



CRITICAL PERIOD: THE EVOLUTION OF DROUGHT MANAGEMENT

(1989 – present)

Presented to the Edwards Aquifer RIP

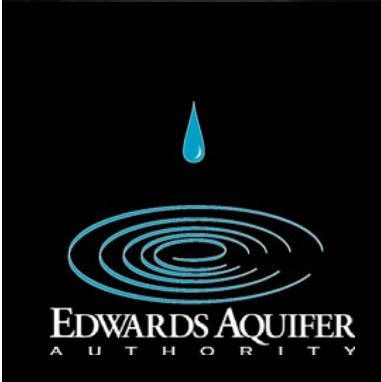
June 29, 2009

CRITICAL PERIOD

History

Key Aspects

Lessons Learned



1989

EUWD DROUGHT MANAGEMENT PLAN

- Simultaneous trigger levels for stage declaration
- DMP never triggered
- User conservation plans



1989 Triggers



EAST	Stage I "Awareness" (10%)	Stage II "Watch" (15%)	Stage III "Alert" (25%)	Stage IV "Risk" (30%)	Stage V "Emergency" TBD
J-17 (ft msl) (10-day avg.)	< 644	< 628	< 612	< 612	Water Quality
Comal Springs (cfs)	< 160	< 70	< 0	< 0	Water Quality
San Marcos Springs (cfs)	< 110	< 80	< 50	< 50	Water Quality

WEST	Stage I "Awareness" (10%)	Stage II "Watch" (15%)	Stage III "Alert" (25%)	Stage IV "Risk" (30%)	Stage V "Emergency" TBD
J-17 (ft msl) (10-day avg.)	< 644	< 644	< 628	< 612	Water Quality
Comal Springs (cfs)	< 160	< 160	< 70	< 0	Water Quality
San Marcos Springs (cfs)	< 110	< 110	< 80	< 50	Water Quality
J-27 (ft msl)	< 870	< 840	< 829	< 811	Water Quality

1989

Lessons Learned

- Regional withdrawal reductions
- Municipal and industrial water use data
- Water use reports
- Overly prescriptive
- “Perfect Storm” trigger levels



1992/1995

1992 - EUWD DEMAND MANAGEMENT PLAN

1995 – CPM DIRECTED BY COURT MONITOR

New conceptual assumptions:

Winter = X

Summer peak = 2X

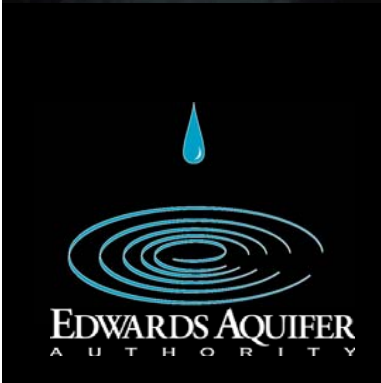
➤ Stage 1 – 1.8 x base

➤ Stage 2 – 1.6 x base

➤ Stage 3 – 1.2 x base



1995 Triggers



	Stage I (1.8 x base)	Stage II (1.6 x base)	Stage III (1.2 x base)
J-17 (ft msl)	< 665	< 648	< 642
Comal Springs (cfs)	< 260	< 200	< 175
San Marcos Springs (cfs)	< 96	< 80	None
J-27 (ft msl)	NA	NA	NA
	Peak Reduction Target	Peak Reduction Target	Peak Reduction Target
	10%	20%	40%

1992/1995

Lessons Learned

- Stage 3 reduction factor (1.2 X base usage) significant challenge for users
- Primary water user commitment
- Early stages allowed more use than actually needed
- Variable base



1997/98

EAA CRITICAL PERIOD MANAGEMENT PLAN

First EAA plan similar to 1995 CPM

Lessons Learned

First regional CPM plan

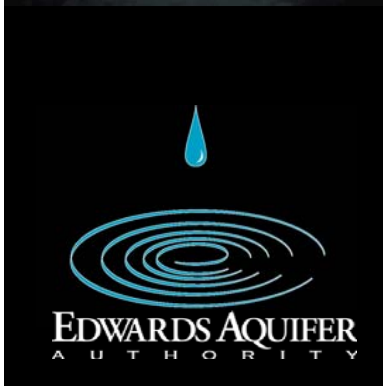
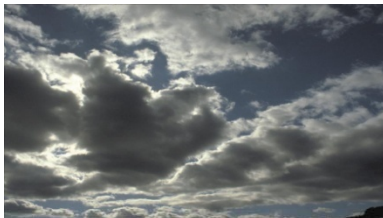
Early stages allowed more use than actually needed

Base use variable

Weekly reporting and monthly enforcement administratively difficult



1997/1998 Triggers



Bexar/Comal/Hays/ Caldwell/Guadalupe	Stage I (1.7 x base)	Stage II (1.6 x base)	Stage III (1.4 x base)	Stage IV (1.3 x base)	Stage V (TBD)
J-17 (ft msl)	< 650	< 642	< 636	< 632	< 628
Medina/Atascosa	Stage I (1.7 x base)	Stage II (1.6 x base)	Stage III (1.4 x base)		
Medina Index Well (ft msl)	< 670	< 660	< 655		
Uvalde	Stage I (1.7 x base)	Stage II (1.6 x base)			
J-27 (ft msl)	< 845	< 840			

2000

EMERGENCY DROUGHT MANAGEMENT PLAN

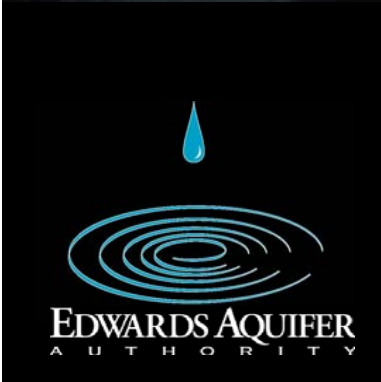
New paradigm:

EAA-developed monthly pumping schedule

- Stage 1 – 95% of monthly schedule
- Stage 2 – 90% of monthly schedule
- Stage 3 – 85% of monthly schedule

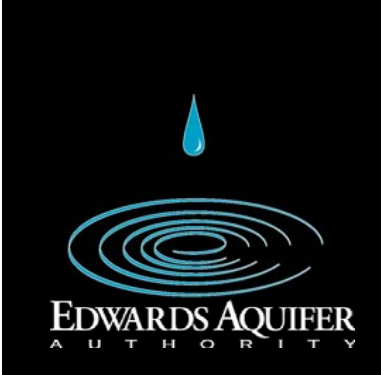


2000 Triggers



	Stage I (95% of Monthly Schedule)	Stage II (90% of Monthly Schedule)	Stage III (85% of Monthly Schedule)
J-17 (ft msl)	< 650	< 640	< 630
Medina County Index Well	< 670	< 660	< 655
J-27 (ft msl)	< 845	< 840	< 835

2001 Triggers



	Stage I (95% of Monthly Schedule)	Stage II (90% of Monthly Schedule)	Stage III <i>TBD</i> (85% of Monthly Schedule)
J-17 (ft msl)	< 650	< 640	< 630
Medina County Index Well	< 670	< 660	< 655
J-27 (ft msl)	< 845	< 840	< 835

2000/2001

Lessons Learned

EAA leadership

User concerns

Reporting and enforcement



2002-2007

DEMAND MANAGEMENT/CRITICAL PERIOD MANAGEMENT PLAN

New paradigm: User-provided Quarterly Allocations

- Quarterly use schedule provided by prior December 1
- Percentage reductions based on quarterly allocations
- Irrigators not subject to stages 1 or 2

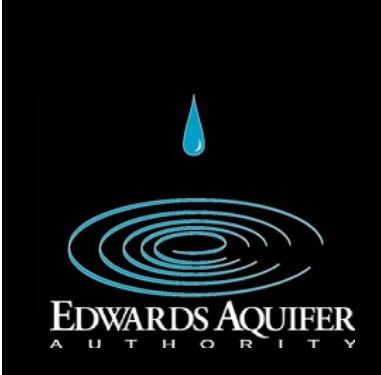


2002 Triggers



	Stage I (10%)	Stage II (15%)	Stage III (20%)	Stage IV (30%)
J-17 (ft msl)	< 650	< 640	< 630	< 630 OR < 627
Comal Springs (cfs)	< 225	< 154	< 86	NA
San Marcos Springs (cfs)	< 110	< 96	< 80	NA
J-27 (ft msl)	NA	NA	< 845	< 845 OR < 842

2006 Triggers



	Stage I (20%)	Stage II (25%)	Stage III (30%)	Stage IV (40%)
J-17 (ft msl)	< 650	< 640	< 630	< 630 OR < 627
Comal Springs (cfs)	NA	< 154	< 86	NA
San Marcos Springs (cfs)	NA	< 96	< 80	NA
J-27 (ft msl)	NA	NA	< 845	< 845 OR < 842

2002-2007

Lessons Learned

Improved communication

Focus on permit holders and authorized use

Permit holder resentment

Permit management

Administratively complicated

Not beneficial during a multi-year drought



2008-present

DEMAND MANAGEMENT/CRITICAL PERIOD MANAGEMENT PLAN

2007 Legislature

New paradigm: Annual management of groundwater use

- Monthly reporting/annual enforcement
- Percentage reductions based on time in each stage
- San Antonio Pool – 4 stages (10-day average)
- Irrigators
- Uvalde Pool – 3 stages based on J-27 (10-day average)



Current Triggers



	Stage I (20%)	Stage II (30%)	Stage III (35%)	Stage IV (40%)
J-17 (ft msl)	< 660	< 650	< 640	< 630
Comal Springs (cfs)	< 225	< 200	< 150	< 100
San Marcos Springs (cfs)	< 96	< 80	NA	NA
J-27 (ft msl)	None (N/A)	< 850 (5%)	< 845 (20%)	< 842 (35%)

2008-present

Lessons Learned

Improved communication

Reduction coefficients easier to explain/understand

Critical period calculator provides more transparency

Total permit reduction:

2008 - 1.6%

2009 - 11.8%

Actual pumping reduction:

6% from 2006

7.5% from 2008



DM/CPM GOALS

- Effectiveness
- Consistency
- Simplicity
 - Administration
 - Enforcement
- EAA manages for multi-year drought
- Well owner manages permit





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