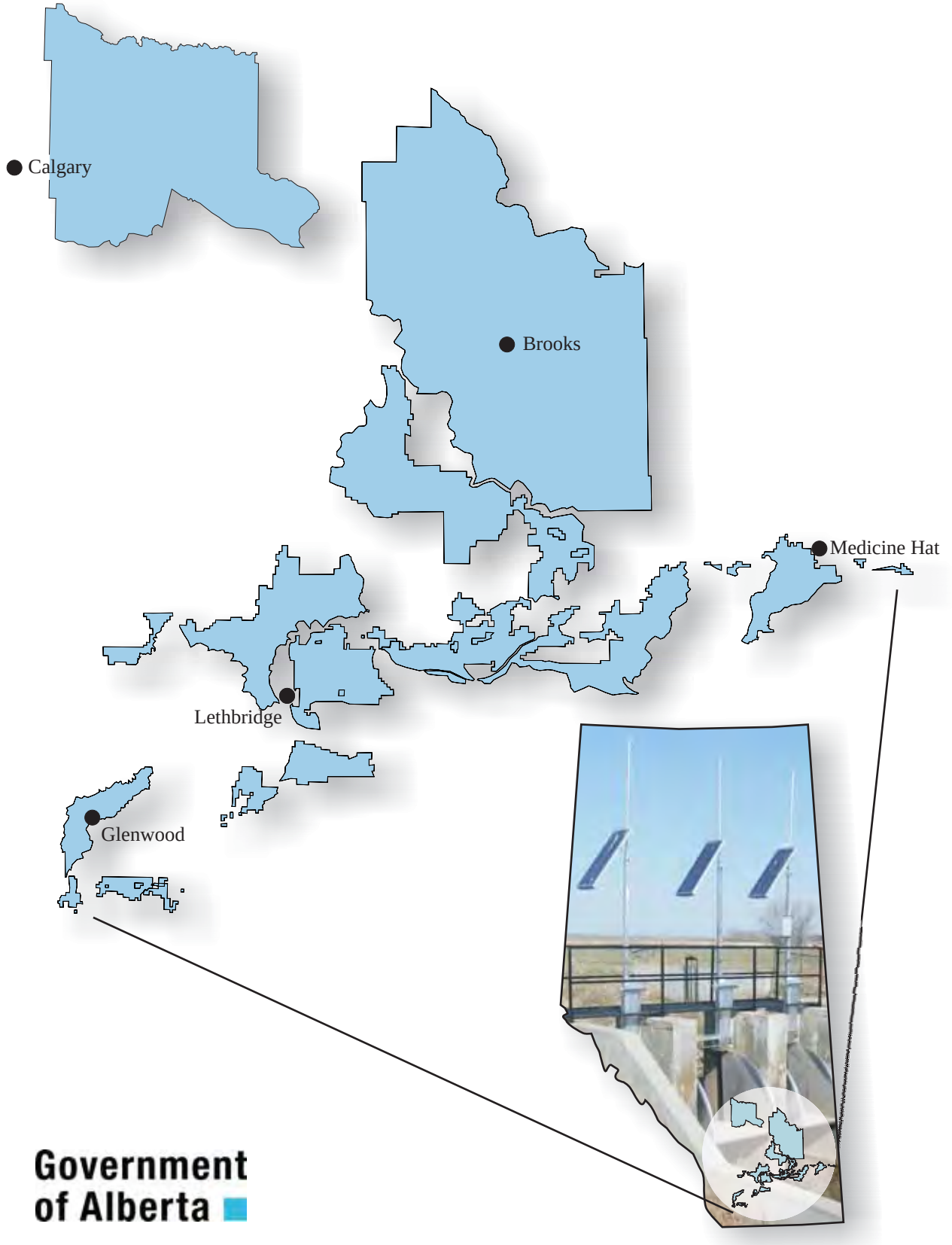
Alberta Irrigation Information
2009



Government of Alberta

ALBERTA IRRIGATION INFORMATION

FACTS AND FIGURES FOR THE YEAR 2009

WATER RESOURCES BRANCH

IRRIGATION AND FARM WATER DIVISION

JUNE 2010

This report is prepared by Alberta Agriculture and Rural Development. The purpose of this booklet is to provide a statistical overview of irrigation information and data relating primarily to the thirteen irrigation districts situated in southern Alberta, but also includes irrigation water use across the whole province.

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Select: Information ⇒ Soil/Water/Air ⇒ Irrigation

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LIST OF FIGURES

LIST OF TABLES

Table 1. Details of Crops Grown within the 13 Irrigation Districts in 2009

CROP TYPE		AID			BRID			EID			LID			LNID			MID			MVID			RCID			RID			SMRID			TID			UID			WID			TOTAL ACRES
		assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	assessed and covered by an irrigation system		assessed with no irrigation system	
		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		Irrigated this year	Not irrigated this year		
CEREALS	Barley	100			16,348	132		21,561			280			18,819	246		1,625	1,021		350						9,948		2,170	19,896	529	992	7,411	14		6,186		5,299	14,150	3,510		**130,588**
	CPS Wheat				509			5,866						1,556															2,120		148							3,858	2,366		**16,422**
	Durum Wheat				17,148	443		2,950			160			6,237	472		635									843		40	38,131		631	2,942	26		25			50	194		**70,925**
	Grain Corn				2,720			744																					4,582			162						120			**8,328**
	Hard Spring Wheat				39,592	419		45,682						5,870	108		2,024	417								3,695		729	49,479	1,593	2,254	15,044	159		1,386		916	3,718	2,270		**175,354**
	Malt Barley				127			556						296																	15									**994**
	Oats	120			619			1,652						620						124						60			734	302	45	432	96		7		20	389	110		**5,330**
	Rye				132			722						1,573			57												64	5								70			**2,623**
	Soft Wheat				10,806	148		1,252						628															8,614	177	218	980	120		80						**23,023**
	Triticale				311			4,041						2,788												260			1,069		33	91									**8,592**
	Winter Wheat				944	13		1,547									260	133											6,696	61	221	489			1,028		66				**11,457**
FORAGES	Alfalfa - Two cuts				6,512	299		42,267						11,068									644						12,412	305	226							15,632			**89,365**
	Alfalfa - Three cuts				1,369	20		3,108						651															693												**5,841**
	Alfalfa Hay	904			8,962	295		1,279						4,482	75		5,473	649		92						11,050		500	23,468	519	782	7,711	428		3,735		1,447	30	2,795		**74,676**
	Alfalfa Silage							4,000			1,020			15,272			71									630		100	2,131		231	451									**23,906**
	Barley Silage				5,127	47		3,128			216			37,312			293						157	55		2,405		180	10,987	104	521	889	55		567		100	2,715	1,582		**66,440**
	Barley Silage (underseeded)							720						1,470															467												**2,657**
	Brome Hay				149									1,328			135												724		84		100								**2,520**
	Corn Silage				6,838			9,517						18,185												1,722			15,784	90	770	3,621			100			550			**57,177**
	Grass Hay	288			1,650	207		10,149			1,012			4,357	66		169	240		2,053						289			5,160	258	835	389			387		224	92	859		**28,684**
	Green Feed	487			1,140			5,267			1,968			216	64		76			284						141		80	1,525	389	57	156			379		193	1,436	325		**14,182**
	Milk Vetch				132			32																																	**164**
	Millet							232																																	**232**
	Native Pasture				1,609	235		2,098						367						566									4,296	364	456	330	291		2,810		661				**14,083**
	Oats Silage				577			53																					248									133			**1,011**
	Sorghum/Sudan Grass							174																					281	30											**485**
	Tame Pasture	462			11,847	572		50,793						5,442	179		1,617	502						245		2,894		2,150	12,003	1,509	1,041	4,543	1,027		1,877		760	6,329	11,437		**117,230**
	Timothy Hay				731	48		1,495			50			7,217	85		65												4,128	22	115	1,643			1,098						**16,697**
	Tritcale Silage																												561		47										**608**
OIL SEEDS	Canola				27,025	287		26,478						19,504			1,794	423								5,825		180	55,984	424	1,021	4,124			2,311		1,112	10,504	5,655		**162,650**
	Flax				5,221			8,777						846			65									150			2,289	25	50	177						130			**17,730**
	Mustard																									120			545			107									**772**
	Safflower													158																											**158**
SPECIALTY CROPS	Alfalfa Seed				3,793	112		14,128																																	**18,033**
	Canary Seed																																								**0**
	Caraway Seed																												40												**40**
	Carrots							155																						10											**165**
	Catnip																												390												**390**
	Chick Peas																												589												**589**
	Dill																												817												**817**
	Dry Beans				11,854	13		1,327																					24,925	222	29	4,304									**42,674**
	Dry Peas				2,115			1,105						381															2,865	220	219	130			1,188		139	582	160		**9,103**
	Faba Beans				1,009			513																					402	3	6										**1,933**
	Fresh Corn (sweet)				292			135																					1,033			2,334									**3,793**
	Fresh Peas				1,327	8																							1,738		30	1,424									**4,527**
	Grass Seed				1,465			5,457									487												481		18	295			132						**8,335**
	Hemp							70																					1,434												**1,504**
	Lawn Turf				104									458												42			728	122		15						2,806			**4,275**
	Lentils																	50											260												**310**
	Market Gardens				59			81						48												50			207			5						50			**499**
	Mint																												3,756	33											**3,789**
	Monarda																																								**0**
	Nursery							419						7												50			359		2	29						637	586		**2,090**
	Onions																															584									**584**
	Potatoes				9,100	100		3,441						792															14,445	123		11,169						214			**39,384**
	Pumpkins																															175									**175**
	Safflower				262																																				**262**
	Seed Potatoes				152			289																					9												**450**
	Small Fruit				130												20												121		5	5	4		10						**295**
	Soy Beans				130			375																					260	67											**832**
	Sugar Beets				11,239	31		909						3,566															11,399	489		5,077									**32,710**
	Sunflower							647						180															365			260									**1,452**
OTHER	Miscellaneous													2,062						40									210	140	68	73	113		76		4				**2,787**
	Non Crop				104	3				126																			1	231	199		2,451									**3,114**
	Summer Fallow				303	173			2,371																				202	93	1,165		114									**4,421**
	Unknown (not reported)			1,338			18,255			6,924						1,151						191																				**27,859**
Total assessment roll acres		**2,361**	**0**	**1,338**	**211,578**	**3,606**	**18,255**	**285,191**	**2,371**	**7,050**	**4,706**	**0**	**0**	**173,755**	**1,295**	**1,151**	**14,866**	**3,434**	**0**	**3,509**	**0**	**191**	**0**	**1,101**	**0**	**40,174**	**0**	**6,129**	**352,104**	**8,457**	**12,531**	**77,571**	**4,998**	**0**	**23,383**	**0**	**10,943**	**64,196**	**31,849**	**0**	**1,368,091**
		3,699			**233,438**			**285,086**			**4,706**			**176,201**			**18,300**			**3,700**			**1,101**			**46,303**			**373,092**			**82,569**			**34,325**			**96,045**			**1,368,091**

Table 2. Summary of Crops Grown within the 13 Irrigation Districts in 2009

CROPS	IRRIGATION DISTRICTS													TOTAL ASSESSMENT ROLL ACRES
	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	
Cereals	220	90,410	86,573	440	39,212	6,172	474	0	17,745	138,606	27,966	15,014	30,805	**453,636**
	5.9%	38.7%	29.4%	9.3%	22.3%	33.7%	12.8%	0.0%	38.3%	37.2%	33.9%	43.7%	32.1%	33.2%
Forages	2,141	48,365	134,312	4,266	107,836	9,290	2,995	1,101	22,141	103,622	21,634	14,339	43,915	**515,956**
	57.9%	20.7%	45.6%	90.7%	61.2%	50.8%	80.9%	100.0%	47.8%	27.8%	26.2%	41.8%	45.7%	37.7%
Oil Seeds	0	32,533	35,255	0	20,508	2,282	0	0	6,275	60,336	4,408	3,423	16,289	**181,309**
	0.0%	13.9%	12.0%	0.0%	11.6%	12.5%	0.0%	0.0%	13.6%	16.2%	5.3%	10.0%	17.0%	13.3%
Specialty Crops	0	43,294	29,051	0	5,432	557	0	0	142	68,219	25,810	1,469	5,035	**179,009**
	0.0%	18.5%	9.9%	0.0%	3.1%	3.0%	0.0%	0.0%	0.3%	18.3%	31.3%	4.3%	5.2%	13.1%
Other	1,338	18,838	9,421	0	3,213	0	231	0	0	2,309	2,751	80	0	**38,181**
	36.2%	8.1%	3.2%	0.0%	1.8%	0.0%	6.2%	0.0%	0.0%	0.6%	3.3%	0.2%	0.0%	2.6%
TOTAL ASSESSMENT ROLL ACRES	**3,699**	**233,438**	**294,612**	**4,706**	**176,201**	**18,300**	**3,700**	**1,101**	**46,303**	**373,092**	**82,569**	**34,325**	**96,045**	**1,368,091**

Note: Assessment roll acres include "irrigation", "terminable" and "annual" acres

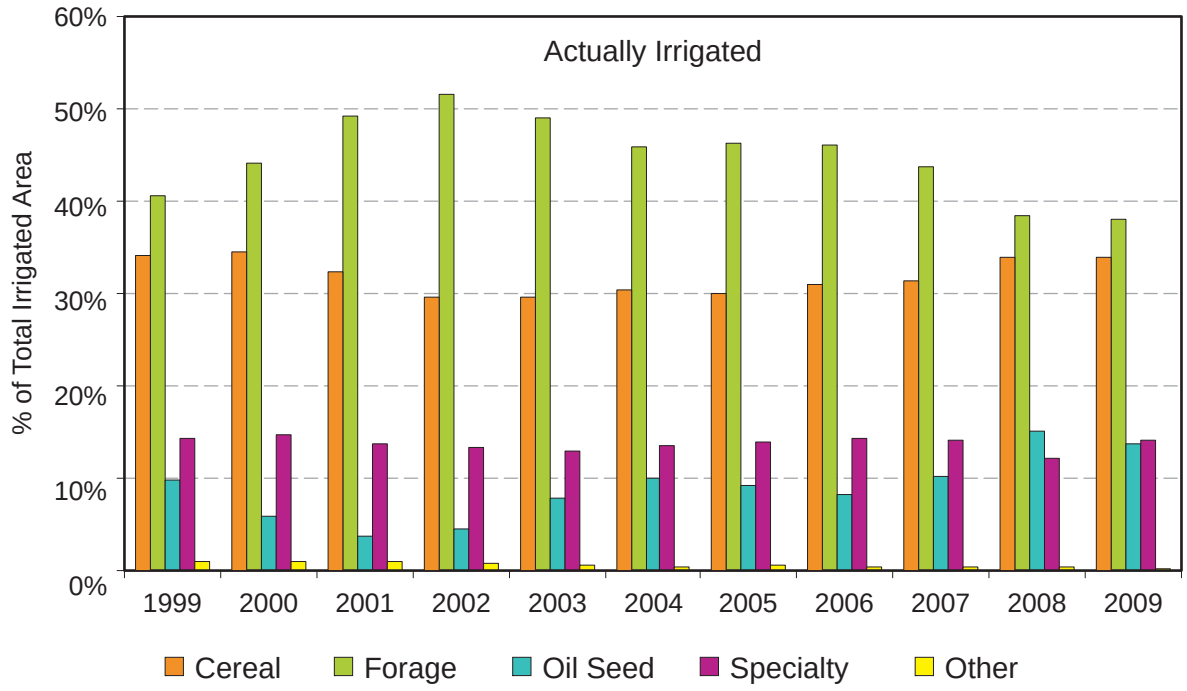


Figure 1. Irrigated Crops within the 13 Irrigation Districts in Southern Alberta (1999 - 2009)

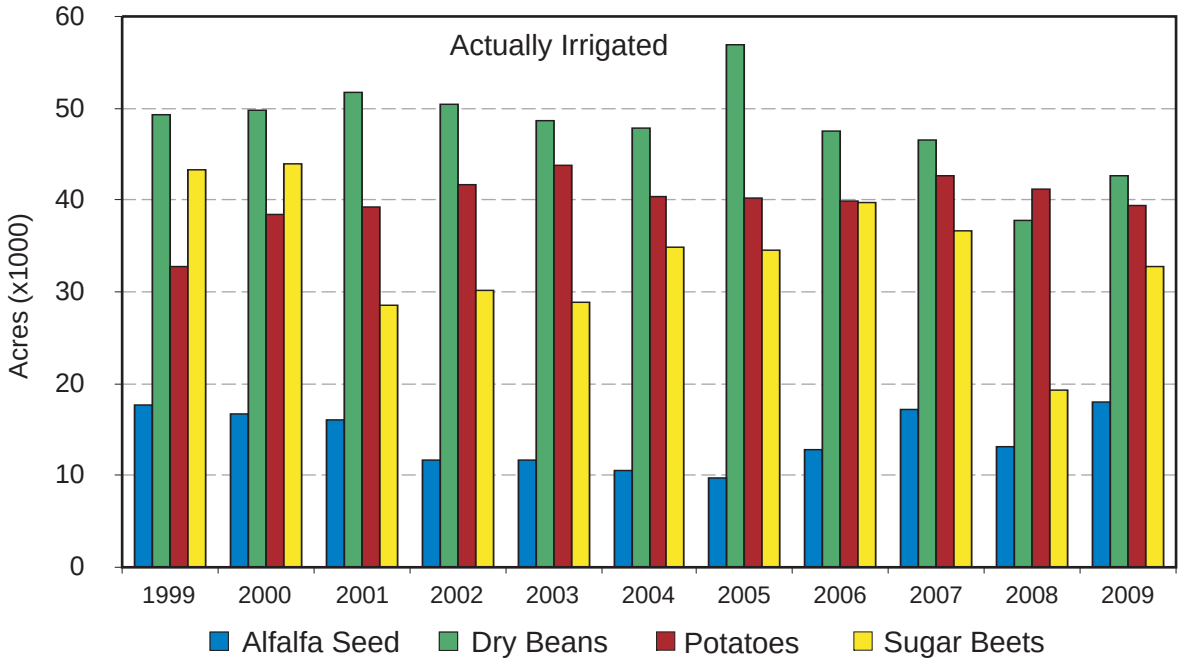


Figure 2. Acres of Four Major Irrigated Specialty Crops – Alfalfa Seed, Dry Beans, Potatoes and Sugar Beets within the 13 Irrigation Districts in Southern Alberta (1999 - 2009)

Table 3. **Alberta Potato Acreage** (seeded acres)

Year	Process	Seed	Table	Total
1990	15,383	5,117	7,882	28,382
91	12,300	5,735	6,509	24,544
92	9,700	5,515	6,970	22,185
93	13,115	5,850	6,115	25,080
94	13,210	7,390	6,075	26,675
1995	13,450	7,400	5,765	26,615
96	13,870	8,485	5,085	27,440
97	12,225	9,430	5,025	26,680
98	12,800	10,250	5,100	28,150
99	24,616	10,886	4,698	40,200
2000	32,563	12,037	4,331	48,931
01	34,877	12,595	3,883	51,355
02	37,296	14,644	3,241	55,181
03	40,960	13,690	4,125	58,775
04	38,077	11,062	3,508	52,647
2005	38,508	10,531	2,567	51,606
06	36,428	11,878	1,615	49,921
07	40,535	9,729	2,245	52,509
08	38,860	8,082	2,535	49,477
09	37,656	9,251	2,605	49,512

Notes: – data are obtained from the Potato Growers of Alberta
– the above acreage is from the whole province of Alberta, but does not include the potato acreage from market gardens of less than 5 acres
– typically, the processed and the table potatoes are irrigated

Table 4. **Alberta Processed Vegetable Acreage** (seeded acres)

Year	Carrots	Corn	Peas
1995	740	3,884	3,163
96	710	3,869	2,775
97	367	3,044	3,125
98	856	2,818	2,983
99	1,170	2,442	2,646
2000	854	2,577	2,563
01	994	3,992	3,967
02	479	3,712	4,053
03	441	4,329	4,534
04	1,009	3,365	4,534
2005	647	2,068	3,346
06	817	3,055	4,675
07	518	3,395	4,750
08	50	2,804	4,317
09	165	2,923	3,940

Notes: – data are obtained from the Alberta Vegetable Growers (Processing)
– processing is defined as fresh, canned, or frozen vegetables for human consumption
– all acres are irrigated

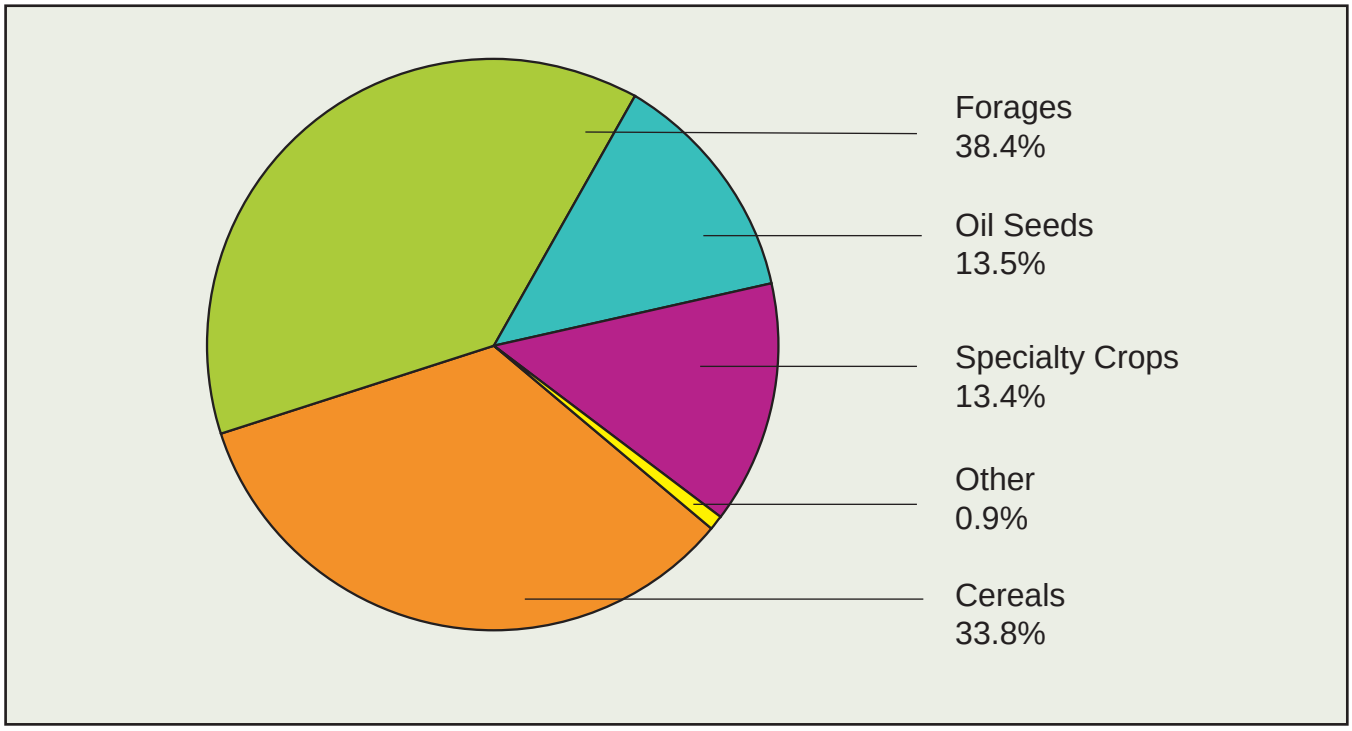


Figure 3. Irrigated Crop Mix within the 13 Irrigation Districts in Southern Alberta in 2009

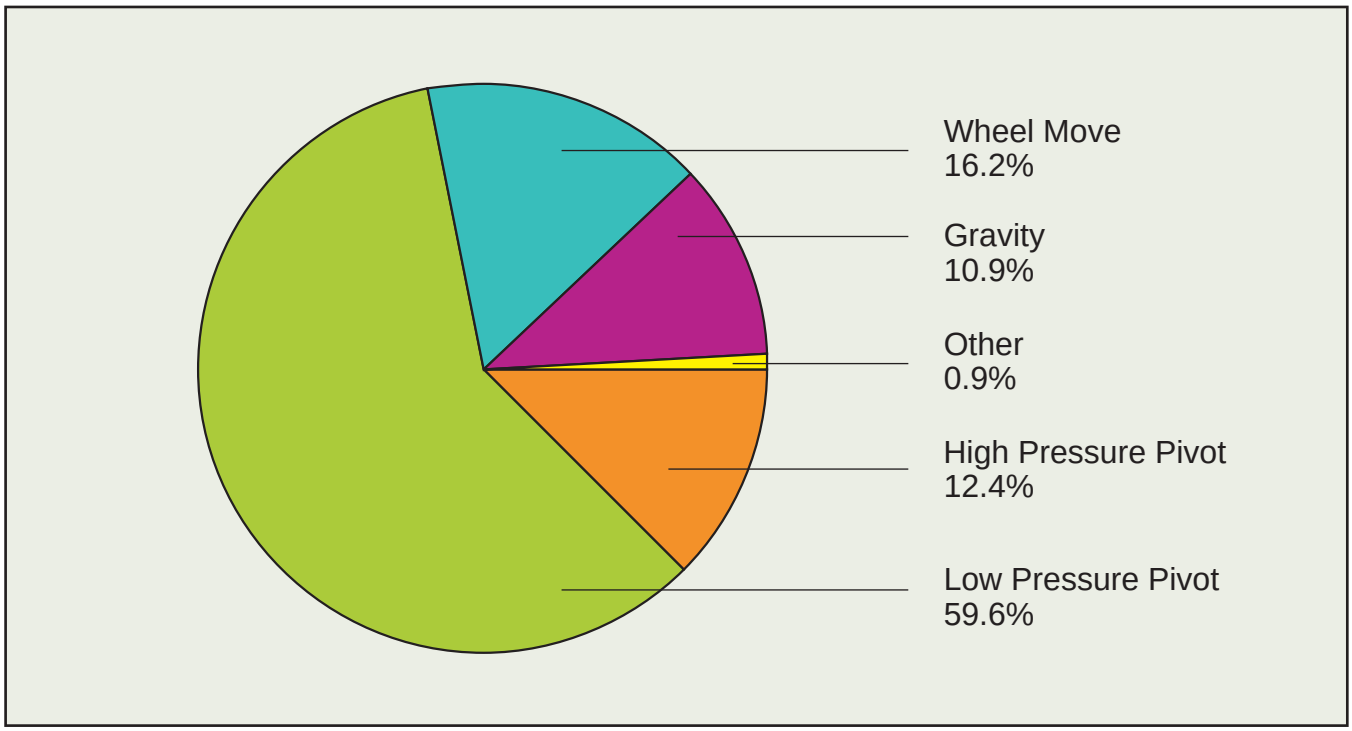
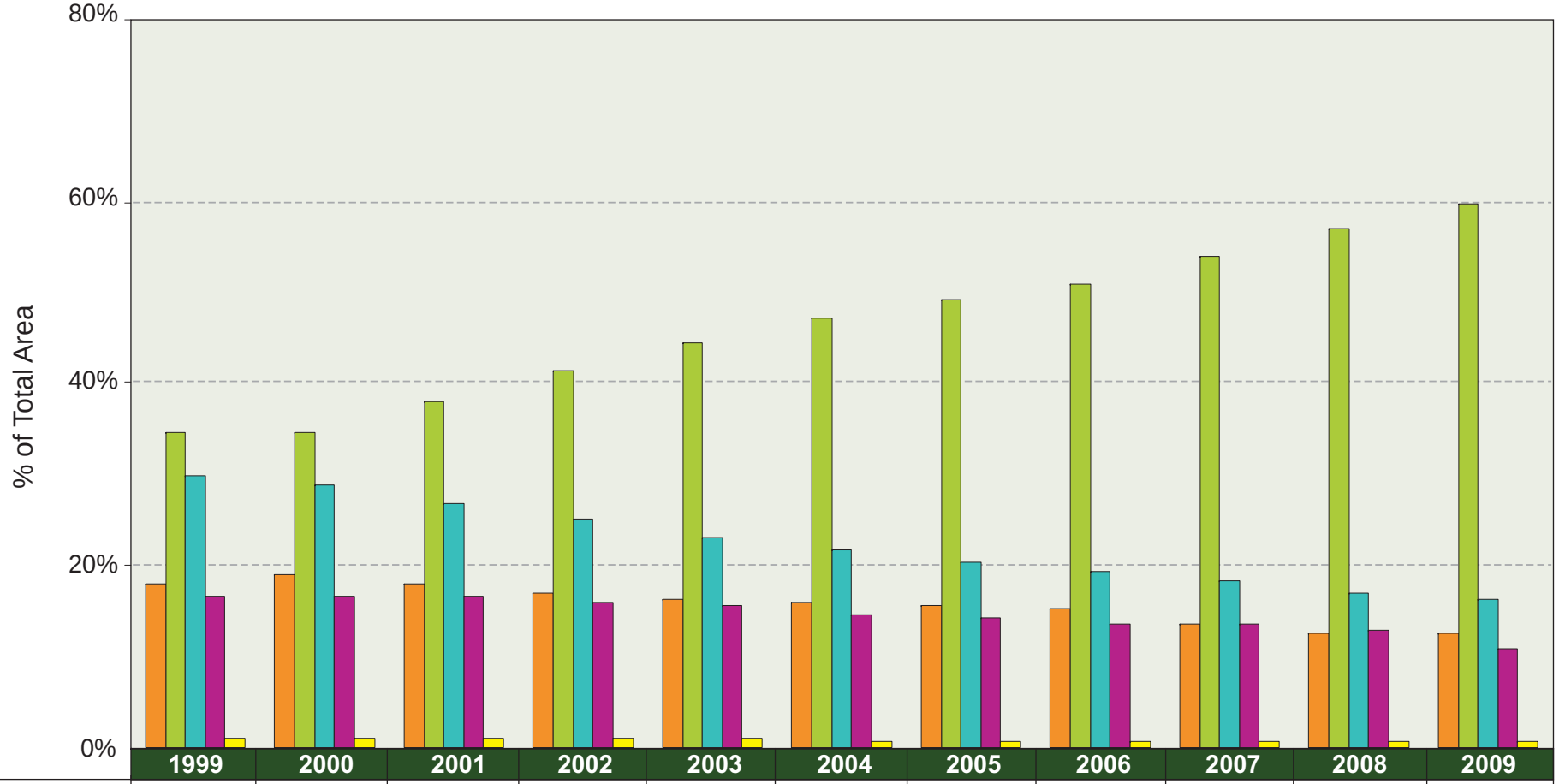


Figure 4. On-farm Irrigation Method Mix within the 13 Irrigation Districts in Southern Alberta in 2009

Table 5. On-farm Irrigation Method Summary within the 13 Irrigation Districts in Southern Alberta in 2009

IRRIGATION METHOD		AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	Individual Method Total	Total Acres Covered
HIGH PRESSURE PIVOT SPRINKLER	Pivot High Pressure	374	43,858	32,757	747	8,283	2,186		40		10,192	13,224	8,377	25,055	**145,093**	**160,664**
	Pivot High Pressure - Corner arm		3,862	3,510		4,324					1,408	1,171			**14,275**	
	Linear - High Pressure					873						109		341	**1,296**	
	percent of total -----	15.8%	22.2%	12.6%	15.7%	7.7%	11.9%	0.0%	3.6%	0.0%	3.2%	18.1%	34.5%	31.9%	**12.4%**	
LOW PRESSURE PIVOT SPRINKLER	Pivot Medium Pressure		2,216			696									**2,911**	**774,537**
	Pivot Medium Pressure - Corner Arm		425												**425**	
	Pivot Low Pressure		105,803	128,394	180	45,470	6,968		981	26,406	246,658	34,382	7,858	28,185	**631,285**	
	Pivot Low Pressure - Corner Arm		16,652	8,134		58,395				1,824	40,221	10,699	253	932	**138,110**	
	Linear - Low Pressure		124			336					931	249	86	80	**1,805**	
	percent of total -----	0.0%	58.2%	47.5%	3.8%	60.2%	38.1%	0.0%	89.1%	61.0%	79.8%	56.6%	33.7%	36.7%	**59.6%**	
WHEEL MOVE	Wheel Move -Two Laterals	1,157	12,442	24,985	1,251	22,557	5,358	417	40	11,932	41,746	15,564	1,906	12,555	**151,910**	**210,605**
	Wheel Move - Four Laterals		8,772	9,423	424	27,509	270			1,688	6,793	1,378	228	2,210	**58,695**	
	percent of total -----	49.0%	9.9%	12.0%	35.2%	28.5%	30.8%	11.9%	3.6%	29.4%	13.5%	21.1%	8.8%	18.6%	**16.2%**	
GRAVITY	Gravity - Developed - No Control			49,727	135	302	3,324			1,357	378	600	70	80	**55,973**	**141,884**
	Gravity - Developed - Controlled		16,074	15,591	85	1,031			40	1,587	1,302	1,300	312		**37,323**	
	Gravity - Undeveloped - Flood	474	4,651	14,242	1,771	972		3,093		1,055	8,915	1,256	4,998	7,079	**48,505**	
	Gravity - Undeveloped - Subsurface					3							30	50	**83**	
	percent of total -----	20.1%	9.6%	27.7%	41.8%	1.3%	18.2%	88.1%	3.6%	8.6%	2.9%	3.9%	22.3%	9.1%	**10.9%**	
OTHER	Volume Gun - Stationary		6								152	10		95	**264**	**11,935**
	Volume Gun - Traveller		40	285		144					117	46		747	**1,379**	
	Solid Set (underground sprinkler)			8		532					254		36	202	**1,032**	
	Hand Move (sprinkler above ground)	356	46	632	170	1,005	174			447	1,357	130	130	639	**5,086**	
	Micro - Spray - Sprinkler		212			41					24	15	5	76	**372**	
	Micro - Drip - Trickle						20			7	121			1,252	**1,400**	
	Other Application Use					2,402									**2,402**	
	percent of total -----	15.1%	0.1%	0.3%	3.6%	2.3%	1.1%	0.0%	0.0%	1.0%	0.6%	0.3%	0.7%	3.8%	**0.9%**	
Total Acres Irrigated		**2,361**	**215,183**	**287,688**	**4,763**	**175,872**	**18,300**	**3,510**	**1,101**	**46,303**	**360,569**	**80,133**	**24,290**	**79,551**	**1,299,624**	**1,299,624**



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
High Pressure	18.1%	18.8%	17.8%	16.8%	16.2%	15.9%	15.5%	15.2%	13.5%	12.5%	12.4%
Low Pressure	34.4%	34.6%	38.0%	41.4%	44.4%	47.1%	49.0%	50.8%	53.8%	56.9%	59.6%
Wheelmove	30.0%	28.9%	26.7%	24.9%	23.1%	21.7%	20.5%	19.4%	18.2%	16.9%	16.3%
Gravity	16.5%	16.7%	16.5%	15.9%	15.5%	14.7%	14.2%	13.7%	13.7%	13.0%	11.0%
Other	1.1%	1.0%	0.9%	0.9%	0.9%	0.7%	0.8%	0.8%	0.8%	0.8%	0.7%

Figure 5. Irrigation Method Summary within the 13 Irrigation Districts in Southern Alberta (1999 - 2009)

Table 6. Assessment Roll Acres within the 13 Irrigation Districts

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
1970	6,673	23,783	199,729	4,523	89,360	8,506	3,719	2,068	20,847	197,540	57,484	33,353	44,006	691,591
71	6,548	24,071	200,459	4,343	89,883	8,105	3,719	2,068	20,349	199,572	59,172	33,353	43,949	695,591
72	3,131	24,196	202,225	4,305	89,379	9,042	3,719	2,068	20,269	204,051	59,833	33,353	43,899	699,470
73	3,081	26,756	205,481	4,305	98,206	9,182	3,719	2,068	20,647	216,136	61,692	33,353	43,919	728,545
74	3,081	118,741	207,245	4,421	105,958	9,077	3,717	2,068	23,257	237,244	63,823	34,034	44,219	856,885
1975	3,081	131,764	212,982	4,430	108,106	8,871	3,720	2,068	26,920	252,019	62,692	33,358	45,311	895,322
76	3,081	139,665	219,405	4,430	109,629	9,069	3,720	2,069	28,350	262,231	66,423	33,358	52,190	933,620
77	3,081	147,795	224,967	4,430	111,735	9,480	3,720	1,319	31,626	274,301	68,178	33,617	68,549	982,798
78	3,104	153,120	227,202	4,431	111,947	10,737	3,717	1,776	31,570	284,151	68,815	33,651	71,603	1,005,824
79	3,104	150,160	227,254	4,477	111,924	10,797	3,710	1,776	31,524	287,329	69,828	33,546	74,525	1,009,954
1980	3,104	164,889	229,110	4,477	112,562	10,797	3,710	1,776	33,681	293,126	70,368	33,544	76,029	1,037,173
81	3,096	174,641	230,553	4,457	113,845	10,963	3,710	1,776	35,385	299,548	70,819	33,417	79,633	1,061,843
82	3,127	179,613	239,651	4,423	114,919	11,647	3,710	1,716	39,130	301,446	71,529	33,383	81,864	1,086,158
83	2,916	181,174	244,099	4,440	116,745	12,357	3,710	1,776	39,148	313,728	72,623	33,448	81,480	1,107,644
84	3,051	183,529	244,243	4,440	117,869	13,047	3,710	1,776	41,729	319,712	72,971	33,534	82,974	1,122,585
1985	3,399	185,034	246,658	4,460	118,883	14,218	3,710	1,319	44,990	328,063	73,063	33,854	84,245	1,141,896
86	3,444	189,202	247,804	4,460	126,307	14,579	3,690	1,210	44,950	331,493	73,314	34,336	83,924	1,158,713
87	3,444	190,263	249,372	4,479	128,867	14,885	3,690	1,210	44,407	334,285	73,654	34,450	85,405	1,168,411
88	3,435	192,424	252,432	4,709	131,565	15,030	3,690	1,210	44,196	339,091	73,602	34,615	86,198	1,182,197
89	3,500	194,977	256,353	4,729	133,620	15,569	3,700	1,210	44,144	342,451	74,898	34,818	87,242	1,197,211
1990	3,500	199,980	260,523	4,742	135,632	15,099	3,728	1,210	44,044	349,849	74,568	34,769	88,480	1,216,124
91	3,527	201,070	263,889	4,762	137,719	16,665	3,728	1,210	44,305	350,108	77,740	34,687	88,112	1,227,522
92	3,519	202,499	269,462	4,800	139,688	16,391	3,734	1,210	44,279	351,393	78,177	34,868	87,949	1,237,969
93	3,519	204,466	270,008	4,780	138,095	16,775	3,737	1,210	44,229	353,039	78,412	34,772	87,453	1,240,495
94	3,519	205,983	272,024	4,780	141,517	16,785	3,727	1,210	44,219	353,466	78,629	34,438	86,725	1,247,022
1995	3,519	207,652	273,848	4,780	143,608	17,908	3,727	1,210	43,678	356,618	78,676	34,428	86,942	1,256,594
96	3,519	209,560	276,405	4,760	147,241	18,169	3,727	1,210	44,315	358,399	79,069	34,506	87,258	1,268,138
97	3,519	209,686	279,966	4,760	150,843	18,300	3,713	1,210	44,810	360,659	79,788	34,353	86,284	1,277,891
98	3,519	210,690	280,573	4,769	153,365	18,300	3,722	1,210	45,533	360,780	80,455	34,352	86,771	1,284,039
99	3,609	211,152	281,107	4,769	154,886	18,300	3,722	1,210	45,751	367,161	81,984	34,352	88,131	1,296,134
2000	3,609	210,352	281,720	4,763	157,825	18,300	3,722	1,210	45,888	369,771	82,257	34,329	87,236	1,300,982
01	3,611	209,927	281,710	4,763	163,878	18,300	3,712	1,210	46,235	370,925	82,261	34,329	87,924	1,308,785
02	3,611	214,279	282,516	4,763	163,870	18,300	3,712	1,210	46,304	371,319	82,284	34,423	96,512	1,323,103
03	3,611	214,585	282,961	4,763	164,288	18,320	3,712	1,210	46,304	372,114	82,562	34,423	96,646	1,325,499
04	3,611	216,533	283,625	4,763	175,568	18,320	3,712	1,210	46,296	372,979	82,515	34,093	96,535	1,339,760
2005	3,608	219,733	283,706	4,763	175,628	18,320	3,561	1,210	46,296	372,619	82,533	34,081	96,415	1,342,473
06	3,608	221,677	284,074	4,763	175,636	18,320	3,561	1,101	46,306	372,618	82,527	34,025	96,100	1,344,316
07	3,699	231,713	284,419	5,205	175,913	18,300	3,654	1,101	46,306	372,996	82,804	34,044	96,091	1,356,245
08	3,699	233,869	285,086	5,126	176,069	18,300	3,700	1,101	46,293	373,162	82,600	34,069	96,079	1,359,153
09	3,699	233,438	294,612	4,706	176,201	18,300	3,700	1,101	46,303	373,092	82,569	34,325	96,045	1,368,091

Notes: – BRID increased 94,000 acres in 1974 with the amalgamation of the BRID and the Bow River Project (Federal).
– Assessment roll acres include "irrigation", "terminable" and "annual" acres. Only "irrigation" and "terminable" acres are considered in district expansion limits.

Table 7. Acres Actually Irrigated within the 13 Irrigation Districts

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
12										76,200			500	**76,700**
13										76,200			2,600	**78,800**
14			7,806							76,200			8,448	**92,454**
1915			7,806							76,200			512	**84,518**
16			1,497							71,281			859	**73,637**
17			9,605							91,780			3,657	**105,042**
18			24,440							102,900			25,191	**152,531**
19			43,460							112,569			31,908	**187,937**
1920		4,240	60,762							60,893	2,000		4,083	**131,978**
21		9,400	88,299							75,550	10,352		33,618	**217,219**
22		9,509	93,375							75,558	13,122		49,752	**241,316**
23		11,249	42,928		6,963					72,345	3,625		3,074	**140,184**
24		9,720	84,200		29,991					71,700	13,051	5,264	24,297	**238,223**
1925		13,252	72,994		43,628					81,110	13,472	10,000	5,384	**239,840**
26		13,467	74,401		56,395					78,399	14,385	10,026	19,561	**266,634**
27		810	7,921		10,012	1,235				20,365	576	41	1,273	**42,233**
28		19,373	45,677		33,436	800			6,800	21,153	3,171	2,577	3,892	**136,879**
29		29,260	78,610		61,231	4,000			6,634	25,713	10,094	3,102	37,394	**256,038**
1930		31,207	89,913		70,007	5,161			7,000	67,004	19,322	5,847	41,570	**337,031**
31		29,803	90,724		70,408	3,400	300		9,000	68,089	19,914	12,983	47,593	**352,214**
32		26,379	90,651		41,842	4,000	800		10,000	68,000	18,998	11,500	8,680	**280,850**
33		22,440	96,019		62,416	4,000	1,168		12,000	70,000	18,854	10,500	40,812	**338,209**
34		22,705	101,566		54,200	4,000	1,950		13,000	70,000	18,490	10,000	31,131	**327,042**
1935		25,257	143,997		73,022	4,000	3,000		13,000	70,000	19,471	12,000	19,109	**382,856**
36		27,170	111,781		62,790	4,000	2,900		13,000	75,274	19,123	18,000	44,614	**378,652**
37		30,817	124,645		70,020	4,000	3,500		13,000	72,250	21,296	17,500	50,866	**407,894**
38		34,614	133,928		73,297	4,000	3,500		12,000	75,749	20,880	10,000	35,775	**403,743**
39		36,874	141,688		56,712	3,700	3,200		12,000	76,492	18,485	10,500	11,647	**371,298**
1940		37,906	146,211		72,492	3,700	3,000		13,000	76,639	21,391	10,500	20,134	**404,973**
41		35,312	156,501		63,575	3,700	3,400		14,000	76,579	15,103	11,000	20,144	**399,314**
42		37,946	166,453		31,102	3,700	3,400		10,000	57,575	14,108	12,000	9,194	**345,478**
43		35,143	168,496		67,777	3,500	3,254		12,000	75,707	20,935	12,000	7,666	**406,478**
44		37,266	167,094	526	75,927	3,500	3,400		12,000	75,725	21,325	13,000	20,000	**429,763**
1945		38,838	167,100	1,000	57,126	3,500	3,300		12,000	75,766	21,218	13,000	20,000	**412,848**
46		42,251	166,328	1,300	64,894	3,500	3,000		12,000	76,013	21,222	13,500	19,000	**423,008**
47		43,611	168,580	1,300	57,343	3,500	3,500		12,000	110,848	19,141	7,453	20,000	**447,276**
48		44,160	172,894	1,500	55,374	3,500	3,700		12,000	76,351	17,720	2,970	12,000	**402,169**
49		46,975	177,084	1,500	72,807	3,500	3,300		12,000	70,117	21,533	19,228	26,345	**454,389**
1950		36,508	180,000	2,500	78,721	3,500	3,300		12,000	77,674	21,864	9,758	23,100	**448,925**
51		24,283	183,316	941	21,979	3,500	100		12,000	83,682	8,739	1,869	1,000	**341,409**
52		40,416	149,289	941	35,314	3,500	3,350		12,000	86,297	21,251	6,072	700	**359,130**
53		40,000	114,776	980	37,409	5,000	3,392	1,100	13,000	76,624	22,503	8,894	500	**324,178**
54		40,000	187,612	254	58,745	7,000	3,392	2,100	16,000	102,266	27,224	10,333	1,500	**456,426**
1955		40,000	190,976	423	31,753	7,000	3,132	1,500	16,000	81,100	20,530	10,115	5,000	**407,529**
56		109,400	191,568	852	31,588	7,000	2,773	1,800	15,500	98,647	21,009	11,082	6,000	**497,219**
57		55,374	189,792	2,779	51,809	7,000	2,733	1,685	16,000	116,713	21,579	15,886	7,000	**488,350**
58		56,995	188,928	1,542	51,916	7,000	2,760	1,500	15,500	123,440	22,854	11,032	9,870	**493,337**
59	360	54,514	188,721	1,542	46,459	7,000	2,789	405	15,800	155,155	25,426	17,761	9,930	**525,862**
1960	440	71,392	189,761	1,542	71,006	5,000	2,789	200	15,200	179,477	29,448	16,536	12,000	**594,791**
61	1,800	80,603	189,421	1,542	73,637	6,000	2,760	200	18,300	157,300	30,747	23,095	23,000	**608,405**
62	2,177	83,259	190,866	4,187	73,317	7,000	2,760	200	18,500	155,500	36,029	28,465	30,000	**632,260**
63	2,315	87,267	192,324	4,511	63,000	7,250	2,789	200	18,500	170,000	33,902	27,012	25,000	**634,070**
64	2,523	86,034	193,381	4,511	70,575	7,500	2,789	200	18,000	170,000	39,015	19,376	24,000	**637,904**
1965	2,523	44,507	194,824	4,511	22,778	3,000	2,789	1,500	15,000	165,000	26,005	9,805	2,750	**494,992**
66	2,523	40,423	195,905	4,523	19,196	4,000	2,789	1,050	16,000	165,000	25,904	12,725	3,100	**493,138**
67	2,523	71,936	196,549	4,523	47,962	5,000	2,789	1,250	17,000	160,000	38,235	11,866	12,870	**572,503**
68	2,523	82,876	198,352	4,523	56,993	4,400	2,789	900	15,200	154,336	45,420	10,109	10,000	**588,421**
69	2,523	79,980	198,248	4,523	35,902	4,500	2,789	900	15,000	124,879	45,980	10,228	13,500	**538,952**
1970	2,523	77,580	199,729	4,523	49,783	5,000	2,789	1,000	15,000	134,982	50,094	15,019	15,000	**573,022**
71	2,424	81,018	166,219	4,343	60,207	5,500	2,789	1,100	15,000	149,444	52,185	14,417	16,000	**570,646**
72	2,400	82,928	175,915	4,305	58,817	5,750	2,000	675	15,000	147,884	52,470	11,061	17,000	**576,205**
73	2,400	98,185	183,279	4,305	80,995	5,600	3,720	800	15,000	176,120	58,826	22,233	19,000	**670,463**
74	2,424	108,021	188,657	4,305	90,085	6,000	3,737	700	18,000	190,017	60,981	11,710	22,000	**706,637**
1975	2,400	116,155	179,095	4,430	92,850	6,000	3,000	600	21,500	171,883	44,606	4,952	34,036	**681,507**
76	2,400	125,380	201,438	4,600	96,661	9,070	2,910	700	22,680	213,085	59,116	13,355	39,824	**791,219**
77	2,500	131,492	208,785	4,430	97,829	7,000	2,000	350	30,000	232,072	64,115	15,000	43,525	**839,098**
78	2,400	127,236	204,192	4,430	93,562	6,000	2,775	578	31,060	198,755	56,940	8,671	33,329	**769,928**
79	2,500	133,517	213,837	4,476	100,487	8,000	2,900	623	31,264	249,232	62,635	13,899	46,570	**869,940**
1980	2,500	134,493	212,524	4,476	95,979	8,000	2,900	600	19,137	251,914	63,202	12,607	43,986	**852,318**
81	2,500	140,300	216,200	4,476	90,552	8,650	2,783	0	19,462	259,564	66,206	15,064	28,389	**854,146**
82	1,200	152,144	216,620	3,000	104,533	8,500	3,154	650	25,169	268,916	67,305	10,054	41,996	**903,241**
83	1,200	168,461	231,125	3,000	108,141	9,000	3,154	650	28,055	288,969	68,474	12,734	46,638	**969,601**
84	1,200	173,334	238,000	3,000	102,301	10,200	3,154	600	34,728	300,071	69,847	12,313	46,638	**995,386**
1985	2,933	174,087	244,763	3,664	114,635	13,000	3,184	700	36,286	305,560	70,133	12,620	49,666	**1,031,231**
86	2,933	174,903	246,916	3,600	113,663	13,000	3,184	700	36,008	307,875	69,928	13,146	48,000	**1,033,856**
87	2,200	178,482	245,514	4,076	119,562	12,400	3,321	700	36,008	305,964	69,413	12,526	46,984	**1,037,150**
88	2,500	173,400	241,494	3,900	124,555	13,436	3,100	500	36,496	316,223	69,581	14,536	52,950	**1,052,671**
89	1,962	181,106	249,623	3,900	127,330	13,555	2,000	0	35,766	323,400	70,278	11,693	52,153	**1,072,766**
1990	2,446	183,147	253,261	4,500	127,439	14,000	2,500	0	36,911	338,274	73,329	11,523	49,000	**1,096,330**
91	2,473	182,932	246,083	4,200	130,989	15,000	2,880	650	32,847	319,745	73,169	11,548	48,300	**1,070,816**
92	2,519	182,543	256,342	4,200	131,305	15,240	2,880	0	36,788	324,477	74,229	15,499	43,889	**1,089,911**
93	0	184,463	259,778	0	67,565	0	0	0	0	262,718	66,158	0	40,007	**880,689**
94	1,940	187,247	259,942	4,200	133,803	11,425	3,277	734	36,291	330,949	73,949	14,255	47,335	**1,105,347**
1995	765	192,328	263,576	1,000	100,589	3,250	3,300	643	16,473	289,173	72,108	5,035	39,130	**987,370**
96	2,145	196,055	271,075	4,277	143,147	14,341	3,355	734	39,662	339,098	74,766	14,135	68,710	**1,171,500**
97	2,476	197,904	274,880	4,600	145,061	13,479	3,600	794	39,484	342,234	76,083	19,205	62,448	**1,182,248**
98	1,930	198,197	274,942	4,600	122,379	11,189	3,228	1,055	32,259	342,758	76,872	17,276	67,643	**1,154,328**
99	1,870	198,060	277,723	4,735	145,782	14,723	3,510	1,210	38,966	355,988	79,166	17,407	51,032	**1,190,172**
2000	2,361	199,873	278,956	4,763	154,300	15,427	3,510	0	42,062	352,372	79,206	19,741	64,414	**1,216,985**
01	3,155	201,859	279,354	4,763	160,657	17,520	3,510	0	39,326	339,666	76,653	21,708	71,158	**1,219,329**
02	2,422	202,807	281,070	4,763	162,624	14,717	3,510	1,149	37,221	342,053	76,245	20,364	75,635	**1,224,580**
03	2,386	202,974	280,624	4,763	162,779	15,579	3,510	1,194	42,210	351,257	76,884	22,660	67,540	**1,234,360**
04	2,386	203,007	283,625	4,763	175,406	14,489	3,510	800	38,461	353,085	76,277	21,735	54,666	**1,232,210**
2005	2,361	206,452	282,267	4,763	175,206	13,044	3,510	800	36,611	346,596	77,522	20,780	56,186	**1,226,097**
06	2,361	208,378	280,753	4,763	175,184	13,232	3,510	0	41,156	335,269	76,765	22,771	43,136	**1,207,278**
07	2,361	201,286	284,419	4,763	174,673	14,676	3,509	600	42,573	345,935	77,068	22,021	40,716	**1,214,600**
08	2,361	206,284	280,691	4,763	175,886	13,420	3,509	0	38,617	352,564	77,132	21,735	48,126	**1,225,088**
09	2,361	211,578	285,191	4,706	174,487	14,866	3,500	800	40,174	352,104	77,571	23,383	64,196	**1,254,916**

Table 8. Irrigation Districts Annual Water Rates ($ per assessed acre per year)

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID
1982	$2.50	$6.50	$6.50	$5.00	$12.00	$6.00	$3.00	$3.00	$6.25	$12.00	$10.75	$3.25	$6.30
83	$5.00	$9.00	$6.75	$8.00	$12.50	$6.00	$5.20	$3.00	$6.50	$12.00	$11.00	$3.25	$6.50
84	$6.00	$10.00	$7.00	$8.00	$12.50	$6.00	$5.20	$3.00	$6.50	$12.00	$11.00	$3.25	$6.75
1985	$6.00	$10.00	$7.00	$7.50	$12.50	$6.00	$5.20	$4.00	$6.50	$12.00	$11.00	$3.25	$7.25
86	$6.00	$10.00	$7.25	$7.50	$12.50	$6.00	$5.20	$6.00	$6.50	$13.00	$11.00	$3.25	$7.47
87	$6.00	$10.00	$7.50	$7.50*	$12.50*	$6.00	$5.20	$6.00	$6.50	$13.00	$11.00	$3.25	$7.47
88	$7.00*	$10.00	$7.50	$8.00*	$12.50*	$6.00	$5.20	$6.00	$6.50	$13.00	$12.00	$3.25	$7.70
89	$7.00*	$10.00	$8.00	$8.00*	$13.50*	$6.00	$6.20	$6.00	$6.50	$13.25	$12.00	$3.50	$8.00
1990	$8.00*	$10.00	$8.50	$8.00*	$13.50*	$6.00	$6.20	$6.00	$6.50	$14.00	$12.00	$3.75	$11.00
91	$8.00*	$10.00	$8.50	$7.00*	$13.50*	$6.00*	$6.20	$6.00	$6.50	$14.00	$12.00	$4.00	$13.00
92	$8.00*	$11.00	$8.50	$7.00*	$14.00*	$6.00*	$6.20	$6.00	$6.50	$14.00	$12.00	$4.25	$13.50
93	$8.00*	$11.00	$8.50	$7.00*	$14.00*	$6.00*	$6.20	$6.00	$6.50	$14.25	$12.00	$4.50	$13.50*
94	$8.00*	$12.00	$8.50	$7.00*	$14.00*	$6.50*	$6.20	$6.00	$7.00	$15.25	$12.00	$4.50	$14.75*
1995	$8.00*	$13.00	$8.50	$8.00*	$14.00*	$7.00*	$8.00	$8.50	$7.00	$16.15	$12.00	$4.50	$14.75*
96	$8.00*	$13.00	$8.50	$8.00*	$14.00*	$7.00*	$8.00	$8.50	$7.50	$16.15	$12.00	$6.50	$15.25*
97	$8.00*	$13.00	$7.50	$8.00*	$14.00*	$7.00*	$8.00	$8.50	$7.50	$16.15	$12.00	$6.75	$15.25*
98	$8.00*	$13.50	$7.50	$8.00*	$14.00*	$7.50*	$8.00	$8.50	$8.50	$16.65	$12.00	$7.00	$16.25*
99	$8.00*	$14.50	$7.50	$8.00*	$14.00*	$7.50*	$8.00	$8.50	$8.50	$17.00	$12.00	$7.25	$16.25*
2000	$8.00*	$14.50	$7.50	$8.00*	$14.00*	$7.50*	$8.00	$8.50	$8.50	$17.50	$12.00	$7.50	$16.25*
01	$8.00*	$14.50	$7.50	$8.00*	$14.00*	$7.50*	$8.00	$8.50	$8.50	$17.90	$11.00	$7.50	$16.25*
02	$8.00*	$14.50	$7.50	$8.00*	$14.00*	$7.50*	$8.00	$6.00	$8.50	$16.90	$11.00	$7.75	$16.25*
03	$9.00*	$15.00	$0.00	$10.00*	$14.00*	$8.00*	$8.00	$13.58	$8.50	$17.90	$11.00	$8.25	$16.25*
04	$9.00*	$14.50	$0.00	$11.00*	$14.00*	$8.00*	$8.00	$13.58	$9.50	$17.90	$11.00	$8.25	$16.25*
2005	$9.00*	$14.50	$0.00	$11.00*	$14.00*	$8.50*	$10.00	$13.58	$9.50	$17.90	$11.00	$8.25	$16.25*
06	$9.00*	$14.50*	$0.00	$11.00*	$14.00*	$8.50*	$10.00	$15.00	$9.50*	$18.50	$11.00	$8.25	$16.25*
07	$9.00*	$14.50*	$0.00	$11.00*	$14.00*	$9.00*	$10.00	$18.00	$9.50*	$18.75*	$8.00	$8.25	$16.25*
08	$10.00*	$14.50*	$0.00	$11.50*	$14.00*	$9.00*	$12.00	$21.00	$9.50*	$18.75*	$8.00	$8.50	$16.25*
09	$10.00*	$15.00*	$0.00	$11.50*	$14.00*	$9.00*	$12.00	$22.50	$9.50*	$19.00*	$8.00*	$8.50	$16.25*

Note: * The districts levy the following additional surcharges.

AID – $2.00 per acre for pipeline delivery in township 2
– $3.00 per acre for pipeline delivery in township 3
BRID – $0.60 per acre inch for volumes used on flood parcels over the annual allocation
LID – $3.00 per acre for pipeline delivery
LNID – $0.25 per psi for pressure pipeline
– $5.00 per acre inch for volumes over the annual allocation
MID – $1.00 per 10 psi for pressure pipeline
RID – $100 per acre inch for volumes over the annual allocation
SMRID – $100 per acre inch for volumes over the annual allocation
TID – $50 per acre inch for volumes over the annual allocation
WID – $0.31 per psi per acre

Table 9. Gross Annual Diversions To Alberta Irrigation Districts

DISTRICT	OLDMAN RIVER BASIN										BOW RIVER BASIN			TOTALS
	AID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	BRID	EID	WID	
WATER SOURCE	diversion from Belly River	diversion from Belly River	diversion from Oldman River	Alberta Environment Main Canal	diversion from Belly River	diversion from Gros Ck. & Ross Ck.	diversion from SMRID main canal	Alberta Environment Main Canal	diversion from SMRID main canal	diversion from Belly, & St.Mary Rivers	diversion from Bow River	diversion from Bow River	diversion from Bow River	
WATER LICENCE ALLOCATION (acre-feet)	9,000	12,000	334,450	34,000	8,000	3,000	81,000	722,000	158,000	66,210	450,000	762,000	158,400	2,798,060
YEAR	**VOLUME OF WATER DIVERTED (acre-feet)**													
76			154,844	9,295		1,981	36,414	339,188	86,330	14,998	321,000	565,100	153,222	1,682,372
77			169,436	18,439		2	48,317	423,509	122,209	31,050	344,000	572,100	137,008	1,866,070
78			85,934	4,378		2,489	12,848	202,066	35,303	10,620	207,000	387,100	102,959	1,050,697
79			138,630	13,059		5,561	24,521	303,097	94,736	23,517	266,000	542,846	138,630	1,550,597
1980			134,576	10,710		0	19,944	340,254	94,858	17,754	314,000	548,686	136,198	1,616,980
81			132,955	8,869		264	22,162	379,075	108,427	12,242	359,000	577,969	108,630	1,709,593
82			142,683	13,068		3,551	27,697	332,337	91,998	19,133	303,000	481,258	129,712	1,544,437
83			150,790	14,363		1,354	14,955	361,537	97,674	24,078	347,000	580,299	146,737	1,738,787
84			177,543	18,857		67	17,544	492,674	101,643	25,093	361,000	657,640	162,140	2,014,201
1985	5,020	8,500	184,029	18,533	4,250	3,827	27,302	425,500	95,751	24,193	358,722	655,188	158,897	1,969,712
86	4,074	6,858	182,159	14,114	3,212	1,832	22,045	406,536	101,597	20,106	311,000	680,592	131,333	1,885,458
87	4,392	5,644	181,934	14,649	3,180	1,321	40,559	426,434	98,621	19,958	309,000	639,928	129,712	1,875,332
88	6,910	9,398	222,936	22,918	6,066	256	60,531	563,621	121,668	30,462	423,000	730,274	171,868	2,369,908
89	4,613	3,517	198,789	12,338	2,750	122	30,728	504,255	78,396	18,372	333,000	605,148	122,416	1,914,444
1990	3,754	5,328	191,899	13,555	3,290	298	32,000	467,244	98,572	16,133	380,907	689,178	128,091	2,030,249
91	3,556	4,468	184,737	12,712	2,662	1,775	30,702	391,634	94,956	17,003	334,792	629,872	147,547	1,865,416
92	2,170	11,216	136,925	15,695	4,118	0	36,210	441,745	101,122	18,628	336,878	625,650	135,387	1,865,744
93	2,126	1,824	61,753	4,848	988	3,300	13,574	218,375	59,278	8,107	210,340	423,551	114,309	1,122,373
94	4,110	4,319	179,663	13,895	3,325	758	28,328	415,162	103,028	16,827	364,126	559,476	132,104	1,825,121
1995	1,802	1,548	110,114	4,248	861	208	19,953	390,285	79,818	7,710	302,305	602,098	116,254	1,637,204
96	4,035	4,892	206,206	12,506	2,660	1,085	45,527	498,483	127,436	19,832	328,182	615,478	117,065	1,983,387
97	6,051	5,193	188,378	12,564	1,529	1,760	38,043	455,300	115,582	20,364	343,380	593,782	116,740	1,898,666
98	4,874	5,331	157,758	9,671	2,323	1,726	33,834	405,000	116,300	14,895	303,565	638,500	142,367	1,836,144
99	3,485	11,415	196,906	25,178	2,499	1,700	42,960	411,532	105,208	20,900	298,524	426,788	88,410	1,635,505
2000	6,000	11,240	263,413	35,375	6,700	0	58,202	451,700	140,046	37,200	417,897	675,238	156,400	2,259,411
01*	3,952	7,593	308,236	21,173	6,814	0	40,207	325,700	94,770	27,526	413,780	685,000	160,000	2,094,751
02	2,938	9,835	112,143	10,788	3,033	N/A	23,552	466,700	53,324	21,283	333,541	430,000	149,577	1,616,714
03	4,598	7,964	201,812	20,711	5,889	N/A	49,723	330,600	86,500	32,500	279,798	459,700	128,700	1,608,495
04	3,440	5,425	166,276	12,391	2,660	N/A	28,224	367,500	64,399	21,600	230,817	417,370	114,000	1,434,102
2005	4,000	6,243	134,088	8,859	2,067	1,190	27,046	316,200	72,487	13,717	182,819	318,000	120,000	1,206,716
06	3,681	5,341	165,752	14,114	3,987	0	37,049	334,100	82,448	20,390	210,741	335,210	72,000	1,284,813
07	3,235	6,330	235,330	18,238	3,600	N/A	47,322	394,700	100,907	31,801	256,518	417,830	68,000	1,583,811
08	3,584	6,389	178,750	12,659	2,609	200	34,348	381,200	84,421	21,054	238,000	409,400	85,000	1,457,614
09	2,651	5,378	179,945	14,885	2,138	200	45,705	370,100	97,532	17,506	295,557	435,650	120,829	1,588,076
Percent of Licence (2009)	29.5%	44.8%	53.8%	43.8%	26.7%	6.7%	56.4%	51.3%	61.7%	26.4%	65.7%	57.2%	76.3%	56.8%
Average ** Volume	3,962	6,448	171,098	14,343	3,328	1,083	32,885	392,157	94,334	20,487	312,329	547,409	127,727	1,723,952

Notes: – Data are obtained from Alberta Environment for AID, LID, MVID, RCID, and UID, and Irrigation Districts for BRID, EID, LNID, MID, RID, SMRID, TID, and WID.
– RCID has a second supply from Ross Creek, but data has not been consistently recorded at that location.
– Diversion data represent the gross diversion into and through the works of the districts and include volumes used directly for irrigation purposes, reservoir filling and the water supplied or licensed to municipal, domestic, other agricultural, industrial and environmental uses.
– UID licence amended in 2004, re-allocating 1300 acre-feet of diversion authority to the Southeast Alberta Water Cooperative.
– *Water rationing in effect for MID, RID, SMRID, and TID in 2001.
– ** Average Volume 1976 - 2009

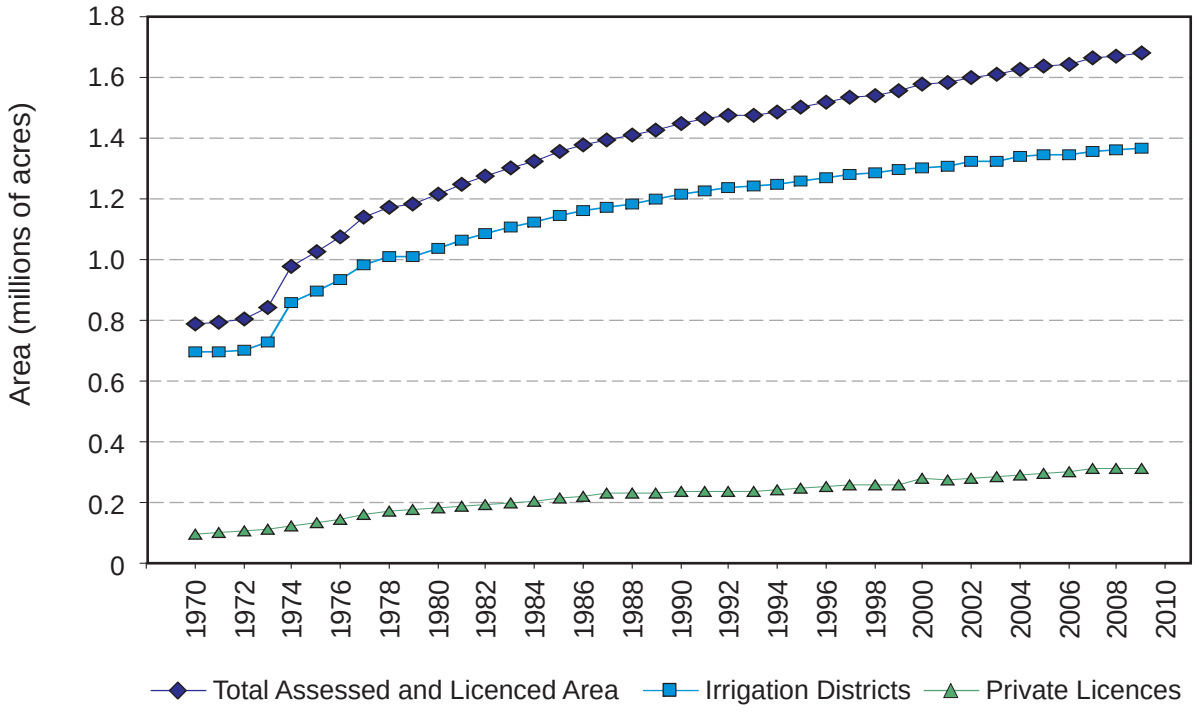


Figure 6. Growth in Irrigation Across Alberta (1970 - 2009)

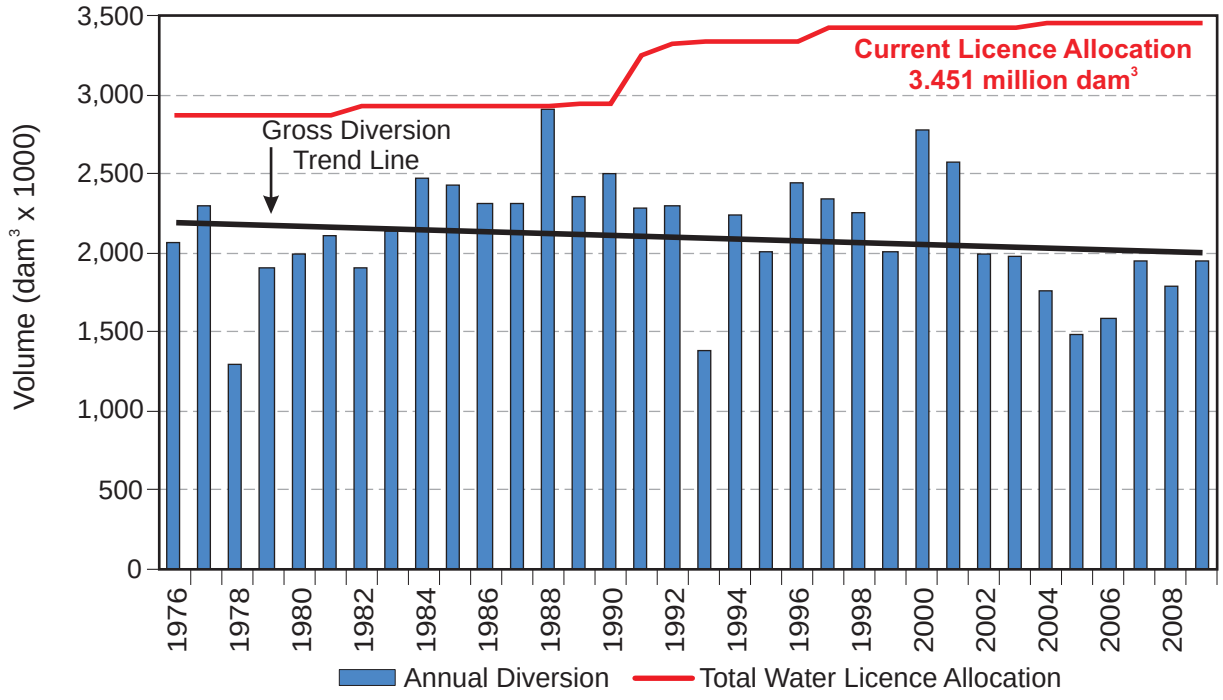


Figure 7. Gross Annual Diversions (1976 - 2009)

Note: The annual gross diversion volumes represent the gross volume of water diverted into the works of all 13 irrigation districts and includes water distributed for irrigation purposes, volumes which may have accrued as net gains in reservoir storage, and volumes diverted through the works of the districts for other uses such as domestic, municipal, other agricultural, industrial, recreational and habitat enhancement purposes.

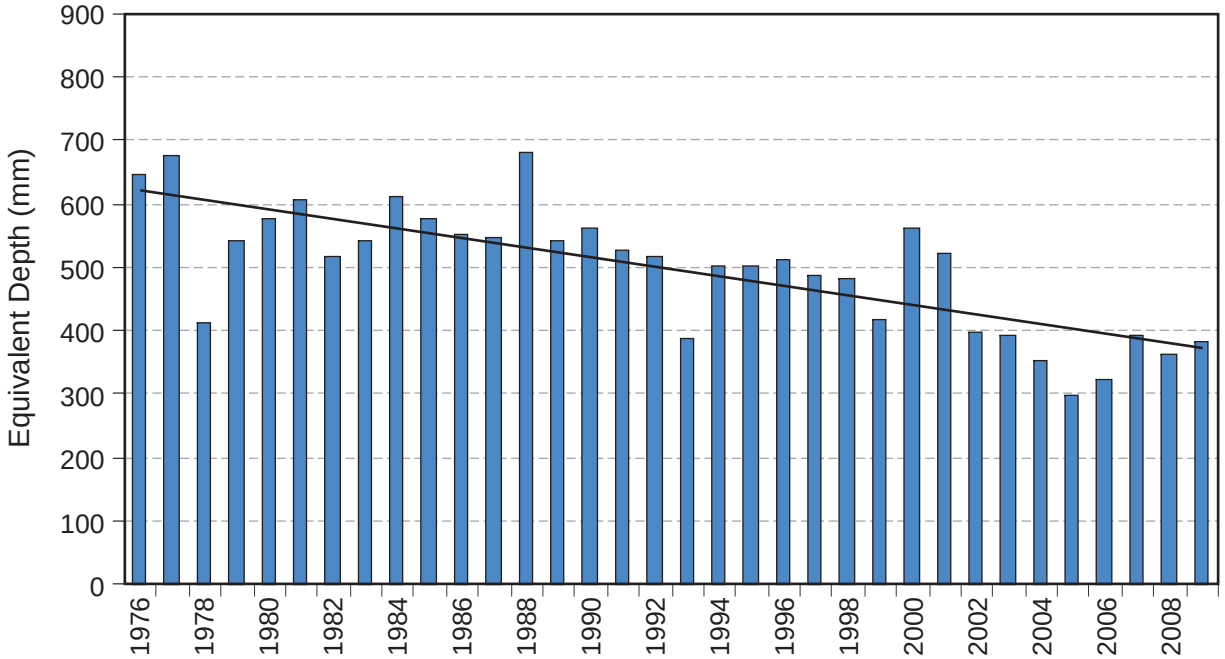


Figure 8. Gross Diversion Equivalent Depth (1976 - 2009)

Note: Irrigation district equivalent depth is the annual gross diversion of water (into the works of all 13 irrigation districts), divided by the area actually irrigated. However, this "depth" also includes water which may have accounted as net gains in reservoir storage, water diverted for other uses such as domestic, municipal, other agricultural, industrial, recreational and habitat enhancement purposes.

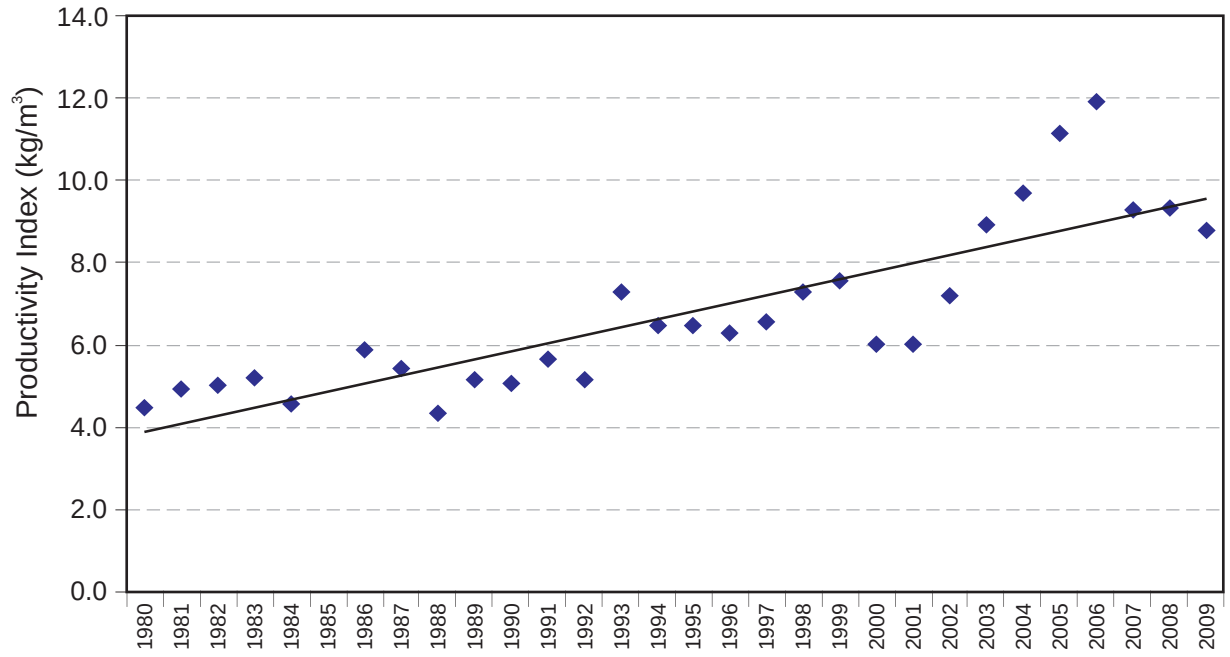


Figure 9. Irrigation District Water Use Productivity (1980 - 2009)

Note: Commodity yield per unit area divided by the volume of irrigation water diverted per unit area provides a measure of productive output per unit of irrigation water used. The historical yields of sugar beets (as recorded by the Alberta Sugar Beet Growers), the historical yields of potatoes (as compiled by the Potato Growers of Alberta) and the historical yields of soft white spring wheat (as provided by the Alberta Soft Wheat Growers) are tallied and then divided by the respective annual gross water diversions to the 13 irrigation districts to derive a 'Productivity Index".

Table 10. Conveyance Infrastructure by Type of Works in 2009

	REHABILITATED										UN-REHABILITATED		
Irrigation District	Membrane-Lined Canals		Pipelines - Closed		Pipelines - Open		Concrete - Lined		Earth Canals		Un-Rehabilitated Canals		Total Conveyance Works (km)
	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	Length (km)	% of District Works	
AID	4.5	11.3%	22.1	55.4%	0.2	0.5%	0.0	0.0%	1.0	2.5%	12.1	30.3%	**40**
BRID	171.5	16.8%	375.0	36.8%	13.3	1.3%	18.6	1.8%	224.0	22.0%	217.0	21.3%	**1,019**
EID	323.2	16.8%	942.0	49.0%	41.4	2.1%	0.0	0.0%	213.1	11.1%	403.2	21.0%	**1,923**
LID	2.0	3.7%	28.7	53.7%	0.3	0.6%	0.0	0.0%	11.7	21.9%	10.7	20.0%	**53**
LNID	56.8	7.6%	376.3	50.5%	12.6	1.7%	48.6	6.5%	68.1	9.1%	182.8	24.5%	**745**
MID	1.2	1.2%	55.6	55.6%	3.9	3.9%	0.3	0.3%	32.2	32.2%	6.8	6.8%	**100**
MVID	0.0	0.0%	15.0	37.8%	1.8	4.5%	0.0	0.0%	17.0	42.8%	5.9	14.9%	**40**
RCID	1.3	4.9%	12.2	46.4%	1.3	4.9%	0.0	0.0%	6.9	26.2%	4.6	17.5%	**26**
RID	0.0	0.0%	114.4	48.5%	6.7	2.8%	0.0	0.0%	89.5	37.9%	25.3	10.7%	**236**
SMRID	68.8	3.8%	800.8	44.1%	20.2	1.1%	85.8	4.7%	450.8	24.8%	390.7	21.5%	**1,817**
TID	57.9	17.3%	163.0	48.6%	11.7	3.5%	7.5	2.2%	69.5	20.7%	25.8	7.7%	**335**
UID	15.8	6.7%	66.4	28.1%	29.5	12.5%	0.3	0.1%	56.4	23.9%	68.0	28.8%	**236**
WID	36.5	3.4%	112.9	10.6%	36.7	3.4%	5.3	0.5%	157.0	14.7%	716.6	67.3%	**1,065**
Total	**740**	**9.7%**	**3,084**	**40.4%**	**179**	**2.3%**	**166**	**2.2%**	**1,397**	**18.3%**	**2,070**	**27.1%**	**7,636**
												Headworks Owned by Alberta Environment (AENV)	**339**
												Total Length of Conveyance System in Southern Alberta (km)	**7,975**

NOTE: Rehabilitated infrastructure includes those works re-constructed through:
- the Irrigation Rehabilitation Program (IRP)
- Alberta Environment's headworks improvement program
- individual district O & M program

Totals only include irrigation conveyance works, ie. does not include domestic water supply

Table 11. Irrigation District Infrastructure by Length and Replacement Cost in 2009

IRRIGATION DISTRICTS	CONVEYANCE WORKS (length - km) (replacement cost)	MAJOR STRUCTURES (number of units) (replacement cost)	DRAINAGE WORKS CONSTRUCTED (length - km) (replacement cost)	DRAINAGE WORKS NATURAL (length - km) (replacement cost)	TOTAL of ALL WORKS (length - km / structures) (replacement cost)
AID	40 $11,493,790	0 $0	0 $0	19 $305,485	**59 / 0** **$11,799,275**
BRID	1019 $381,739,257	22 $97,752,916	103 $5,238,836	505 $5,705,413	**1,626 / 22** **$490,436,422**
EID	1923 $660,952,326	61 $349,421,106	183 $8,173,672	1702 $15,529,139	**3,809 / 61** **$1,034,076,243**
LID	53 $12,800,754	0 $0	10 $435,135	0.4 $6,464	**63 / 0** **$13,242,353**
LNID	745 $249,870,712	2 $2,879,826	19 $890,974	229 $2,802,927	**994 / 2** **$256,444,439**
MID	100 $28,439,100	0 $0	13 $619,404	150 $2,139,413	**263 / 0** **$31,197,917**
MVID	40 $14,806,553	0 $0	1 $32,955	0 $0	**41 / 0** **$14,839,508**
RCID	26 $3,972,792	1 $135,000	3 $104,966	5 $19,809	**34 / 1** **$4,232,567**
RID	236 $58,853,798	0 $0	19 $965,324	184 $3,482,433	**440 / 0** **$63,301,555**
SMRID	1817 $615,087,364	48 $335,617,499	46 $3,174,394	346 $4,986,030	**2,209 / 48** **$958,865,287**
TID	335 $121,002,793	12 $14,168,210	57 $3,967,827	18 $194,411	**410 / 12** **$139,333,241**
UID	236 $75,806,205	11 $16,206,484	4 $313,856	56 $668,626	**296 / 11** **$92,995,171**
WID	1065 $325,954,081	13 $18,179,874	8 $664,247	865 $15,704,877	**1,938 / 13** **$360,503,079**
DISTRICT TOTALS	**7,635** **$2,560,779,525**	**170** **$834,360,915**	**466** **$24,581,590**	**4,080** **$51,545,027**	**12,181 / 170** **$3,471,267,057**

NOTE: – Constructed drainage works include both open channels and pipelines.
– Natural drains are those channels that exist as natural watercourses and provide a means to drain unused tailwater away from irrigated works.
– Total of All Works length values include the summation of conveyance and drainage works only.

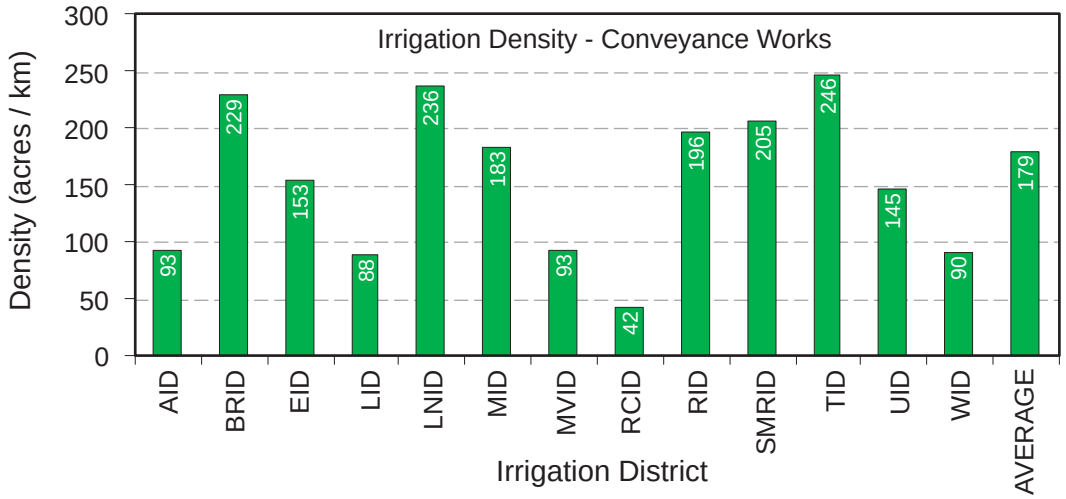


Figure 10. Density of Irrigation Area Relative to Infrastructure (2009)

Note: Irrigation Density is a measure of the "compactness" of an irrigation district. Greater compactness or being able to serve more irrigated area per unit of conveyance length is one factor that leads to opportunities for conveying water more efficiently.

Table 12. Summary of Condition Assessments (All Works by Replacement Cost)

Works Category	Good	Fair	Poor	TOTAL
Conveyance	$1,551,750,925	$877,115,605	$131,912,991	$2,560,779,521
Drainage	$14,914,993	$46,753,773	$14,457,849	$76,126,615
Major Structures	$526,840,690	$300,308,391	$7,211,834	$834,360,915
TOTAL	**$2,093,506,608**	**$1,224,177,769**	**$153,582,674**	**$3,471,267,051**
Proportion	60.3%	35.3%	4.4%	100%

Note: Construction and material costs are updated approximately every five years. The last valuation was done in 2006.

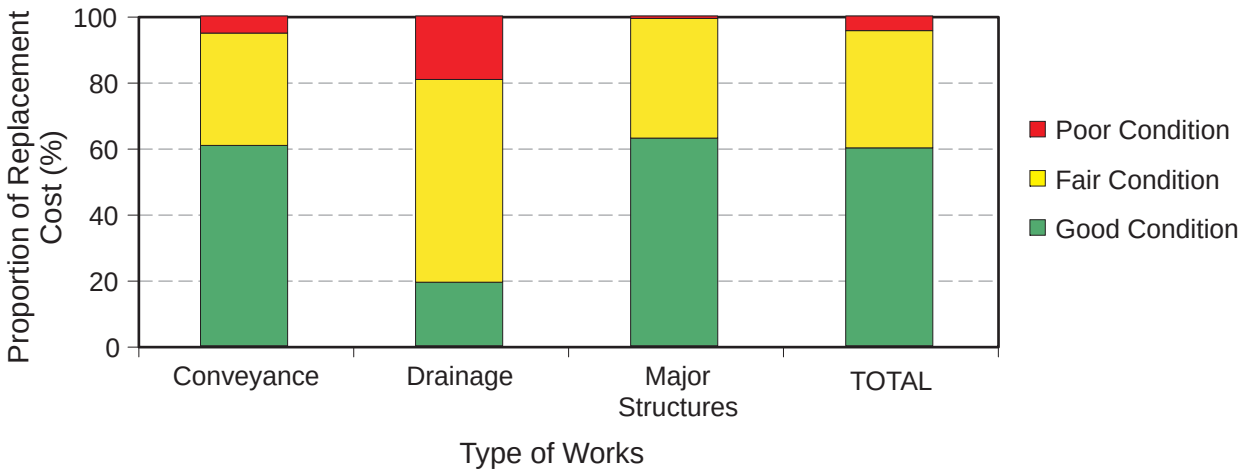


Figure 11. Irrigation District Infrastructure Condition Rating (2009)

Table 13. Irrigation District Reservoirs

Location	Reservoir	Approximate Date of Impoundment	Live Storage (dam^3)	Live Storage (acre-feet)
Bow River Irrigation District	Badger	1985	53,650	43,494
	'D' Reservoir	2005	395	320
	'H' Reservoir	1953	2,220	1,800
	Lost Lake	1973 - 1987*	5,050	4,094
	'PFRID' Reservoir	2005	586	475
	Scope	1953	19,740	16,003
	Total storage	-	81,641	66,186
Eastern Irrigation District	Bantry # 1	1968	617	500
	Bantry # 2	1967	5,550	4,500
	Cowoki Lake	1937	19,735	16,000
	Crawling Valley	1984	130,500	105,797
	'J' Reservoir	1949 - 1966*	615	500
	Kitsim	1980	26,520	21,500
	Lake Newell	1914	320,215	259,600
	One Tree	1935	2,345	1,901
	Rock Lake	1956	9,250	7,500
	Rolling Hills	1940 - 2003*	46,000	37,292
	Snake Lake	1997	18,230	14,779
	Tilley "A"	1972	33,300	26,996
	Tilley "B"	1973 - 1979*	38,235	30,997
	Total storage	-	651,112	527,862
Lethbridge Northern Irrigation District	Park Lake	1928	740	600
	Picture Butte	1936	1,600	1,297
	Vandenburg	1992	114	93
	Total storage	-	2,454	1,990
Raymond Irrigation District	Corner Lake	1925	495	400
	Craddock	1925	615	500
	Factory Lake	1925	370	300
	Total storage	-	1,480	1,200
St. Mary River Irrigation District	Bullshead	1954	125	101
	Chin	1954	190,330	154,300
	Cross Coulee	1954	2,590	2,100
	Forty Mile	1987	86,345	70,000
	Murray	1954	30,590	24,800
	North East	1954	2,095	1,698
	Raymond	1954	1,600	1,297
	Sauder	1953 - 1982*	37,745	30,600
	Seven Persons	1953	1,355	1,099
	Sherburne	1952	10,625	8,614
	Stafford	1954 - 1982*	23,315	18,900
	Yellow Lake	1952	18,130	14,690
	Total storage	-	404,845	328,199
Taber Irrigation District	Fincastle	1952	3,085	2,501
	Horsefly	1950	9,250	7,499
	Taber Lake	1955	6,415	5,200
	Total storage	-	18,750	15,200
United Irrigation District	Cochrane Lake	1923	3,100	2,513
Western Irrigation District	Chestermere	1944	5,180	4,200
	Langdon	1979	7,895	6,400
	Total storage	-	13,075	10,600
Grand Total	**-**	**-**	**1,176,457**	**953,751**

Note: – all reservoirs are off-stream storage sites

* denotes year of reservoir enlargement

Table 14. Provincially Owned and Operated Reservoirs

Source Supply for:	Reservoir	Approximate Date of Impoundment	Live storage (dam^3)	Live storage (acre-feet)
Bow River Irrigation District	Little Bow	1920	21,078	17,088
	McGregor	1914	351,059	284,604
	Travers *	1954	104,638	84,830
	Total Storage	-	476,775	386,522
Lethbridge Northern Irrigation District	Keho	1920	95,635	77,531
	Oldman River *	1991	490,180	397,390
	Total Storage	-	585,815	474,921
Ross Creek Irrigation District	Cavan	1950	4,625	3,750
Mountain View, Leavitt, Aetna	Payne	1942	8,690	7,045
St. Mary Project (SMRID, MID, TID, RID)	Jensen *	1948	19,000	15,403
	Milk River Ridge	1957	127,297	103,200
	St Mary *	1951	369,310	299,400
	Waterton *	1965	111,196	90,147
	Total Storage	-	626,803	508,150
Diversions Outside of Irrigation Districts	Chain Lakes *	1966	14,679	11,900
	Twin Valley Dam *	2003	62,700	50,831
	Pine Coulee	1998	51,000	41,346
	Women's Coulee	1949	362	293
	Total Storage	-	128,741	104,370
Grand Total	**-**	**-**	**1,831,449**	**1,484,759**

Note: – * denotes on-stream storage reservoir

Table 15. Hydroelectric Plants Associated with Water Distribution Works

Location	Owner	Capacity (megawatts)
Oldman Reservoir	ATCO Electric	32.0
Waterton Reservoir	Canadian Hydro	2.8
Belly River Chute	Canadian Hydro	3.0
St. Mary Reservoir	Canadian Hydro	2.5
Taylor Coulee Chute (Jensen Reservoir)	Canadian Hydro	12.7
Raymond Reservoir	Irrican	20.5
Chin Chute (Chin Reservoir)	Irrican	11.4
SMRID - Main Canal Drops #4, #5 and #6	Irrican	7.0

Table 16. Private Water Licences for Irrigation in Alberta

There are 2,930 individual irrigation projects, outside of the 13 irrigation districts, irrigating approximately 310,821 acres in Alberta. These projects vary in size from 1 acre to over several thousand acres of agricultural or horticultural production. Each of these projects is licensed to an individual, a group of producers or to private or public lands (ie. golf courses or parks). The agricultural feasibility of these projects is reviewed by Alberta Agriculture and Rural Development and the licencing is regulated by Alberta Environment.

RIVER BASIN	Total Acres Irrigated	No. of Licences 1 to 100 ac.	No. of Licences 101 to 300 ac.	No. of Licences over 300 ac.	Total No. of Licences
ATHABASCA RIVER	2,410	43	6	1	50
MILK RIVER	18,777	97	43	14	154
NORTH SASKATCHEWAN RIVER	27,888	326	56	15	397
PEACE RIVER	4,327	75	13	0	88
SOUTH SASKATCHEWAN RIVER					
- Bow River	28,732	155	61	20	236
- Little Bow River	30,785	128	67	23	218
- Lower Oldman River	15,993	22	25	11	58
- Red Deer River	45,938	425	90	19	534
- South Saskatchewan River	47,646	533	80	25	638
- Upper Oldman River	7,575	64	22	3	89
- Waterton / Belly / St. Mary Rivers	52,378	137	71	19	227
- Willow Creek	28,372	153	73	15	241
Total (2009)	**310,821**	**2,158**	**607**	**165**	**2,930**
2008	310,272	2,161	602	166	2,929
2007	310,733	2,157	601	166	2,924
2006	296,964	2,150	579	159	2,888
2005	293,055	2,138	572	154	2,864
2004	285,276	2,113	575	152	2,840
2003	283,254	2,108	571	149	2,828
2002	275,599	2,100	567	141	2,808
2001	272,353	2,085	558	143	2,786
2000	277,826	2,076	555	140	2,771
1999	257,258	1,863	509	137	2,509
1998	255,192	1,884	501	138	2,523
1997	253,868	1,893	486	129	2,508

Notes: – upper Oldman reach is defined as upstream of the Belly River confluence
– lower Oldman reach is defined as downstream of the Belly River confluence
– 25,000 acres from the Waterton / Belly / St. Mary Rivers category is for the Blood Tribe Agricultural Project
– does not include irrigation licences issued to irrigation districts in southern Alberta
– data are obtained from Alberta Environment
– licence authorization as of January 2009

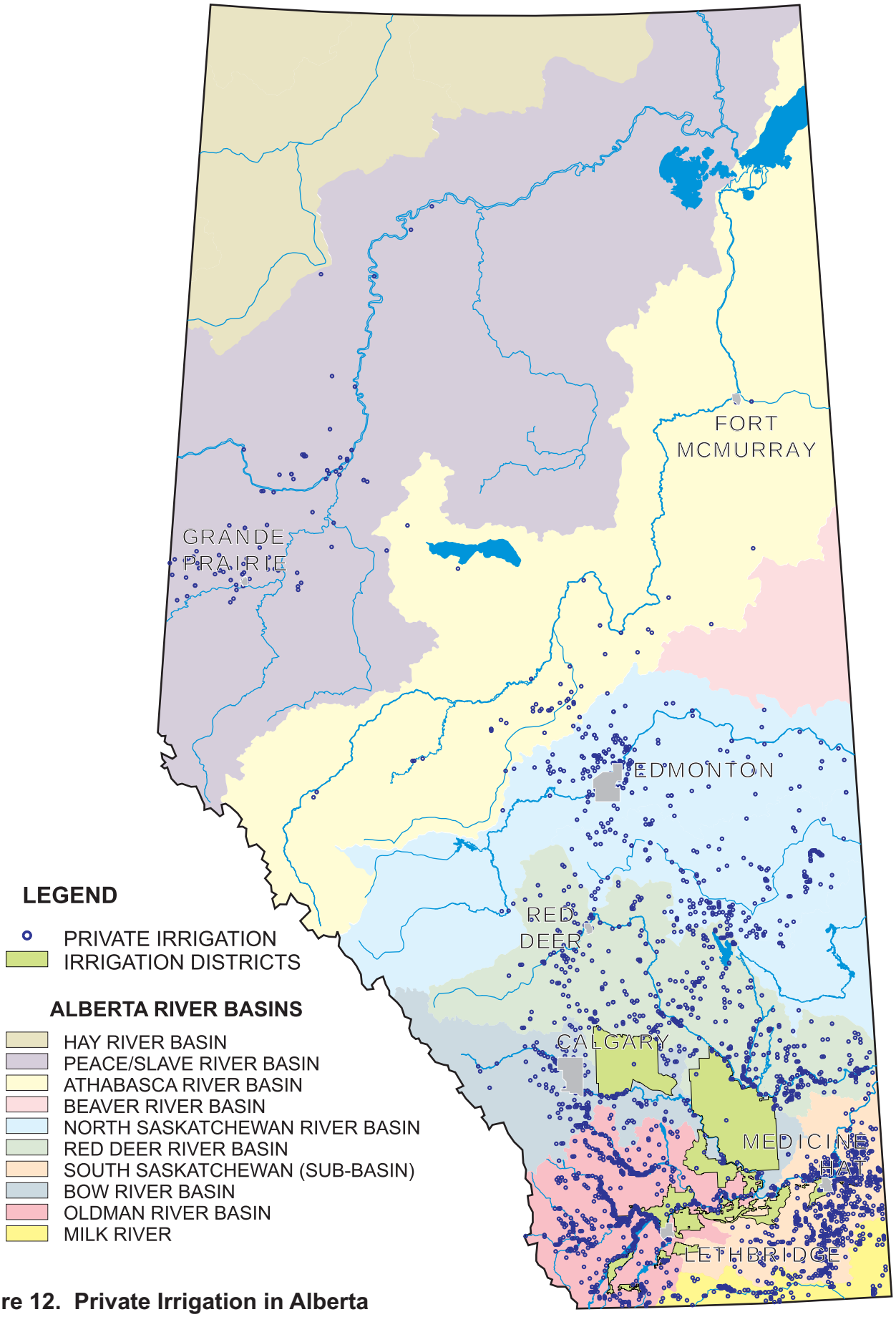


Figure 12. Private Irrigation in Alberta

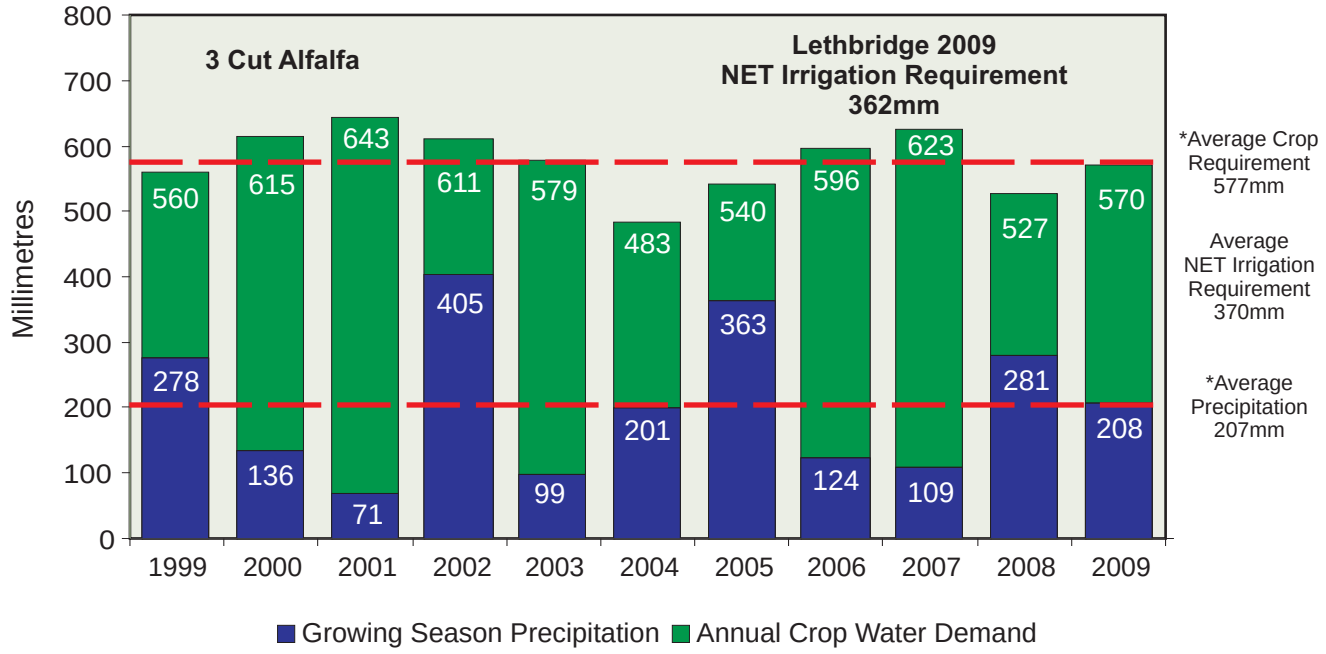
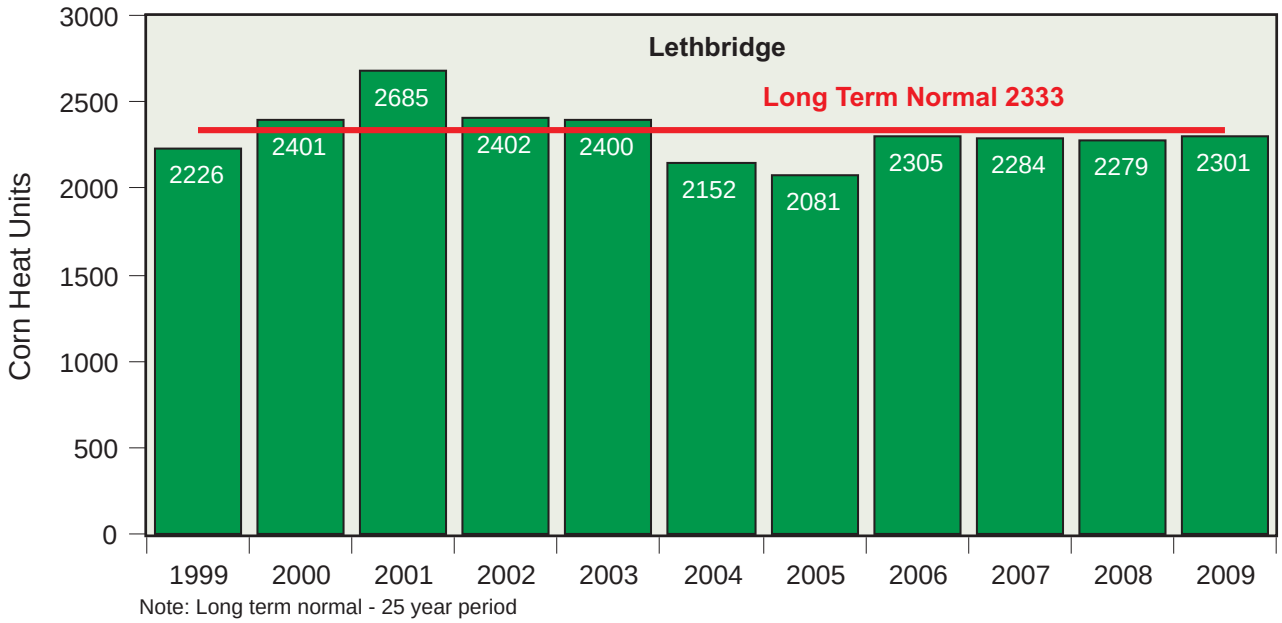


Figure 13. Lethbridge Optimum Crop Water and Net Irrigation Requirements (1999 - 2009)

Note: The high water use, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2009.



Note: Long term normal - 25 year period

Figure 14. Lethbridge Corn Heat Units (1999 - 2009)

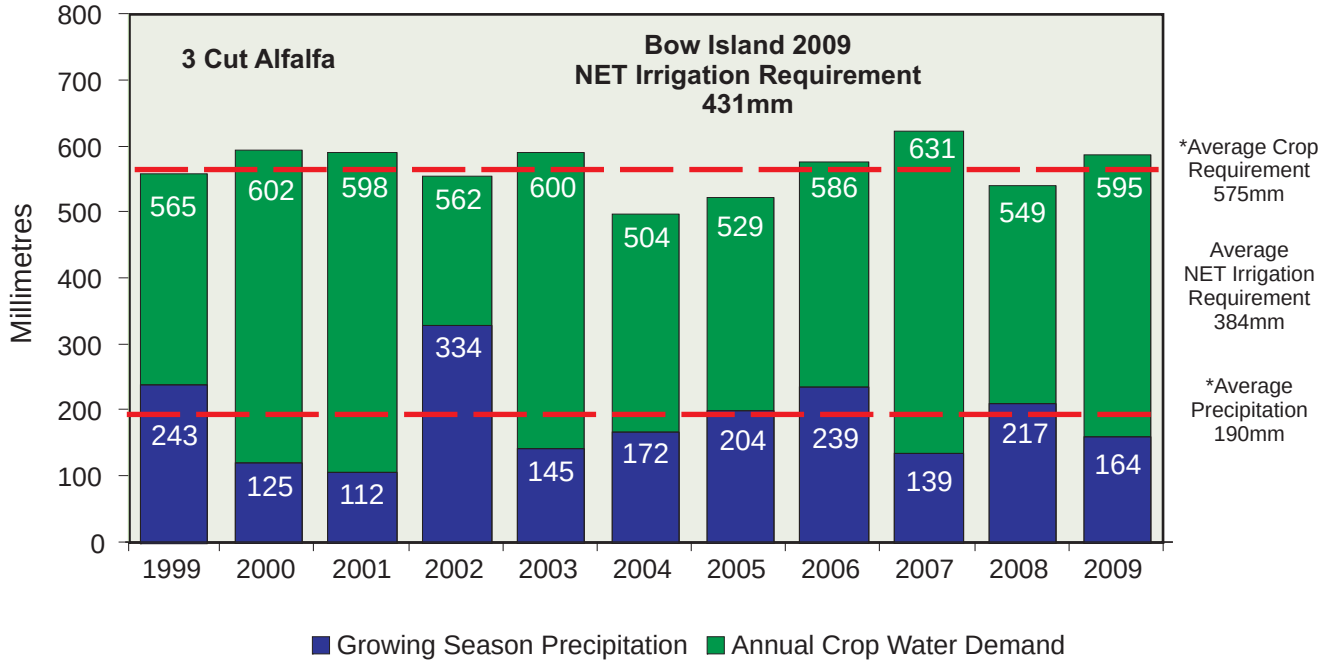
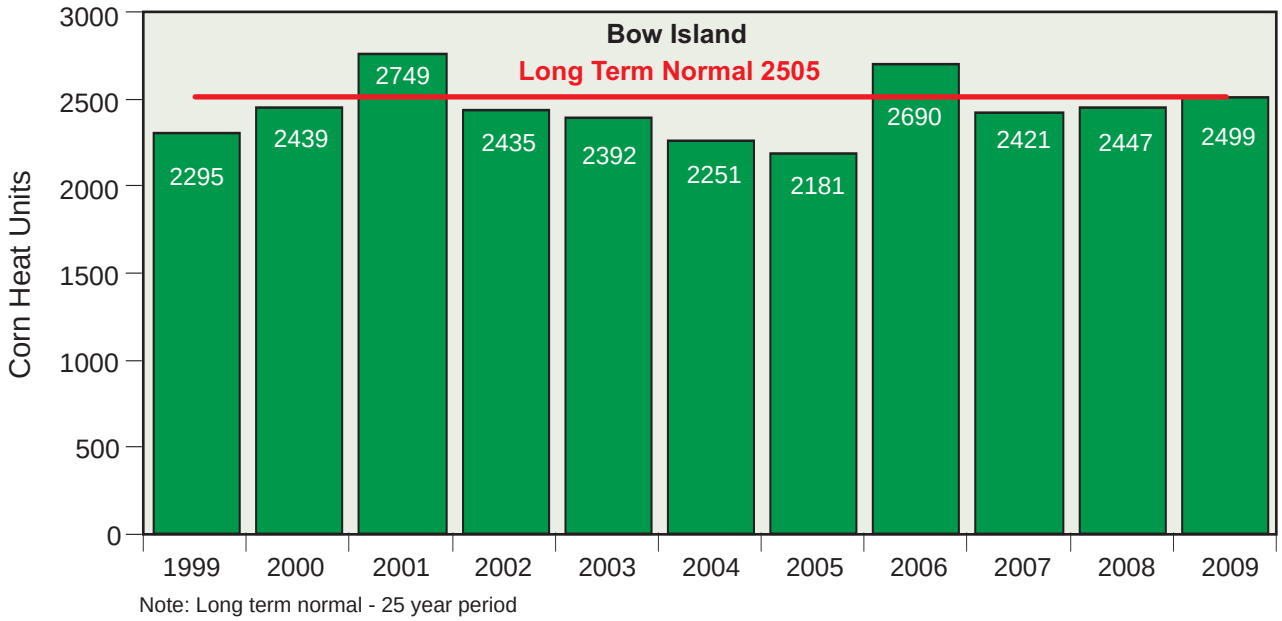


Figure 15. Bow Island Optimum Crop Water and Net Irrigation Requirements (1999 - 2009)

Note: The high water use, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2009.



Note: Long term normal - 25 year period

Figure 16. Bow Island Corn Heat Units (1999 - 2009)

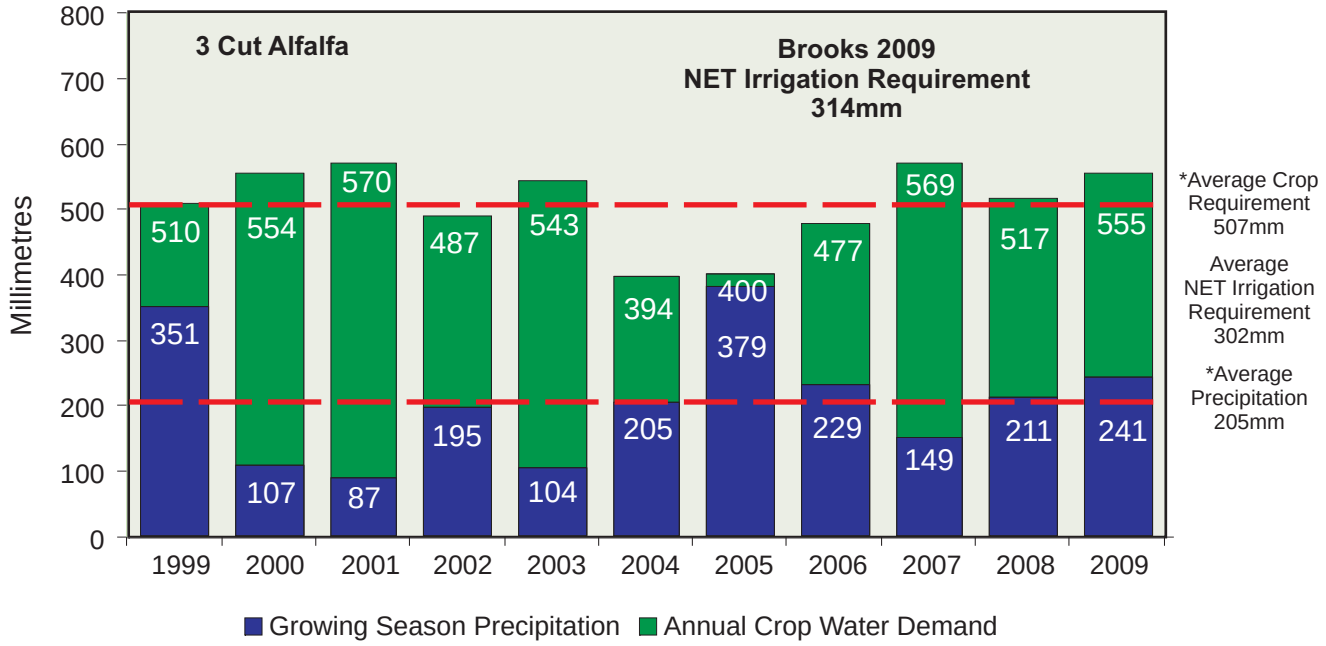
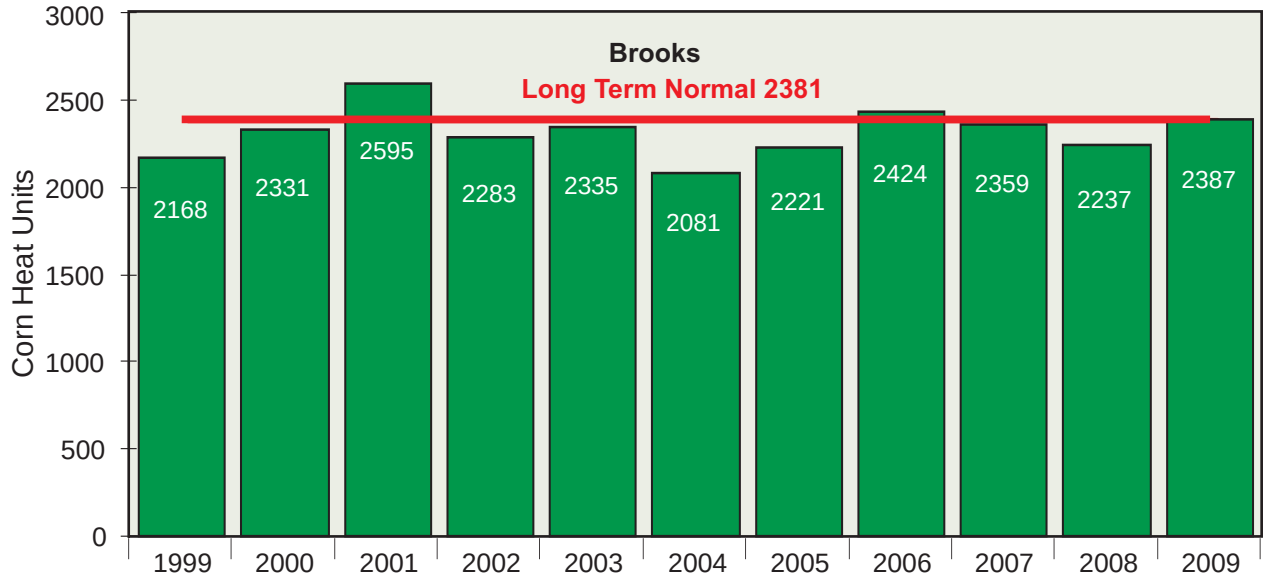


Figure 17. Brooks Optimum Crop Water and Net Irrigation Requirements (1999 - 2009)

Note: The high water use, 3 cut alfalfa is used in these examples because this crop's annual growing season closely coincides with the annual irrigation season.

The difference between the total crop water requirement and total precipitation is the NET irrigation requirement.

*The average crop requirement and average precipitation are from the period 1997 to 2009.



Note: Long term normal - 25 year period

Figure 18. Brooks Corn Heat Units (1999 - 2009)

Table 17. Historical Rainfall in Southern Alberta (April 15 to October 15)

AREA	MAXIMUM RAINFALL (mm)	MINIMUM RAINFALL (mm)	NORMAL RAINFALL* (mm)	2009 RAINFALL (mm)	2009 % OF NORMAL
Lethbridge	534 (1978)	71 (2001)	270	253	94%
Bow Island	439 (1993)	112 (2001)	253	198	78%
Brooks	484 (2005)	87 (2001)	240	263	110%

* Note: Normal rainfall 1970 - 2009

Table 18. Historical Corn Heat Units in Southern Alberta (May 15 to 1st Killing Frost)

AREA	MAXIMUM CHU (1998-2008)	MINIMUM CHU (1998-2008)	LONG TERM NORMAL*	2009 CHU	2009 % OF NORMAL
Lethbridge	2685 (2001)	2081 (2005)	2333	2301	99%
Bow Island	2749 (2001)	2181 (2005)	2505	2499	100%
Brooks	2595 (2001)	2081 (2004)	2381	2387	100%

* Note: Long term normal - 25 year period

Table 19. Frost Free Period (0° C) in Southern Alberta

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	2009 LAST FROST	2009 FIRST FROST	2009 FROST FREE DAYS	2009 % OF NORMAL
Lethbridge	May 18	Sept 19	124	May 20	Sept 30	133	107%
Bow Island	May 12	Sept 23	134	May 21	Oct 1	133	99%
Brooks	May 20	Sept 13	116	June 7	Sept 27	112	97%

* Note: Average frost free days 1971 - 2000

Table 20. Frost Free Period (-2° C) in Southern Alberta

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	2009 LAST FROST	2009 FIRST FROST	2009 FROST FREE DAYS	2009 % OF NORMAL
Lethbridge	May 2	Sept 29	150	May 1	Sept 30	152	101%
Bow Island	Apr 30	Oct 1	154	May 15	Oct 21	159	103%
Brooks	May 5	Sept 28	146	June 7	Sept 28	113	77%

* Note: Average frost free days 1971 - 2000

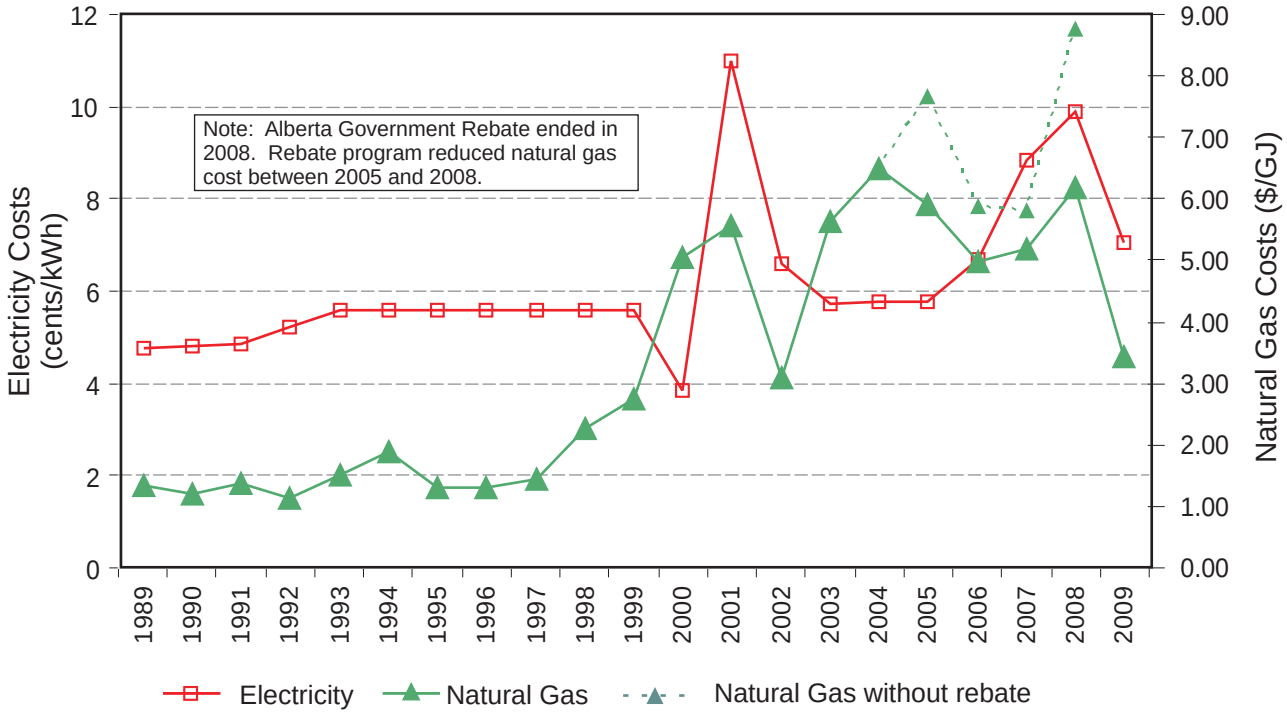
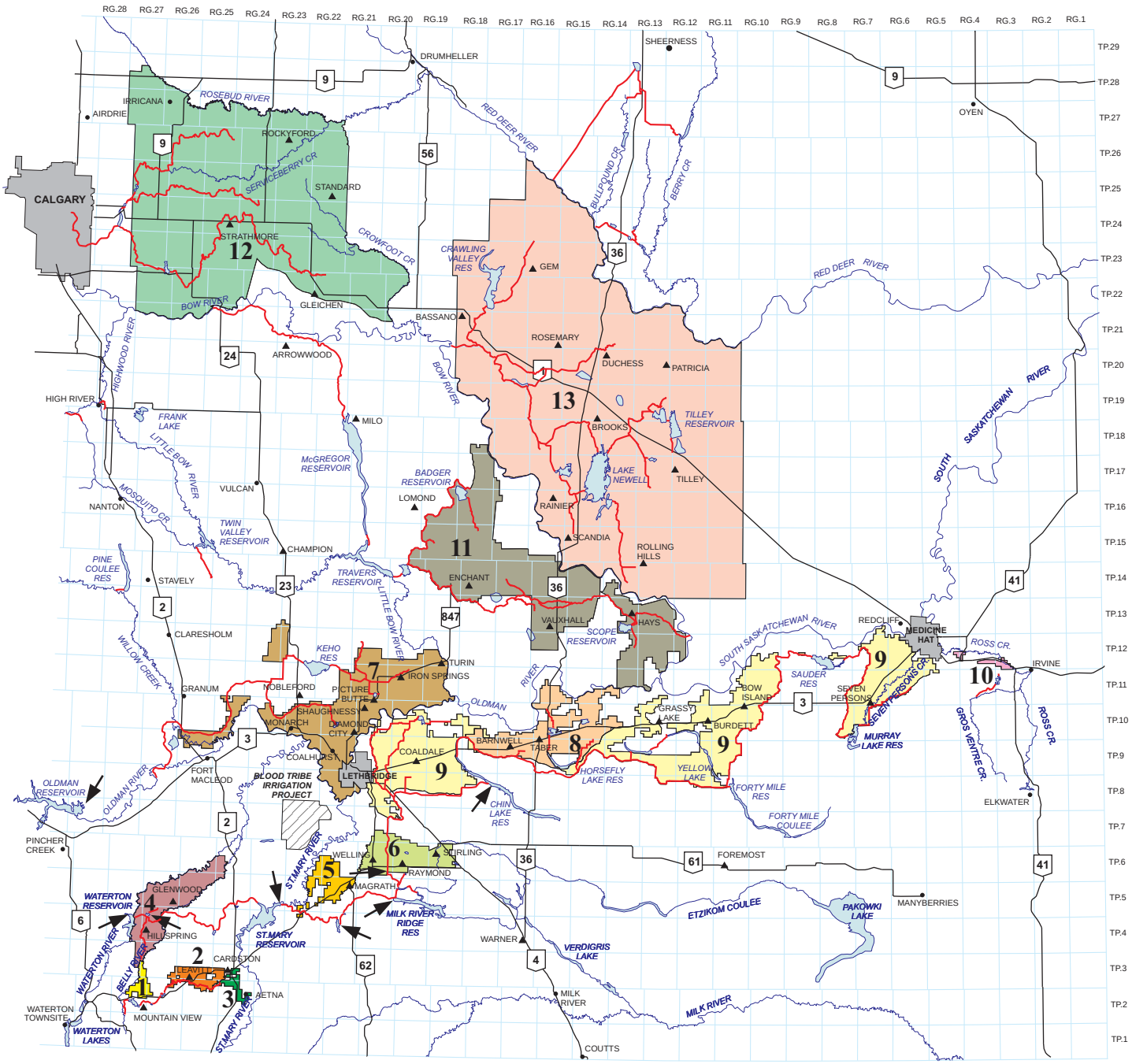


Figure 19. Historical Irrigation Energy Costs

Table 21. Energy Type Used in the Irrigation Districts (acres irrigated by energy type)

Energy Type	BRID	EID	LNID	MID	RID	SMRID	TID	UID	WID	Average Energy Type
Electricity	68.0% 146,407	32.8% 93,734	45.9% 79,316	9.0% 1,646	32.9% 14,871	50.6% 194,684	57.2% 45,816	55.7% 8,524	32.4% 25.799	48.0%
Natural Gas	16.2% 34,885	28.7% 81,902	39.8% 68,895	57.1% 10,454	50.5% 22,842	39.9% 143,993	37.2% 29,770	10.1% 1,548	32.4% 25,756	33.8%
Diesel	3.8% 8,255	5.1% 14,504	0.7% 1,179	0.0% 0	1.0% 444	1.0% 3,452	1.0% 785	1.2% 189	9.6% 7,651	2.9%
Gravity	8.9% 19,201	28.1% 80,307	1.6% 2,775	17.5% 3,199	7.4% 3,330	2.1% 7,539	3.6% 2,869	19.5% 2,984	9.8% 7,824	10.2%
Gravity Pressure Pipeline	1.9% 4,121	2.3% 6,698	9.2% 15,887	16.2% 2,971	0.0% 0	2.7% 9,567	0.9% 708	9.6% 1,470	7.5% 5,977	3.7%
Pump Pressure Pipeline	0.2% 402	0.8% 2,332	0.5% 879	0.0% 0	0.0% 0	0.0% 0	0.0% 0	3.3% 505	0.2% 125	0.3%
Other*	0.4% 865	0.9% 2,706	0.8% 1,332	0.2% 30	2.0% 891	0.4% 1,333	0.2% 170	0.2% 23	8.0% 6,389	1.1%
Unknown	0.5% 1,046	1.2% 3,321	1.6% 2,701	0.0% 0	6.4% 2,888	0.0% 0	0.0% 15	0.5% 70	0.0% 0	0.8%

Notes: – * other includes gasoline, propane or butane
– AID, LID, MVID and RCID did not report any data



N

1 Mountain View Irrigation District
2 Leavitt Irrigation District
3 Aetna Irrigation District
4 United Irrigation District
5 Magrath Irrigation District
6 Raymond Irrigation District
7 Lethbridge Northern Irrigation District
8 Taber Irrigation District
9 St.Mary River Irrigation District
10 Ross Creek Irrigation District
11 Bow River Irrigation District
12 Western Irrigation District
13 Eastern Irrigation District

▲ Communities receiving irrigation water

● Communities not receiving irrigation water

Hydroelectric plants associated with water distribution works

— Main canals

There are 13 irrigation districts in southern Alberta providing water to 1,368,091 assessed acres of farmland. The infrastructure within these irrigation districts is comprised of approximately 7,975 kilometers of conveyance system, of which 339 kilometers are owned and operated by Alberta Environment.

Figure 20. Alberta's Irrigation Districts