# Alberta Irrigation Information 2017

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AID	<ul> <li>Aetna Irrigation District</li> </ul>
BRID	<ul> <li>Bow River Irrigation District</li> </ul>
EID	<ul> <li>Eastern Irrigation District</li> </ul>
LID	<ul> <li>Leavitt Irrigation District</li> </ul>
LNID	<ul> <li>Lethbridge Northern Irrigation District</li> </ul>
MID	<ul> <li>Magrath Irrigation District</li> </ul>
MVID	<ul> <li>Mountain View Irrigation District</li> </ul>
RID	<ul> <li>Raymond Irrigation District</li> </ul>
RCID	<ul> <li>Ross Creek Irrigation District</li> </ul>
SMRID	<ul> <li>St. Mary River Irrigation District</li> </ul>
TID	<ul> <li>Taber Irrigation District</li> </ul>
UID	<ul> <li>United Irrigation District</li> </ul>
WID	<ul> <li>Western Irrigation District</li> </ul>

#### **Unit Conversion Factors**

#### **Imperial to Metric**

1 acre = 0.405 ha 1 ac-ft = 1233.480 m<sup>3</sup> 1 ac-ft = 1.233 dam<sup>3</sup> 1 inch = 25.4 mm 1 mile = 1.609 km 1 lbs = 0.454 kg

#### Metric to Imperial

1 ha = 2.471 acres 1 m<sup>3</sup> = 0.00081 ac-ft 1 dam<sup>3</sup> = 0.8107 ac-ft 1 mm = 0.0394 inches 1 km = 0.6214 miles 1 kg = 2.205 lbs

#### Other

1 m<sup>3</sup> = 1000 L 1 dam<sup>3</sup> = 1000 m<sup>3</sup> 1 dam<sup>3</sup> = 1 megalitre 1 km = 1000 m

## ALBERTA IRRIGATION INFORMATION 2017

## BASIN WATER MANAGEMENT SECTION IRRIGATION AND FARM WATER BRANCH

#### JULY 2018

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 Alberta, but also includes information about irrigation across the whole province. The majority of the annual data is provided by the irrigation districts. This report is prepared by Alberta Agriculture and Forestry.

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Aberta Government

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Glossary		

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

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CENCIO         Mathy         Mathy <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>CROP TYPE</th><th></th></t<>															CROP TYPE	
Belay         Body         Body <t< th=""><th>ed Not irrigated irriga</th><th>Irrigated</th><th>irrigation</th><th>Not irrigated</th><th>Irrigated</th><th>irrigation</th><th>Not irrigated</th><th>Irrigated</th><th>irrigation</th><th>Not irrigated</th><th>Irrigated</th><th>irrigation</th><th>Not irrigated</th><th>Irrigated</th><th></th><th></th></t<>	ed Not irrigated irriga	Irrigated	irrigation	Not irrigated	Irrigated											
			system			system	this year		system			system			Barley	
Dum Woal         Dum Woal         No.         <				10	150					0			991	475		
Hard Sping Max         Image of the set of th										124						
Mail alony         Mail al	18	1,398						10,550		3	4,032				Grain Corn	
	4	3,794						50,204		640	49,067				Hard Spring Wheat	
Ores         Ores <th< td=""><td>8</td><td>168</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>71</td><td></td><td></td><td></td><td></td><td>CEREALS</td></th<>	8	168									71					CEREALS
Pro         Pro <td>13</td> <td>303</td> <td></td> <td></td> <td>20</td> <td></td> <td></td> <td>1 799</td> <td></td> <td>28</td> <td>1 114</td> <td></td> <td></td> <td></td> <td></td> <td></td>	13	303			20			1 799		28	1 114					
Tracone         Image         <					50					20						
Winker Max         Image	'8	4,678						861		43	2,308					
Addic-Two cals         No					60			4,266		36	656				Triticale	
Alala-Turne cold         I										14						
Aladia Hay         1,34         050         11,236         0,75         0,83         75         11,334           Barley Singo         -         -         2,489         -         3,271         -         -         -         9,717         -        <											254					
Afails Singe         · <t< td=""><td></td><td></td><td></td><td>75</td><td>663</td><td></td><td></td><td></td><td></td><td>17</td><td>14.235</td><td></td><td>550</td><td>1.345</td><td></td><td></td></t<>				75	663					17	14.235		550	1.345		
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Biome Hay         Image         Image <thimage< th="">         Image         Image</thimage<>	7	37,117						3,271			2,469				Barley Silage	
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CARCON         Control values/ prompetition         Control values/ promp								14.004			4.404					
PORACES         Grass Hay         Gass Hay	0	27,666								30						
Gene Field         202         89         90         155         157         15	27	5.527		330	466						117		6			FORAGES
Naive Pasture         14         Image         10         100         <											854			202		
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Sorghum/Sudia Grass	14	244			100			1,611						14		
Time Patture Timoday hay         388         428         9.956         724         3.8433         20         1.333         3.0         1.418           Timoday hay         -											290					
Timothy Hay         Imade Slage         Imade Slage <thimade slage<="" th=""> <thimade slage<="" th=""></thimade></thimade>	8	4 4 18		30	1 393			38 483		724	9 956		428	388	-	
Trickel Sillage         Image         Image <thimage< th="">         Image         Image</thimage<>													420	000		
Pix         Inv          Carols         Gan															Tritcale Silage	
Oll SEEDs         Mastard	.7	28,947						28,268		229	19,700				Canola	
Sefflower         Image         Image <thimage< th="">         Image         Image</thimage<>	.8	1,148						5,756		26						OIL SEEDS
Attafia Seed         Image: Seed Canary Seed C		450														
Canary Seed         Canary Seed <thcanary seed<="" th=""> <thcanary seed<="" th=""></thcanary></thcanary>								27 047		76						
Carrots         Carrots <t< td=""><td></td><td>101</td><td></td><td></td><td></td><td></td><td></td><td>21,011</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>		101						21,011								
Catnip         Catnip         Chick Peas								9,796		8	13,599				Canola Seed	
Chick Peas         Image								316								
Dill         Dill <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>																
Bry Beans         Dry Beans         Image: Bord Beans         Image: Bo	7	147						375			67					
Bry Peas         Image: set of the										27						
SPECUALT     Fresh Com (sweet)     Image: Seed     I								6,744			17,512				Dry Peas	
Fresh Com (sweet)     Image: seed sector (sweet)     Image: seed sector (sweet)     Image: sector (sweet)								577			392					SPECIALTY
Grass Seed         Image: Seed seed seed seed seed seed seed seed								249								
Hemp         Index         Index <thi< td=""><td>4</td><td>304</td><td></td><td></td><td></td><td></td><td></td><td>140</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></thi<>	4	304						140								
Lawn Turf         Image: Constraint of the constrain	57	1.367								57						
Lentils         Index         <								1,009		5.						
Mint     Image: Mint								369								
NurseryImage: second secon	8	48						126								
OnionsIndicator <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>97</td><td>99</td><td></td><td></td><td></td><td></td><td></td></th<>										97	99					
PotatoesImage: selection of the	1	7						399								
Pumpkins       Image: second sec	8	748						5,301		10	10,684					
Seed Potatoes       Image:										10						
Small Fruit     Image: Solution of the solution of t											59				Radishes	
Soybeans         Image: solution of the solutican be solutican be solution of the solution of the solution of								225			40					
Sugar Beets         Sugar Geets         Super Sector         Super Sector <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.505</td> <td></td> <td></td> <td>400</td> <td></td> <td></td> <td></td> <td></td> <td></td>								0.505			400					
Sunflower         Sunflower <t< td=""><td>3</td><td>2.613</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	3	2.613														
Yellow Peas         Image: Second																
Non Crop         Image: Comparison of the system of th								.,								
OTHER         Summer Fallow         Image: Constraint of the second secon				717	228								65	44	Miscellaneous	
	4	174														OTHER
0100000 042	12	640						573		38	133					OTHER
Total acros 2,467 2,236 0 242,150 3,074 0 301,309 0 0 3,863 1,168 0 184,565 0			0	1,168	3,863	0	0	301,309	0	3.074	242,150	0	2 236	2,467		
	184,565								~			-			rotal acres	

## Table 1. Details of Crops Grown within the 13 Irrigation Districts (cont'd)

			MID			MVID			RCID			RID			SMRID	
			overed by tion system	acres		overed by ion system	acres		overed by ion system	acres		overed by ion system	acres		overed by ion system	acres
	CROP TYPE	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation
		this year	this year	system	this year	this year	system	this year	this year	system	this year	this year	system	this year	this year	system
	Barley CPS Wheat	1,977	100			103					2,247 1,027	180		11,412 1,996	140	799 66
	Durum Wheat	117									1,135			34,575	99	620
	Grain Corn										106			4,957		30
CEREALS	Hard Spring Wheat Malt Barley	3,512	275			125					2,577 1,403	20		47,303 402	158	2,237
CEREALS	Miscellaneous Cereals										1,403			402		13
	Oats				68	16					107			258		
	Rye										167			942		32
	Soft Wheat Triticale										65 30			1,229 307	17	335
	Winter Wheat	135	212								3,122	40		13,212	4	394
	Alfalfa - Two cuts													12,202	88	956
	Alfalfa - Three cuts										6,700			3,820		
	Alfalfa Hay	5,577	265		717	802		781			4,003			15,224	164	1,213
	Alfalfa Silage Barley Silage	140									102 1,583	40		540 3,697		80 218
	Barley Silage (underseeded)										1,000			339		36
	Brome Hay													21		17
FORAGES	Corn Silage										2,401			20,148	9	952
	Custom Variety Forage/Misc Grass Hay	365	33		272	206				94	571			260 4,411	421	575
	Green Feed	25	64		82	100				34	169			2,150	240	96
	Milk Vetch															
	Native Pasture													4,883	296	374
	Oats Silage										768			0.14		
	Sorghum/Sudan Grass Tame Pasture	1,093	377		697	223					3,710	867		341 8,789	662	1,017
	Timothy Hay	1,000	511		001	220					585	001		5,468	48	220
	Tritcale Silage										125			261		
	Canola	3,010	359		141			116			9,320	130		45,163	244	1,542
OIL SEEDS	Flax	213	63								322			8,092	70	148
	Mustard Safflower	50												132		
	Alfalfa Seed													2,466		11
	Canary Seed															
	Canola Seed													13,301		41
	Carrots Catnip													169 260		37
	Chick Peas													2,588		21
	Dill															2
	Dry Beans	30									90			29,486	148	298
	Dry Peas		40								2,030	40		17,323	315	939
SPECIALTY	Faba Beans Fresh Corn (sweet)													266 1,260		23
CROPS	Fresh Peas				112									1,632		23
	Grass Seed	159			112									589	3	
	Hemp		20							10	429			11,546	64	181
	Lawn Turf Lentils									12	155			146 6,048	20	190
	Market Gardens										50			212	20	100
	Mint													4,872		
	Nursery										43			328		7
	Onions Potatoes													15,850		17
	Polatoes													15,850		17
	Radishes															
	Seed Potatoes															
	Small Fruit Soybeans	20									180			44 1,749	35	44
	Soybeans Sugar Beets										180			1,749	35 74	44 71
	Sunflower													429		36
	Yellow Peas													521		
	Miscellaneous										10			1,632	159	304
OTHER	Non Crop Summer Fallow										42			530 92	180 10	293 796
	Unknown													52	10	190
	Total acres	16,423	1,808	0	2,089	1,574	0	897	0	0	45,183	1,317	0	377,047	3,668	15,276
	Iotal acres		18,231			3,663			897			46,500			395,992	

## Table 1. Details of Crops Grown within the 13 Irrigation Districts (cont'd)

			TID			UID			WID		A	LL DISTRIC	TS	TOTAL
			covered by tion system	acres		overed by ion system	acres		overed by ion system	acres		overed by ion system	acres	ACRES
	CROP TYPE	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	Irrigated	Not irrigated	with no irrigation	(for all districts)
		this year	this year	system	this year	this year	system	this year	this year	system	this year	this year	system	
	Barley	5,268			5,514			3,821	865		68,041	2,403	799	71,243
	CPS Wheat	0.070	10					4,613	1,287		9,686	1,287	66	11,039
	Durum Wheat	3,379 1,690	40 9					400	220		61,326	483	620	62,429 22,904
	Grain Corn Hard Spring Wheat	13,969	92		4,282			130 8,680	1,119		22,863 183,388	12 2,430	30 2,237	188,054
CEREALS	Malt Barley	125	92 74		4,202			1,560	1,119		3,881	2,430	2,237	4,059
	Miscellaneous Cereals	120						1,000			44	0	13	57
	Oats	438						527	78		4,643	122	0	4,765
	Rye	112						150			1,954	0	32	1,986
	Soft Wheat							728	197		9,869	257	335	10,461
	Triticale	366						130			7,222	36	0	7,258
	Winter Wheat	614			729			220			22,270	270	394	22,935
	Alfalfa - Two cuts	529	105		2,734				1,202		57,675	1,290	956	59,921
	Alfalfa - Three cuts	2,948	165		2,574			201	0.000		30,400	165	0	30,565
	Alfalfa Hay Alfalfa Silage	4,756 56	241		79			6,999 58	2,026		6,999	2,026 0	1,213	77,670
	Barley Silage		20		1.000				405		7,021 55,911		80	7,101
	Barley Silage (underseeded)	262	38		1,633 115			5,739 278	435		2,280	513 0	218 36	56,643 2,316
	Brome Hay				115			70	50		562	50	17	629
	Corn Silage	3,382						75			72,450	9	952	73,410
	Custom Variety Forage/Misc	.,						15			427	30	0	457
	Grass Hay	160	87		913			681	192		25,805	1,375	575	27,756
FORAGES	Green Feed	169	30		240			248			9,531	578	96	10,204
	Milk Vetch										132	0	0	132
	Native Pasture	18	197		3,171			2,703	1,940		12,744	2,433	374	15,551
	Oats Silage	21						125			1,204	0	0	1,204
	Sorghum/Sudan Grass	50									391	0	0	391
	Tame Pasture	3,240	1,027		1,854			1,602	904		75,622	5,242	1,017	81,880
	Timothy Hay	2,153			1,494			1,037	50		21,853	354	220	22,427
	Tritcale Silage										386	0	0	386
	Canola	1,496	30		7,067			13,458	1,974		156,544	3,072	1,542	161,159
OIL SEEDS	Flax	676							25		20,981	184	148	21,313
	Mustard Safflower				39						356 294	0	0	356 294
	Alfalfa Seed	65									49,515	0 76	0 11	49,602
	Canary Seed	05									132	0	0	132
	Canola Seed	3,956									37,793	8	41	37,842
	Carrots	0,000									485	0	37	522
	Catnip										260	0	0	260
	Chick Peas										2,588	0	21	2,609
	Dill										589	0	2	591
	Dry Beans	4,103									54,314	175	298	54,787
	Dry Peas	859			1,238			1,941	329		48,031	808	939	49,778
SPECIALTY	Faba Beans	119									1,354	0	0	1,354
CROPS	Fresh Corn (sweet)	1,279									2,788	0	23	2,811
	Fresh Peas	3,048						175			5,270	0	0	5,270
	Grass Seed				135			481	50		1,567	53	0	1,620
	Hemp	855						0.005			22,768	141	181	22,768
	Lawn Turf	94 2						2,335	425		3,684	425	0	4,109
	Lentils Market Gardens	2			11			130	180		7,338	20	190	7,548
	Market Gardens							130	100		590 4,971	180 97	0	770 5,069
	Nursery	12						579	402		1,368	402	7	1,777
	Onions	812	9					315	402		812	402	0	821
	Potatoes	10,893	J		3			220			43.699	19	17	43,735
	Pumpkins	126									136	0	0	136
	Radishes	67									126	0	0	126
	Seed Potatoes	279						97			641	0	0	641
	Small Fruit							60	25		124	25	0	149
	Soybeans	151									4,625	35	441	4,703
	Sugar Beets	4,450									29,432	74	71	29,577
	Sunflower	595									5,506	0	36	5,542
	Yellow Peas	163									684	0	0	684
	Miscellaneous	185	79		120			20	30		2,760	1,050	304	4,114
	Non Crop		181		4				955		1,074	1,650	293	3,016
OTHER		-	75								1 000	123	796	1,722
OTHER	Summer Fallow	6	75								803			
OTHER	Summer Fallow Unknown	6 77,996	2,374	0	34,099	0	0	68,131	11,756 <b>26,820</b>	0	642 1,356,220	11,756	0	12,398

CROPS						IRRIGA		STRICTS						TOTAL
	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	ACRES
Cereals	1,466	82,151	85,563	255	36,027	6,328	311	0	12,225	121,583	26,176	10,667	24,429	407,191
	31.2%	33.5%	28.4%	5.1%	19.5%	34.7%	8.5%	0.0%	26.3%	30.7%	32.6%	31.3%	25.7%	28.8%
Forages	3,021	39,100	119,798	3,830	110,005	7,939	3,099	781	21,624	90,234	19,529	14,806	34,875	468,642
Ŭ	64.2%	15.9%	39.8%	76.1%	59.6%	43.5%	84.6%	87.1%	46.5%	22.8%	24.3%	43.4%	36.7%	33.1%
Oil Seeds	107	25,000	34,024	0	30,253	3,695	0	116	9,772	55,390	2,202	7,106	15,457	183,121
	2.3%	10.2%	11.3%	0.0%	16.4%	20.3%	0.0%	12.9%	21.0%	14.0%	2.7%	20.8/%	16.3%	12.9%
Specialty		98,289	61,205	0	6,935	269	253	0	2,837	124,790	31,937	1,387	7,429	335,331
Crops	0.0%	40.1%	20.3%	0.0%	3.8%	1.5%	6.9%	0.0%	6.1%	31.5%	39.7%	4.1%	7.8%	23.7%
Other*	109	685	719	945	1,345	0	0	0	42	3,995	526	123	12,761	21,249
o thor	2.3%	0.3%	0.2%	18.8%	0.7%	0.0%	0.0%	0.0%	0.1%	1.0%	0.7%	0.4%	13.4%	1.5%
TOTAL ACRES	4,703	245,224	301,309	5,030	184,565	18,231	3,663	897	46,500	395,992	80,370	34,099	94,951	1,415,534

## Table 2. Crop Types Grown within the 13 Irrigation Districts

Note: \*Other includes miscellaneous, non crop, summer fallow and unknown crops AID and LID data is from 2016

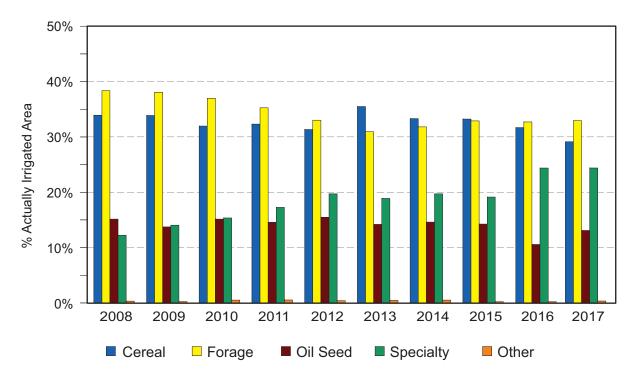
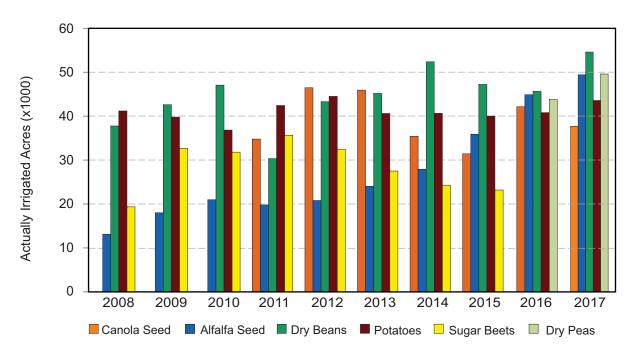


Figure 1. Irrigated Crop Types within the 13 Irrigation Districts

Note: Starting in 2011, acreage data for canola seed (canola grown for seed production) was moved from the oilseed category to the specialty crop category.



#### Figure 2. Acres of Five Major Irrigated Specialty Crops within the 13 Irrigation Districts

Note: Starting in 2011, acreage data for canola seed (canola grown for seed production) was moved from the oilseed category to the specialty crop category. Starting in 2016, dry peas surpassed sugar beets in the five major irrigated specialty crops in acreage.

5

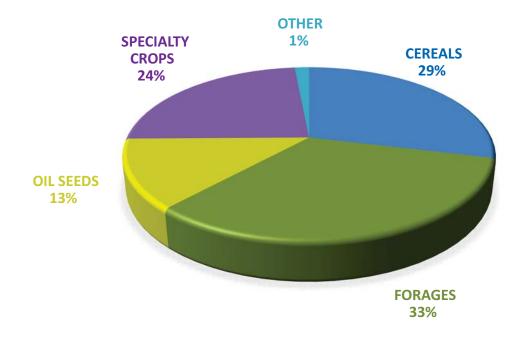


Figure 3. Crop Types within the 13 Irrigation Districts in 2017 (% of area)

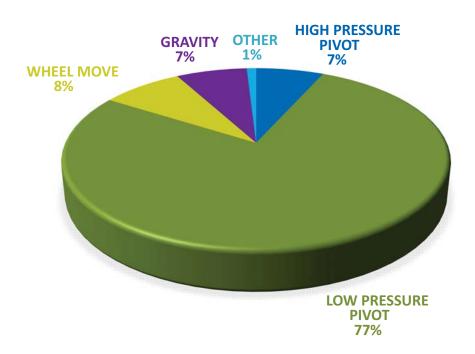


Figure 4. On-farm Irrigation Methods within the 13 Irrigation Districts in 2017 (% of area)

IRRIG	GATION METHOD	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	Individual Method Total	Total Acres Covered
	Pivot Medium Pressure		1,769	4,274		212		253		824	3,436				10,768	
1.014	Pivot Medium Pressure - Corner Arm		296	252		308					500				1,356	
LOW PRESSURE	Pivot Low Pressure	1,099	151,186	185,422	411	60,386	8,343		604	29,192	279,030	42,214	16,910	49,726	824,522.2	1,072,113
PIVOT	Pivot Low Pressure - Corner Arm		54,301	16,254		86,907	140			2,336	48,130	18,227	1,191	3,788	231,274	1,072,113
	Linear - Low Pressure			1,441		276				407	1,362	220	80	406	4,192	
	percent of total	23.4%	84.6%	68.9%	8.2%	80.2%	46.5%	6.9%	66.8%	72.2%	87.3%	75.5%	53.3%	64.7%	77.3%	
HIGH	Pivot High Pressure		18,645	25,140	761	6,722	2,186		67	805	10,054	8,438	1,221	7,960	81,999	
PRESSURE	Pivot High Pressure - Corner arm		2,186	2,827		2,844					1,336	793		305	10,290	93.053
PIVOT	Linear - High Pressure			217								84		462	763	93,053
	percent of total	0.0%	8.5%	9.4%	15.1%	5.2%	12.0%	0.0%	7.4%	1.8%	3.0%	11.6%	3.6%	10.5%	6.7%	
	Wheel Move - One-Two Laterals	1,822	3,982	12,849	1,323	10,909	4,537	468	226	6,827	25,444	7,845	1,672	8,311	86,213	
WHEEL MOVE	Wheel Move - Three-Four Laterals		2,237	3,911	198	12,033				1,058	3,210	546	103	2,582	25,878	112,090
MOVE	percent of total	38.7%	2.5%	5.6%	30.2%	12.4%	24.9%	12.7%	25.0%	17.4%	7.5%	10.4%	5.2%	13.1%	8.1%	
	Gravity - Developed		8,923	38,292		755	2,805			2,048	974	729	1,410	115	56,051	
GRAVITY	Gravity - Undeveloped	277	1,504	9,650	1,747	653		2,949	7	1,524	5,508	1,052	11,316	5,184	41,371	97,422
	percent of total	5.9%	4.3%	15.9%	34.7%	0.8%	15.4%	80.4%	0.8%	7.9%	1.7%	2.2%	37.3%	6.4%	7.0%	
	Volume Gun - Stationary										130	30		74	234	
	Volume Gun - Traveller		25	306		150					55	22		500	1,058	
	Solid Set (underground sprinkler)	140		8		691	25			95	254			914	2,127	
OTHER	Hand Move (sprinkler above ground)	1,366	88	466	591	1,085	174			179	987	80	181	935	6,132	12.807
	Micro - Spray - Sprinkler					135				51	39	15	15	76	331	12,007
	Micro - Drip - Trickle						20			7	228	75	2	2,018	2,350	
	Other Application Use		74			501									575	
	percent of total	32.0%	0.1%	0.3%	11.7%	1.4%	1.1%	0.0%	0.0%	0.7%	0.4%	0.3%	0.6%	5.4%	0.9%	
	Total Acres Covered	4,704	245,217	301,309	5,030	184,566	18,230	3,669	904	45,351	380,678	80,370	34,102	83,355	1,387,484	1,387,484

Note:

-Information for RCID is for 2014 irrigation season -Information for AID and LID is for 2016 irrigation season

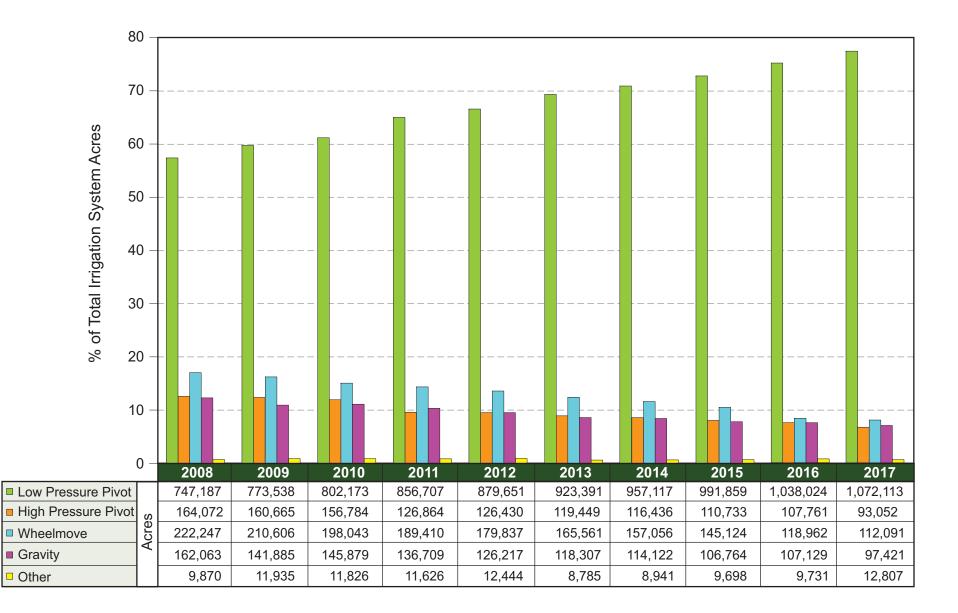


Figure 5. On-farm Irrigation Methods within the 13 Irrigation Districts

#### Table 4. Acres on the Assessment Roll within the 13 Irrigation Districts

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
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 09	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
2010	3,699 4,389	233,438 233,925	294,612 290,429	4,706	176,201 176,282	18,300 18,300	3,700 3,700	1,101	46,303 46,302	373,092 373,018	82,569 82,728	34,325 34,370	96,045 95,628	1,368,091 1,364,965
11	4,389	233,925	290,429	4,793	176,187	18,300	3,617	1,101	46,302	373,018	82,773	34,370	95,028	1,370,449
12	4,390	234,014	294,373	4,840 4,840	177,593	18,300	3,617	1,101	46,302	373,835	82,750	34,382 34,382	95,754 95,788	1,370,449
13	4,376	241,604	296,619	4,853	179,014	18,300	3,698	1,101	46,500	380,371	82,822	34,393	95,776	1,389,427
14	4,511	254,909	297,884	4,876	179,719	18,300	3,698	1,101	46,500	388,039	83,263	34,395	95,641	1,412,836
2015	4,607	258,114	298,763	4,898	180,007	18,300	3,711	1,101	46,500	390,497	83,584	34,391	95,516	1,419,989
16	4,705	259,792	299,762	5,031	182,716	18,300	3,733	1,101	46,500	393,034	84,045	34,383	95,475	1,428,577
17	4,705	260,008	301,428	5,031	184,831	18,300	3,647	1,091	46,500	395,991	84,431	34,386	95,320	1,435,669

Notes: Assessment roll acres include "irrigation", "terminable" and "annual" acres. Only "irrigation" and "terminable" acres are considered in district expansion limits. In 2017, irrigation districts reported 7,182 annual acres.

1980         440         71.382         199.761         1.422         71.68         70.00         71.390         71.302         70.00         70.00         71.302         71.302         70.00         70.00         71.302         71.302         70.00         70.00         71.302         71.302         70.00         71.302         71.302         70.00         71.302         71.302         70.00         71.302         71.302         70.00         72.50         72.70         71.302         71	YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID	TOTAL
61         1.800         0.8063         199.421         1.427         7.637         7.000         2.700         200         18.500         0.5503         0.30747         2.2082         2.845         3.000         63.2460           62         2.175         87.267         192.324         4.511         7.575         7.500         2.789         200         18.000         17.000         3.0302         7.717         3.0302         7.718         4.918         4.517         7.575         7.570         7.590         1.500         15.000         16.000         2.603         4.203         4.944         4.911         2.775         7.900         15.000         16.000         2.604         12.272         3.100         7.780         9.91         15.000         16.304         4.231         15.000         5.8421           199         2.523         7.980         19.92         4.533         5.000         2.789         10.00         15.000         14.944         4.231         15.000         5.8421           2.440         81.62.19         4.333         4.530         5.600         7.770         10.00         16.001         16.444         5.2470         11.061         7.000         10.001         16.4334         4.5400<	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
62         2,177         83,269         190,866         4,187         73,317         7,000         2,769         200         18,000         30,002         27,012         25,000         632,4070           64         2,523         88,034         193,381         4,511         70,577         75,00         2,789         1000         150,00         150,00         82,052         2,780         494,932           66         2,523         40,423         195,905         4,523         49,642         50,00         2,780         1000         150,00         25,003         42,9313           67         2,523         71,980         198,24         4,523         50,992         4,502         1500         15,000         144,349         44,980         10,228         15,000         56,00         3,73         720         10,000         15,000         144,444         16,000         17,000         15,000         14,014         16,000         17,018         14,010         10,000         15,000         14,414         16,000         17,028         10,000         15,000         14,414         16,000         17,028         17,000         15,000         14,334         46,000         76,020         75,020         75,020         75,020			,	,			-	-		-		-	-	-	u ·
63         2,315         87,867         192,324         4,511         63,007         757         750         278         200         18,001         70,000         33,002         27,02         200         18,001         70,000         83,005         13,76         24,000         83,001         13,76         24,000         150,001         150,000         25,001         12,725         31,001         49,932           66         2,523         41,420         195,905         4,523         19,946         4,000         27,89         100         15,000         12,225         31,000         553,952           1970         2,523         79,840         198,242         45,900         778         1000         15,000         148,444         52,481         15,010         15,000         148,444         52,481         15,010         15,000         148,444         52,481         15,010         15,000         148,444         52,481         15,010         15,000         148,444         52,481         14,117         10,000         15,000         17,012         58,302           74         2,444         110,101         11,021         18,687         14,303         52,600         3,000         15,000         14,032         38,000					,	-	'			-		,	,	,	
1965         2.523         44.507         194.824         4.511         2.2778         3.000         2.789         1.500         15.000         25.005         2.750         4.9492           62         2.523         71.936         196.54         4.523         4.7982         5.000         2.789         1.500         15.000         15.203         4.523         5.938         4.500         2.789         1.000         15.000         15.437         4.528         1.018         6.62         5.33.852           170         2.523         77.580         199.729         4.533         5.902         4.500         1.000         15.000         14.447         16.000         57.002         57.302         57.002         5.78         1.000         15.000         14.744         1.600         17.002         5.700 <th></th> <th></th> <th></th> <th></th> <th>-</th> <th>63,000</th> <th>7,250</th> <th>-</th> <th></th> <th>-</th> <th>-</th> <th>33,902</th> <th></th> <th>25,000</th> <th>634,070</th>					-	63,000	7,250	-		-	-	33,902		25,000	634,070
666         2         2         3         49.196         4.000         2.789         1.800         16.000         165.000         2.59.04         1.228         3.100         493.138           67         2.56.3         19.88         4.52.3         56.99.3         4.400         2.789         1000         15.000         124.336         45.290         1000         15.000         124.336         45.980         10.228         13.500         558.421           170         2.424         1018         166.27         1.330         550.01         14.348         52.165         14.417         16.000         170.014         16.000         16.000         170.014         16.000         170.014         16.001         170.001         170.016         170.001         170.016         170.001         170.016         170.001         170.016         170.001         170.017         170.016         170.017         170.016         180.001         170.017         170.016         180.001         170.017         170.016         170.017         170.016         170.017         170.016         170.017         170.016         170.017         170.017         170.017         170.017         170.017         170.017         170.017         170.017         170.017	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
67       2.523       71.936       196.649       4.523       6.509       4.600       2.789       15.000       16.338       45.42       10.000       588.421         68       2.523       77.860       199.72       4.523       45.90       2.789       900       15.000       124.879       45.804       10.228       13.500       573.622         71       2.424       81.018       16.6219       4.343       60.207       5.500       2.789       1.100       15.000       174.848       52.420       11.061       17.000       60.881       7.776       18.000       17.000       17.000       17.02       58.421       17.001       17.000       77.620       50.00       17.00       16.300       17.000       77.620       50.00       77.620       50.00       17.010       10.001       17.018       44.00       4.92       4.92       4.930       3.661.507         77       2.400       12.632       20.1438       4.400       96.661       9.070       2.910       700       2.680       13.085       9.118       13.000       3.126       44.22       62.08       13.899       76.92       776       31.060       19.372       2.600       13.284       4.823       8.39.08 <th>1965</th> <th>2,523</th> <th>44,507</th> <th>194,824</th> <th>4,511</th> <th>22,778</th> <th>3,000</th> <th>2,789</th> <th>1,500</th> <th>15,000</th> <th>165,000</th> <th>26,005</th> <th>9,805</th> <th>2,750</th> <th>494,992</th>	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
668         2,523         82,267         99,990         15,200         15,300         149,448         52,185         14,417         16,000         77,024           7         2,404         81,018         166,219         4,343         60,207         5,500         2,739         1000         15,000         174,884         52,475         11,001         17,000         576,225           7         2,400         98,185         183,279         4,300         8,086         6,000         3,000         16,000         17,007         6,303         4,862         3,9,22         7,9,2,00         13,327         7,91,219           7         2,400         116,153         17,948         4,800         3,202         7,663         3,106         19,475         5,64,40         4,852         3,898         4,653         13,229         14,216         13,202         16,64         13,329         7,65,928         13,264         4,	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
68         2,523         79,880         198,248         4,523         35,902         2,789         100         15,000         124,379         45,884         10,208         13,000         77,322           71         2,424         81,018         16,219         4,343         60,207         5,500         2,789         1,000         15,000         174,848         52,470         11,001         17,000         576,205           73         2,400         88,185         183,379         4,305         80,985         5,600         3,737         700         16,000         190,017         60,981         117,102         58,223         14,036         68,1507           78         2,400         116,155         179,095         4,430         92,850         6,000         3,000         60,000         21,000         17,833         44,860         43,228         763,392           7         2,400         127,328         4,400         93,662         6,000         2,705         73         1,600         19,017         63,018         8,611         3,328         769,928           7         2,500         134,493         21,2524         4,476         95,978         8,000         19,137         26,114         63,008<	67			196,549				2,789	1,250					12,870	
1970         2.523         77.580         199.729         4.523         49.783         5.000         2.789         1.000         15.000         134.982         50.904         42.518         14.171         16.000         57.002           71         2.444         81.018         166.219         4.305         68.817         5.750         2.000         675         15.000         147.884         52.213         19.000         570.644         58.822         22.233         19.000         570.646         58.822         22.331         19.000         670.643           177         2.400         116.165         179.055         4.300         9.066         9.007         2.1800         171.833         4.600         4.382         39.824         797.29         39.228         61.033         31.060         19.705         64.904         8.713         33.229         766.928         83.098         83.24         83.22         83.238         79.230         13.242         22.60         33.257         769.28         83.098         63.414         63.22         12.604         13.493         24.52         44.76         9.528         8.50         2.700         13.241         63.23         18.89         46.51         9.902         13.251				-	-	-		-		-	-	-	-	-	
71       2,424       81,018       166,219       4,343       60,207       5,500       2,789       1,100       15,000       149,444       52,185       1,417       16,000       576,205         73       2,400       98,185       183,279       4,305       80,995       5,600       3,737       700       18,000       190,017       60,981       11,710       22,000       706,637         74       2,424       108,021       18,862       21,386       61,000       3,737       700       18,000       190,017       60,981       11,710       22,000       706,637         77       2,400       116,155       179,095       4,430       92,856       6,000       2,000       230       0,000       23,007       64,115       15,004       43,359       46,570       839,098         78       2,400       12,522       4,476       95,979       8,000       2,900       620       19,462       26,355       43,999       45,570       66,944       43,839       45,570       869,444       48,533       48,514       48,514       48,533       48,514       48,533       48,514       48,514       48,514       48,514       48,514       48,514       48,514       48,514 <td< th=""><th></th><th></th><th>.,</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>ii</th></td<>			.,												ii
72       2.400       82.928       175.915       4.305       58.817       5.750       2.000       67.57       15.000       147.884       52.201       11.061       17.000       576.205         747       2.400       116.155       179.095       4.430       92.850       6.000       3.737       700       18.000       190.017       6.018       4.335       39.864       4.1710       22.000       706.813         76       2.400       125.380       201.484       4.400       97.829       7.000       2.000       32.000       32.085       5.116       13.355       39.824       33.036       681.507         77       2.500       13.437       21.224       44.76       100.447       8.000       2.900       623       31.242       249.232       62.655       13.899       45.70       869.940         81       2.500       13.437       12.254       44.76       90.552       8.650       2.783       0       19.462       29.295.64       62.061       5.064       48.300       853.146         92       5.501       13.417       14.632       3.000       3.154       600       3.124       60.03       3.727       63.928       3.44       49.663			,	,			,		1						
73       2.400       98.185       183.279       4.305       80.995       5.600       3.737       700       18.000       107.10       22.000       11.10       22.000       11.10       22.000       13.852       23.31       10.001       60.911       10.991       11.10       22.000       43.85       10.001       60.911       10.991       11.10       22.000       43.85       10.001       706.837       700       13.005       90.911       13.085       91.10       23.055       30.00       43.05       23.021       24.01       13.452       23.072       64.115       15.000       43.527       769.928         72       2.500       13.454       24.00       13.571       21.3337       47.67       00.487       8.000       2.900       13.126       13.021       22.021       13.077       64.939       45.77       66.940         81       2.000       13.447       24.00       4.337       4.76       95.528       85.00       2.783       0.902       29.900       19.402       29.564       62.06       15.076       43.986       852.318         12.00       15.414       26.00       3.154       650       27.83       0.90.146.28       28.966       64.74       12		-	-			-	,	-	'	,	,	- ,	,		
74         2,424         108,051         18,055         4,305         90,085         6,000         3,737         700         18,000         190,017         108,005         108,005         108,005         108,005         108,005         108,005         108,005         108,005         108,005         108,005         50,116         13,355         30,824         791,219           77         2,500         134,492         208,785         4,430         97,829         7,000         2,000         300         00,000         22,057         55,640         4,675         769,928           780         2,500         134,492         12,524         4,476         10,457         8,000         2,900         623         31,264         249,232         2,607         43,988         854,146           81         2,000         152,144         16,620         3,000         104,533         8,500         3,154         650         2,819         68,071         12,240         4,663         999,260           1945         2,333         174,082         244,743         3,664         114,635         13,000         3,154         650         28,055         28,056         10,02,14         44,638         999,5,366           1945			-	-	-	-	-	-		-		-	-	-	
1975         2.400         116,155         170,095         4.430         92,850         6,000         3,000         600         21,500         171,834         4,606         4,600         9,670         2,910         700         22,680         21,3085         59,116         13,355         39,824         791,219           77         2,500         131,492         208,785         4,430         97,829         7,000         2,000         30,000         29,007         64,115         150,00         43,525         889,940           78         2,500         133,412         2,503         1,514         216,000         4,769         9,979         8,000         2,900         600         19,137         251,914         61,504         2,539         854,146         82,318           81         2,500         14,300         100,453         8,500         3,154         650         251,69         68,474         12,313         4,653         993,846           82         1,200         158,44         21,600         3,154         650         28,105         28,476         3,146         46,061         1,03,153         993,846         1,033,150         1,033,150         1,033,150         1,033,123         1,033,123         1,033,1			,	-	-	-	,	-		-	-	,		,	
76         2.400         125.380         201.438         4.600         96.661         9.070         2.910         700         22.680         213.065         9.116         13.352         39.824         791.219           77         2.500         131.492         208,785         4.430         97.829         7000         2.000         55         59.410         13.500         43.525           78         2.400         127.236         204.192         4.430         93.562         6.000         2.775         578         31.000         184.75         2.607         43.988         852.148           81         2.500         143.493         21.524         4.476         90.552         8.650         2.783         0         19.462         259.64         6.7.06         15.064         28.989         68.744         12.734         46.638         999.611           81         1.200         178.442         216.249         4.66.268         19.054         12.620         49.666         10.31.231           84         1.200         173.434         246.010         114.635         13.000         3.184         700         36.086         305.560         70.133         12.620         49.666         10.31.231 <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>8</th></td<>															8
77       2.500       13.492       208,785       4.430       97.829       7.000       2.000       356       30,000       23.725       64,115       15.000       43.525       839,088         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       140,300       162,000       4.76       90,552       8.650       2.780       19.442       25.954       66,207       150.64       823,318       851,146         81       2.500       168,461       2.125       3.000       108,141       9003,314       650       25,169       268,965       76,474       12,344       46,638       9903,841         81       2.000       168,461       2.300       10,200       3,154       650       28,058       70,131       12,201       49,666       10,01,231         82       2.331       74,003       3,649       113,663       13,000       3,144       700       36,008       307,875       69,281       14,44       48,000       1,033,856         81       2.468       4,170       3,164       3,007							,								H
78       2.400       127.236       204,192       4.430       93.652       6.000       2.775       57.8       31.060       198.755       56.940       8.671       33.329       769.328         79       2.500       133.493       212.524       4.476       90.552       8.650       2.783       0       19.462       25.064       66.202       12.607       43.986       852.318         81       2.500       152.144       6.622       3.000       104.532       8.50       3.154       650       25.168       66.268       66.205       10.564       44.1996       993.241         84       1.200       162.144       14.622       3.000       102.301       10.200       3.154       650       25.168       66.368       68.471       12.313       46.638       995.386         1985       2.933       174.087       244.763       3.664       114.663       13.000       3.184       700       36.008       30.787       69.928       13.146       48.000       10.33.855         87       2.200       178.482       245.514       4.076       119.562       12.400       3.310       500       36.496       316.223       69.581       14.536       52.080       10.		,	,	,		-	,	-					,		
79         2.500         133.457         213.837         4.476         90.487         8.000         2.900         623         31.264         249.232         62.835         13.899         46.570         869.301           1960         2.500         134.493         12.254         4.476         90.552         8650         2.783         0         19.462         259.54         66.206         15.064         28.399         854.146           81         2.500         168.461         21.205         3.000         108.143         9003.241         650         25.855         288.96         66.274         12.744         21.44         26.83         93.84         46.638         990.601           84         1.200         168.461         24.831         3.664         114.635         13.000         3.184         700         36.083         30.71         69.847         12.313         46.638         995.366           92.200         178.482         245.51         4.076         119.562         12.400         3.124         700         36.08         30.787         69.928         3.144         68.400         10.33.856           869         2.417         18.4923         2.613         12.733         13.55 <th< th=""><th></th><th>,</th><th>,</th><th>,</th><th></th><th>-</th><th>-</th><th></th><th></th><th>-</th><th></th><th>-</th><th>,</th><th>-</th><th></th></th<>		,	,	,		-	-			-		-	,	-	
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         160.300         126.204         4.476         90.552         8.650         3.154         650         25.169         268.916         67.305         10.054         41.990         903.241           81         1.200         158.4461         231.125         3.000         104.333         46.00         3.454         660         28.055         28.999         68.474         12.734         46.638         9995.366           1985         2.933         174.087         244.763         3.664         114.635         13.000         3.184         700         36.008         30.596         69.281         13.146         80.001         1.033.856           7         2.200         178.442         245.514         4.076         119.562         12.400         3.21         700         36.008         305.964         69.281         1.456         52.950         1.052.614         1.057.766         22.340         7.278         1.057.766         22.3400         7.278         1.939				-	-	,	,						-	-	
81         2.500         140.300         216.200         4.476         90.552         8.650         2.783         0         19.462         28.664         66.206         15.064         42.8389         854.146           82         1.200         152.144         216.620         3.000         104.333         8.500         3.154         650         25.169         268.916         67.305         10.054         41.969         903.241           143         1.200         173.334         238.000         108.411         10.000         3.154         600         34.728         300.071         69.847         12.734         46.638         995.661           186         2.933         174.907         246.916         3.600         113.663         13.000         3.184         700         36.008         307.875         69.928         13.144         48.000         1.033.856           8         2.500         173.400         241.943         3.900         127.333         1555         2.000         0         36.766         23.400         70.276         11.693         52.155         1.052.671           1990         2.446         183.107         253.264         4.901         13.1555         2.000         0			,	,		-	-	-				,			
82         1200         152.144         216,620         3,000         104,533         8,500         3,154         650         25,169         268,916         67,305         10,54         1,996         903,241           84         1,200         168,461         231,125         3,000         100,1141         9,000         3,154         650         28,055         288,969         68,741         12,734         46,638         995,386           1985         2,933         174,087         244,763         3,664         114,635         13,000         3,184         700         36,008         305,564         69,281         13,46         40,001         1,033,856           7         2,000         173,432         245,514         4,076         119,652         12,400         3,11         700         36,008         305,964         69,413         1,252         46,984         1,037,150           88         2,500         173,400         244,555         13,436         3,100         500         36,496         316,223         69,981         138,274         73,291         15,233         49,000         1,056,330           9190         2,446         183,147         253,261         4,200         13,305         15,240 <th></th> <th></th> <th>,</th> <th></th> <th></th> <th>-</th> <th>,</th> <th>-</th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th></th>			,			-	,	-					-		
83         1,200         168,461         231,125         3,000         102,011         10,200         3,154         650         28,055         288,969         68,474         12,734         46,638         995,366           9185         2,933         174,087         244,763         3,664         114,653         13,000         3,184         700         36,286         305,564         69,143         12,526         46,668         103,123           86         2,933         174,087         244,763         3,664         114,653         13,000         3,184         700         36,008         307,875         69,928         13,146         48,000         1,033,856           87         2,000         173,402         244,61         3,000         127,330         13,555         2,000         0         36,616         332,274         73,329         11,523         49,000         1,070,816           91         2,4473         182,932         26,083         3,000         17,330         13,055         2,000         0         36,914         338,274         73,329         11,523         49,000         1,070,816           91         2,4473         182,923         26,053         39,010         14,550         27,070 <th></th> <th>'</th> <th>-</th> <th>-</th> <th>-</th> <th>-</th> <th>,</th> <th>-</th> <th></th> <th>,</th> <th>,</th> <th>-</th> <th>,</th> <th>-</th> <th></th>		'	-	-	-	-	,	-		,	,	-	,	-	
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         3,000         113,663         12,000         3,184         700         36,088         305,964         69,928         13,146         46,000         1,033,856           87         2,200         173,400         241,494         3,000         127,330         13,555         2,000         0         35,766         323,407         70,278         11,653         45,000         1,096,330           91         2,447         182,832         266,342         4,200         130,989         15,000         2,880         650         32,847         13,747         73,329         11,523         49,000         1,009,330           94         1,940         187,247         259,942         4,200         133,803         11,425         3,277         734         36,291         330,949         73,494         14,255         47,389         1,083,809         1,096,330           94         1,940         187,247         259,942         4,200         1		1,200	168,461	231,125	3,000	108,141	9,000	3,154		28,055	288,969	68,474	12,734	46,638	969,601
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           1990         2,446         183,147         253,261         4,500         127,439         14,000         2,500         0         35,766         32,2400         70,278         11,693         52,2151         1,072,766           1990         2,446         183,147         256,342         4,200         130,989         15,000         2,880         650         32,847         73,299         11,548         48,000         1,070,816           2,519         182,643         256,372         0         67,565         0         0         0         262,718         66,158         0         40,007           980         1,940         187,247         259,942         4,200         133,803         11,425         3,277         734         36,627         339,109 <t< th=""><th>84</th><th>1,200</th><th>173,334</th><th>238,000</th><th>3,000</th><th>102,301</th><th>10,200</th><th>3,154</th><th>600</th><th>34,728</th><th>300,071</th><th>69,847</th><th>12,313</th><th>46,638</th><th>995,386</th></t<>	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
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         241,623         3,000         127,555         13,436         3,100         500         36,961         133,627         73,329         11,523         49,000         1,052,671           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         2,446         183,147         256,342         4,200         131,305         15,240         2,880         0         36,788         32,477         74,229         15,499         43,889         1,089,911           93         184,463         259,778         0         67,565         0         0         0         0262,718         66,158         0         40,007         880,689           94         1,940         187,247         259,372         14,3147         14,341         3,355         3,300         643         16,271	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
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         241,623         3,000         127,555         13,436         3,100         500         36,961         133,627         73,329         11,523         49,000         1,052,671           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         2,446         183,147         256,342         4,200         131,305         15,240         2,880         0         36,788         32,477         74,229         15,499         43,889         1,089,911           93         184,463         259,778         0         67,565         0         0         0         0262,718         66,158         0         40,007         880,689           94         1,940         187,247         259,372         14,3147         14,341         3,355         3,300         643         16,271	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
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           1900         2.446         183,147         253,261         4,000         130,091         2,800         0         36,911         338,274         73,329         11,548         48,300         1,070,816           92         2,519         182,543         266,342         4,200         131,305         15,240         2,880         650         32,847         19,475         73,169         11,548         48,300         1,080,81           94         1,940         187,247         259,942         4,200         133,033         11,425         3,277         734         36,291         330,949         73,949         14,255         47,335         1,105,347           1995         765         192,228         283,576         1,000         100,589         3,250         3,300         643         16,473         289,173         73,108         5,035         39,130         987,370           96         2,145         196,055         271,075         4,277         143,147         14,341         3,355					-			-				-		-	
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       73,199       11,548       48,000       1,070,816         92       2,513       125,543       256,342       4,200       133,005       15,240       2,880       650       32,647       74,229       15,499       43,889         93       1,840       18,747       259,942       4,200       133,803       11,425       3,277       734       36,291       30,949       73,949       14,255       47,335       1,089,911         1995       765       199,042       274,707       143,147       14,314       3,355       734       39,662       330,998       74,766       14,135       68,710       1,17,500         97       2,476       199,904       274,942       4,600       122,379       11,189       3,228       1,055       32,259       342,758       76,872       17,206       67,643       1,142,148       1,182,248         98	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	
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       1,940       187,247       259,942       4,200       133,803       11,425       3,277       734       36,291       330,949       74,766       14,135       68,710       1,171,500         94       1,940       187,247       24,800       4,600       145,061       13,479       3,600       794       39,484       342,234       76,083       19,205       62,448       1,182,248         99       1,870       198,197       27,480       4,600       145,061       13,479       3,600       794       39,484       342,234       76,083       19,205       62,448       1,182,248         99       1,870       198,060       277,72       4,753       145,772       14,723       3,510       0       42,062       352,988       79,166       17,407       51,032	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
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         1,940         187,247         259,778         0         67,565         0         0         0         262,718         66,158         0         40,007         880,689           94         1,940         187,247         259,778         1,000         100,589         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         3,277         143,147         14,341         3,355         734         39,662         339,098         74,766         14,135         68,710         1,118,328           91         1,870         198,060         277,723         4,733         15,472         3,510         0         42,062         352,372         79,206         19,414         4,141         1,216,985           91         3,155         201,859         279,354         4,763         15,427         3,510         0         42,210	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
93         0         184,463         259,778         0         67,565         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         2,476         197,904         274,880         4,600         122,379         11,87,41         3,550         342,234         76,083         19,205         62,444         1,182,248           98         1,930         198,197         274,942         4,600         122,379         11,189         3,228         1,055         32,259         342,758         76,687         17,276         67,643         1,154,328           99         1,850         279,354         4,763         154,277         3,510         1,210         38,966         36,653         21,708         1,158	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
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       339,088       74,766       14,135       68,710       1,171,500         97       2,476       197,004       274,800       4,600       122,379       1,822       80,55       32,259       342,758       76,872       17,276       67,643       1,182,248         98       1,870       198,060       277,723       4,735       145,782       14,723       3,510       0       42,062       352,98       79,166       17,407       51,032       1,190,172         2000       2,361       199,873       278,956       4,763       166,57       17,520       3,510       1       39,326       339,666       76,653       21,708       71,168       1,224,580 </th <th>92</th> <th>2,519</th> <th>182,543</th> <th>256,342</th> <th>4,200</th> <th>131,305</th> <th>15,240</th> <th>2,880</th> <th>0</th> <th>36,788</th> <th>324,477</th> <th>74,229</th> <th>15,499</th> <th>43,889</th> <th>1,089,911</th>	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
1995765192,328263,5761,000100,5893,2503,30064316,473289,17372,1085,03539,130987,370962,145196,055271,0754,277143,14714,3413,35573439,662339,09874,76614,13568,7101,171,500972,476197,904274,8804,600145,06113,4793,60079439,484342,23476,08319,20562,4481,182,248981,930198,197274,9424,600122,37911,1893,2281,055322,559342,75876,87217,27667,6431,147,3289118,701198,060277,7234,735145,78214,7233,5101,21038,966355,98879,16617,40751,0321,190,17220002,361199,873278,9564,763166,65717,5203,510039,326339,66676,65321,70871,1581,219,329022,422202,807281,0704,763162,77915,5793,5101,14937,221342,05376,24520,36475,6551,224,800032,386203,00728,6254,763175,20613,0443,51080036,611346,59677,52220,78056,1861,223,210062,361206,452282,6774,763175,18413,2323,510041,156335,26976,76522,771<	93			-		67,565	0		0			66,158			
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       199,873       278,956       4,763       165,720       3,510       0       42,062       352,372       79,206       19,741       64,414       1,216,985         02       2,422       20,807       281,070       4,763       162,624       14,717       5,100       0       39,326       39,666       76,653       21,708       71,035       14,24,500         03       2,386       202,974       280,624       4,763       162,679       15,579       3,510       1,149       42,210       351,257       76,884       22,660       67,540       1,224,5	94	1,940				-		3,277	734	,					
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       1,190,172         2000       2,361       199,873       278,956       4,763       164,672       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       9,326       39,366       76,643       21,078       71,158       1,219,329         02       2,422       202,807       281,070       4,763       162,624       14,471       3,510       1,149       37,221       342,053       76,245       20,364       75,635       1,224,500       1,224,580         04       2,386       203,007       283,625       4,763       175,206       13,044       3,510       800       36,611       346,596       77,522       20,780       56	1995	765	192,328			100,589	3,250		643		-			39,130	
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       1,224,580         02       2,422       20,807       281,024       4,763       162,779       15,579       3,510       1,194       42,210       351,257       76,884       22,660       67,540       1,224,580       1,224,580         04       2,386       203,07       283,625       4,763       175,206       13,044       3,510       800       36,611       346,598       77,512		, -	,		-		-	-						,	
991,870198,060277,7234,735145,78214,7233,5101,21038,966355,98879,16617,40751,0321,190,17220002,361199,873278,9564,763154,30015,4273,510042,062352,37279,20619,74164,4141,216,985013,155201,859279,3544,763160,65717,5203,510039,326339,66676,65321,70871,1581,219,329022,422202,807281,0704,763162,62414,7173,5101,14937,221342,05376,24520,36475,6351,224,580032,386203,007283,6254,763175,20613,0443,51080038,461353,08576,27721,73554,6661,232,21020052,361206,452282,2674,763175,20613,0443,51080038,461353,08576,27721,73554,6661,226,097062,361208,378280,7534,763175,18413,2323,510041,156335,26976,76522,77143,1361,207,278072,361201,286284,4194,763174,67314,6763,509038,617352,56477,13221,73548,1261,225,088092,361211,578285,1914,706174,48714,8663,50080034,617352,56477,1223,383 <th></th> <th></th> <th></th> <th>,</th> <th>'</th> <th>,</th> <th>,</th> <th>-</th> <th></th> <th>,</th> <th>,</th> <th></th> <th></th> <th>-</th> <th></th>				,	'	,	,	-		,	,			-	
20002,361199,873278,9564,763154,30015,4273,510042,062352,37279,20619,74164,4141,216,985013,155201,859279,3544,763160,65717,5203,510039,326339,66676,65321,70871,1581,219,329022,422202,807281,0704,763162,62414,7173,5101,14937,221342,05376,24520,36475,6351,224,580032,386202,974280,6244,763162,77915,5793,5101,19442,210351,25776,88422,66067,5401,234,360042,386203,007283,6254,763175,20613,0443,51080038,461353,08576,27721,73554,6661,232,21020052,361206,452282,2674,763175,20613,0443,51080036,611346,59677,52220,78056,1861,226,097062,361208,378280,7534,763175,88613,4203,5090042,573345,93577,06822,02140,7161,214,600082,361206,284280,6914,763174,67314,6763,50980040,174352,10477,57123,38364,1961,225,088092,361201,286285,1914,706174,48714,8663,50080040,174352,10477,57123,38			,	,	-	-	-			-		-	-	-	
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         175,206         13,044         3,510         800         36,611         346,596         77,522         20,780         56,186         1,226,097           06         2,361         206,8378         280,753         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 <td< th=""><th></th><th>,</th><th></th><th></th><th>-</th><th></th><th></th><th></th><th></th><th>,</th><th></th><th></th><th></th><th></th><th></th></td<>		,			-					,					
022,422202,807281,0704,763162,62414,7173,5101,14937,221342,05376,24520,36475,6351,224,580032,386202,974280,6244,763162,77915,5793,5101,19442,210351,25776,88422,66067,5401,234,360042,386203,007283,6254,763175,40614,4893,51080038,461353,08576,27721,73554,6661,232,21020052,361206,452282,2674,763175,20613,0443,51080036,611346,59677,52220,78056,1861,226,097062,361201,286284,4194,763175,18413,2323,510041,156335,26976,76522,77143,1361,227,278072,361201,286284,4194,763174,67314,6763,50960042,573345,93577,06822,02140,7161,214,600082,361206,284280,6914,763175,88613,4203,509038,617352,56477,13221,73548,1261,225,088092,361211,578285,1914,706174,48714,8663,50080040,174352,10477,57123,33364,1961,254,9162010150182,483235,3710174,5185,68850037417,481340,07872,98917,333 <t< th=""><th></th><th>,</th><th>,</th><th>,</th><th>-</th><th></th><th></th><th></th><th></th><th>,</th><th>,</th><th>,</th><th></th><th></th><th></th></t<>		,	,	,	-					,	,	,			
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       1,226,097         07       2,361       201,286       284,419       4,763       174,673       14,676       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       64,19															
042,386203,007283,6254,763175,40614,4893,51080038,461353,08576,27721,73554,6661,232,21020052,361206,452282,2674,763175,20613,0443,51080036,611346,59677,52220,78056,1861,226,097062,361208,378280,7534,763175,18413,2323,510041,156335,26976,76522,77143,1361,207,278072,361201,286284,4194,763174,67314,6763,50960042,573345,93577,06822,02140,7161,214,600082,361206,284280,6914,763175,88613,4203,509038,617352,56477,13221,73548,1261,225,088092,361211,578285,1914,706174,48714,8663,50080040,174352,10477,57123,38364,1961,254,9162010150182,483235,3710174,5185,68850037417,481340,07872,98917,33348,7001,095,665112,961202,478294,5694,714175,68312,77450077037,163346,07975,04821,00342,2701,216,012122,797208,217294,7484,625177,59314,17553587839,560338,43976,77522,65552,483															
20052,361206,452282,2674,763175,20613,0443,51080036,611346,59677,52220,78056,1861,226,097062,361208,378280,7534,763175,18413,2323,510041,156335,26976,76522,77143,1361,207,278072,361201,286284,4194,763174,67314,6763,50960042,573345,93577,06822,02140,7161,214,600082,361206,284280,6914,763175,88613,4203,509038,617352,56477,13221,73548,1261,225,088092,361211,578285,1914,706174,48714,8663,50080040,174352,10477,57123,38364,1961,254,9162010150182,483235,3710174,5185,68850037417,481340,07872,98917,33348,7001,095,665112,961202,478294,5694,714175,68312,77450077037,163346,07975,04821,00342,2701,216,012122,797208,217294,7484,625177,59314,17553587839,560338,43976,77522,65552,4831,233,480133,285217,417295,9231,736178,69714,3051,80189737,511362,25475,83821,04460,587					-										
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         2010       150       182,483       235,371       0       174,518       5,688       500       374       17,481       340,078       72,989       17,333       48,700       1,095,665         11       2,961       202,478       294,569       4,714       175,683       12,774       500       770       37,163       346,079       75,048       21,003       42,270						-	-								
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       1,225,088         2010       150       182,483       235,371       0       174,518       5,688       500       374       17,481       340,078       72,989       17,333       48,700       1,095,665         11       2,961       202,478       294,569       4,714       175,683       12,774       500       770       37,163       346,079       75,048       21,003       42,270       1,216,012         12       2,797       208,217       294,748       4,625       177,593       14,175       535       878       39,560       338,439       76,775       22,655       52,483												-		-	
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         2010       150       182,483       235,371       0       174,518       5,688       500       374       17,481       340,078       72,989       17,333       48,700       1,095,665         11       2,961       202,478       294,569       4,714       175,683       12,774       500       770       37,163       346,079       75,048       21,003       42,270       1,216,012         12       2,797       208,217       294,748       4,625       177,593       14,175       535       878       39,560       338,439       76,775       22,655       52,483       1,233,480         13       3,285       217,417       295,923       1,736       178,697       14,386       608       770       39,839       338,588       76,002       22,708       49,791 <t< th=""><th></th><th>,</th><th>,</th><th>,</th><th>-</th><th></th><th></th><th>-</th><th></th><th></th><th></th><th></th><th></th><th>-</th><th></th></t<>		,	,	,	-			-						-	
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12       2,797       208,217       294,748       4,625       177,593       14,175       535       878       39,560       338,439       76,775       22,655       52,483       1,233,480         13       3,285       217,417       295,923       1,736       178,697       14,386       608       770       39,839       338,588       76,002       22,708       49,791       1,239,750         14       1,611       224,952       297,015       1,736       179,296       14,305       1,801       897       37,511       362,254       75,838       21,044       60,587       1,278,847         2015       1,611       228,480       297,930       1,736       179,625       16,182       1,746       897       43,378       370,590       77,123       34,391       67,800       1,321,489         16       2,467       226,492       299,336       3,863       182,160       16,387       1,746       897       43,743       374,554       77,801       22,757       65,735       1,317,938	2010	150	182,483	235,371	0	174,518	5,688	500	374	17,481	340,078	72,989	17,333	48,700	1,095,665
13       3,285       217,417       295,923       1,736       178,697       14,386       608       770       39,839       338,588       76,002       22,708       49,791       1,239,750         14       1,611       224,952       297,015       1,736       179,296       14,305       1,801       897       37,511       362,254       75,838       21,044       60,587       1,278,847         2015       1,611       228,480       297,930       1,736       179,625       16,182       1,746       897       43,378       370,590       77,123       34,391       67,800       1,321,489         16       2,467       226,492       299,336       3,863       182,160       16,387       1,746       897       43,743       374,554       77,801       22,757       65,735       1,317,938	11	2,961	202,478	294,569	4,714	175,683	12,774	500	770	37,163	346,079	75,048	21,003	42,270	1,216,012
14       1,611       224,952       297,015       1,736       179,296       14,305       1,801       897       37,511       362,254       75,838       21,044       60,587       1,278,847         2015       1,611       228,480       297,930       1,736       179,625       16,182       1,746       897       43,378       370,590       77,123       34,391       67,800       1,321,489         16       2,467       226,492       299,336       3,863       182,160       16,387       1,746       897       43,743       374,554       77,801       22,757       65,735       1,317,938	12							535	878	39,560	338,439	76,775	22,655	52,483	
2015         1,611         228,480         297,930         1,736         179,625         16,182         1,746         897         43,378         370,590         77,123         34,391         67,800         1,321,489           16         2,467         226,492         299,336         3,863         182,160         16,387         1,746         897         43,378         370,590         77,123         34,391         67,800         1,321,489           16         2,467         226,492         299,336         3,863         182,160         16,387         1,746         897         43,743         374,554         77,801         22,757         65,735         1,317,938														, , , , , , , , , , , , , , , , , , , ,	
16 2,467 226,492 299,336 3,863 182,160 16,387 1,746 897 43,743 374,554 77,801 22,757 65,735 <b>1,317,938</b>															8
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17 2,467 242,150 301,309 3,863 184,565 16,423 2,089 897 45,183 377,047 77,996 34,099 68,131 <b>1,356,219</b>					-					-	-	-	-		
	17	2,467	242,150	301,309	3,863	184,565	16,423	2,089	897	45,183	377,047	77,996	34,099	68,131	1,356,219

#### Table 6. Irrigation Districts Irrigation Rates (\$ per irrigation acre per year)

YEAR	AID	BRID	EID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	WID
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
2010	\$10.00	\$15.00	\$0.00	\$11.50	\$14.00	\$9.50	\$12.00	\$21.50	\$9.50	\$20.00	\$8.00	\$8.50	\$16.25
11	\$10.00	\$15.00	\$0.00	\$11.50	\$14.00	\$9.50	\$12.00	\$20.50	\$9.50	\$20.00	\$8.00	\$8.50	\$16.25
12	\$11.00	\$16.00*	\$0.00*	\$11.50*	\$14.00*	\$11.00*	\$12.00	\$20.50	\$10.00*	\$20.00*	\$8.00*	\$9.00	\$16.25*
13	\$11.00	\$16.00*	\$0.00*	\$11.50*	\$14.00*	\$11.00*	\$12.00	\$20.50	\$10.00*	\$20.00*	\$8.00*	\$11.00	\$18.00*
14	\$12.00	\$16.00*	\$0.00*	\$12.00*	\$16.00*	\$11.00*	\$12.00	\$23.00	\$10.00*	\$20.00*	\$8.00*	\$11.00	\$18.00*
2015	\$12.00	\$16.00*	\$0.00*	\$12.00*	\$16.00*	\$11.00*	\$12.00	\$25.00	\$10.00*	\$20.00*	\$10.00*	\$11.00	\$18.00*
16 17	\$12.00* \$13.00*	\$16.00* \$16.00*	\$0.00* \$0.00*	\$12.00* \$12.00*	\$16.00* \$16.00*	\$11.00* \$11.00*	\$12.00 \$12.00	\$25.00 \$25.00	\$12.00* \$12.00*	\$20.00* \$22.00*	\$14.00* \$16.00*	\$11.00 \$11.50	\$18.00* \$18.00*

Note: \* The districts levy the following additional surcharges.

- charges vary for pipeline delivery AID

BRID - \$0.70 per acre inch for volumes used on flood parcels over the annual water allocation (sprinkler parcels may not use more than the allocation)

EID - \$6.00 per acre if served from H Cowoki, 03 East Branch, Springhill, or Rolling Hills Reservoir pressure systems

LID - \$3.00 per acre for pressure pipeline

- \$0.30 per psi for pressure pipeline; \$5.00 per acre inch for volumes over the annual LNID allocation

- \$4.00 per acre for pipeline delivery; \$1.00 per 10 psi MID
  - charges vary for pipeline and pressure delivery; \$100 per acre inch for volumes over the annual allocation

- \$100 per acre inch for volumes over the annual allocation SMRID

TID - \$70 per acre inch for volumes over the annual allocation WID

- \$0.31 per psi; \$0.50 per acre for automated screen cleaning

Some districts have centralized pump stations delivering pressurized water to individual farm turnouts. In these cases, the irrigators served by that pump station are charged for the energy used and often an additional maintenance charge.

RID

#### Table 7. Gross Annual Diversions, Expansion Limits, and Licence Allocations for Irrigation Districts

				OL	DMAN R	IVER BA	SIN				BOW	RIVER E	BASIN	
DISTRICT	AID	LID	LNID	MID	MVID	RCID	RID	SMRID	TID	UID	BRID	EID	WID	TOTALS
WATER SOURCE	diversion from Belly River	diversion from Belly River	diversion from Oldman River	diversion from Belly, Waterton, St. Mary Rivers	diversion from Belly River	diversion from Gros Ventre Ck.	diversion from Belly, Waterton, St. Mary Rivers	diversion from Belly, Waterton, St. Mary Rivers	diversion from Belly, Waterton, St. Mary Rivers	diversion from Belly, Waterton Rivers	diversion from Bow River	diversion from Bow River	diversion from Bow River	
EXPANSION LIMITS (acres)	7,500	6,000	227,000	18,300	4,240	1,210	46,500	412,000	92,200	34,400	260,000	311,000	95,000	1,515,350
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	490,000	761,000	190,500	2,869,160
YEAR					VOLU	IME OF WAT	ER DIVERTI	ED (acre-feet)	)					
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	1,856,416
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	120,400	1,207,116
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	85,829	21,054	238,000	409,400	85,000	1,459,022
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
2010	1,938	2,383	71,950	5,351	1,013	116	21,900	201,700	53,135	7,264	156,116	210,500	65,850	799,219
11	2,902	8,028	132,388	15,233	2,393	530	32,534	286,000	84,909	19,073	151,700	310,100	85,985	1,131,775
12	2,761	3,973	176,683	20,720	2,558	0**	35,200	340,800	88,309	19,039	260,000	343,200	103,862	1,397,105
13	3,446	4,101	139,035	17,210	2,297	2,319	39,723	314,600	77,371	18,598	240,000	383,400	99,473	1,341,573
14	3,113	5,928	120,097	13,552	1,801	700	31,448	297,600	71,847	16,565	222,191	371,000	113,666	1,269,535
2015	3,306	4,540	197,000	21,459	2,420	700	50,711	453,300	100,481	25,839	331,900	471,900	136,600	1,800,156
16	3,848	4,564	206,730	20,325	2,233	367	39,704	402,600	84,313	21,864	328,085	371,100	109,865	1,595,598
17	4,710	5,697	274,400	24,221	2,838	800	54,062	536,900	123,923	31,350	422,000	521,200	131,000	2,133,101
Percent of Licence (2017)	52.3%	47.5%	82.0%	71.2%	35.5%	26.7%	66.7%	74.4%	78.4%	47.3%	86.1%	68.5%	68.8%	74.3%
Average Volume (1976-2017)	3,790	6,073	169,895	14,898	3,053	1,009	33,890	384,925	92,692	20,384	303,123	514,150	123,546	1,668,661

Notes: - Data is obtained from Water Survey of Canada (WSC), Alberta Environment and Irrigation Districts' annual reports.

- RCID has a second supply from Ross Creek, but data has not been consistently recorded at that location.

- Diversion data is 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. – \*Water rationing in effect for MID, RID, SMRID, TID, UID, AID, LID, MVID and Blood Tribe Agricultural Project (BTAP) in 2001.

- UID licence amended in 2004, re-allocating 1300 acre-feet of diversion authority to the Southeast Alberta Water Cooperative.

- \*\*RCID 2012 had zero diversion since the diversion structure was under construction; 562 ac-ft was delivered for irrigation from Cavan Lake.

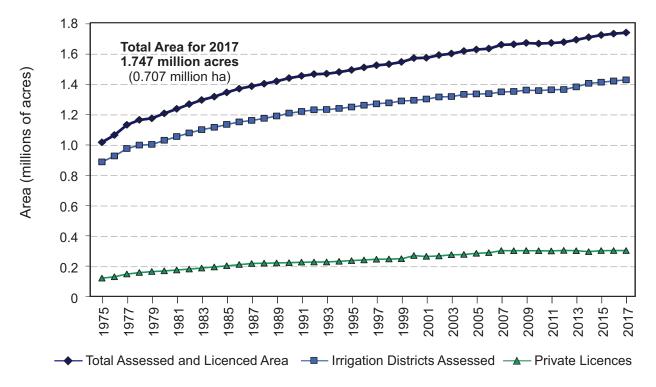
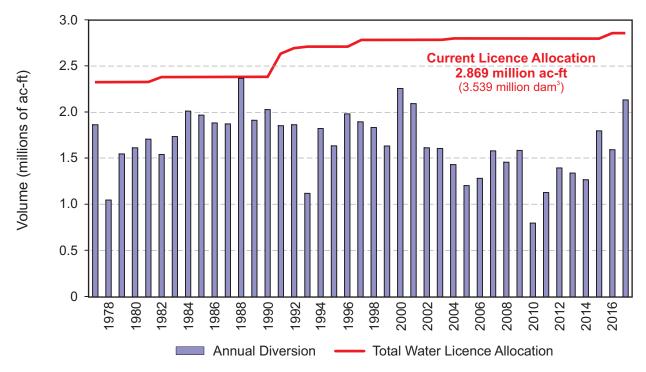
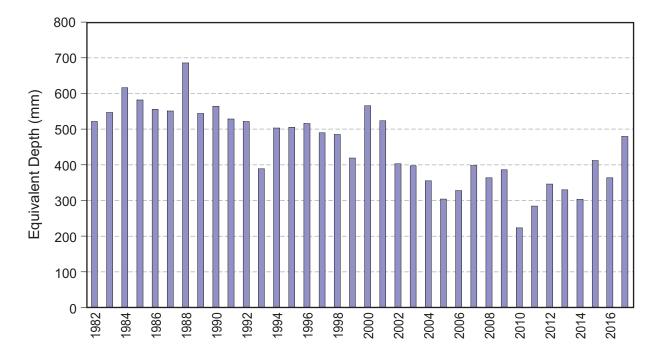


Figure 6. Growth in Irrigation Area



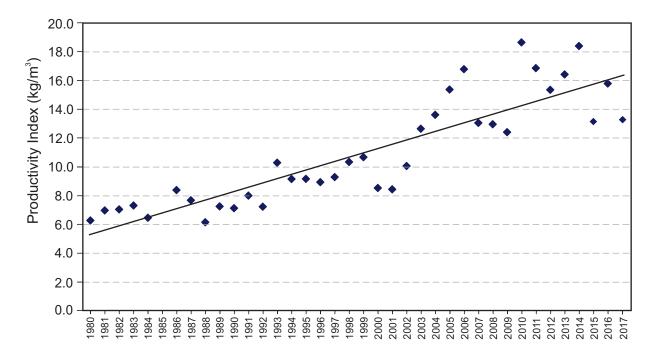
#### Figure 7. Irrigation Districts Gross Annual Diversion and Licence Allocation

Note: Diversion data represent the gross diversion into and through the works of the irrigation districts and include volumes used directly for irrigation purposes, reservoir filling and the water supplied or licensed to municipal, domestic, other agricultural, industrial, environmental uses and water delivered to other licence holders through a conveyance agreement with the licence holder.



#### Figure 8. Irrigation Districts Gross Diversion Equivalent Depth

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 used for net gains in reservoir storage, water diverted for other uses such as domestic, municipal, other agricultural, industrial, recreational and habitat enhancement purposes.

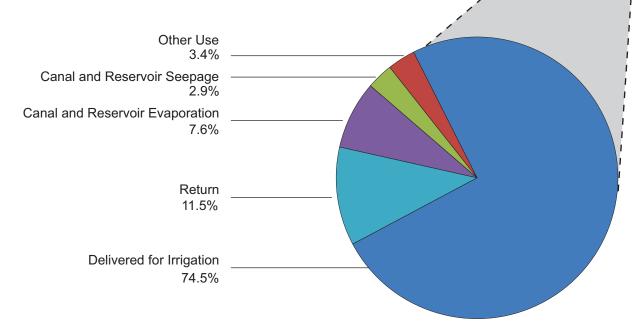


#### Figure 9. Irrigation Districts Water Use Productivity

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 reported by the Alberta Sugar Beet Growers), the historical yields of potatoes (as estimated by the Potato Growers of Alberta) are tallied and then divided by the respective reported annual gross water diversions to the 13 irrigation districts to derive a "Productivity Index".

Table 8.	Irrigation	<b>Districts</b>	Water	Balance
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Water Balance Category	OLDMAN RIVER BASIN	BOW RIVER BASIN	IRRIGATION DISTRICTS
Gross Diversion	1,058,900	1,074,200	2,133,100
Net District Storage Change	48,800	(22,100)	26,700
TOTAL DISTRICT USE	1,107,700	1,052,100	2,159,800
Delivered for Irrigation	841,600	767,300	1,608,900
Delivered for Other Use	32,600	40,600	73,200
Canal & Reservoir Seepage	35,500	27,700	63,200
Canal & Reservoir Evaporation	77,700	87,400	165,100
Return	120,300	129,100	249,400
TOTAL DISTRICT OPERATIONS	1,107,700	1,052,100	2,159,800



**Note:** Irrigation district reported values were used to estimate the water balance. Where district reporting was incomplete, Alberta Agriculture and Forestry calculated estimates.

#### **Glossary**

Gross Diversion - Volume of water diverted from a lake, reservoir or the river system by irrigation districts.

**Net District Storage Change** - Net volume of water removed from internal irrigation district reservoirs for use. A negative number within brackets, indicates a net increase in reservoir storage volume over the irrigation season.

Total District Use - Total volume of water used from diversion and storage.

Delivered for Irrigation - Net volume of water supplied for irrigation purposes.

**Delivered for Other Use** - Volume of water supplied for other uses including municipal domestic, other agricultural, industrial, and environmental uses.

Canal & Reservoir Seepage - Water lost from reservoirs and through delivery system from seepage.

**Canal & Reservoir Evaporation** - Water lost from evaporation from the surface of irrigation district canals and reservoirs. **Return** - Volume of water returned to the river system.

**Total District Operations** - Total volume of water used for irrigation districts operations comprised of water delivered for irrigation, other use, seepage and evaporation, and water returned.

	REHABILITATED UN-REHABILITATED												
Irrigation District	Pipelin	es - Closed	Pipelin	es - Open		rane-Lined Canals		rete - Lined Canals	Earth	n Canals	Un-Rehabi	litated Canals	Total Conveyance
	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	Works (km)
AID	24.4	61.6%	0.2	0.6%	4.5	11.4%	0.0	0.0%	1.0	2.5%	9.4	23.9%	40
BRID	563.2	56.3%	6.2	0.6%	128.5	12.9%	6.4	0.6%	177.9	17.8%	117.4	11.7%	1000
EID	1199.0	62.2%	31.6	1.6%	254.5	13.2%	0.0	0.0%	197.3	10.2%	246.6	12.8%	1,929
LID	29.5	53.9%	0.3	0.5%	2.0	3.6%	0.0	0.0%	11.7	21.4%	11.2	20.4%	55
LNID	522.1	68.6%	10.2	1.3%	55.2	7.2%	20.6	2.7%	64.6	8.5%	88.8	11.7%	761
MID	59.8	59.0%	1.5	1.5%	1.2	1.2%	0.3	0.3%	33.7	33.3%	4.9	4.8%	101
MVID	17.0	41.0%	1.8	4.4%	0.0	0.0%	0.0	0.0%	16.9	40.8%	5.7	13.8%	41
RCID	12.2	83.2%	0.0	0.0%	0.0	0.0%	0.0	0.0%	2.5	16.8%	0.0	0.0%	15
RID	147.2	61.6%	4.0	1.7%	0.0	0.0%	0.0	0.0%	69.0	28.9%	18.6	7.8%	239
SMRID	951.3	52.6%	22.0	1.2%	65.7	3.6%	58.3	3.2%	461.9	25.5%	250.7	13.9%	1,810
TID	196.1	56.6%	10.9	3.2%	56.5	16.3%	6.5	1.9%	57.2	16.5%	19.4	5.6%	347
UID	97.8	42.3%	24.1	10.4%	13.9	6.0%	0.2	0.1%	42.6	18.4%	52.6	22.7%	231
WID	242.8	23.4%	33.6	3.2%	94.0	9.1%	5.2	0.5%	162.7	15.7%	498.0	48.1%	1,036
Total	4,062	53.4%	146	1.9%	676	8.9%	97	1.3%	1,299	17.1%	1,323	17.4%	7,604
	Headworks Owned by Alberta Environment and Parks Total Length of Conveyance System in Southern Alberta (km)								339 7,943				

#### Table 9. Type of Conveyance Infrastructure within the 13 Irrigation Districts

NOTE: Rehabilitated infrastructure includes those works re-constructed through:

the Irrigation Rehabilitation Program (IRP).
Alberta Environment and Parks.
district funded infrastructure projects.

IRRIGATION DISTRICTS		CONVEYANCE WORKS		AINAGE /ORKS		AJOR JCTURES		of ALL RKS
	length (km)	replacement cost (\$'000)	length (km)	replacement cost (\$'000)	number of units	replacement cost (\$'000)	length (km)	replacement cost (\$'000)
AID	40	\$11,157	19	\$314	0	\$0	59	\$11,471
BRID	1000	\$366,508	757	\$15,416	22	\$97,753	1,757	\$479,677
EID	1,929	\$719,917	1,949	\$34,631	61	\$349,421	3,878	\$1,103,969
LID	55	\$12,773	5	\$160	0	\$0	60	\$12,933
LNID	761	\$265,156	247	\$7,491	2	\$2,880	1008	\$275,527
MID	101	\$26,930	163	\$5,666	0	\$0	264	\$32,596
MVID	42	\$14,440	1	\$59	0	\$0	43	\$14,499
RCID	15	\$2,848	20	\$987	1	\$135	35	\$3,970
RID	239	\$60,118	218	\$10,840	0	\$0	457	\$70,958
SMRID	1,810	\$669,878	412	\$11,351	48	\$335,617	2,222	\$1,016,846
TID	347	\$131,545	78	\$4,545	12	\$14,168	425	\$150,258
UID	231	\$75,674	58	\$1,133	11	\$16,206	289	\$93,013
WID	1,036	\$356,146	927	\$24,598	13	\$18,180	1,963	\$398,924
Total	7,604	\$2,713,089	4,853	\$117,191	170	\$834,361	12,460	\$3,664,641

Table 10. Irrigation District Infrastructure Length and Replacement Cos	Table 10.	Irrigation	District	Infrastructure	Length ar	nd Replaceme	nt Cost
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NOTE: Total of All Works length values include the summation of conveyance and drainage works.

Replacement cost is based on construction and material costs that were updated in 2012.

Irrigation District	Other Purposes* (ac-ft)	Total Licensed Volume (ac-ft)
AID	700	9,000
BRID	2,380	490,000
EID	5,000	761,000
LID	1,000	12,000
LNID	39,068	334,450
MID	740	34,000
MVID	340	8,000
RCID	n/a	3,000
RID	4,500	81,000
SMRID	12,000	722,000
TID	8,000	158,000
UID	1,000	66,210
WID	3,500	190,500
Total	78,228	2,869,160

#### Table 11. Irrigation District Water Licence Allocations

Note: The other purposes volumes may be used for purposes other than irrigation, as set out in the districts water licences. Other purpose uses of water volumes licensed to irrigation districts include non-irrigation uses such as municipal, rural water supply, agricultural, commercial, industrial, rural residential, management of fish/wildlife, habitat enhancement and recreation.

\* Water volumes allocated to other purposes are included in the total licensed volumes.

#### Table 12. Irrigation District Infrastructure Value Condition Assessments

Works Category	Good	Fair	Poor	TOTAL
Conveyance	\$1,930,898,464	\$686,264,077	\$95,926,202	\$2,713,088,743
Drainage	\$30,002,646	\$65,222,999	\$21,965,281	\$117,190,926
Major Structures	\$535,333,457	\$291,815,624	\$7,211,834	\$834,360,915
Total	\$2,496,234,567	\$1,043,302,700	\$125,103,317	\$3,664,640,584
Proportion	68.1%	28.5%	3.4%	100%

Note: Condition assessments ratings are determined based on criteria in the Irrigation Works Condition Evaluation Guidelines. The last valuation was completed in 2012.

## Table 13. Irrigation District Reservoirs

l c cation	Deservein	Approximate Date	Irrigation	Irrigation
Location	Reservoir	of Impoundment	Live Storage (dam³)	Live Storage (acre-feet)
	Badger	1985	57,120	46,300
	'D' Reservoir	2005	350	280
	'H' Reservoir	1953	2,790	2,260
Bow River Irrigation District	Lost Lake	1973/1987*	5,060	4,100
C C	'PFRID' Reservoir	2005	570	480
	Scope	1953	12,930	10,480
-	Total storage		78,820	63,900
	Bantry # 1	1968	1,090	880
	Bantry # 2	1967	4,150	3,360
	Cowoki Lake	1937	8,370	6,780
	Crawling Valley	1984	94,300	76,450
	'J' Reservoir	1949/1966*	1,460	1,180
	Kitsim	1980	19,470	15,790
Eastern Irrigation District	Lake Newell	1914	315,300	255,610
Eastern Inigation District	One Tree	1935	5,660	4,590
	Rock Lake	1956	3,990	3,240
	Rolling Hills	1940/2003*	40,640	32,950
	Snake Lake	1997	18,620	15,100
	Tilley "B"	1972	21,070	17,080
-	Total storage		534,120	433,010
Lethbridge Northern	Park Lake	1928	1,440	1,170
Irrigation District	Picture Butte	1936	1,490	1,210
Ingation Diotnot	Vandenburg	1992	120	90
-	Total storage		3,050	2,470
	Corner Lake	1925	500	400
	Craddock	1925	620	500
Raymond Irrigation District	Factory Lake	1925	370	300
-	Total storage		1,490	1,200
	Bullshead	1954	130	100
	Chin	1954	207,370	168,120
	Cross Coulee	1954	2,090	1,700
	Forty Mile	1987	100,430	81,420
	Murray	1954	30,630	24,830
	North East	1954	2,820	2,290
St. Mary River Irrigation District	Raymond	1954	1,810	1,470
	Sauder	1953/1982*	45,240	36,680
	Seven Persons	1953	900	730
	Sherburne	1952	12,190	9,880
	Stafford	1954/1982*	21,790	17,670
	Yellow Lake	1952	18,130	14,700
	Total storage		443,530	359,590
	Fincastle	1952	3,770	3,060
Taber Irrigation District	Horsefly	1950	6,370	5,170
	Taber Lake	1955	6,410	5,190
	Total storage		16,550	13,420
United Irrigation District	Cochrane Lake	1923	3,130	2,540
	Chestermere	1944	5,090	4,130
Western Irrigation District	Langdon	1979/2014*	15,750	12,770
	Total storage		20,840	16,900
Grand Total			1,101,530	893,010

Note: all reservoirs are off-stream storage sites

\* denotes year of reservoir enlargement

Source Supply for:	Reservoir	Approximate Date of Impoundment	Live storage (dam³)	Live storage (acre-feet)
	Little Bow	1920	43,260	35,070
Bow River Irrigation District	McGregor	1914	351,060	284,600
°	Travers *	1954	104,640	84,830
	Total Storage		498,960	454,500
Lethbridge Northern Irrigation District	Keho	1920	95,640	77,530
Louisinge Kernen ingalen District	Oldman River *	1991	490,180	397,390
	Total Storage		560,200	454,150
Ross Creek Irrigation District	Cavan	1950	4,630	3,750
MVID, LID, AID	Payne	1942	8,690	7,040
	Jensen	1948	19,000	15,400
	Milk River Ridge	1957	127,300	103,200
St. Mary Project	St. Mary *	1951	369,310	299,400
(SMRID, MID, TID, RID)	Waterton *	1965	111,200	90,150
	Total Storage		626,810	508,150
	Chain Lakes *	1966	14,680	11,900
Other	Twin Valley Dam *	2003	60,700	49,210
	Pine Coulee	1998	51,000	41,350
	Women's Coulee	1949	360	290
	Total Storage		126,740	102,750
Grand Total			1,826,030	1,480,340

## Table 14. Provincially Owned and Operated Reservoirs Used by Irrigation

Note: \* denotes on-stream storage reservoir

## Table 15. Hydroelectric Plants Associated with Irrigation Infrastructure

Location	Commission Date	Owner	<b>Capacity</b> (megawatts)
Oldman Reservoir	2003	ATCO Power	32
Waterton Reservoir	1992	TransAlta	3
Belly River Chute	1991	TransAlta	3
St. Mary Reservoir	1992	TransAlta	2
Taylor Coulee Chute (Jensen Reservoir)	2000	TransAlta	13
Raymond Reservoir	1994	Irrican Power	21
Chin Chute (Chin Reservoir)	1994	Irrican Power	15
SMRID - Main Canal Drops #4, #5 and #6	2004	Irrican Power	7
Total			96

#### Table 16. Private Water Licences for Irrigation

There are 2,908 individual irrigation projects, outside of the 13 irrigation districts, irrigating approximately 311,258 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 Forestry and the licencing is regulated by Alberta Environment and Parks.

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	1,985	43	6	0	49
MILK RIVER	18,875	99	43	14	156
NORTH SASKATCHEWAN RIVER	27,089	312	56	15	382
PEACE RIVER	3,791	65	9	1	75
SOUTH SASKATCHEWAN RIVER					
- Bow River	25,697	149	59	18	226
- Little Bow River	33,592	125	73	26	224
- Oldman River (Lower)	17,752	30	28	14	72
- Oldman River (Upper)	7,478	60	20	4	84
- Red Deer River	46,277	419	94	18	531
- South Saskatchewan River	46,857	528	81	23	632
- Waterton / Belly / St. Mary Rivers	50,266	137	71	17	225
- Willow Creek	32,724	158	79	17	254
South Saskatchewan River Total	260,643	1,606	505	137	2,248
Total	312,383	2,124	619	167	2,910

Notes: - Oldman (upper) reach is defined as upstream of the Belly River confluence

- Oldman (lower) 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 and Parks
 licence authorization as of January 2017

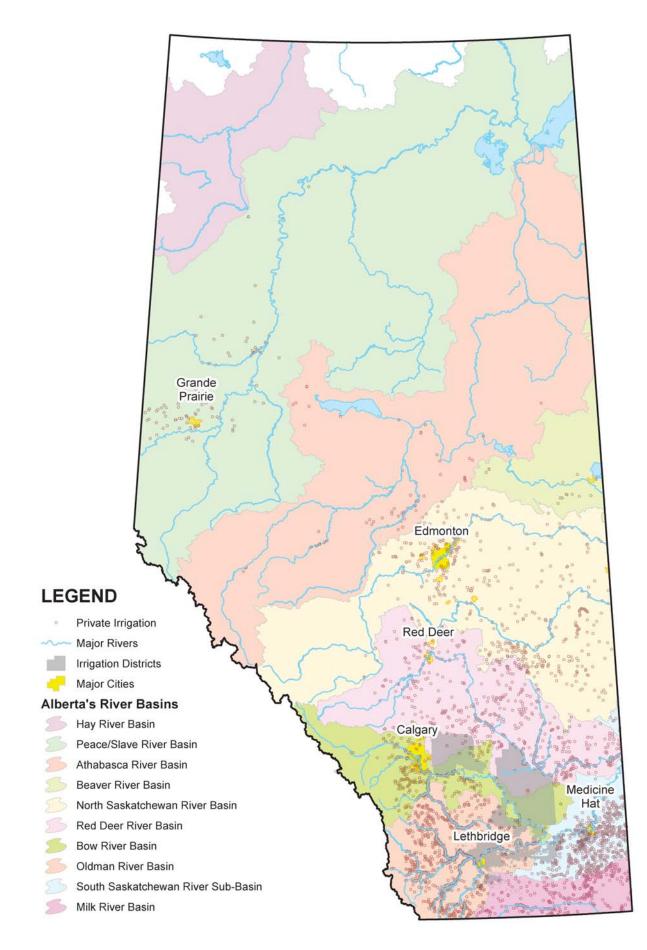
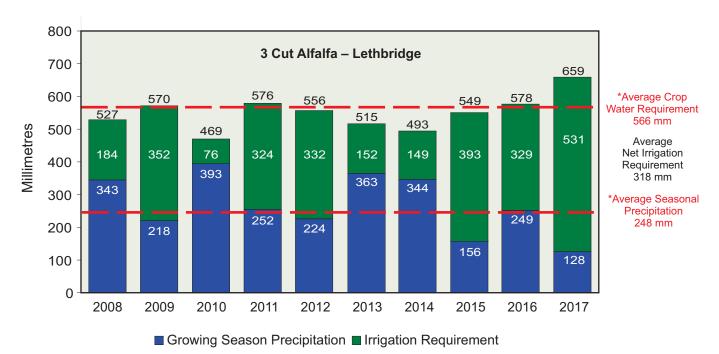


Figure 10. Location of Private Irrigation



#### Figure 11. Lethbridge Optimum Crop Water and Net Irrigation Requirements

Note: Three cut alfalfa is used as an indicator crop because of its high water demand.

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 2016. Seasonal precipitation from May 1 to September 30.

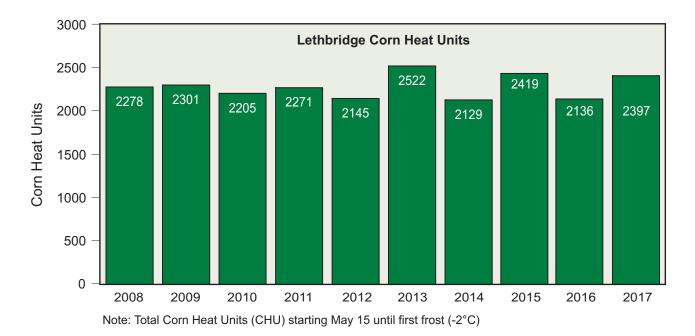
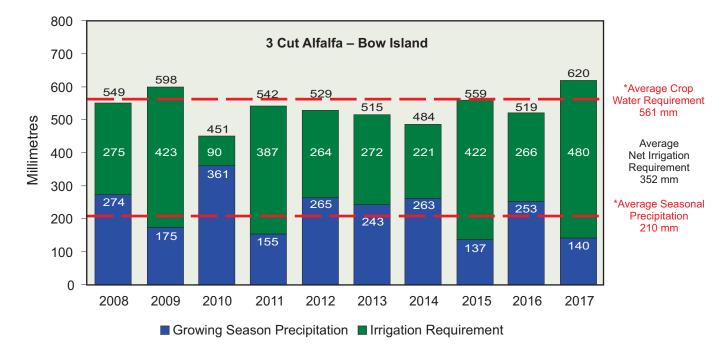


Figure 12. Lethbridge Corn Heat Units

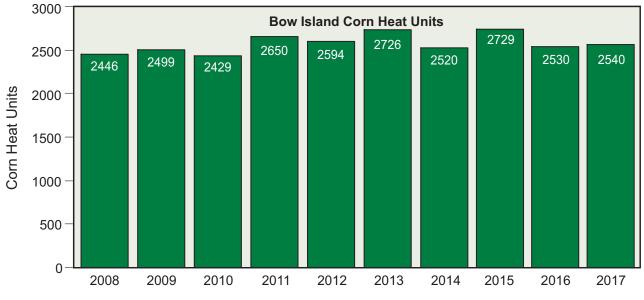


#### Figure 13. Bow Island Optimum Crop Water and Net Irrigation Requirements

Note: Three cut alfalfa is used as an indicator crop because of its high water demand.

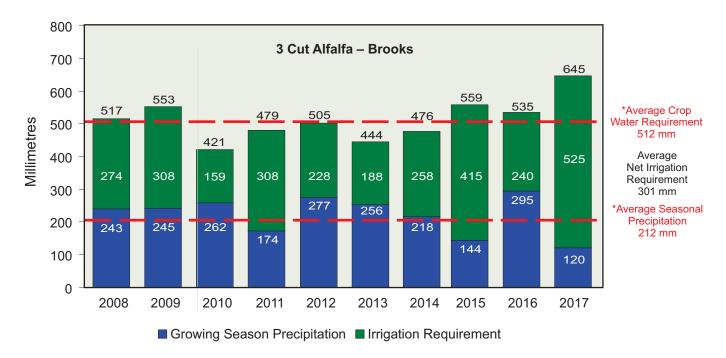
The difference between the total crop water requirement and total precipitation is the Net irrigation requirement.

\*The average crop requirement and average precipitation are from the period 1997 to 2016. Seasonal precipitation from May 1 to September 30.



Note: Total Corn Heat Units (CHU) starting May 15 until first frost (-2°C)

Figure 14. Bow Island Corn Heat Units

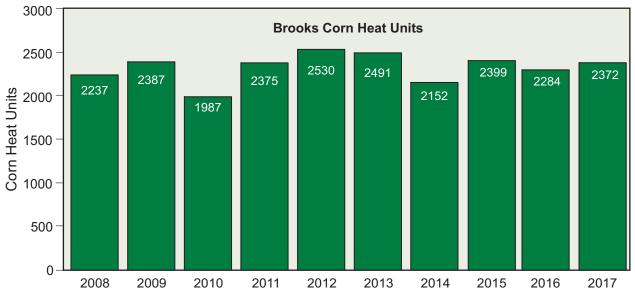


#### Figure 15. Brooks Optimum Crop Water and Net Irrigation Requirements

Note: Three cut alfalfa is used as an indicator crop because of its high water demand.

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 2016. Seasonal precipitation from May 1 to September 30.



Note: Total Corn Heat Units (CHU) starting May 15 until first frost (-2°C)

Figure 16. Brooks Corn Heat Units

AREA	MAXIMUM RAINFALL (mm)	MINIMUM RAINFALL (mm)	NORMAL RAINFALL* (mm)	2017 RAINFALL (mm)	2017 % OF NORMAL
Lethbridge	534 (1978)	71 (2001)	277	183	66%
Bow Island	439 (1993)	112 (2001)	255	215	84%
Brooks	484 (2005)	87 (2001)	240	162	68%

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

Note: \* Normal rainfall: 1970 - 2017 average

#### Table 18. Historical Corn Heat Units in Southern Alberta (May 15 to First -2° C Frost)

AREA	MAXIMUM CHU (2008-2017)	MINIMUM CHU (2008-2017)	LAST TEN YEAR AVERAGE*	2017 CHU	2017 % OF LAST TEN YEAR AVERAGE
Lethbridge	2522 (2013)	2129 (2014)	2280	2397	105%
Bow Island	2729 (2015)	2429 (2010)	2566	2540	99%
Brooks	2530 (2012)	1987 (2010)	2321	2372	102%

Note: \* Last ten year average 2008 - 2017

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

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	2017 LAST FROST	2017 FIRST FROST	2017 FROST FREE DAYS	2017 % OF AVERAGE
Lethbridge	May 11	Sept 20	132	May 8	Sept 23	138	104%
Bow Island	May 11	Sept 21	134	Apr 29	Sept 15	139	104%
Brooks	May 14	Sept 19	127	Apr 29	Sept 15	139	109%

Note: \* Average frost free days 1998 - 2017

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

AREA	AVERAGE LAST FROST	AVERAGE FIRST FROST	AVERAGE FROST FREE DAYS*	2017 LAST FROST	2017 FIRST FROST	2017 FROST FREE DAYS	2017 % OF AVERAGE
Lethbridge	May 3	Sept 27	147	Apr 22	Sept 24	137	106%
Bow Island	May 2	Oct 1	153	Apr 17	Sept 24	178	105%
Brooks	May 9	Sept 23	137	Apr 29	Sept 20	128	105%

Note: Average frost free days 1998 - 2017

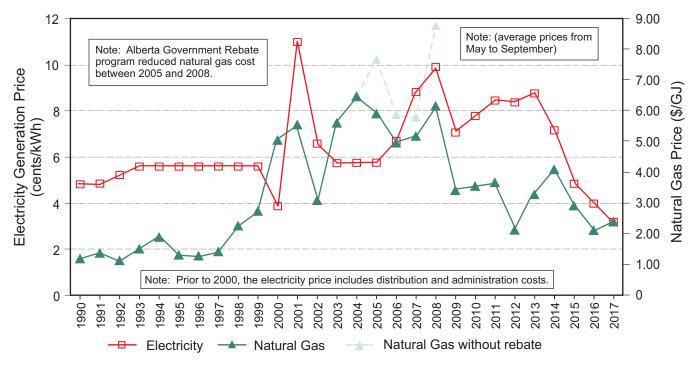


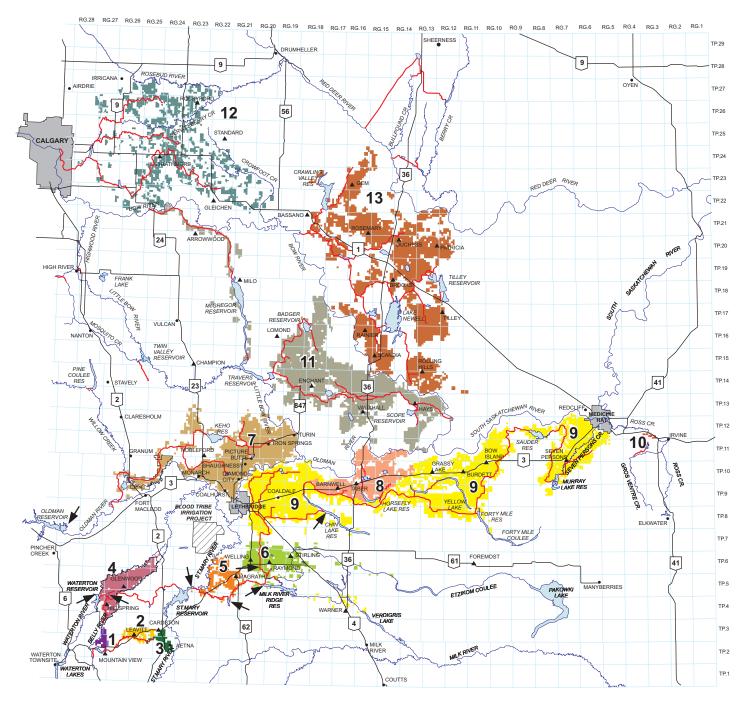
Figure 17. Historical Energy Prices for Irrigation Systems

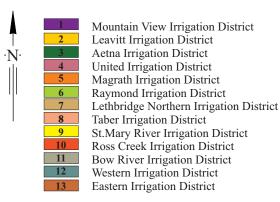
Energy Type	BRID	EID	LNID	MID	RCID	RID	SMRID	TID	UID	WID	Energy Type
Electricity	76.1% 184,823	53.5% 161,119	40.0% 73,887	8.2% 1,499	0 0	53.8% 24,390	65.0% 247,447	63.3% 50,907	37.4% 12,746	36.1% 30,100	57.4%
Natural Gas	10.8% 26,336	22.3% 67,091	29.6% 54,596	59.0% 10,761	0 0	33.6% 15,249	29.7% 113,171	32.1% 25,765	1.6% 540	29.0% 24,184	24.6%
Diesel	2.8% 6,787	3.3% 10,091	0.5% 912	0.0% 0	0 0	0.4% 204	0.7% 2,598	0.9% 712	0.4% 132	10.1% 8,431	2.2%
Gravity	4.2% 10,243	15.8% 47,726	1.4% 2,577	16.6% 3,019	0 0	7.4% 3,375	1.5% 5,747	2.8% 2,290	9.3% 3,160	6.5% 5,428	6.1%
Gravity Pressure Pipeline	3.7% 8,985	2.0% 5,935	18.0% 33,311	16.0% 2,921	100.0% 1,075	0.9% 391	2.8% 10,535	0.5% 400	13.2% 4,508	8.4% 7,041	5.5%
Pump Pressure Pipeline	0.4% 868	2.2% 6,634	8.9% 16,508	0.0% 0	0 0	0.0% 0	0.0%	0.0% 0	0.0% 0	0.3% 225	1.8%
Other*	0.5% 1,232	0.9% 2,713	0.5% 837	0.2% 30	0 0	1.5% 667	0.3% 1,019	0.3% 210	0.1% 37	6.5% 5,440	0.9%
Unknown	1.5% 3,716	0.0% 0	1.1% 1,939	0.0% 0	0 0	2.4% 1,079	0.0% 162	0.1% 86	38.1% 12,979	3.0% 2,507	1.6%
Total Acres	242,990	301,309	184,566	18,230	1,705	45,353	380,679	80,370	34,102	83,355	1,372,028

Table 21. Energy Type Used in the Irrigation Districts' Irrigated Areas

Notes: - \* other includes gasoline, propane or butane

AID, LID, and MVID did not report any data
 RID data is for the year 2014





Hydroelectric plants associated with water distribution works

Main canals

There are 13 irrigation districts in Alberta providing water to 1,435,669 assessed acres of land. The infrastructure that provides water to the irrigation districts is comprised of approximately 7,943 kilometres of conveyance system, of which 339 kilometres are owned and operated by Alberta Environment and Parks\*.

\* based on 2017 data

Figure 18. Alberta's Irrigation Districts

#### Glossary

**Acres Actually irrigated:** A parcel of assessed land that includes an irrigation system and received water during the current year, as reported by the irrigation districts.

Acres covered by an irrigation system: A parcel of land recorded on the assessment roll of an irrigation district as having irrigation acres and has some type of irrigation system.

**Irrigated this year:** A parcel of land that received irrigation water in the current year. **Not irrigated this year:** A parcel of land that did not receive irrigation water in the current year.

**Acres with no irrigation system:** A parcel of land recorded on the assessment roll of an irrigation district as having irrigation acres without any type of system.

**Assessment roll:** List of all parcels in a district that have irrigation acres, and acres subject to terminable or annual agreements. To learn more about assessment rolls, please refer to Alberta's *Irrigation Districts Act.* 

**Canal Evaporation:** Water lost through the delivery system by vaporizing from the water surface of an open channel.

**Canal Seepage:** Water lost through the delivery system through the sides and bottom of an open channel.

**Constructed Drain:** A man-made open channel or pipeline that provides a means to move unused water away from irrigation works.

**Corn Heat Unit:** A numerical measure of the growth response of a corn plant to daily minimum and maximum temperatures. Zero corn heat units are calculated when daily minimum temperatures are below 4.4°C and daily maximum temperatures are below 10°C. They are calculated on a daily basis and accumulated annually starting on May 15 and continuing until the first killing frost of -2°C.

**Crop Water Requirement:** The amount of water a crop needs to transpire in response to meteorological conditions.

**Crop Type:** Plants that are grown in the irrigation districts are grouped into five categories: cereals, forages, oil seeds, specialty crops, and other.

**Cereals:** Annual grasses grown for their grain. Crops reported include barley, Canada Prairie Spring (CPS) wheat, durum wheat, grain corn, hard red spring wheat, malt barley, oats, rye, soft wheat, triticale, and winter wheat.

**Forages:** Plants that are consumed by livestock. Crops reported include alfalfa (two & three cut, hay, and silage), barley silage, brome hay, corn silage, grass hay, green feed, milk vetch, native pasture, oats silage, sorghum/sudan grass, tame pasture, timothy hay, and triticale silage.

**Oil Seeds:** Plants that are grown for the oil contained in the seeds. Crops reported include canola, flax, mustard and safflower.

**Specialty Crops:** Include fruits and vegetables, horticulture, seed production, pulse crops, and nursery crops. Crops reported include alfalfa seed, canola seed, carrots, catnip, chick peas, dill, dry beans, dry peas, faba beans, fresh sweet corn, fresh peas, grass seed, hemp, lawn turf, lentils, market gardens, mint, nursery, onions, potatoes, pumpkins, seed potatoes, small fruit, soy beans, sugar beets, sunflower and yellow peas.

Other: Other reported include miscellaneous, non-crop, summer fallow, and unknown.

**Delivered for Irrigation:** Any water delivered by an irrigation district for irrigation purposes.

**Delivered for Other Use:** Any water delivered by an irrigation district for a use other than irrigation; this includes municipal, domestic, other agricultural, industrial, and environmental uses.

**Expansion Limit:** The maximum number of irrigation acres plus acres subject to a terminable agreement in an irrigation district; the total irrigated area of an irrigation district cannot exceed this limit as per the *Irrigation Districts Act*.

**Frost Free Period (0°C):** Continuous number of days where the minimum daily temperature does not drop below 0°C.

**Frost Free Period (-2°C):** Continuous number of days where the minimum daily temperature does not drop below -2°C.

**Gross Annual Diversion:** All water diverted into the works of an irrigation district from a water source. It includes water used directly for irrigation purposes, reservoir filling, and the water supplied or licenced to municipal, domestic, other agricultural, industrial, and environmental uses, as well as losses through seepage and evaporation.

**Irrigation District:** A corporation that operates under the authority of the Alberta *Irrigation Districts Act* whose primary purpose is to convey and deliver water through irrigation works, divert and use quantities of water within the terms of its licence, and to construct, operate and maintain irrigation works. An irrigation district is the geographical area consisting of the parcels of land included in the district.

**Irrigation District Irrigation Rate:** The annual amount charged by an irrigation district per irrigation acre of land for irrigation water delivery. Some districts levy additional surcharges for services including pipeline and/or pressurized delivery, using more water than allocated, and automated screen cleaning.

**Irrigation District Works:** Any structure, device, or artificial body of water or watercourse used or to be used by a district.

**Membrane-lined canal:** An open channel that has been lined with a membrane material to prevent water seepage.

**Concrete-lined canal:** An open channel that has been constructed with concrete to prevent water seepage.

**Earth canal:** An open channel that has been constructed with a natural low porosity material that reduces water seepage.

**Closed pipeline:** A buried conduit that is closed at the outlet.

**Open pipeline:** A buried conduit that is open at the outlet.

**Irrigation method:** On-farm technique and system used to apply irrigation water to an irrigated field. Irrigation systems are grouped into five categories: high pressure pivot sprinkler, low pressure pivot sprinkler, wheel move sprinkler, gravity, and other.

#### High pressure pivot sprinkler includes:

**Pivot high pressure:** Centre pivot irrigation system with high pressure (greater than 50 pounds per square inch (psi) impact sprinklers.

**Pivot high pressure – corner arm:** Centre pivot irrigation system with high pressure (greater than 50 psi) impact sprinklers with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

**Linear – high pressure:** Linear move irrigation pivot system with high pressure (greater than 50 psi) impact sprinklers that irrigate a rectangular field.

#### Low pressure pivot sprinkler includes:

**Pivot medium pressure:** Centre pivot irrigation system with medium pressure (between 30 and 50 psi) impact sprinklers.

**Pivot medium pressure – corner arm:** Centre pivot irrigation system with medium pressure (between 30 and 50 psi) impact sprinkler nozzles with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

**Pivot low pressure:** Centre pivot irrigation system with low pressure (less than 30 psi) spray nozzles.

**Pivot low pressure – corner arm:** Centre pivot irrigation system with low pressure (less than 30 psi) spray nozzles with the addition of a secondary pivotal arm connected to the end of the centre pivot boom.

**Linear – low pressure:** Linear move pivot irrigation system with low pressure (less than 30 psi) spray nozzles that irrigates a rectangular field.

#### Wheel move includes:

**Wheel move – two laterals:** Two wheel mounted pipelines with sprinklers along their length per parcel of land.

**Wheel move – four laterals:** Four wheel mounted pipelines with sprinklers along their length per parcel of land.

#### Gravity includes:

**Gravity – developed:** surface irrigation system with some land modification (leveling plus construction of border strips, furrows, basin), where the soil surface is used to distribute and infiltrate the applied water.

**Gravity undeveloped:** surface irrigation system without any land modification (leveling) or application control (furrows, border strips, dykes).

#### Other includes:

**Volume gun – stationary:** Large volume sprinkler stationed at a single point.

Volume gun – traveller: Large volume sprinkler mounted on wheels.

**Solid set:** Sprinklers mounted on risers connected to a buried pipe.

**Hand move:** Sprinklers mounted on risers connected to a surface pipe that can be moved.

**Micro – spray – sprinkler:** Spray emitter connected to a drip irrigation system.

**Micro – drip – trickle:** Drip emitter connected to a drip irrigation system.

**Other application use:** Water used for purposes other than irrigation.

**Natural Drain:** An open channel that exists as a natural watercourse that provides a means to move unused water away from irrigation works.

**Net District Storage Change:** Net volume of water removed from internal irrigation district reservoirs for use. Irrigation districts own and operate reservoirs to store irrigation water for release when there is insufficient diversion capacity to meet the demand for water. They are also used for normal district operations to stabilize flows and capture unused water for further use.

**Net Irrigation Requirement:** The amount of water supplied by irrigation to meet the crop water requirement.

**Percent of Licence:** The percentage of the irrigation district's water licence volume that was diverted in a year.

**Replacement Cost:** The cost in today's dollars to restore a piece of irrigation district infrastructure.

**Reservoir Evaporation:** Water lost from the surface of a reservoir by vaporization.

**Reservoir Seepage:** Water lost from a reservoir through seepage.

**Return:** Water returned by an irrigation district to the river system.

Water Licence (Irrigation): Includes irrigation district and private licences.

**Irrigation District Water Licence:** An authorization which permits the irrigation district to divert a certain volume of water, at a specific rate, from a watercourse into district owned conveyance and storage systems.

**Private Irrigation Water Licence:** An authorization which permits a private irrigator to divert a certain volume of water, at a specific rate, from a watercourse to a private irrigation development project.

**Water Licence Allocation (Irrigation District):** The total volume of water that an irrigation district is licenced to divert annually.