



Wichita Falls Water Resources and Impact on Economic Development

21 November 2014



Objectives

- 1. Impact of Drought and Mitigation**
- 2. Impact of Drought on Economic Development**
- 3. Innovative Water Reuse Projects for Local Industry**



DEVELOPING STORY

TENNIS STAR'S MANSION FIRE MYSTERY

4 DEAD AT FLORIDA HOME OWNED BY JAMES BLAKE





Water Supply Summary

- Current Population Served ~ 150,000
- Supply Reservoirs
 - Lake Arrowhead, Lake Kickapoo (Fresh water)
 - Lake Kemp (Brackish water)
 - Water Rights ~95,000 acft
 - Current Storage Capacity ~ 23.3%
- Water Treatment Plants
 - Cypress WTP, Cypress MF/RO, Jasper WTP
 - Capacity 66 MGD Conventional Treatment
 - Capacity 10 MGD Membrane Treatment
- Supply 15 Wholesale Customers
 - Cities, River Authority



Causes of Problem

Record Temperatures

Wichita Falls typically averages 28 days over 100 degrees

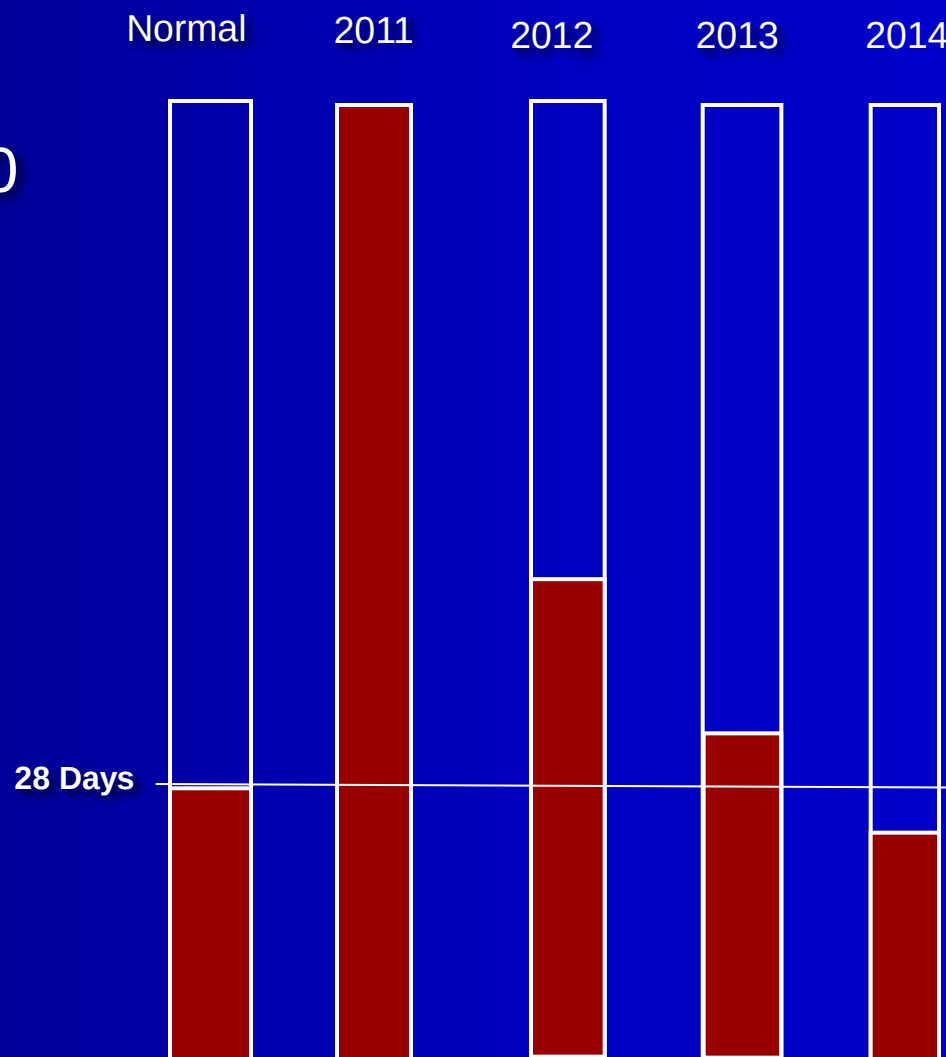
In 2011 we had 100 days

The Weather Channel ranked Wichita Falls the #1 Worst Summer anywhere in the U.S. for 2011.

In 2012 we had 50 days

In 2013 we had 32 days

In 2014 we had 21 days





Causes of Problem

Loss of Rainfall

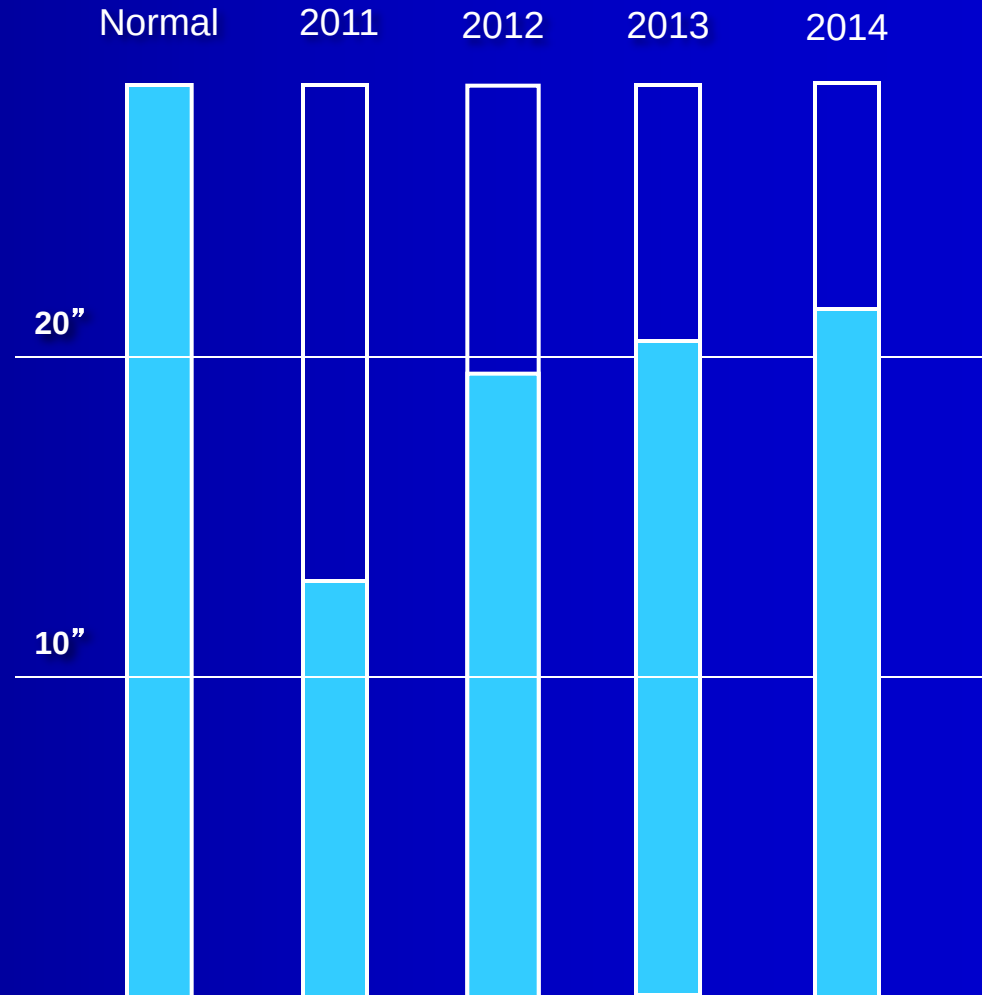
Annual average rainfall for the Wichita Falls area is 28.5 inches.

2011 we were 15.5 inches below normal.

2012 we were 8.75 inches below normal.

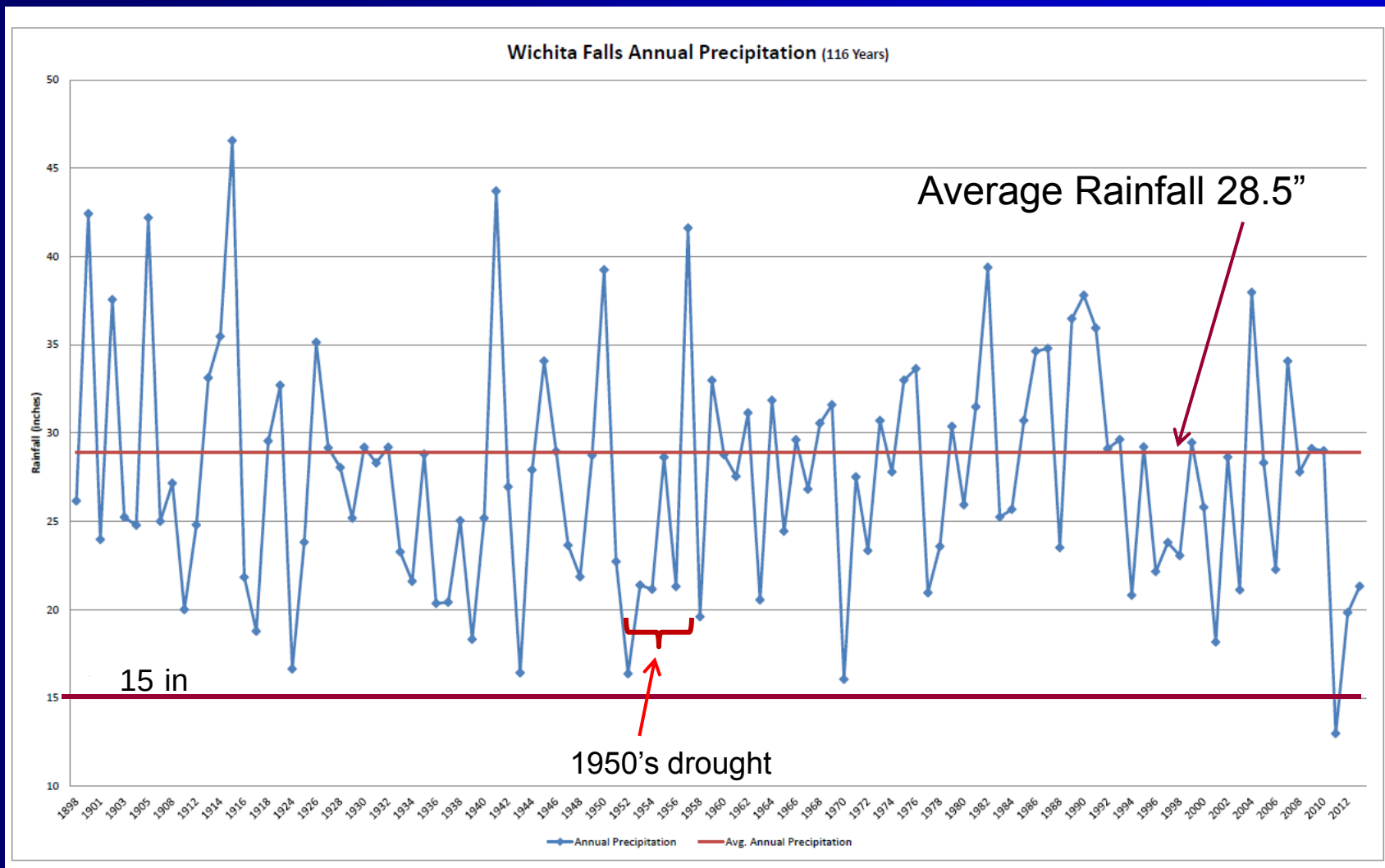
2013 we were 7.24 inches below normal.

2014 we are 6.30 inches below normal





WF Precipitation Data (116yrs)





State of the Drought 2011

Drought Conditions (Percent Area)

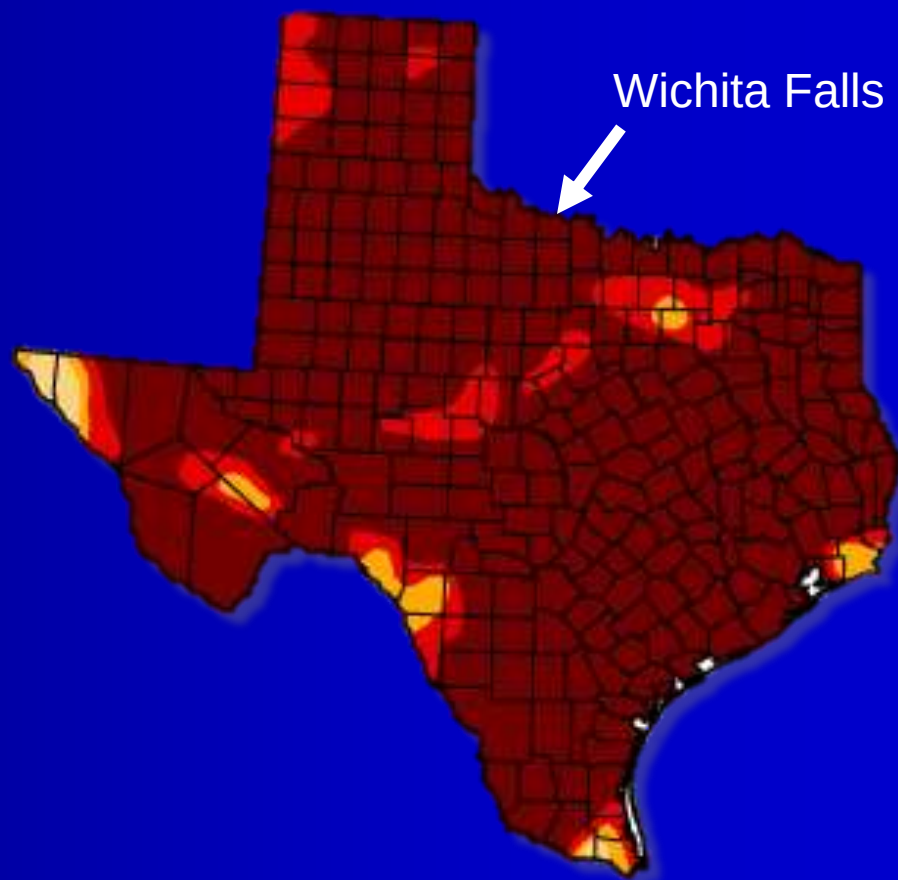
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	99.17	96.75	87.83
Last Week (09/06/2011 map)	0.00	100.00	99.93	99.01	95.68	81.06
3 Months Ago (06/14/2011 map)	1.97	98.03	96.53	94.77	88.57	64.78
Start of Calendar Year (12/28/2010 map)	7.89	92.11	69.43	37.46	9.59	0.00
Start of Water Year (09/28/2010 map)	75.57	24.43	2.43	0.99	0.00	0.00
One Year Ago (09/07/2010 map)	69.60	30.40	5.25	1.51	0.00	0.00

Intensity:

 D0 Abnormally Dry	 D3 Drought - Extreme
 D1 Drought - Moderate	 D4 Drought - Exceptional
 D2 Drought - Severe	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



October 2011



State of the Drought 2014

October 21, 2014

(Released Thursday, Oct. 23, 2014)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

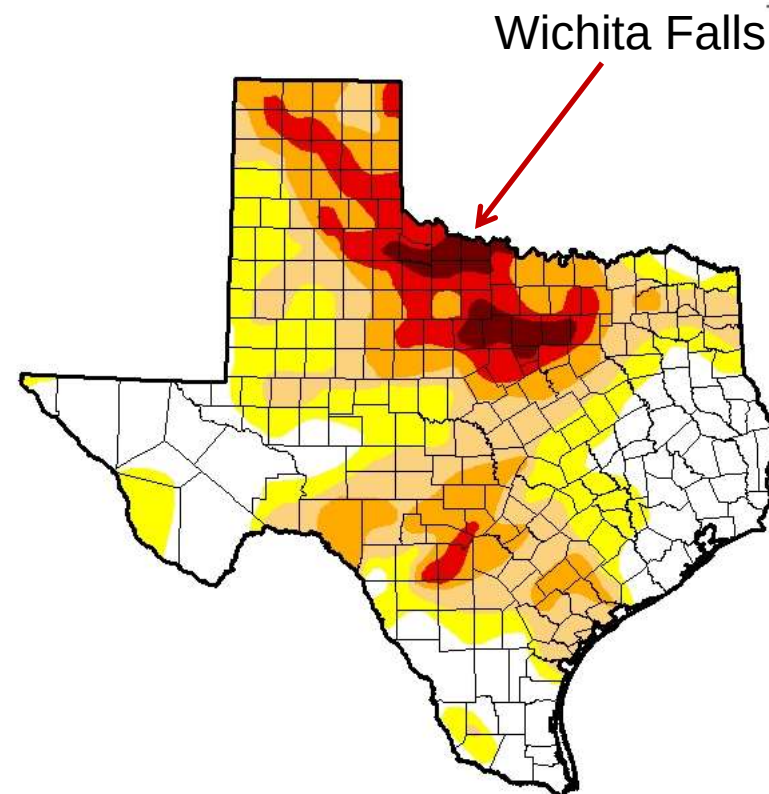
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	29.97	70.03	48.56	27.50	11.53	2.88
Last Week <i>10/14/2014</i>	30.96	69.04	48.42	27.50	10.97	2.88
3 Months Ago <i>7/22/2014</i>	16.58	83.42	57.97	33.37	14.98	3.28
Start of Calendar Year <i>12/31/2013</i>	28.48	71.52	43.84	21.15	5.82	0.79
Start of Water Year <i>9/30/2014</i>	28.92	71.08	48.95	29.54	11.26	2.69
One Year Ago <i>10/22/2013</i>	13.16	86.84	62.03	22.76	4.19	0.23

Intensity:

 D0 Abnormally Dry	 D3 Extreme Drought
 D1 Moderate Drought	 D4 Exceptional Drought
 D2 Severe Drought	

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

U.S. Drought Monitor Texas

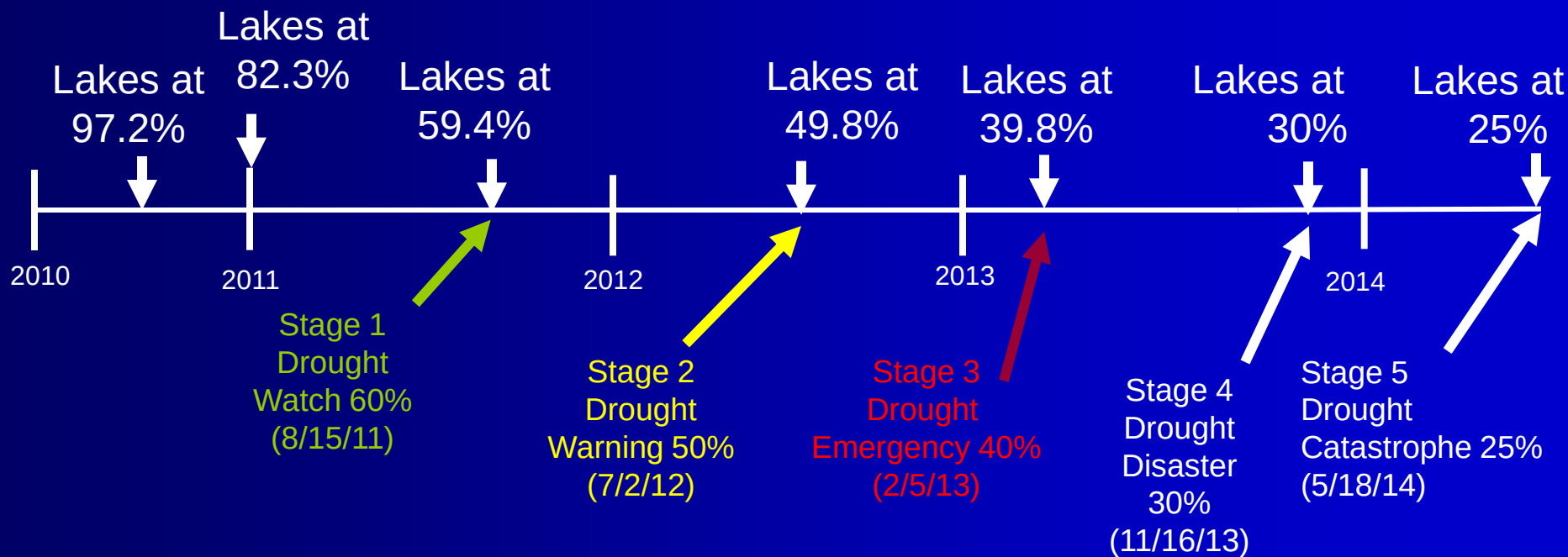


October 2014



What Was Done

Drought Triggers to Date



- 1190 days of water restrictions
- City has been much more aggressive with restrictions during this drought.
- Conservation efforts reduced consumption from 35 MGD to 11 MGD



What Was Done

- April 2012 staff begins to revive 1999/2000 Reuse Project
- Met with Texas Commission on Environmental Quality (TCEQ) staff on numerous occasions
- New regulations established
 - Direct Potable Reuse (DPR)
 - Indirect Potable Reuse (IPR)
- Regulations and level of treatment identified
- Consultants hired to evaluate long-term reuse options
- Staff developed an Emergency Reuse Project





Emergency Reuse Project

- Temporary Pump Station and pipeline to convey 7.5 MGD of treated effluent from RRWWTP to Cypress Micro-filtration/Reverse Osmosis Plant
- Treat water through both membrane plants
- Blend water with lake water 50/50 ratio
- Treat blended water through conventional treatment plant (***water is treated 4 times***)
- Concept paper developed
- Preliminary Engineering Report submitted to TCEQ



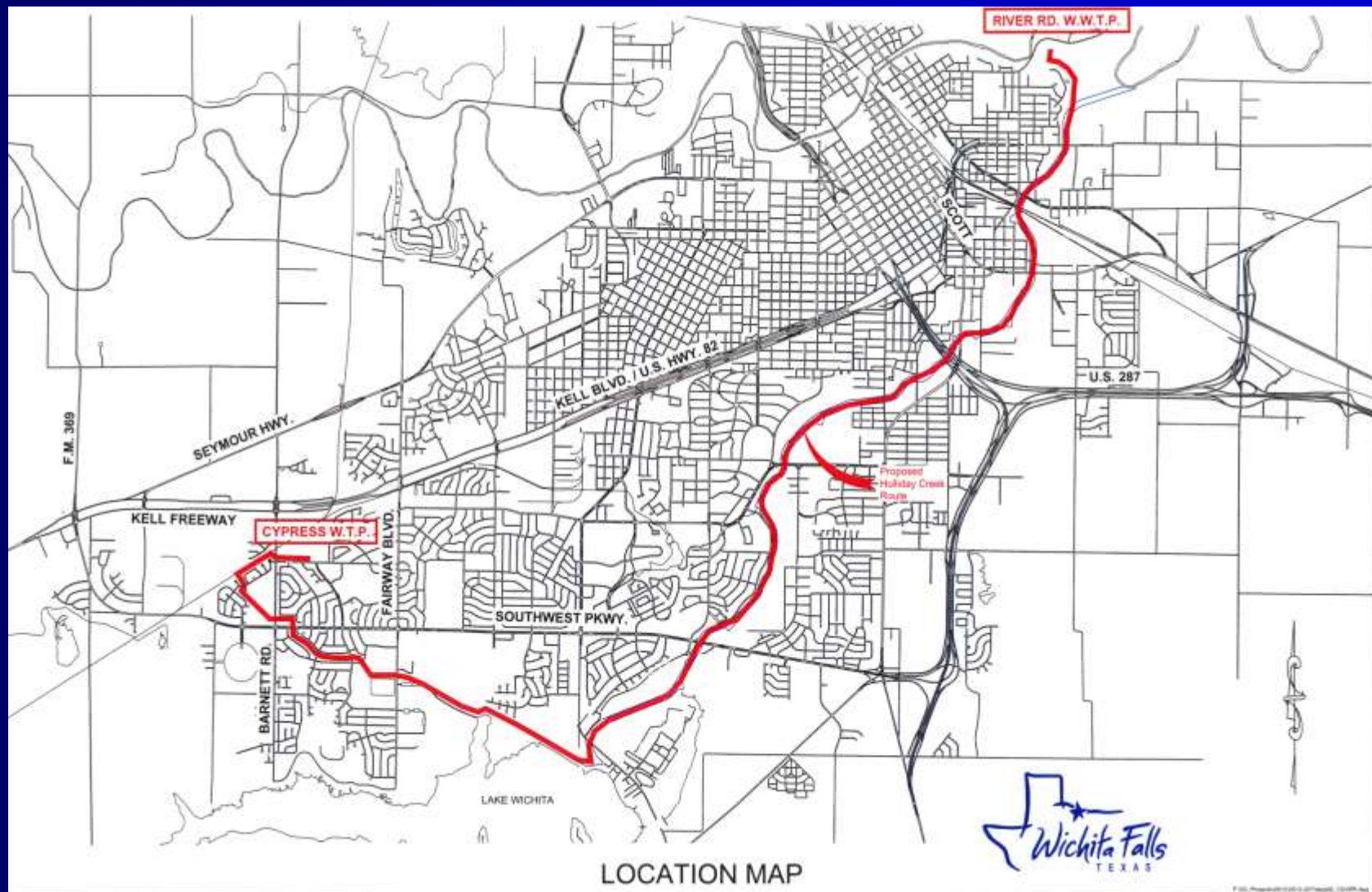


Emergency Reuse Project

- Construction began August 23, 2013
- TCEQ approval in Sept 27, 2013
- 75 Days of Full Scale Verification testing began on January 27, 2014
- Water in distribution system July 9, 2014
- Project adds 5 MGD of supply (1/2 of daily demand)



Emergency Reuse Project





Emergency Reuse Project





Emergency Reuse Project





Emergency Reuse Project





Emergency Reuse Project





Permanent Reuse Project

- Alternatives evaluated
 - Discharge to Lake Arrowhead ~\$29,000,000
 - Discharge to Lake Wichita ~\$158,300,000
 - Construct new MF/RO Plant at Cypress ~\$91,000,000
 - Construct new MF/RO Plant at Jasper ~\$81,000,000
- Discharge to Lake Arrowhead identified as most economical and feasible.



Permanent Reuse Project

- Project requires:
 - Discharge permit from TCEQ
 - Approved September 2014
 - Improvements to River Road WWTP
 - Design underway
 - 17 miles of ROW acquisition
 - Acquisition is underway
 - Construction of pipeline and pump station ~ May 2015
- Project Completion ~ May 2017,
- Additional Supply 8 – 10 MGD



Other Short-term Supply Options

- Develop remaining water in Lake Kemp/Diversion
 - 10 MGD max amount
 - Treatment Plant Capacity of MF/RO Plant
- Supplement with DPR
 - Would require portable RO Skids
- Could supply up to 13 - 14 MGD
- TCEQ approval underway



Cloud Seeding Operations

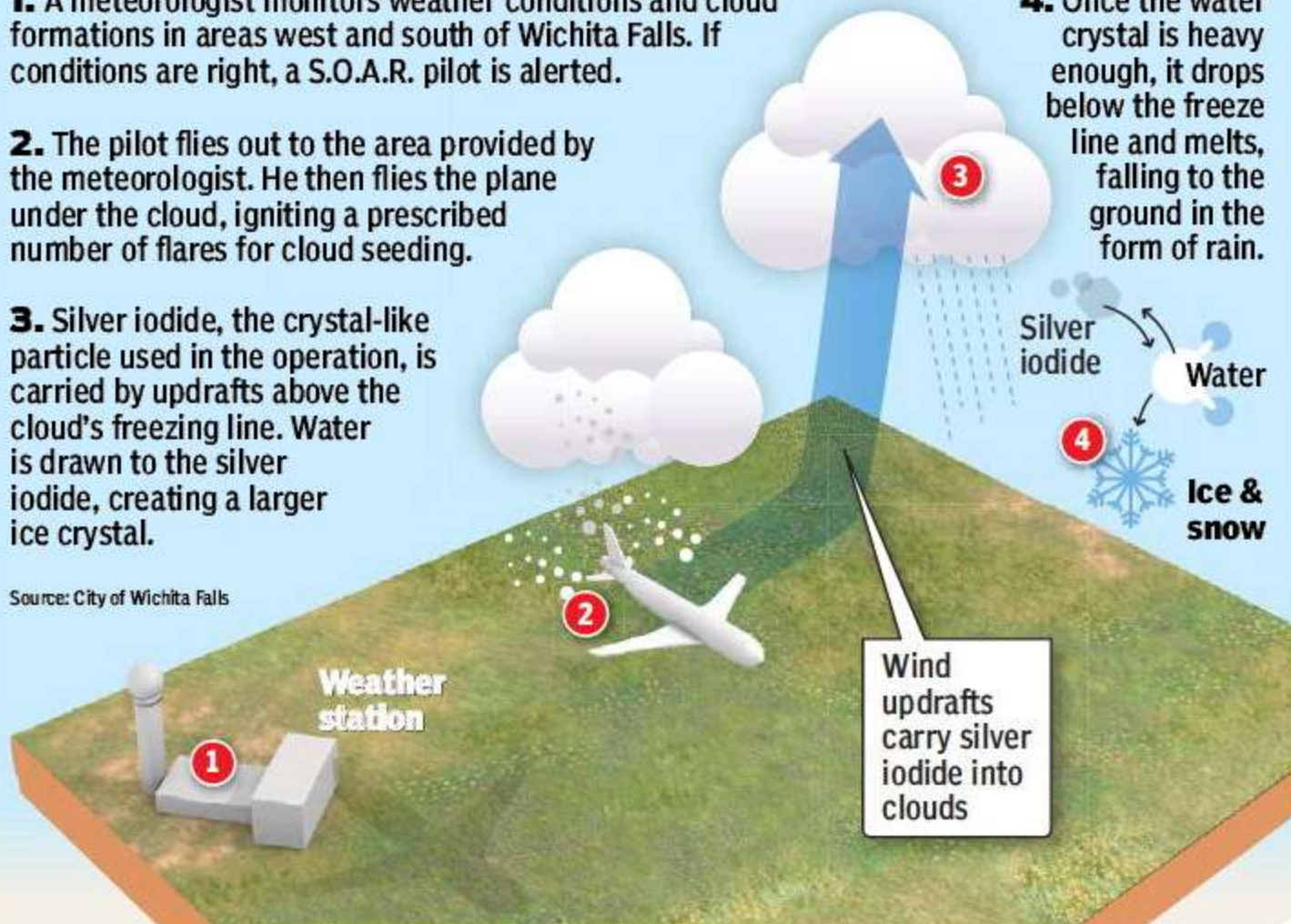
1. A meteorologist monitors weather conditions and cloud formations in areas west and south of Wichita Falls. If conditions are right, a S.O.A.R. pilot is alerted.

2. The pilot flies out to the area provided by the meteorologist. He then flies the plane under the cloud, igniting a prescribed number of flares for cloud seeding.

3. Silver iodide, the crystal-like particle used in the operation, is carried by updrafts above the cloud's freezing line. Water is drawn to the silver iodide, creating a larger ice crystal.

4. Once the water crystal is heavy enough, it drops below the freeze line and melts, falling to the ground in the form of rain.

Source: City of Wichita Falls







Weather Modification Summary

- Scientific Operations & Atmospheric Research (SOAR) Contractor
- Operations March – June 2014, Sept 2014
- 33 Missions Flown
 - Below average seeding opportunities
- Evaluation determined cost benefit ratio of \$1.00 / \$1.91



Evaporation Suppression

- Product WaterSavr (Lime based product)
- Forms a monolayer on water surface
- Used in Las Vegas, Australia, Singapore
- Shown to reduce evaporation by 30% on smaller reservoirs
- Applied to water surface via boat.
- Requires 1 lb/ acre of water surface
- Dissipates in 48 to 72 hours and must be reapplied.



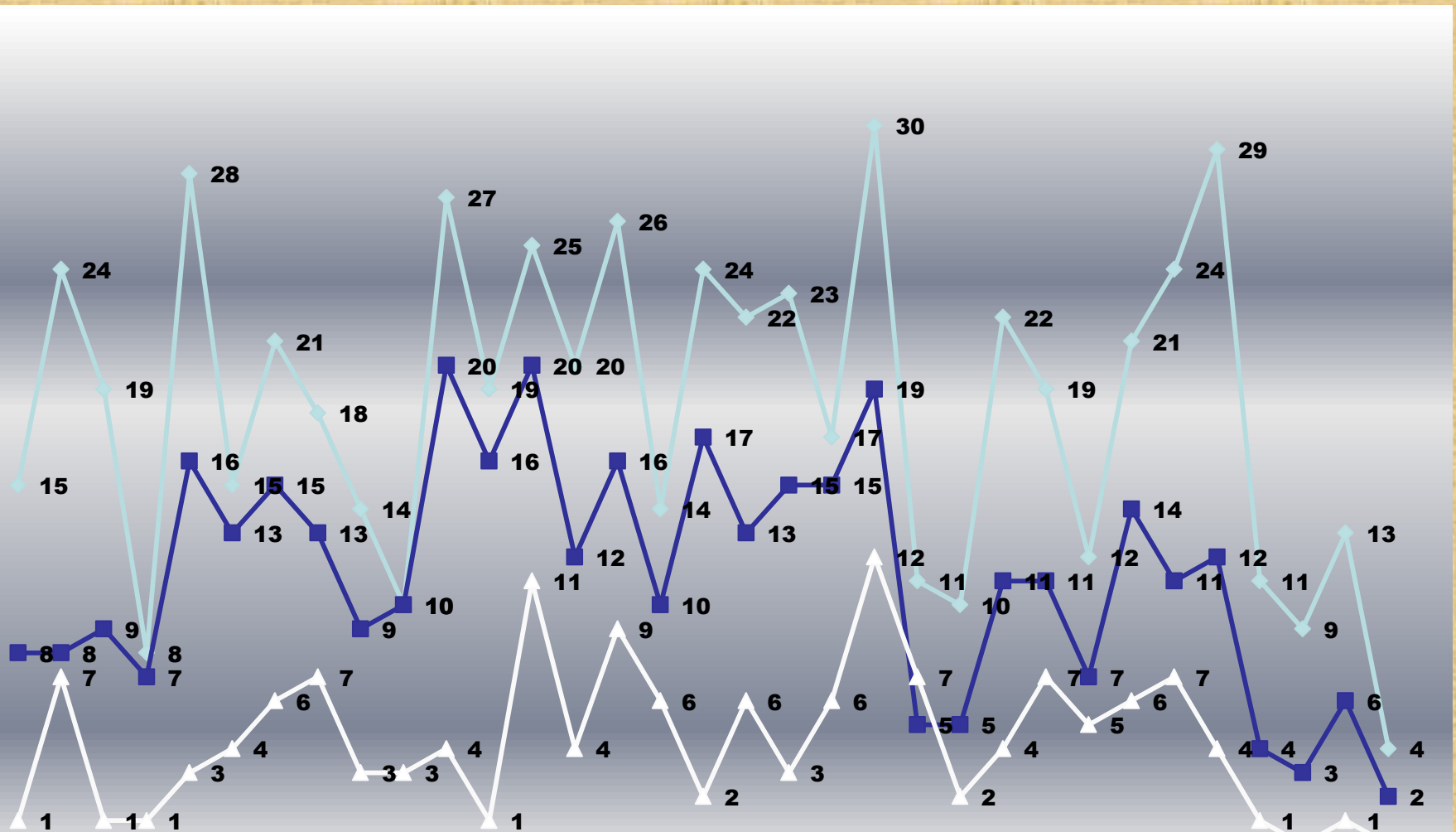
Evaporation Suppression

- Operations in August and September 2014
- Weather station and evaporation pan data collected from 2 lakes, one control, one with product applied
- Evaluation of product to be completed by Texas Water Development Board (TWDB)
- Analysis to be completed by December 2014.

Drought Impacts on Economic Development

Prospect Activity Q3 of 2006 to Q3 of 2014

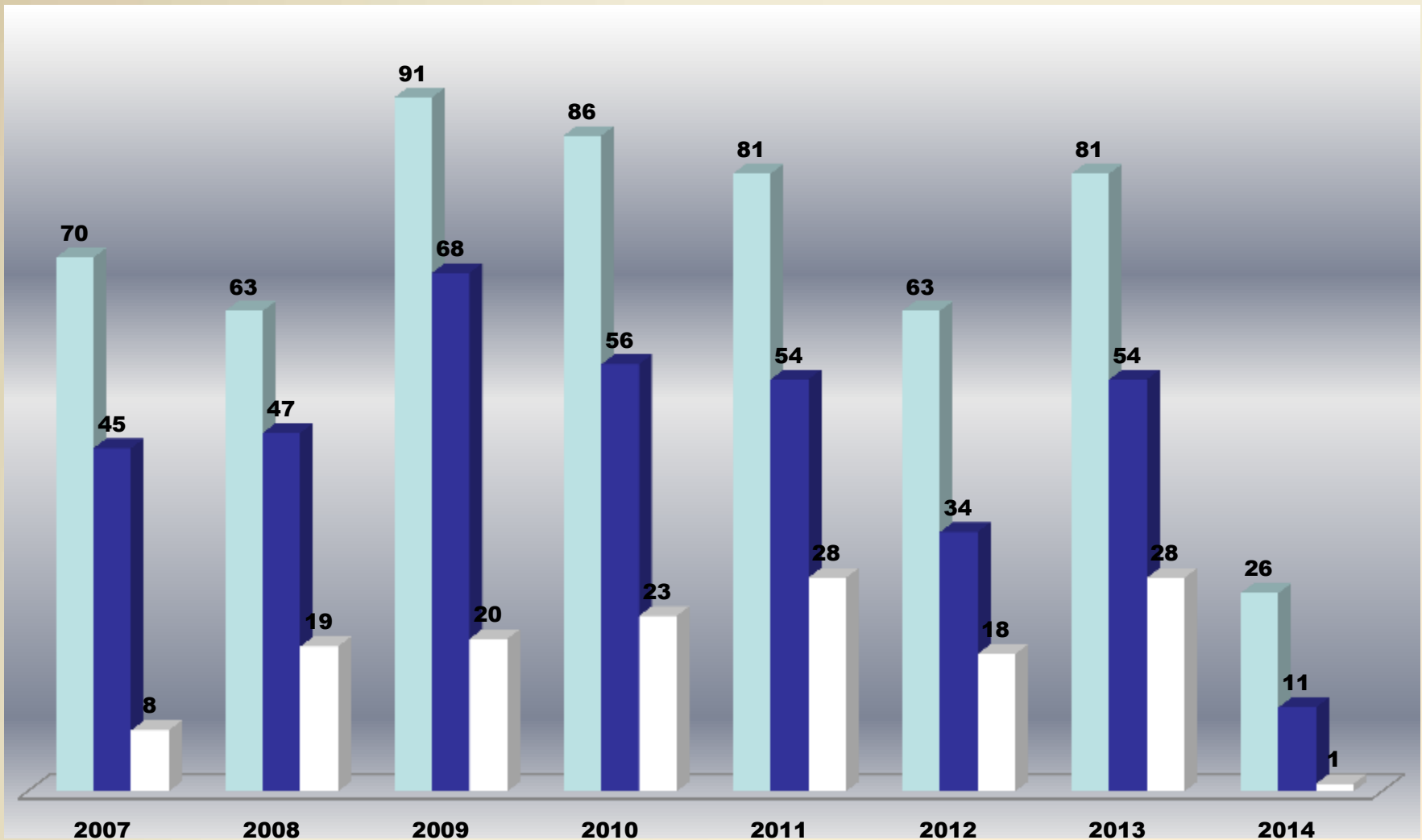
◆ Requests For Proposals
 ■ Proposals Submitted
 ▲ Prospect Visits (WF)



Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2006			2007			2008			2009			2010			2011			2012			2013			2014	

Prospect Activity - 2010 to Q3 2014

Requests For Proposals Proposals Submitted Prospect Visits (WF)

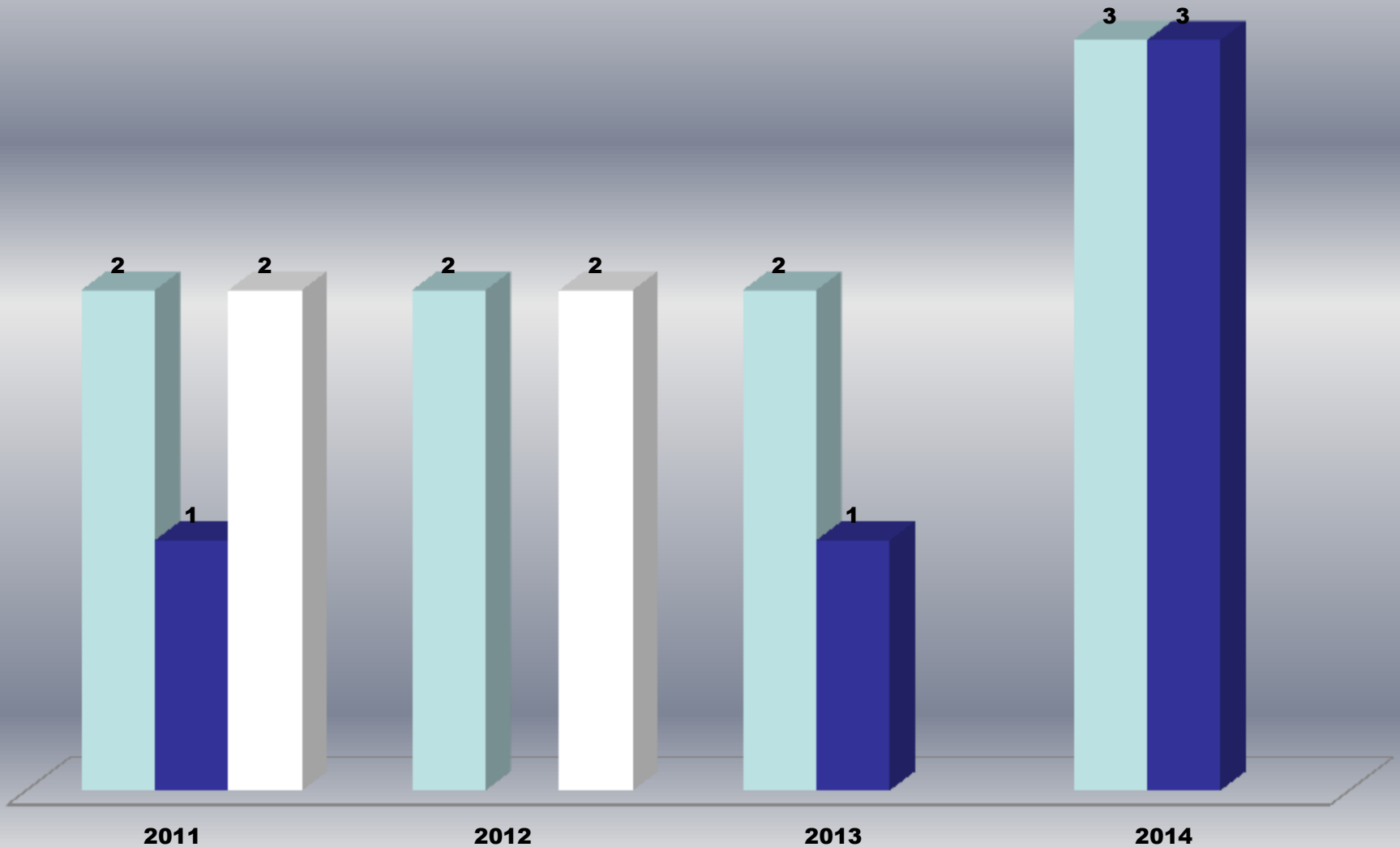


4A Board Projects - 2011 to 2014

					NEW	
		Primary	Secondary	Total	Expansion	4A Incentives Allocated
Year	Project Name	Jobs	Jobs	Jobs	Retention	
2011	Pratt Whitney	12	0	12	R	\$ 250,000
2011	Ameri-Kal***	25	10	35	R	\$ 75,000
2011	Moving Staffer	60	12	72	N	\$ 364,000
2011	Wichita Clutch	10	3	13	E	\$ 300,000
2011	Arrow Mfg.	27	12	39	N	\$ 178,250
2012	ATT**	350	200	550	N	\$ -
2012	Tryer Process Equip	16	9	24	R	\$ 112,000
2012	Tobol Ind.	24	13	37	N	\$ 196,750
2012	Blue Cross/Blue Shield	385	219	604	R	\$ 820,000
2013	Ulm***	372	212	584	N	\$ 2,396,000
2013	Nocona Trucking	64	36	100	E	\$ 216,000
2013	Eagle Rail	64	36	100	N	\$ 928,800
2014	Hunting Titan	56	32	98	E	\$ 185,500
2014	Lone Star Milk Producers	20	11	31	N	\$ 116,000
2014	Cryovac	34	19	53	E	\$ 256,000
2014	Hunting Titan	53	37	90	E	\$ 1,100,000
2014	PPG	243	154	397	E	\$ 1,400,000
2014	Lone Star Milk Transport	62	42	104	N	\$ 3,800,000
2014	Saftey Design	123	77	200	N	\$ 1,400,000
2014	Howmet/Alcoa	600	357	957	E	\$ 2,400,000
		2,600	1,491	4,100		\$ 4,692,000

Type of Project

■ New ■ Expansion ■ Retention





BuyDentalEquipment.com

Magic Aire®



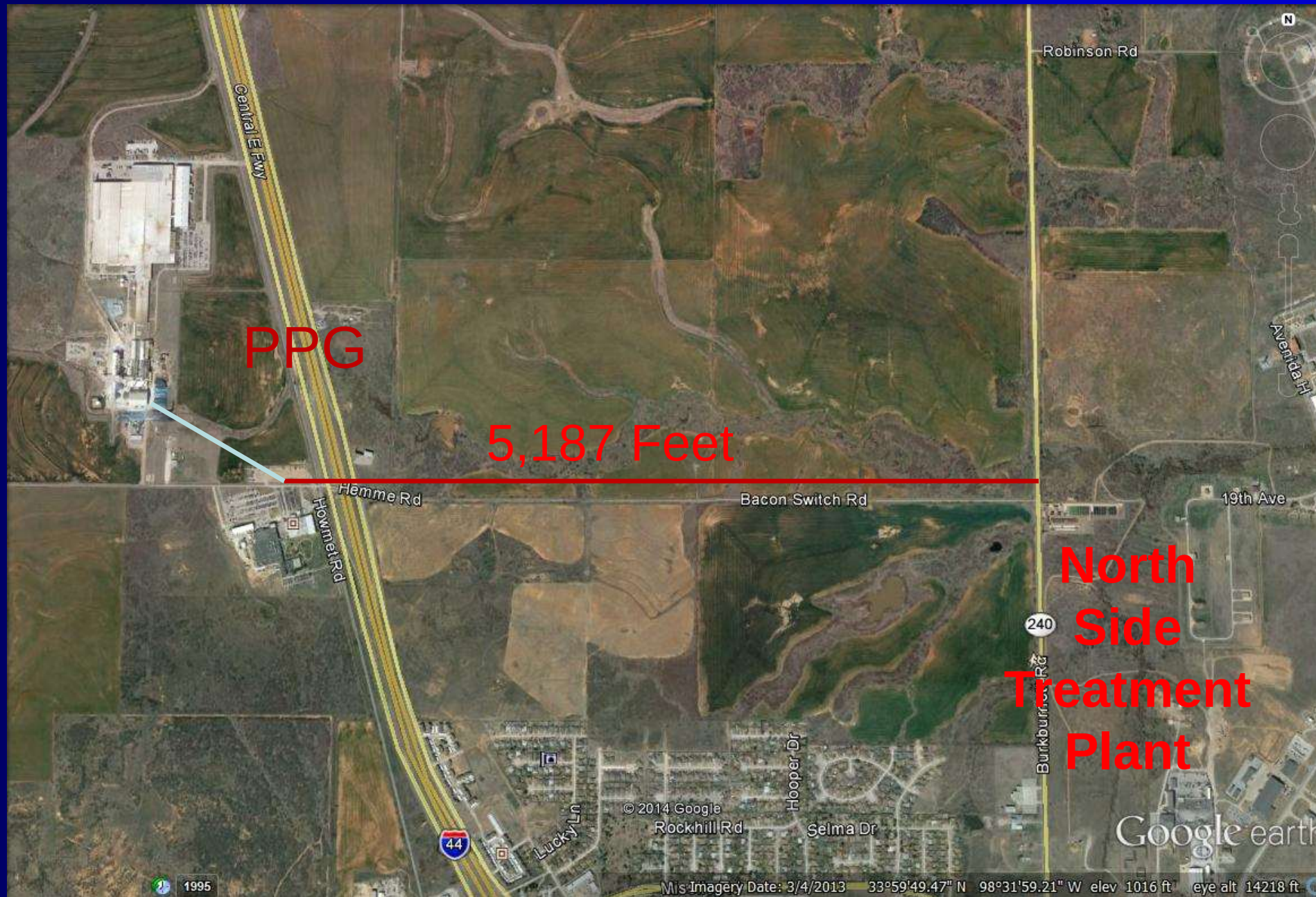
PPG Industries Water Project



PPG

5,187 Feet

North
Side
Treatment
Plant



1995

© 2014 Google
Mis Imagery Date: 3/4/2013 33°59'49.47" N 98°31'59.21" W elev 1016 ft eye alt 14218 ft

PPG Project

- **Corporate Concerned About \$60 Million Furnace Investment**
- **PPG Has 300 Employees With \$15 Million Payroll Per Year**
- **150 Indirect Employees With \$6 Million Per Year Benefit**
- **PPPG Uses 3 mgd, - 90% For Process Water**
- **60% Evaporation From Cooling Towers**
- **Project Will Save PPG 76 mgy**
- **4a Paying For Line From Plant**
- **Cost: \$1,145,000; PPG: \$400,000**



Alcoa Howmet Water Project



Turbine Blades
for Commercial
Aircraft
Engines

Alcoa Howmet

- Largest Manufacturing Employer In Wichita Falls
- 908 Employees
- \$50 Million Annual Payroll
- \$180 Million Annual Economic Impact On Area

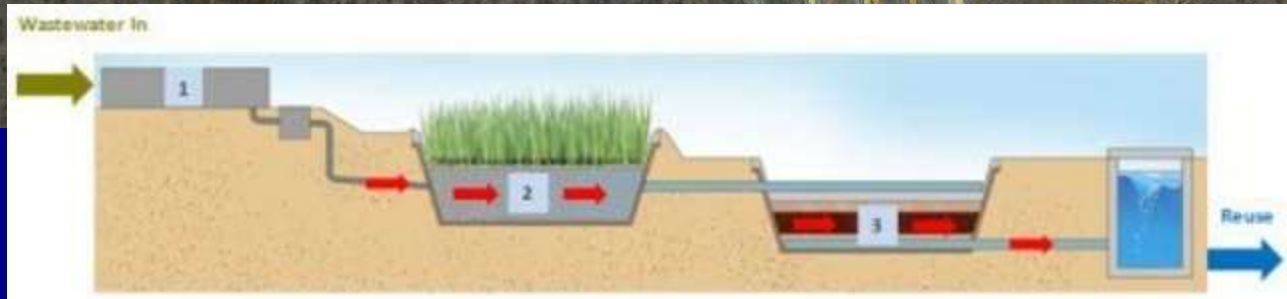
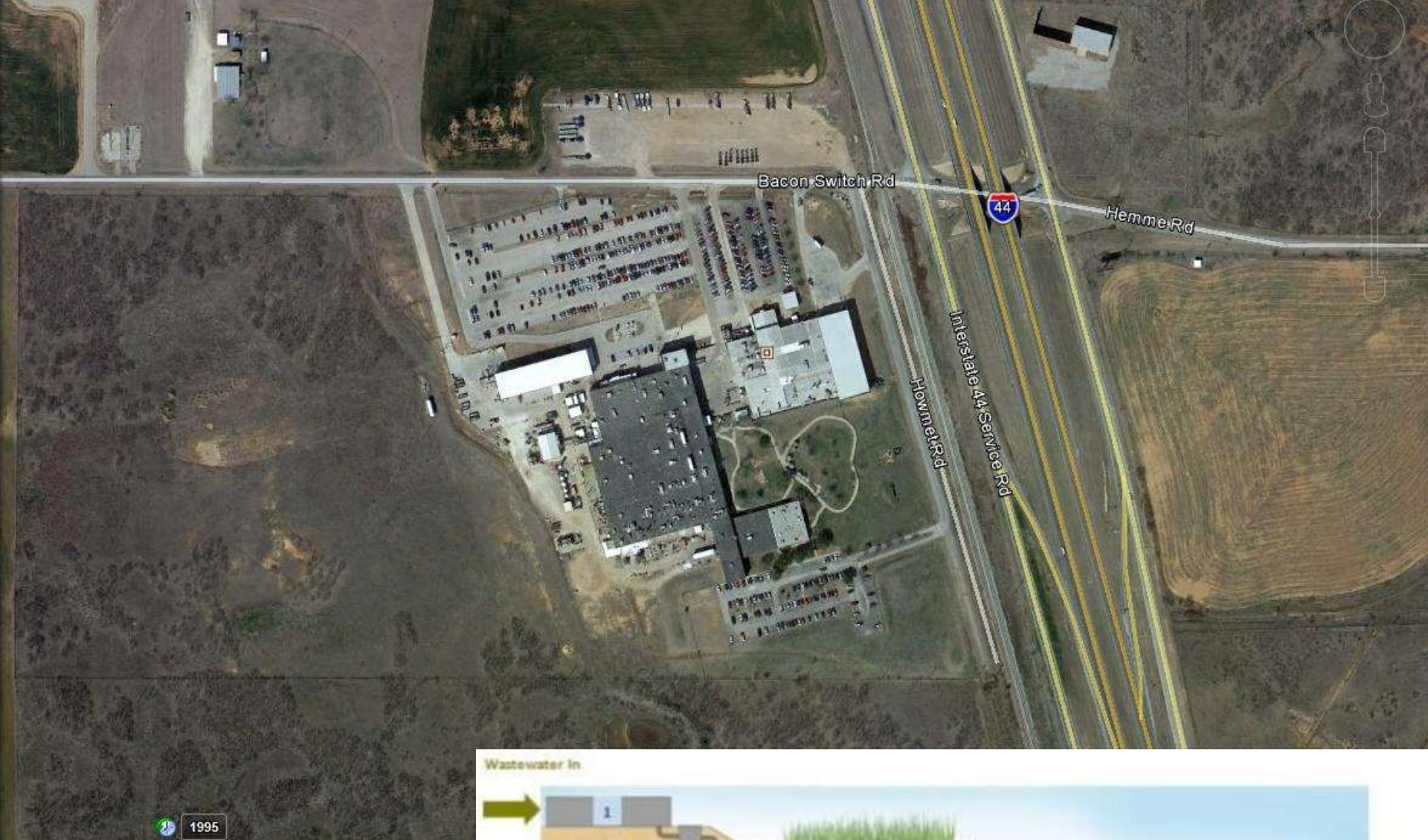
Alcoa Howmet



Howmet/Alcoa Water Project

- Corporate is Demanding Cuts in All Areas, Especially Utilities
- Also, To Reduce Environmental Footprint
- Installing R/O and NEWT – Naturally Engineered Water Treatment
- Cost \$2.4 million
- City is Paying \$1.2 million Through Forgivable Loan
- Will Reduce Potable Water Use by 30 mgd
- Why?
 - Reduce Water Consumption
 - Possibility of New Investment





Cryovac - Iowa Park

- Plastic Film for Food Industry
- 535 Employees
- 387 Live in Wichita Falls
- \$37 Million Annual Payroll
- \$111 Annual Economic Impact
- Cryovac & Iowa Park Asking for Help With Water Reuse





Johnson Rd

Mockingbird Dr

Bluejay Dr

Park Plaza Dr

W Magnolia Ave

W Smith Ave

© 2014 Google

Google earth

1994

Imagery Date: 3/4/2013 33°57'18.87" N 98°41'11.25" W elev 1034 ft eye alt 3394 ft

Why Needed?

- **Corporate Insists on Cutting All Utility Costs**
 - **Local Plants Want to Stay Off Corporate Radar**
 - **Reduce Water Consumption by 30 – 40 MGY**
 - **Save \$500,000 Per Year**
- 
- A map of Washington state is shown in the bottom right corner. It features two orange location markers with white numbers inside. Marker 47 is located in the northern part of the state, and marker 13 is in the southern part. The state is labeled 'WA' in the center.



Regional Cooperation

Total Project Cost	\$1,630,000
IP Community Development Corp. Cert. Of Obligation	\$ 700,000
IP Community Development Corp.	\$ 100,000
IP Water & Sewer Fund	\$ 365,000
Wichita Falls 5a Fund	\$ 465,000



Wichita Falls Concerns

- **Wichita Falls Sell Water to Iowa Park Wholesale**
- **Project Would Decrease Wichita Falls Water Revenue**
- **WF Sells Water to IP for \$4.25 per 1,000 gallons**
- **IP Sells to Cryovac at \$13.35 per 1,000 gallons**
- **Cryovac Is Not In IP City Limits**
- **Cryovac Has Non Annexation Agreement with IP**
- **Cryovac pays IP 1.5 times rate of City Customers**



Bottom Line





Questions / Discussion

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940.723.2741