	505.0
1980	148.4	87.6	134.7	63.9	30.7	36.5	7.5	4.8	37.7	31.5	131.3	167.2	881.8
1981	184.7	133.7	91.4	8.1	66.3	13.6	50.0	5.4	214.6	50.7	84.2	243.3	1146.0
1982	132.7	48.0	66.8	108.3	36.3	10.7	52.2	12.7	0.0	16.6	49.1	80.2	613.6
1983	128.3	117.4	10.8	65.2	74.0	45.5	18.5	19.9	26.0	97.5	139.6	55.3	798.0
1984	87.9	62.3	91.5	88.0	34.7	18.5	59.4	32.5	5.8	17.1	47.5	17.2	562.4
1985	122.8	53.8	28.7	35.4	14.4	13.2	21.0	0.0	18.4	129.8	149.1	58.2	644.8
1986	98.5	132.1	8.1	16.7	6.7	42.5	12.1	0.0	2.6	70.1	73.0	110.8	573.2
1987	155.2	31.0	92.7	42.1	56.5	21.2	47.7	36.2	1.4	76.9	88.6	169.0	818.5
1988	11.8	47.0	42.1	81.3	41.2	27.5	6.5	9.1	28.8	111.7	169.9	89.5	666.4
1989	13.5	12.3	15.7	3.7	53.9	81.3	47.7	10.9	7.8	133.6	151.6	74.9	606.9
1990	28.1	53.8	35.9	35.8	53.9	66.3	6.3	16.7	100.1	113.8	140.1	108.8	759.6
1991	35.2	49.4	24.9	127.3	109.5	10.5	46.8	1.5	81.2	111.1	43.0	92.7	733.1
1992	26.5	80.4	98.2	37.9	25.2	149.2	51.5	0.0	7.2	98.7	53.8	84.2	712.8
1993	78.0	48.8	38.2	28.8	56.2	36.7	3.2	4.1	36.6	3.9	83.2	55.2	472.9
1994	73.7	27.1	25.9	21.6	24.9	99.5	14.8	4.0	0.9	194.4	113.1	107.9	707.8
Mean	91.7	71.5	69.7	52.4	38.3	36.6	24.5	23.0	50.7	75.2	79.6	119.1	732.2

Table 19.2 Monthly Effective Rainfall, Station: Yaloba, Station No.: 660 (for Ilyaskoy Project)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	12.4	26.6	39.8	34.7	49.6	3.4	1.9	13.2	23.4	36.8	45.7	109.6	396.1
1958	56.5	46.0	110.3	50.0	18.6	32.1	3.4	37.1	83.6	65.5	50.4	78.2	631.8
1959	113.9	44.5	52.7	11.4	74.2	58.4	86.1	2.8	44.8	34.0	63.9	77.6	664.2
1960	89.7	47.4	58.5	39.2	36.8	45.4	33.5	17.9	25.2	30.2	33.6	97.3	554.6
1961	89.8	81.5	56.0	32.5	54.8	49.3	21.2	6.2	45.6	89.1	53.6	70.0	649.5
1962	54.7	95.9	93.4	63.8	0.7	11.3	36.0	0.0	48.5	93.8	66.5	150.2	714.7
1963	118.5	65.1	84.4	36.0	19.3	2.4	19.7	0.8	32.2	76.0	31.2	153.6	639.2
1964	27.8	108.4	80.1	33.2	39.4	7.6	4.4	34.3	97.5	5.2	76.7	90.3	604.8
1965	38.0	121.9	67.3	104.6	42.7	1.5	43.8	6.7	0.0	44.0	54.6	62.9	588.1
1966	104.5	14.2	98.2	33.7	15.1	17.6	0.1	44.0	6.6	4.4	33.6	99.9	471.8
1967	98.4	60.7	50.3	36.2	36.7	19.3	10.9	0.5	24.3	90.7	41.1	98.6	667.7
1968	113.3	61.7	81.7	42.5	20.4	21.4	0.7	40.3	123.1	54.5	77.4	104.6	741.6
1969	88.0	75.1	52.7	75.5	27.6	41.1	23.4	0.3	0.7	21.0	57.7	97.9	561.0
1970	85.1	92.0	73.4	59.0	39.7	13.7	2.1	9.5	94.8	93.5	44.0	118.3	725.2
1971	52.5	60.8	114.1	13.0	18.2	27.4	13.1	7.9	23.3	63.4	87.9	90.5	572.1
1972	40.8	22.5	28.4	50.3	22.2	27.8	38.5	48.3	82.3	73.9	75.9	17.4	528.3
1973	40.4	50.4	66.2	67.8	11.2	26.0	0.0	25.8	9.6	123.9	74.1	92.3	587.9
1974	64.7	50.0	48.1	31.9	62.6	100.0	10.7	68.2	15.4	25.6	63.8	91.3	632.3
1975	86.7	81.7	71.5	36.1	49.1	68.6	6.4	65.6	16.0	67.4	57.6	96.9	703.5
1976	56.9	26.3	20.8	37.6	13.1	41.3	52.4	92.3	47.5	54.2	49.0	100.0	591.3
1977	50.0	36.3	61.8	68.8	6.5	8.2	8.4	0.2	93.2	37.9	61.8	99.8	532.8
1978	92.1	66.5	51.3	52.3	20.5	2.2	2.2	44.3	82.3	49.4	31.7	88.2	582.9
1979	69.5	39.5	9.5	49.3	17.2	2.1	15.1	57.4	43.2	33.6	57.7	53.6	447.6
1980	104.4	72.3	98.4	55.7	28.8	33.8	7.4	4.8	34.9	29.5	96.8	111.3	678.0
1981	116.5	97.9	74.7	8.0	57.5	13.2	45.0	5.3	122.5	45.6	70.0	124.9	781.1
1982	97.5	43.4	57.9	84.8	33.7	10.5	46.8	12.4	0.0	16.0	44.3	67.3	514.5
1983	95.4	89.8	10.6	56.7	63.0	41.4	17.8	19.1	24.6	78.5	100.6	49.2	646.8
1984	72.4	54.5	74.8	72.5	32.3	17.8	52.3	30.4	5.7	16.5	43.0	16.6	488.9
1985	92.6	48.0	27.1	32.9	14.0	12.9	20.1	0.0	17.7	96.1	104.6	51.4	517.4
1986	79.1	97.2	8.0	16.1	6.6	38.9	11.8	0.0	2.6	60.3	62.3	86.2	469.2
1987	107.0	29.1	75.5	38.6	50.1	20.3	43.1	33.6	1.4	65.1	72.9	111.9	648.6
1988	11.5	42.6	38.6	68.1	37.8	26.0	6.4	8.9	27.1	86.7	112.2	73.5	539.4
1989	13.1	12.0	15.2	3.7	48.1	68.1	43.1	10.7	7.7	97.9	105.6	63.7	488.9
1990	26.5	48.0	33.3	33.2	48.1	57.5	6.2	16.1	80.1	87.9	100.8	85.1	623.0
1991	32.7	44.5	23.7	94.9	85.5	10.3	42.4	1.5	68.0	86.4	39.3	75.5	604.7
1992	25.1	67.5	78.9	36.0	23.9	104.7	46.2	0.0	7.1	79.2	48.0	70.0	585.7
1993	65.8	44.0	35.3	27.1	49.9	34.0	3.2	4.1	33.9	3.9	69.4	49.1	419.7
1994	62.8	25.6	24.6	20.7	23.7	79.7	14.4	4.0	0.9	118.8	87.5	84.6	547.2
Mean	69.6	57.7	56.5	44.9	34.2	31.5	22.1	20.4	39.4	58.8	64.4	65.8	585.3
Crop	4.50	4.37	8.17	77.30	109.99	133.57	166.70	122.48	53.73	21.53	3.70	3.76	709.79



Table 19.3 Monthly Crop Water Requirement in mm for Ilyaskoy Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957				42.6	60.4	130.2	164.8	109.3	30.3				537.6
1958				27.3	91.3	101.5	163.3	85.3					468.7
1959				65.9	35.8	75.2	80.6	119.7	9.0				386.2
1960				38.1	73.2	88.2	133.2	104.6	28.5				465.8
1961				44.8	55.2	84.3	145.5	116.3	8.2				454.3
1962				13.6	109.3	122.2	130.7	122.5	5.3				503.5
1963				41.3	90.7	131.2	147.0	121.7	21.5				563.4
1964				44.2	70.6	126.0	162.3	88.1		16.3			507.5
1965					67.3	132.1	122.9	115.8	53.7				491.8
1966				43.6	94.9	115.9	166.6	78.5	47.1	17.2			563.9
1967				41.1	73.3	114.3	155.8	122.0	29.4				535.9
1968				34.8	89.6	112.2	166.0	82.2					484.8
1969				1.9	82.4	92.5	143.3	122.2	53.0	0.5			495.7
1970				18.3	70.3	119.9	164.6	113.0					486.0
1971				64.3	91.8	106.2	153.6	114.6	30.4				560.8
1972				27.0	87.8	105.7	128.2	74.2					422.9
1973				9.5	98.8	107.6	166.7	96.7	44.1				523.3
1974				45.4	47.4	33.6	156.0	54.3	38.3				375.1
1975				41.2	60.9	65.0	160.3	56.9	37.7				422.0
1976				39.7	96.9	92.3	114.3	30.2	6.3				379.6
1977				8.5	103.5	125.4	158.3	122.3					518.1
1978				25.0	89.5	131.4	164.5	78.2					488.6
1979				28.0	92.8	131.5	151.6	65.1	10.5				479.5
1980				21.6	81.2	99.7	159.3	117.7	18.9				498.4
1981				69.3	52.5	120.3	121.7	117.1					481.0
1982					76.3	123.1	119.9	110.1	53.7	5.5			488.7
1983				20.6	46.9	92.2	148.9	103.4	29.1				441.1
1984				4.8	77.7	115.8	114.4	92.1	48.0	5.0			457.7
1985				44.4	96.0	120.7	146.6	122.5	36.0				566.2
1986			0.2	61.2	103.4	94.7	154.9	122.5	51.1				587.9
1987				38.7	59.9	113.3	123.5	88.9	52.3				476.7
1988				9.2	72.2	107.6	160.3	113.5	26.6				489.4
1989				73.6	61.9	65.5	123.5	111.8	46.1				482.4
1990				44.1	61.9	76.1	160.5	106.3					448.8
1991					24.5	123.3	124.3	121.0					393.0
1992				42.3	86.1	28.9	120.5	122.5	46.6				446.9
1993				50.2	60.1	99.6	163.5	118.4	19.8	17.7			529.2
1994				56.6	86.3	53.9	152.3	118.5	52.8				520.5
Mean			0.2	36.6	75.8	102.1	144.6	102.1	33.4	10.3			484.6

Table 19.4 Monthly Runoff Discharge in mm for Ilyaskoy Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	1.6	3.6	5.6	4.8	7.2	0.4	0.2	1.7	3.2	5.0	6.5	20.8	60.7
1958	19.1	15.1	48.3	16.6	5.7	10.1	1.0	11.9	31.2	22.8	16.7	28.5	227.0
1959	56.2	15.8	19.2	3.7	29.0	21.6	35.4	0.9	15.9	11.8	24.1	30.8	264.4
1960	27.1	12.3	15.6	9.9	9.2	11.7	8.3	4.3	6.1	7.5	8.4	30.6	151.0
1961	34.8	30.4	19.1	10.4	18.6	16.4	6.6	1.9	15.0	34.5	18.1	25.0	230.7
1962	23.6	48.9	47.0	28.3	0.3	4.4	14.8	0.0	20.6	47.2	29.9	95.1	360.0
1963	69.2	27.6	38.5	14.0	7.2	0.9	7.4	0.3	12.4	33.5	12.0	102.7	325.6
1964	8.6	46.4	29.2	10.4	12.6	2.2	1.3	10.8	38.7	1.5	27.6	34.5	223.9
1965	12.1	61.8	23.5	43.7	13.8	0.4	14.2	2.0	0.0	14.3	18.3	21.6	225.9
1966	30.1	3.0	27.2	7.3	3.2	3.7	0.0	9.9	1.4	0.9	7.3	27.9	121.8
1967	34.4	18.1	14.5	10.0	10.2	5.1	2.8	0.1	6.5	30.4	11.5	34.5	178.4
1968	69.8	29.0	41.3	18.8	8.6	9.0	0.3	17.8	68.2	25.0	38.5	59.9	406.1
1969	28.1	22.7	14.8	22.8	7.2	11.1	6.1	0.1	0.2	5.4	16.4	32.9	167.7
1970	41.0	45.8	33.7	25.8	16.4	5.3	0.8	3.7	47.9	47.0	18.4	72.4	368.0
1971	16.0	19.0	47.1	3.6	5.1	7.8	3.6	2.1	6.6	19.9	30.5	31.7	193.0
1972	9.3	4.9	6.3	11.7	4.8	6.1	8.7	11.2	21.5	18.6	19.3	3.7	126.2
1973	13.1	16.8	23.3	23.9	3.4	8.1	0.0	8.1	2.9	67.1	26.8	36.2	229.8
1974	22.1	16.3	15.6	9.9	21.2	40.0	3.2	23.6	4.6	7.8	21.7	34.8	220.8
1975	37.4	34.4	28.9	13.1	18.5	27.5	2.2	26.0	5.6	26.9	22.2	44.0	286.7
1976	17.0	7.2	5.6	10.6	3.5	11.8	15.4	31.6	13.8	16.0	14.2	36.8	182.6
1977	12.9	9.0	16.5	18.8	1.5	1.9	1.9	0.0	28.4	9.5	16.6	31.6	148.7
1978	31.3	20.3	14.9	15.2	5.5	0.6	0.6	12.6	26.7	14.3	8.7	29.4	180.1
1979	12.2	6.3	1.4	8.1	2.6	0.3	2.3	9.7	7.0	5.3	9.8	9.0	74.1
1980	51.5	30.4	46.7	22.2	10.6	12.7	2.6	1.7	13.1	10.9	45.5	58.0	305.7
1981	83.6	60.5	41.4	3.7	30.0	6.2	22.6	2.4	97.1	22.9	38.1	110.1	518.7
1982	27.8	10.0	14.0	22.6	7.6	2.2	10.9	2.7	0.0	3.5	10.3	16.8	128.3
1983	39.4	36.0	3.3	20.0	22.7	14.0	5.7	6.1	8.0	29.9	42.8	17.0	244.9
1984	15.8	11.2	16.5	15.8	6.2	3.3	10.7	5.8	1.0	3.1	8.5	3.1	101.2
1985	27.8	12.2	6.5	8.0	3.3	3.0	4.8	0.0	4.2	29.4	33.8	13.2	146.1
1986	18.3	24.6	1.5	3.1	1.2	7.9	2.3	0.0	0.5	13.0	13.6	20.6	106.7
1987	49.2	9.8	29.4	13.3	17.9	6.7	15.1	11.5	0.4	24.4	28.1	53.6	259.4
1988	2.8	11.2	10.0	19.4	9.8	6.6	1.5	2.2	6.9	26.6	40.5	21.3	158.9
1989	2.8	2.5	3.2	0.8	11.1	16.7	9.8	2.2	1.6	27.4	31.1	15.4	124.6
1990	8.1	15.5	10.3	10.3	15.5	19.1	1.8	4.8	28.8	32.7	40.3	31.3	218.5
1991	9.6	13.5	6.8	34.9	30.0	2.9	12.8	0.4	22.3	30.4	11.8	25.4	200.9
1992	7.0	21.2	25.9	10.0	6.6	39.3	13.6	0.0	1.9	26.0	14.2	22.2	187.7
1993	10.0	6.2	4.9	3.7	7.2	4.7	0.4	0.5	4.7	0.5	10.8	7.1	60.5
1994	19.2	7.1	6.8	5.6	6.5	25.9	3.9	1.0	0.2	50.7	29.5	28.1	184.6
Mean	26.0	20.3	19.8	14.9	10.9	10.4	6.9	6.5	14.4	21.3	22.6	33.8	207.6

Table 19.5 Monthly Runoff Discharge in '000cum for Ilyaskoy Project

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1957	7.0	15.5	24.0	20.7	30.8	1.9	1.0	7.5	13.6	21.4	28.1	89.5	261
1958	82.1	64.9	207.6	71.3	24.5	43.6	43	51.1	134.3	98.0	71.9	122.6	976
1959	241.7	68.0	82.5	16.1	124.8	93.0	152.2	3.9	68.5	50.6	103.6	132.2	1137
1960	116.4	52.7	67.2	42.6	39.8	50.2	35.9	18.5	26.4	32.1	36.0	131.5	649
1961	149.8	130.8	81.9	44.5	79.9	70.7	28.3	8.0	64.7	148.1	77.8	107.4	992
1962	101.6	210.1	202.0	121.9	1.1	18.9	63.5	0.0	88.4	203.1	128.4	409.0	1548
1963	297.4	118.7	165.7	60.3	31.0	3.7	31.6	1.2	53.3	144.0	51.5	441.6	1400
1964	37.0	199.4	125.6	44.8	54.1	9.7	5.5	46.5	166.4	6.6	118.7	148.4	963
1965	52.2	265.7	101.1	188.0	59.4	1.9	61.1	8.6	0.0	61.5	78.7	93.0	971
1966	129.5	12.7	116.9	31.6	13.6	15.9	0.1	42.4	5.8	3.8	31.5	120.1	524
1967	148.0	77.7	62.3	43.2	43.8	22.1	12.2	0.5	28.1	130.7	49.7	148.5	767
1968	300.0	124.6	177.6	81.0	36.8	38.7	1.2	76.4	379.3	107.7	165.4	257.5	1746
1969	120.7	97.4	63.4	98.1	31.0	47.9	26.1	0.3	0.7	23.3	70.5	141.6	721
1970	176.1	197.0	144.9	110.8	70.5	22.8	3.4	15.7	205.9	201.9	78.9	311.3	1539
1971	68.6	81.6	202.7	15.4	21.8	33.5	15.5	9.2	28.2	85.7	131.0	136.5	830
1972	39.9	21.0	26.9	50.5	20.7	26.3	37.4	48.2	92.5	80.2	83.0	16.1	543
1973	56.4	72.4	100.1	103.0	14.6	35.0	0.0	34.8	12.5	288.5	115.2	155.6	988
1974	95.0	70.2	67.1	42.6	91.3	171.9	13.6	101.4	19.8	33.7	93.5	149.6	960
1975	160.8	148.0	124.4	56.4	79.5	118.1	9.4	111.7	23.9	115.6	95.6	189.2	1233
1976	73.0	31.1	24.2	45.7	15.0	50.6	66.3	136.0	59.2	68.9	61.3	154.0	785
1977	55.5	38.8	71.1	81.0	6.5	8.2	8.4	0.2	122.0	40.7	71.2	135.7	639
1978	134.6	87.3	64.1	65.5	23.7	2.4	2.4	54.3	114.8	61.4	37.6	126.3	774
1979	52.6	27.2	6.1	36.0	11.2	1.3	9.8	41.7	30.1	22.8	41.9	38.5	319
1980	221.2	130.6	200.8	95.3	45.8	54.4	11.2	7.2	56.2	47.0	195.8	249.3	1315
1981	359.5	280.2	177.9	15.8	129.0	26.5	97.3	10.5	417.7	96.7	163.9	473.5	2230
1982	119.3	43.2	60.1	97.4	32.6	9.6	46.9	11.4	0.0	14.9	44.2	72.1	552
1983	169.3	154.9	14.3	86.1	97.7	60.1	24.4	26.3	34.3	128.7	184.2	73.0	1053
1984	68.0	48.2	70.8	68.1	26.9	14.3	46.0	25.1	4.5	13.2	36.8	13.3	435
1985	119.6	52.4	28.0	34.5	14.0	12.9	20.5	0.0	17.9	126.5	145.3	56.7	628
1986	78.8	105.7	6.5	13.4	5.4	34.0	9.7	0.0	2.1	56.1	58.4	88.7	459
1987	211.5	42.2	126.3	57.4	77.0	28.9	65.0	49.3	1.9	104.8	120.8	230.3	1116
1988	12.1	48.2	43.2	83.4	42.2	28.2	6.7	9.3	29.5	114.5	174.2	91.8	683
1989	11.9	10.9	13.9	3.3	47.6	71.8	42.1	9.6	6.9	118.0	133.9	66.1	536
1990	34.8	66.6	44.4	44.3	66.7	82.0	7.8	20.7	123.8	140.8	173.3	134.6	940
1981	41.5	58.2	29.3	150.0	129.0	12.4	55.1	1.8	96.7	130.9	50.7	109.2	864
1982	30.0	91.1	111.2	42.9	28.5	169.0	58.3	0.0	8.2	111.8	60.9	95.4	807
1983	42.9	26.9	21.0	15.8	30.9	20.2	1.8	2.3	20.1	2.1	45.8	30.4	260
1984	82.6	30.4	29.0	24.2	27.9	111.6	16.6	4.5	1.0	218.0	126.8	121.0	794
Mean	113.1	89.0	86.5	60.6	45.4	42.7	28.9	26.2	67.3	91.0	93.0	149.0	893

Table 19.6 Hyskoy Dam Operation (Yaloba Sation, Dam Volume=660,000cum, Irrigation Area=120ha)

Year	Month	W. R. mm	W. R., Kcum	Runoff, Kcum	Dam, Kcum Actual	Dam, Kcum	Loss Kcum	Dam, Kcum	Spill Kcum	Spill Total	Remarks
1957	Jan		0.0	7.0	7	7	0	7			
	Feb		0.0	15.5	22	22	0	22			
	Mar		0.0	24.0	46	46	0	46			
	Apr	42.6	51.1	20.7	15	15	0	15			
	May	60.4	72.5	30.8	-26	0	0	0			Empty
	Jun	130.2	156.2	1.9	-154	0	0	0			Empty
	Jul	164.8	197.8	1.0	-197	0	0	0			Empty
	Aug	109.3	131.1	7.5	-124	0	0	0			Empty
	Sep	30.3	36.4	13.6	-23	0	0	0			Empty
	Oct		0.0	21.4	21	21	0	21			
	Nov		0.0	28.1	49	49	0	49			
	Dec		0.0	89.5	138	138	1	137		0	
1958	Jan		0.0	82.1	219	219	2	217			
	Feb		0.0	64.9	282	282	2	280			
	Mar		0.0	207.6	488	488	4	483			
	Apr	27.3	32.7	71.3	522	522	4	518			
	May	91.3	109.6	24.5	433	433	4	429			
	Jun	101.5	121.7	43.6	351	351	3	348			
	Jul	163.3	196.0	4.3	156	156	1	155			
	Aug	85.3	102.4	51.1	104	104	1	103			
	Sep		0.0	134.3	237	237	2	235			
	Oct		0.0	98.0	333	333	3	330			
	Nov		0.0	71.9	402	402	3	399			
	Dec		0.0	122.6	521	521	4	517		0	
1959	Jan		0.0	241.7	560	560	5	555	199		
	Feb		0.0	68.0	560	560	5	555	63		
	Mar		0.0	82.5	560	560	5	555	78		
	Apr	65.9	79.1	16.1	492	492	4	488	11		
	May	35.8	43.0	124.8	560	560	5	555	53		
	Jun	75.2	90.2	93.0	558	558	5	553	88		
	Jul	80.6	96.7	152.2	560	560	5	555	146		
	Aug	119.7	143.6	3.9	416	416	3	412			
	Sep	9.0	10.8	68.5	470	470	4	466			
	Oct		0.0	50.6	516	516	4	512			
	Nov		0.0	103.6	560	560	5	555	56		
	Dec		0.0	132.2	560	560	5	555	128	822	
1960	Jan		0.0	116.4	560	560	5	555	112		
	Feb		0.0	52.7	560	560	5	555	48		
	Mar		0.0	67.2	560	560	5	555	63		
	Apr	38.1	45.7	42.6	552	552	5	548	38		
	May	73.2	87.8	39.8	500	500	4	495	27		
	Jun	88.2	105.8	50.2	440	440	4	436			
	Jul	133.2	159.8	35.9	312	312	3	310			
	Aug	104.6	125.5	18.5	203	203	2	201			
	Sep	28.5	34.3	26.4	193	193	2	192			
	Oct		0.0	32.1	224	224	2	222			
	Nov		0.0	36.0	258	258	2	256			
	Dec		0.0	131.5	387	387	3	384		288	
1961	Jan		0.0	149.8	534	534	4	529			
	Feb		0.0	130.8	560	560	5	555	100		
	Mar		0.0	81.9	560	560	5	555	77		
	Apr	44.8	53.8	44.5	546	546	5	542	40		
	May	55.2	66.3	79.9	555	555	5	550	61		
	Jun	84.3	101.2	70.7	520	520	4	516	61		
	Jul	145.5	174.6	28.3	369	369	3	366			
	Aug	116.3	139.5	8.0	235	235	2	233			
	Sep	8.2	9.8	64.7	288	288	2	285			
	Oct		0.0	148.1	434	434	4	430			
	Nov		0.0	77.8	508	508	4	504			
	Dec		0.0	107.4	560	560	5	555	51	391	
1962	Jan		0.0	101.6	560	560	5	555	97		
	Feb		0.0	210.1	560	560	5	555	205		
	Mar		0.0	202.0	560	560	5	555	197		
	Apr	13.6	16.3	121.9	560	560	5	555	117		
	May	109.3	131.2	1.1	425	425	4	422			
	Jun	122.2	146.7	18.9	294	294	2	291			
	Jul	130.7	156.8	63.5	198	198	2	197			
	Aug	122.5	147.0	0.0	50	50	0	49			
	Sep	5.3	6.3	88.4	131	131	1	130			
	Oct		0.0	203.1	333	333	3	331			

	Nov		0.0	128.4	459	459	4	455			
	Dec		0.0	409.0	560	560	5	555	304	921	
1963	Jan		0.0	297.4	560	560	5	555	200		
	Feb		0.0	118.7	560	560	5	555	114		
	Mar		0.0	165.7	560	560	5	555	161		
	Apr	41.3	49.5	60.3	560	560	5	555	56		
	May	90.7	106.8	31.0	477	477	4	474	26		
	Jun	131.2	157.4	3.7	320	320	3	317			
	Jul	147.0	176.4	31.6	172	172	1	171			
	Aug	121.7	146.0	1.2	26	26	0	26			
	Sep	21.5	25.8	53.3	53	53	0	53			
	Oct		0.0	144.0	197	197	2	195			
	Nov		0.0	51.5	247	247	2	245			
	Dec		0.0	441.6	560	560	5	555	126	776	
1964	Jan		0.0	37.0	560	560	5	555	32		
	Feb		0.0	199.4	560	560	5	555	195		
	Mar		0.0	125.6	560	560	5	555	121		
	Apr	44.2	53.0	44.8	547	547	5	543	40		
	May	70.6	84.7	54.1	512	512	4	508	37		
	Jun	126.0	151.2	9.7	366	366	3	363			
	Jul	162.3	194.8	5.5	174	174	1	172			
	Aug	88.1	105.8	46.5	113	113	1	112			
	Sep		0.0	166.4	279	279	2	276			
	Oct	16.3	19.5	6.6	263	263	2	261			
	Nov		0.0	118.7	380	380	3	377			
	Dec		0.0	148.4	525	525	4	521		425	
1965	Jan		0.0	52.2	560	560	5	555	13		
	Feb		0.0	265.7	560	560	5	555	261		
	Mar		0.0	101.1	560	560	5	555	96		
	Apr		0.0	186.0	560	560	5	555	183		
	May	67.3	80.8	59.4	534	534	4	529	55		
	Jun	132.1	158.5	1.9	373	373	3	370			
	Jul	122.9	147.5	61.1	283	283	2	281			
	Aug	115.8	138.9	8.6	151	151	1	149			
	Sep	53.7	64.5	0.0	85	85	1	84			
	Oct		0.0	61.5	146	146	1	145			
	Nov		0.0	78.7	223	223	2	221			
	Dec		0.0	93.0	314	314	3	312		608	
1966	Jan		0.0	129.5	441	441	4	438			
	Feb		0.0	12.7	450	450	4	447			
	Mar		0.0	116.9	560	560	5	555	3		
	Apr	43.6	52.4	31.6	535	535	4	530	27		
	May	94.9	113.9	13.6	430	430	4	426			
	Jun	115.9	139.1	15.9	303	303	3	301			
	Jul	166.6	199.9	0.1	101	101	1	100			
	Aug	78.5	94.2	42.4	48	48	0	48			
	Sep	47.1	56.5	5.8	3	0	0	0			Empty
	Oct	17.2	20.6	3.8	-17	0	0	0			Empty
	Nov		0.0	31.5	32	32	0	31			
	Dec		0.0	120.1	151	151	1	150		30	
1967	Jan		0.0	148.0	298	298	2	296			
	Feb		0.0	77.7	373	373	3	370			
	Mar		0.0	62.3	432	432	4	429			
	Apr	41.1	49.3	43.2	423	423	4	419			
	May	73.3	87.9	43.8	375	375	3	372			
	Jun	114.3	137.1	22.1	257	257	2	255			
	Jul	155.8	187.0	12.2	80	80	1	79			
	Aug	82.2	98.6	0.5	-19	0	0	0			Empty
	Sep	29.4	35.3	28.1	-7	0	0	0			Empty
	Oct		0.0	130.7	131	131	1	130			
	Nov		0.0	49.7	179	179	1	178			
	Dec		0.0	148.5	326	326	3	324		0	
1968	Jan		0.0	300.0	560	560	5	555	64		
	Feb		0.0	124.6	560	560	5	555	120		
	Mar		0.0	177.6	560	560	5	555	173		
	Apr	34.8	41.8	81.0	560	560	5	555	76		
	May	89.6	107.5	36.8	485	485	4	481	32		
	Jun	112.2	134.6	38.7	385	385	3	381			
	Jul	168.0	199.2	1.2	183	183	2	182			
	Aug		98.6	76.4	180	180	1	158			
	Sep	82.2	0.0	379.3	538	538	4	533			
	Oct		0.0	107.7	560	560	5	555	81		
	Nov		0.0	165.4	560	560	5	555	161		

1969	Dec		0.0	257.5	560	560	5	555	253	959	
	Jan		0.0	120.7	560	560	5	555	116		
	Feb		0.0	97.4	560	560	5	555	63		
	Mar		0.0	63.4	560	560	5	555	59		
	Apr	1.9	2.2	98.1	560	560	5	555	83		
	May	82.4	98.9	31.0	487	487	4	483	28		
	Jun	92.5	111.0	47.9	420	420	4	417			
	Jul	143.3	172.0	26.1	271	271	2	269			
	Aug	122.2	146.6	0.3	122	122	1	121			
	Sep	53.0	63.6	0.7	58	58	0	58			
	Oct	0.5	0.6	23.3	81	81	1	80			
	Nov		0.0	70.5	151	151	1	149			
Dec		0.0	141.6	291	291	2	288			367	
1970	Jan		0.0	176.1	465	465	4	461			
	Feb		0.0	197.0	560	560	5	555	98		
	Mar		0.0	144.9	560	560	5	555	140		
	Apr	18.3	21.9	110.8	560	560	5	555	108		
	May	70.3	84.3	70.5	541	541	5	537	66		
	Jun	119.9	143.8	22.8	416	416	3	413			
	Jul	164.6	197.5	3.4	218	218	2	217			
	Aug	113.0	136.6	15.7	97	97	1	96			
	Sep		0.0	205.9	302	302	3	299			
	Oct		0.0	201.9	501	501	4	497			
	Nov		0.0	78.9	560	560	5	555	16		
	Dec		0.0	311.3	560	560	5	555	307		733
1971	Jan		0.0	68.6	560	560	5	555	64		
	Feb		0.0	81.6	560	560	5	555	77		
	Mar		0.0	202.7	560	560	5	555	198		
	Apr	64.3	77.1	15.4	494	494	4	490	11		
	May	91.8	110.2	21.8	401	401	3	398			
	Jun	106.2	127.4	33.5	304	304	3	301			
	Jul	153.6	184.3	15.5	133	133	1	131			
	Aug	114.6	137.5	9.2	3	3	0	3			
	Sep	30.4	36.5	28.2	-5	0	0	0			Empty
	Oct		0.0	85.7	86	86	1	85			
	Nov		0.0	131.0	216	216	2	214			
	Dec		0.0	136.5	351	351	3	348			350
1972	Jan		0.0	39.9	388	388	3	384			
	Feb		0.0	21.0	405	405	3	402			
	Mar		0.0	26.9	429	429	4	425			
	Apr	27.0	32.4	50.5	443	443	4	440			
	May	87.8	105.3	20.7	355	355	3	352			
	Jun	105.7	126.9	26.3	252	252	2	250			
	Jul	128.2	153.9	37.4	133	133	1	132			
	Aug	74.2	89.0	48.2	91	91	1	90			
	Sep		0.0	92.5	183	183	2	181			
	Oct		0.0	80.2	262	262	2	259			
	Nov		0.0	83.0	342	342	3	340			
	Dec		0.0	16.1	356	356	3	353			0
1973	Jan		0.0	56.4	409	409	3	406			
	Feb		0.0	72.4	478	478	4	474			
	Mar		0.0	100.1	560	560	5	555	14		
	Apr	9.5	11.4	103.0	560	560	5	555	98		
	May	98.8	118.5	14.6	451	451	4	448	10		
	Jun	107.6	129.1	36.0	354	354	3	351			
	Jul	166.7	200.0	0.0	151	151	1	149			
	Aug	96.7	116.0	34.8	68	68	1	68			
	Sep	44.1	52.9	12.5	27	27	0	27			
	Oct		0.0	288.5	315	315	3	313			
	Nov		0.0	115.2	428	428	4	424			
	Dec		0.0	155.6	560	560	5	555	20		142
1974	Jan		0.0	95.0	560	560	5	555	90		
	Feb		0.0	70.2	560	560	5	555	66		
	Mar		0.0	67.1	560	560	5	555	62		
	Apr	45.4	54.5	42.6	543	543	5	539	38		
	May	47.4	56.8	91.3	560	560	5	555	70		
	Jun	33.6	40.3	171.9	560	560	5	555	167		
	Jul	156.0	187.2	13.8	382	382	3	378	9		
	Aug	54.3	65.1	101.4	415	415	3	411			
	Sep	36.3	46.0	19.8	385	385	3	382			
	Oct		0.0	33.7	416	416	3	412			
	Nov		0.0	93.5	506	506	4	501			
	Dec		0.0	149.8	560	560	5	555	91		583

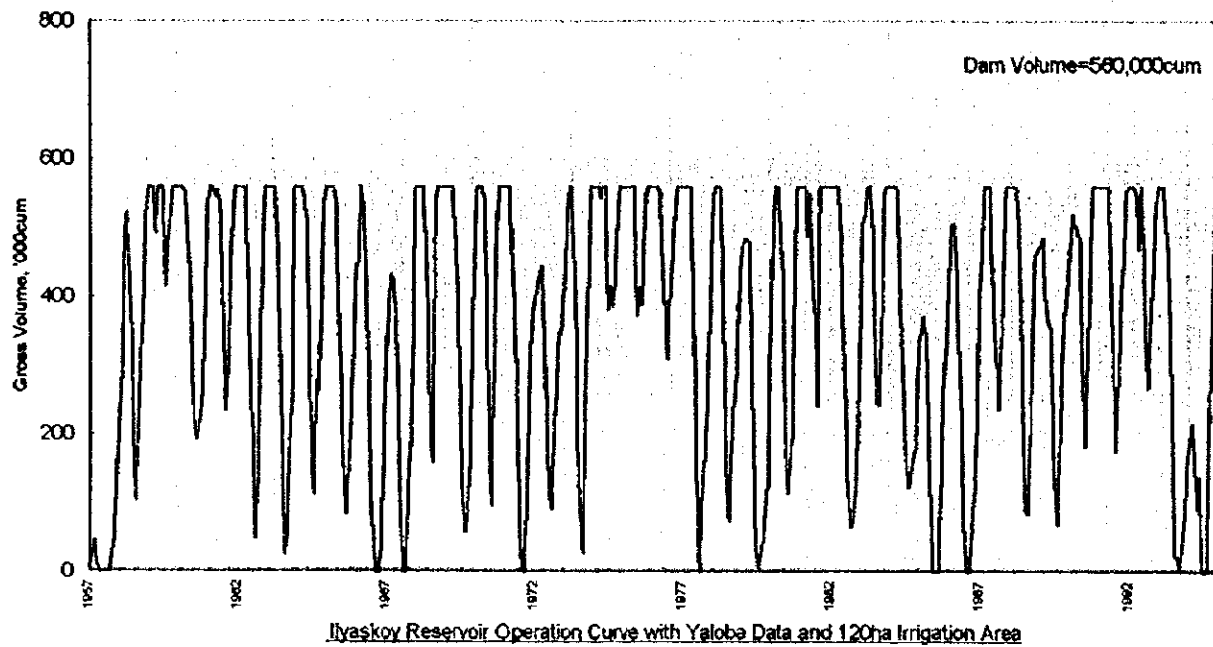
1975	Jan		0.0	160.8	560	560	5	555	156		
	Feb		0.0	148.0	560	560	5	555	143		
	Mar		0.0	124.4	560	560	5	555	120		
	Apr	41.2	49.4	56.4	560	560	5	555	52		
	May	60.9	73.1	79.5	560	560	5	555	75		
	Jun	65.0	78.0	118.1	560	560	5	555	113		
	Jul	160.3	192.3	9.4	372	372	3	369	5		
	Aug	56.9	68.3	111.7	413	413	3	409			
	Sep	37.7	45.2	23.9	368	368	3	365			
	Oct		0.0	115.6	500	500	4	496			
	Nov		0.0	95.6	560	560	5	555	32		
	Dec		0.0	189.2	560	560	5	555	185	880	
1976	Jan		0.0	73.0	560	560	5	555	68		
	Feb		0.0	31.1	560	560	5	555	26		
	Mar		0.0	24.2	560	560	5	555	20		
	Apr	39.7	47.6	45.7	553	553	5	549	41		
	May	96.9	116.2	15.0	448	448	4	444	4		
	Jun	92.3	110.8	50.6	384	384	3	381			
	Jul	114.3	137.1	66.3	310	310	3	307			
	Aug	30.2	36.2	136.0	407	407	3	403			
	Sep	6.3	7.5	59.2	455	455	4	451			
	Oct		0.0	68.9	520	520	4	516			
	Nov		0.0	61.3	560	560	5	555	17		
	Dec		0.0	154.0	560	560	5	555	149	326	
1977	Jan		0.0	55.5	560	560	5	555	51		
	Feb		0.0	38.8	560	560	5	555	34		
	Mar		0.0	71.1	560	560	5	555	66		
	Apr	8.5	10.3	81.0	560	560	5	555	76		
	May	103.5	124.2	6.5	438	438	4	434	2		
	Jun	125.4	150.5	8.2	292	292	2	289			
	Jul	158.3	190.0	8.4	108	108	1	107			
	Aug	122.3	146.7	0.2	-40	0	0	0			Empty
	Sep		0.0	122.0	122	122	1	121			
	Oct		0.0	40.7	162	162	1	160			
	Nov		0.0	71.2	231	231	2	230			
	Dec		0.0	135.7	365	365	3	362		230	
1978	Jan		0.0	134.6	497	497	4	493			
	Feb		0.0	87.3	560	560	5	555	20		
	Mar		0.0	64.1	560	560	5	555	59		
	Apr	25.0	30.9	65.5	560	560	5	555	61		
	May	89.5	107.4	23.7	472	472	4	468	19		
	Jun	131.4	157.7	2.4	312	312	3	310			
	Jul	164.5	197.4	2.4	115	115	1	114			
	Aug	78.2	93.8	54.3	74	74	1	74			
	Sep		0.0	114.8	189	189	2	187			
	Oct		0.0	61.4	248	248	2	246			
	Nov		0.0	37.6	284	284	2	282			
	Dec		0.0	126.3	408	408	3	404		159	
1979	Jan		0.0	52.6	457	457	4	453			
	Feb		0.0	27.2	480	480	4	476			
	Mar		0.0	6.1	483	483	4	479			
	Apr	28.0	33.6	35.0	480	480	4	476			
	May	92.8	111.4	11.2	376	376	3	373			
	Jun	131.5	157.8	1.3	216	216	2	214			
	Jul	151.6	181.9	9.8	42	42	0	42			
	Aug	65.1	78.1	41.7	6	6	0	6			
	Sep	10.5	12.6	30.1	23	23	0	23			
	Oct		0.0	22.8	46	46	0	45			
	Nov		0.0	41.9	87	87	1	87			
	Dec		0.0	38.5	125	125	1	124		0	
1980	Jan		0.0	221.2	345	345	3	342			
	Feb		0.0	130.6	473	473	4	469			
	Mar		0.0	200.8	560	560	5	555	110		
	Apr	21.6	25.9	95.3	560	560	5	555	91		
	May	81.2	97.4	45.8	504	504	4	499	41		
	Jun	99.7	119.7	54.4	434	434	4	431			
	Jul	159.3	191.2	11.2	251	251	2	249			
	Aug	117.7	141.3	7.2	114	114	1	113			
	Sep	18.9	22.6	56.2	147	147	1	146			
	Oct		0.0	47.0	193	193	2	191			
	Nov		0.0	195.8	387	387	3	384			
	Dec		0.0	249.3	560	560	5	555	73	315	
1981	Jan		0.0	359.5	560	560	5	555	355		

	Feb		0.0	260.2	560	560	5	555	256		
	Mar		0.0	177.9	560	560	5	555	173		
	Apr	69.3	83.2	15.8	488	488	4	484	11		
	May	52.5	63.0	129.0	550	550	5	545	53		
	Jun	120.3	144.4	26.5	427	427	4	424	12		
	Jul	121.7	146.0	97.3	375	375	3	372			
	Aug	117.1	140.6	10.5	242	242	2	240			
	Sep		0.0	417.7	560	560	5	555	98		
	Oct		0.0	98.7	560	560	5	555	94		
	Nov		0.0	163.9	560	560	5	555	159		
	Dec		0.0	473.5	560	560	5	555	469	1679	
1982	Jan		0.0	119.3	560	560	5	555	115		
	Feb		0.0	43.2	560	560	5	555	38		
	Mar		0.0	60.1	560	560	5	555	55		
	Apr		0.0	97.4	560	560	5	555	93		
	May	76.3	91.6	32.6	496	496	4	492	28		
	Jun	123.1	147.7	9.6	354	354	3	351			
	Jul	119.9	143.9	46.9	254	254	2	252			
	Aug	110.1	132.1	11.4	131	131	1	130			
	Sep	53.7	64.5	0.0	66	66	1	65			
	Oct	5.5	6.6	14.9	74	74	1	73			
	Nov		0.0	44.2	117	117	1	116			
	Dec		0.0	72.1	188	188	2	187		329	
1983	Jan		0.0	169.3	356	356	3	353			
	Feb		0.0	154.9	508	508	4	504			
	Mar		0.0	14.3	518	518	4	514			
	Apr	20.6	24.7	86.1	560	560	5	555	40		
	May	46.9	56.3	97.7	560	560	5	555	93		
	Jun	92.2	110.7	60.1	505	505	4	501	55		
	Jul	148.9	178.7	24.4	346	346	3	343			
	Aug	103.4	124.0	26.3	246	246	2	244			
	Sep	29.1	34.9	34.3	243	243	2	241			
	Oct		0.0	126.7	370	370	3	367			
	Nov		0.0	184.2	551	551	5	546			
	Dec		0.0	73.0	560	560	5	555	59	247	
1984	Jan		0.0	68.0	560	560	5	555	63		
	Feb		0.0	48.2	560	560	5	555	44		
	Mar		0.0	70.8	560	560	5	555	66		
	Apr	4.8	5.7	68.1	560	560	5	555	63		
	May	77.7	93.2	26.9	489	489	4	485	22		
	Jun	115.8	138.9	14.3	360	360	3	357			
	Jul	114.4	137.2	46.0	266	266	2	264			
	Aug	92.1	110.5	25.1	178	178	1	177			
	Sep	48.0	57.6	4.5	124	124	1	123			
	Oct	5.0	6.0	13.2	130	130	1	129			
	Nov		0.0	36.8	166	166	1	164			
	Dec		0.0	13.3	178	178	1	176		259	
1985	Jan		0.0	119.6	296	296	2	293			
	Feb		0.0	52.4	346	346	3	343			
	Mar		0.0	28.0	371	371	3	368			
	Apr	44.4	53.3	34.5	349	349	3	346			
	May	96.0	115.2	14.0	245	245	2	243			
	Jun	120.7	144.9	12.9	111	111	1	110			
	Jul	146.6	175.9	20.5	-46	0	0	0		Empty	
	Aug	122.5	147.0	0.0	-147	0	0	0		Empty	
	Sep	36.0	43.2	17.9	-25	0	0	0		Empty	
	Oct		0.0	126.5	126	126	1	125			
	Nov		0.0	145.3	271	271	2	268			
	Dec		0.0	56.7	325	325	3	322		0	
1986	Jan		0.0	78.8	401	401	3	398			
	Feb		0.0	105.7	504	504	4	499			
	Mar	0.2	0.2	6.5	506	506	4	501			
	Apr	61.2	73.4	13.4	441	441	4	438			
	May	103.4	124.1	5.4	319	319	3	316			
	Jun	94.7	113.6	34.0	237	237	2	235			
	Jul	154.9	185.9	9.7	59	59	0	58			
	Aug	122.5	147.0	0.0	-89	0	0	0		Empty	
	Sep	51.1	61.4	2.1	-59	0	0	0		Empty	
	Oct		0.0	56.1	56	56	0	56			
	Nov		0.0	58.4	114	114	1	113			
	Dec		0.0	68.7	202	202	2	200		0	
1987	Jan		0.0	211.5	412	412	3	408			
	Feb		0.0	42.2	450	450	4	447			



	Mar		0.0	126.3	560	500	5	555	13		
	Apr	36.7	46.5	57.4	560	560	5	555	53		
	May	59.9	71.9	77.0	560	560	5	555	72		
	Jun	113.3	135.9	28.9	448	448	4	445	24		
	Jul	123.6	148.3	65.0	361	361	3	368			
	Aug	88.9	106.7	49.3	301	301	3	298			
	Sep	52.3	62.8	1.9	238	238	2	236			
	Oct		0.0	104.8	340	340	3	338			
	Nov		0.0	120.8	458	458	4	454			
	Dec		0.0	230.3	560	560	5	555	125	287	
1988	Jan		0.0	12.1	560	560	5	555	7		
	Feb		0.0	48.2	560	560	5	555	44		
	Mar		0.0	43.2	560	560	5	555	38		
	Apr	9.2	11.1	63.4	560	560	5	555	79		
	May	72.2	86.6	42.2	511	511	4	507	38		
	Jun	107.6	129.1	28.2	406	406	3	402			
	Jul	160.3	192.3	6.7	217	217	2	215			
	Aug	113.5	136.3	9.3	88	88	1	87			
	Sep	26.6	31.9	29.5	85	85	1	84			
	Oct		0.0	114.5	199	199	2	197			
	Nov		0.0	174.2	371	371	3	368			
	Dec		0.0	91.8	460	460	4	456		206	
1989	Jan		0.0	11.9	468	468	4	464			
	Feb		0.0	10.9	475	475	4	471			
	Mar		0.0	13.9	485	485	4	481			
	Apr	73.6	88.4	3.3	396	396	3	392			
	May	61.9	74.3	47.6	366	366	3	363			
	Jun	65.5	78.6	71.8	356	356	3	353			
	Jul	123.5	148.3	42.1	247	247	2	245			
	Aug	111.8	134.2	9.6	120	120	1	119			
	Sep	46.1	55.3	6.9	71	71	1	70			
	Oct		0.0	118.0	188	188	2	187			
	Nov		0.0	133.9	320	320	3	318			
	Dec		0.0	66.1	384	384	3	381		0	
1990	Jan		0.0	34.8	415	415	3	412			
	Feb		0.0	66.6	479	479	4	475			
	Mar		0.0	44.4	519	519	4	515			
	Apr	44.1	52.9	44.3	506	506	4	502			
	May	61.9	74.3	66.7	494	494	4	490	9		
	Jun	76.1	91.3	82.0	481	481	4	477	12		
	Jul	160.5	192.6	7.8	292	292	2	290			
	Aug	106.3	127.6	20.7	183	183	2	181			
	Sep		0.0	123.8	305	305	3	302			
	Oct		0.0	140.8	443	443	4	440			
	Nov		0.0	173.3	560	560	5	555	53		
	Dec		0.0	134.6	560	560	5	555	130	204	
1991	Jan		0.0	41.5	560	560	5	555	37		
	Feb		0.0	58.2	560	560	5	555	54		
	Mar		0.0	29.3	560	560	5	555	25		
	Apr		0.0	150.0	560	560	5	555	145		
	May	24.5	29.4	129.0	560	560	5	555	124		
	Jun	123.3	148.0	12.4	420	420	3	416	8		
	Jul	124.3	149.1	55.1	322	322	3	320			
	Aug	121.0	145.2	1.8	176	176	1	175			
	Sep		0.0	95.7	270	270	2	268			
	Oct		0.0	130.9	399	399	3	396			
	Nov		0.0	50.7	446	446	4	443			
	Dec		0.0	109.2	552	552	5	547		392	
1992	Jan		0.0	30.0	560	560	5	555	17		
	Feb		0.0	91.1	560	560	5	555	86		
	Mar		0.0	111.2	560	560	5	555	107		
	Apr	42.3	50.7	42.9	548	548	5	543	38		
	May	86.1	103.3	28.5	468	468	4	464	12		
	Jun	28.9	34.7	169.0	560	560	5	555	73		
	Jul	120.5	144.6	58.3	469	469	4	465	54		
	Aug	122.5	147.0	0.0	318	318	3	316			
	Sep	46.6	56.0	8.2	268	268	2	265			
	Oct		0.0	111.8	377	377	3	374			
	Nov		0.0	60.9	435	435	4	431			
	Dec		0.0	95.4	527	527	4	522		387	
1993	Jan		0.0	42.9	560	560	5	555	5		
	Feb		0.0	26.9	560	560	5	555	22		
	Mar		0.0	21.0	560	560	5	555	16		

	Apr	50.2	60.2	15.8	511	511	4	507	11		
	May	60.1	72.1	30.9	466	466	4	462			
	Jun	99.6	119.5	20.2	362	362	3	359			
	Jul	163.5	196.2	1.8	165	165	1	164			
	Aug	118.4	142.1	2.3	24	24	0	23			
	Sep	19.8	23.8	20.1	20	20	0	20			
	Oct	17.7	21.2	2.1	1	1	0	1			
	Nov		0.0	45.8	46	46	0	46			
	Dec		0.0	30.4	76	76	1	76		55	
1994	Jan		0.0	82.6	158	158	1	157	70		
	Feb		0.0	30.4	187	187	2	186			
	Mar		0.0	29.0	215	215	2	213			
	Apr	56.6	68.0	24.2	169	169	1	168			
	May	86.3	103.6	27.9	92	92	1	92			
	Jun	53.9	64.6	111.6	138	138	1	137			
	Jul	152.3	182.8	16.6	-29	0	0	0			Empty
	Aug	118.5	142.2	4.5	-138	0	0	0			Empty
	Sep	52.8	63.4	1.0	-62	0	0	0			Empty
	Oct		0.0	218.0	218	218	2	216			
	Nov		0.0	126.8	343	343	3	340			
	Dec		0.0	121.0	461	461	4	457		70	
Required, '000cum		22047.8		Total	164405	166615					
Provided, '000cum		20838.1		Not Provided	-1210						
Per-year-provided, '000cum		548.4									



**Table 19.7 Elevation and Reservoir Volume Calculation**

Depth m	Elevation m	Area m <sup>2</sup>	Average m <sup>2</sup>	Interval m	Volume m <sup>3</sup>	Accu. Volume m <sup>3</sup>
0	226	0	0	0	0	0
2	228	5,370	2,685	2	5,370	5,370
4	230	14,260	9,815	2	19,630	25,000
6	232	24,300	19,280	2	38,560	63,560
8	234	41,320	32,810	2	65,620	129,180
10	236	61,640	51,480	2	102,960	232,140
12	238	84,910	73,275	2	146,550	378,690
14	240	110,460	97,685	2	195,370	574,060
16	242	140,340	125,400	2	250,800	824,860
18	244	175,020	157,680	2	315,360	1,140,220

Note: This calculation based on Planning Report in 1996 and modified with reference to the topographic survey carried out in 1997 having contour of 5m interval.