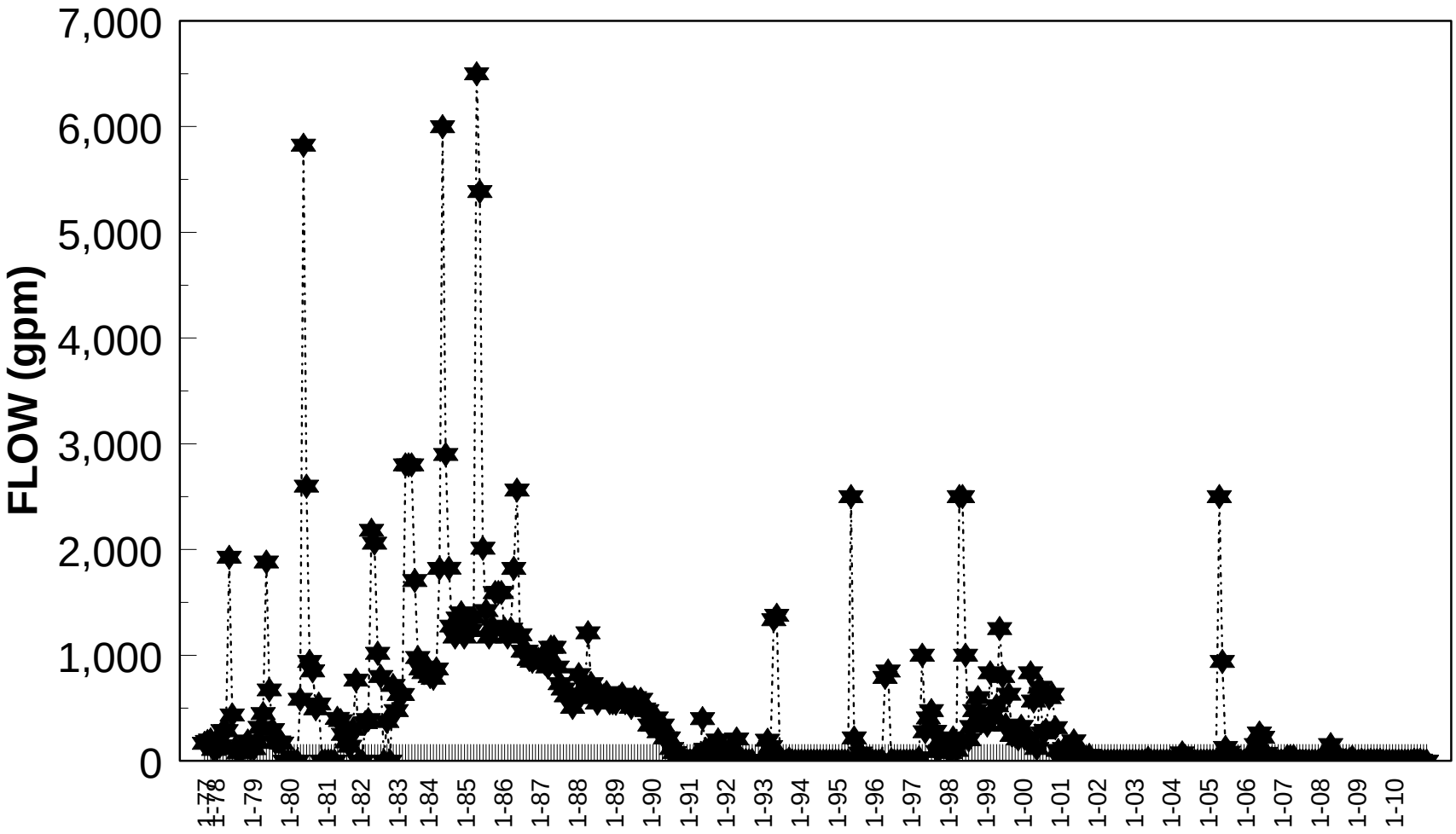
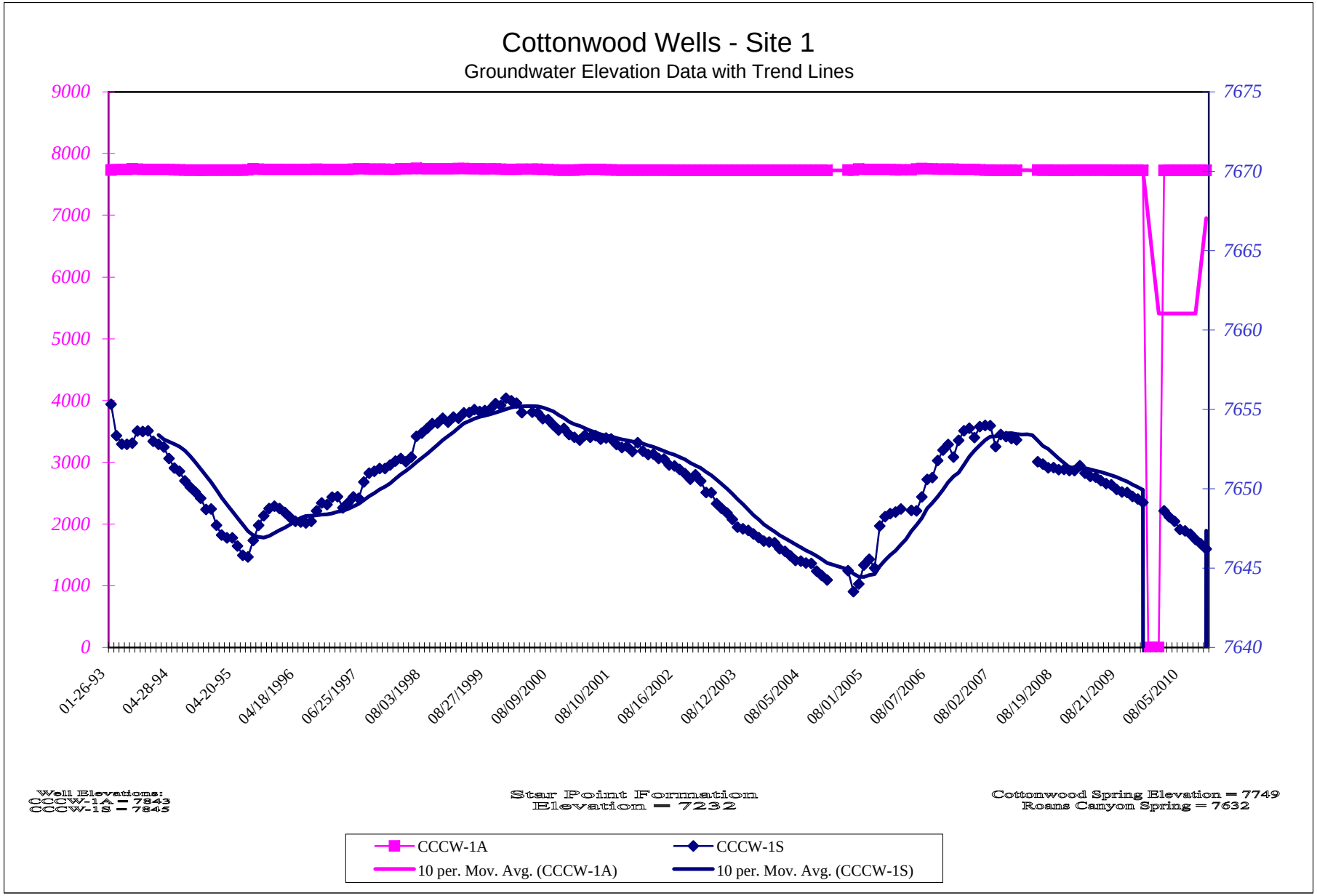
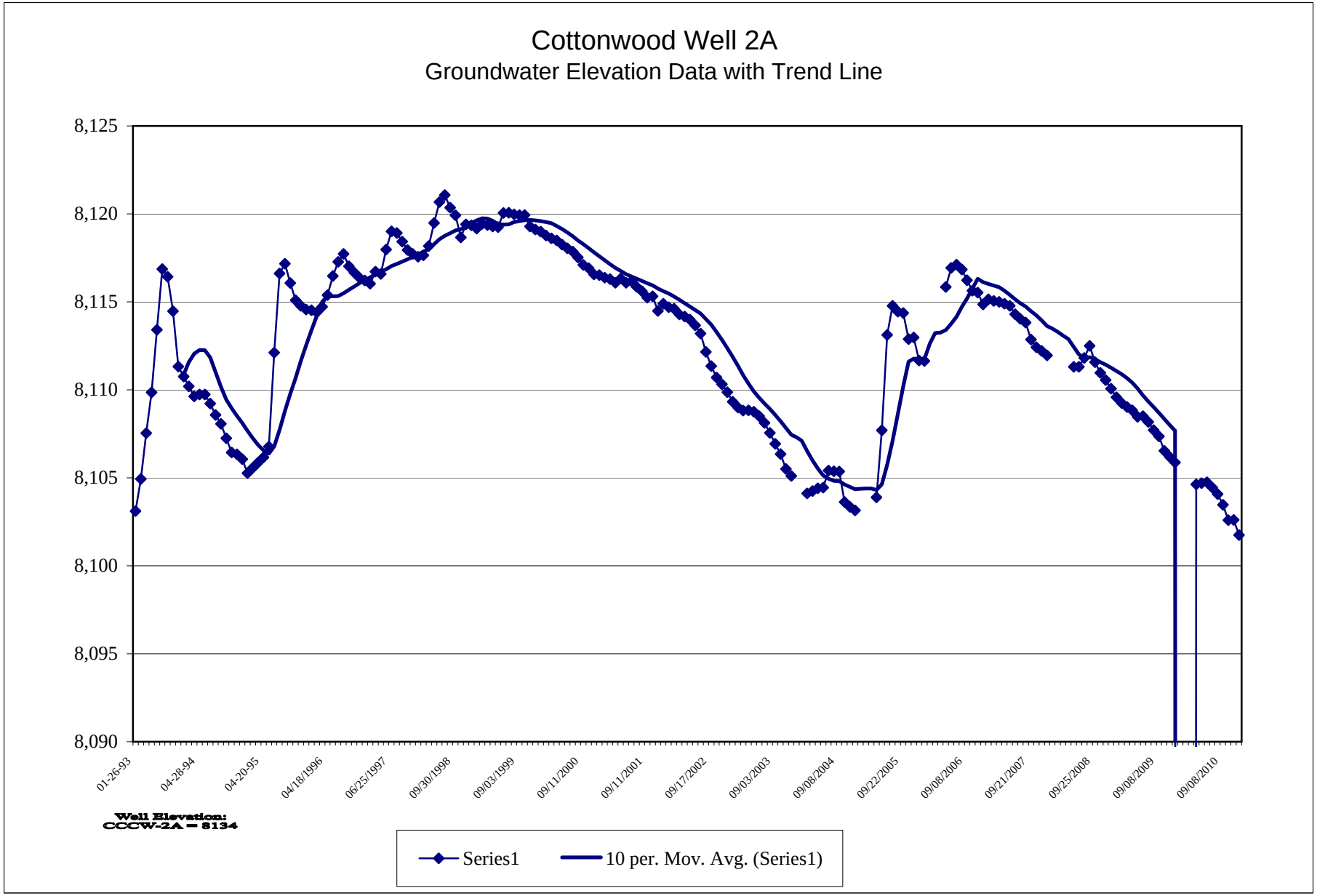
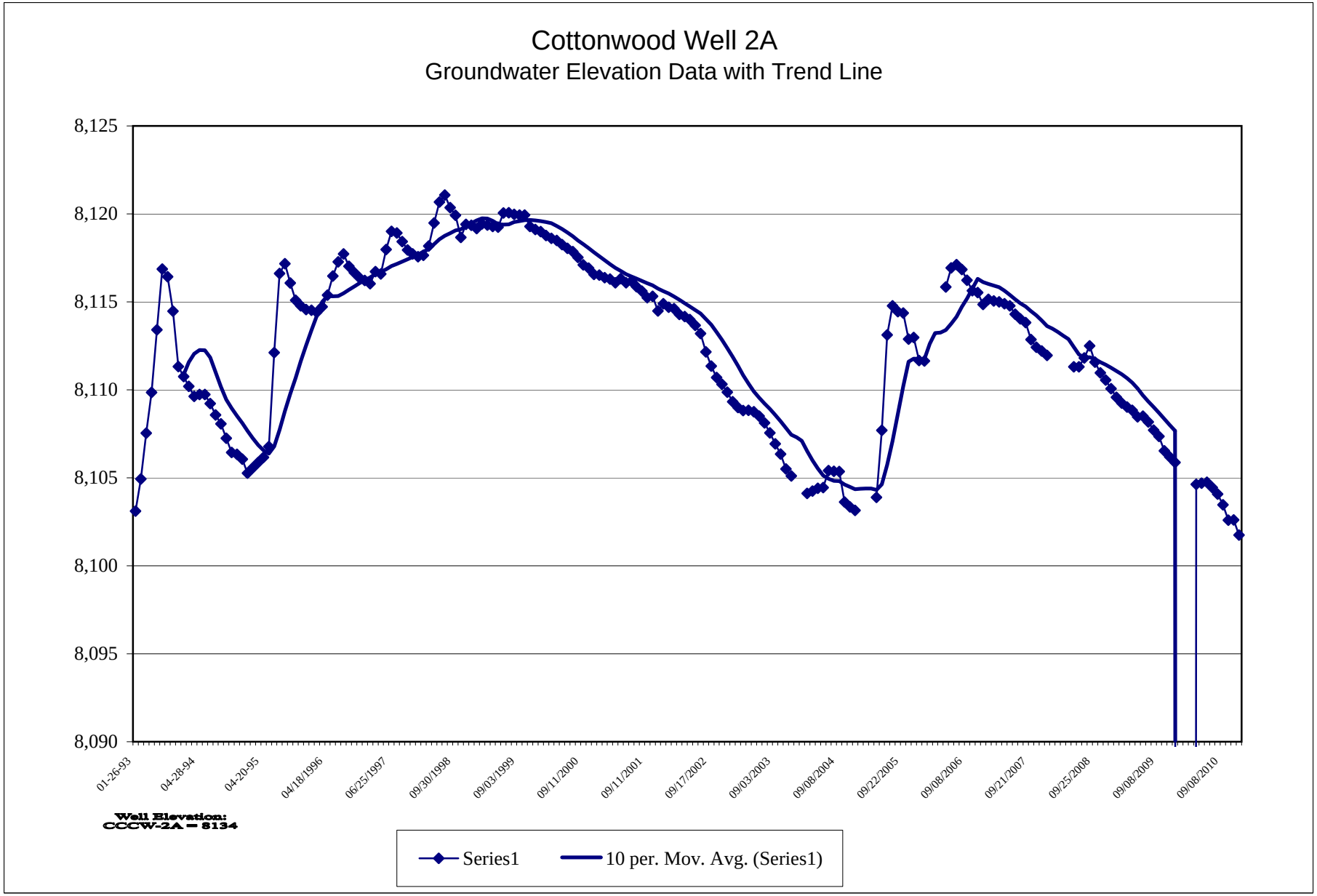
COTTONWOOD CANYON CREEK

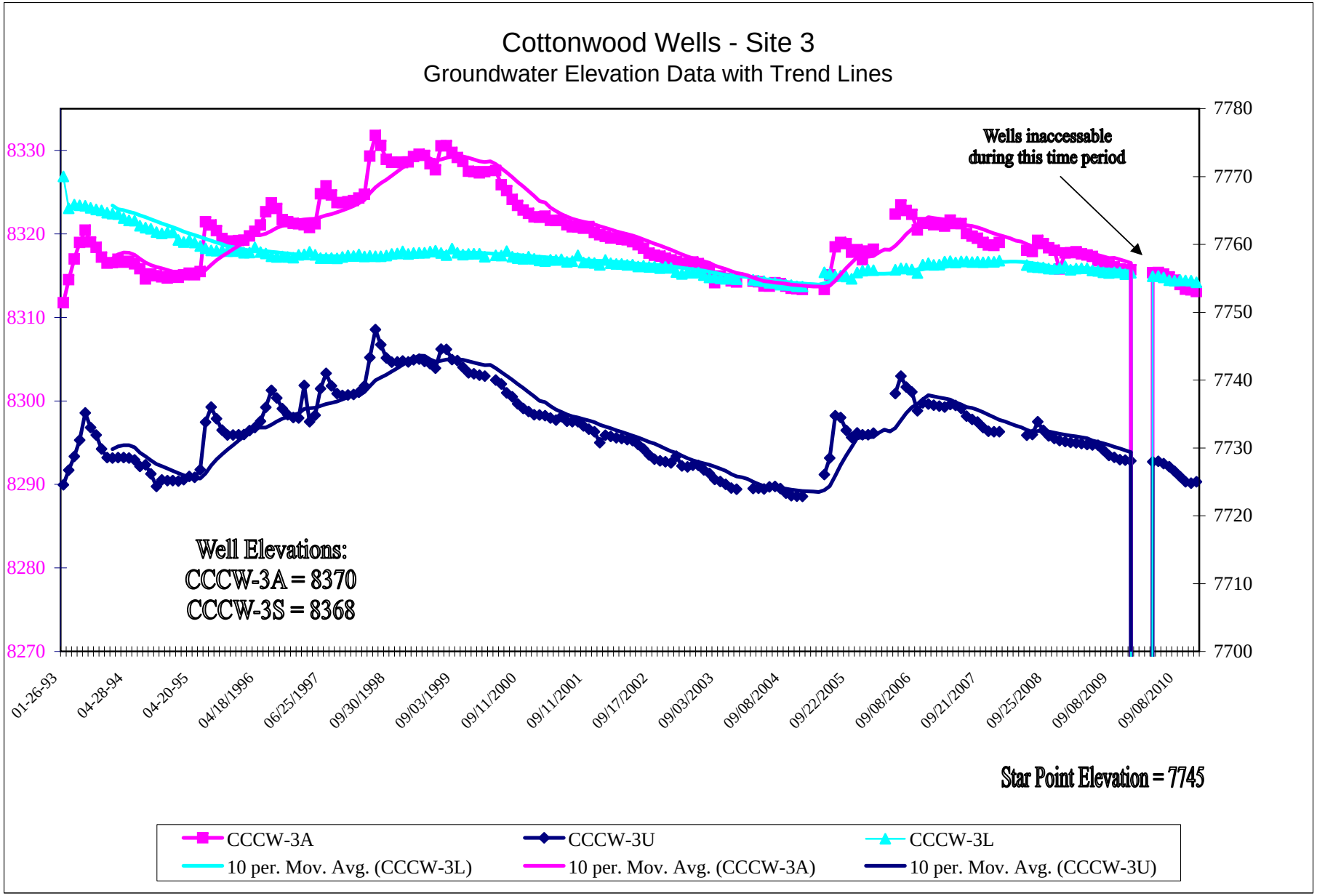
@ USGS FLUME
DISCHARGE RECESSION CURVE




Cottonwood Wells - Site 1
Groundwater Elevation Data with Trend Lines
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
7675
7670
7665
7660
7655
7650
7645
7640
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
08/03/1998
08/27/1999
08/09/2000
08/10/2001
08/16/2002
08/12/2003
08/05/2004
08/01/2005
08/07/2006
08/02/2007
08/19/2008
08/21/2009
08/05/2010
Well Elevations:
CCCW-1A = 7843
CCCW-1S = 7845
Star Point Formation
Elevation = 7232
Cottonwood Spring Elevation = 7749
Roans Canyon Spring = 7632
CCCW-1A
CCCW-1S
10 per. Mov. Avg. (CCCW-1A)
10 per. Mov. Avg. (CCCW-1S)

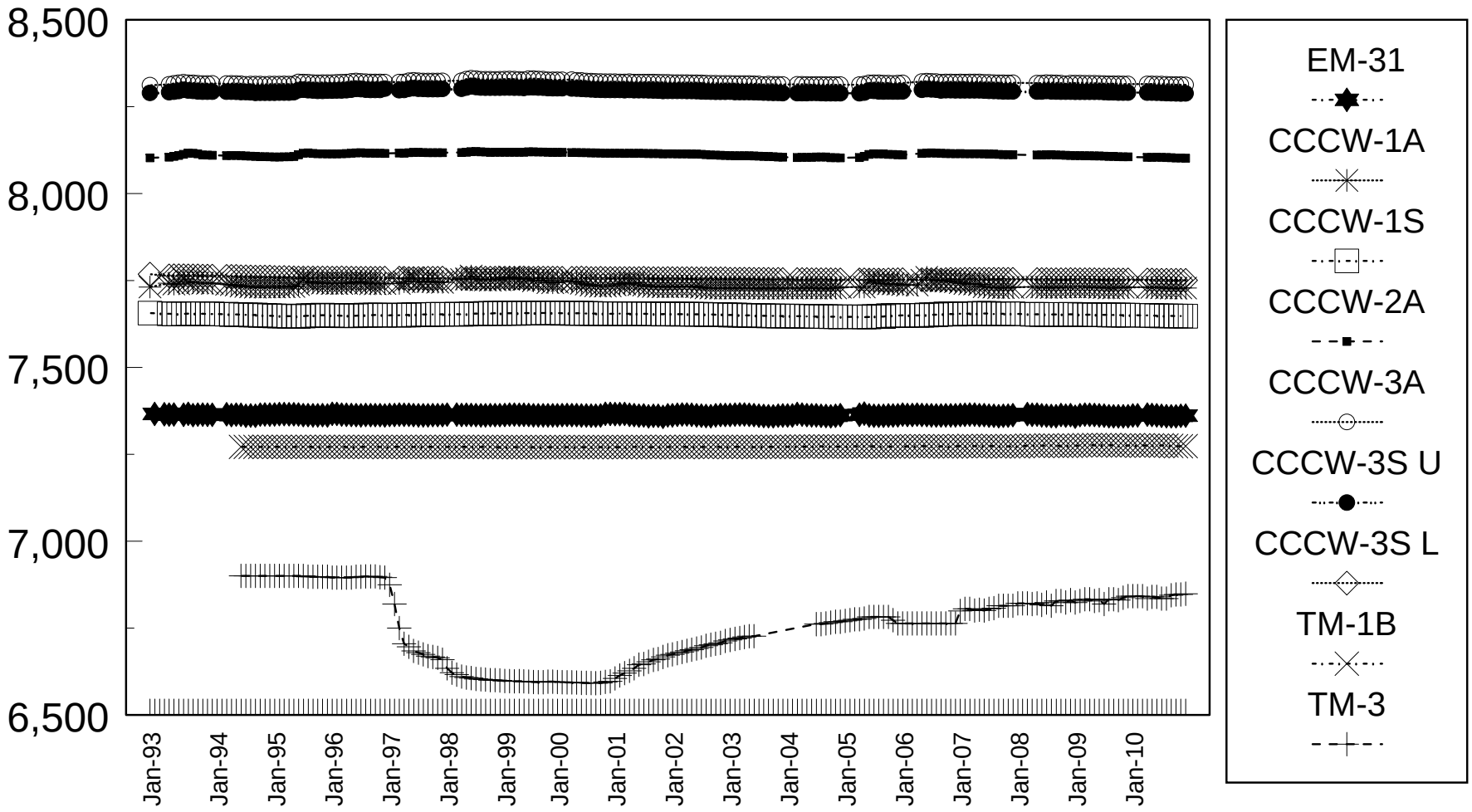

Cottonwood Well 2A
Groundwater Elevation Data with Trend Line
8,125
8,120
8,115
8,110
8,105
8,100
8,095
8,090
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
09/30/1998
09/03/1999
09/11/2000
09/11/2001
09/17/2002
09/03/2003
09/08/2004
09/22/2005
09/08/2006
09/21/2007
09/25/2008
09/08/2009
09/08/2010
Well Elevation:
CCCW-2A = 8134
Series1
10 per. Mov. Avg. (Series1)

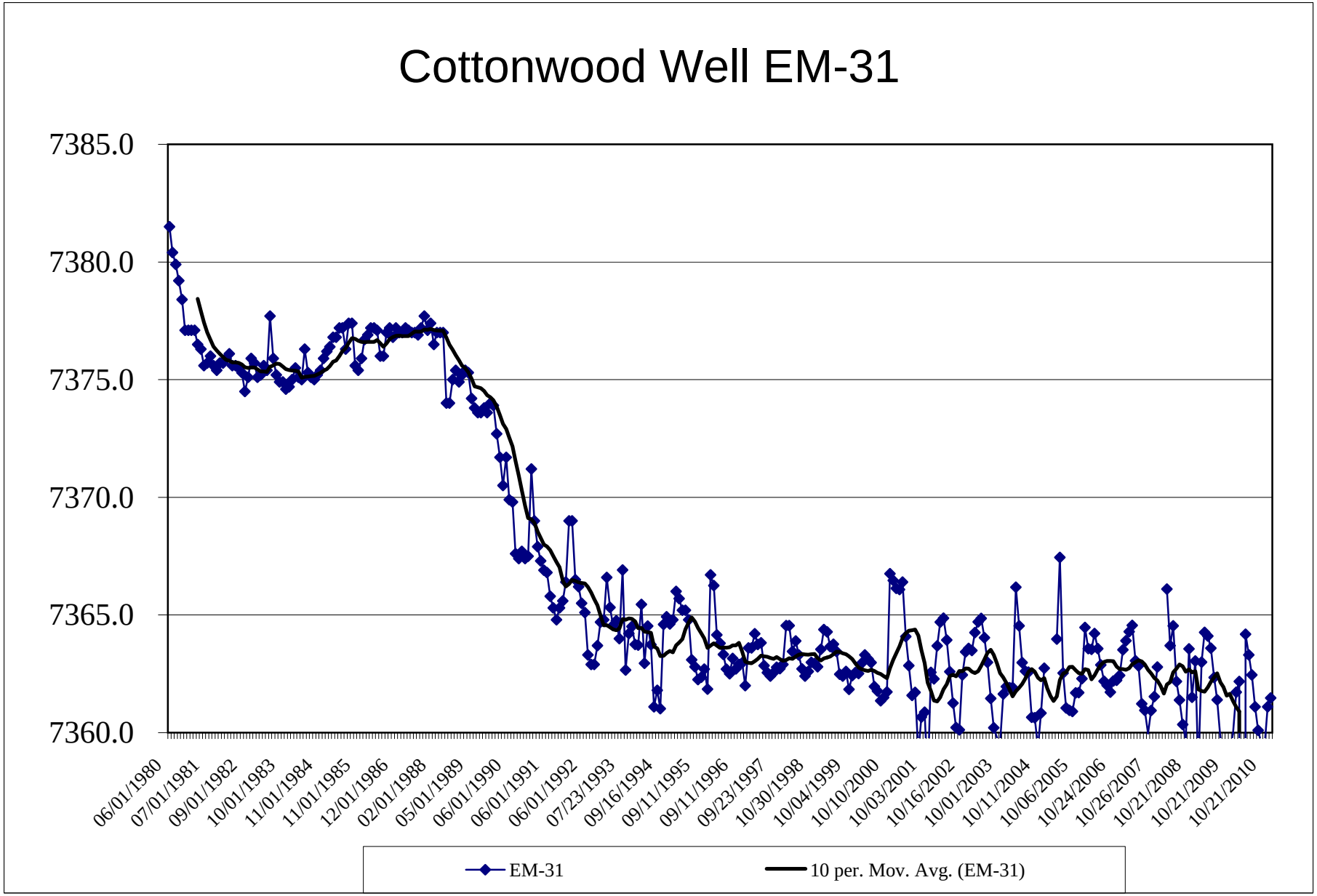

Cottonwood Well 2A
Groundwater Elevation Data with Trend Line
8,125
8,120
8,115
8,110
8,105
8,100
8,095
8,090
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
09/30/1998
09/03/1999
09/11/2000
09/11/2001
09/17/2002
09/03/2003
09/08/2004
09/22/2005
09/08/2006
09/21/2007
09/25/2008
09/08/2009
09/08/2010
Well Elevation:
CCCW-2A = 8134
Series1
10 per. Mov. Avg. (Series1)


Cottonwood Wells - Site 3
Groundwater Elevation Data with Trend Lines
Wells inaccessable during this time period
Well Elevations:
CCCW-3A = 8370
CCCW-3S = 8368
Star Point Elevation = 7745
8330
8320
8310
8300
8290
8280
8270
7780
7770
7760
7750
7740
7730
7720
7710
7700
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
09/30/1998
09/03/1999
09/11/2000
09/11/2001
09/17/2002
09/03/2003
09/08/2004
09/22/2005
09/08/2006
09/21/2007
09/25/2008
09/08/2009
09/08/2010
CCCW-3A
CCCW-3U
CCCW-3L
10 per. Mov. Avg. (CCCW-3L)
10 per. Mov. Avg. (CCCW-3A)
10 per. Mov. Avg. (CCCW-3U)

COTTONWOOD CANYON

MONITORING WELLS
PIEZOMETRIC DATA




Cottonwood Well EM-31
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
06/01/1980
07/01/1981
09/01/1982
10/01/1983
11/01/1984
11/01/1985
12/01/1986
02/01/1988
05/01/1989
06/01/1990
06/01/1991
06/01/1992
07/23/1993
09/16/1994
09/11/1995
09/11/1996
09/23/1997
10/30/1998
10/04/1999
10/10/2000
10/03/2001
10/16/2002
10/01/2003
10/11/2004
10/06/2005
10/24/2006
10/26/2007
10/21/2008
10/21/2009
10/21/2010
EM-31
10 per. Mov. Avg. (EM-31)

INDIAN CREEK WATER QUALITY *

ICA

APPENDIX F

2010** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20101013	0	264	72.59	0	3	512		270	0.21	0	21.56	0		8.19	1.05	3.26	12	0	313
2009**																			
MEAN	5	262	72.65		2	511		278	0.09		23.39			8.22	1.05	3.32	11	0	277
2008**																			
MEAN		257	74.26		2	499		280	0.12		22.97	0.002		8.3	0.89	3.27	10	0	286
2007**																			
MEAN		251	72.0		2	496		274	0.30		22.8	0.02		8.02	1.07	3.01	14	26	294
2006**																			
MEAN		297	77.5		3	554		282	0.06		21.5	0.01		7.96	0.64	2.71	8		282
2005**																			
MEAN		265	80.8		3	571	10	294	0.07		23	0		8.30	1.56	3.27	8	5	291
2004**																			
MEAN		262	77.4		2	493		281	0.08		21.4	0.03		8.06	0.79	2.92	13	7	299
2003**																			
MEAN		312	71.5		2	493		271	0.02		22.4			8.24	0.91	2.93	19		265
2002**																			
MEAN		286	67.0		2	483		258			22.0			8.25		4.00	23		304
2001**																			
MEAN		327	71.0		3	633		264	0.20		21.0			8.21		3.00	9		289
2000**																			
MEAN		313	69.0		2	487		255	0.20		20.0			8.10		3.00	10	43	274
HISTORICAL 2000-2009																			
MIN	0	251.0	67.0	0.0	2	483	0	255.00	0.02	0.0	20.000	0.0		7.96	0.64	2.7	8.0	0	265
MAX	5	327.0	80.8	0.0	3	633	0	294.00	0.30	0.0	23.390	0.0		8.30	1.56	4.0	23.0	43	304
MEAN	3	283.2	73.3	0.0	2	522	-	273.70	0.13	0.0	21.991	0.0		8.17	0.99	3.1	12.5	13.5	286.1
No. of Analysis	2	10	10		10	10	1	10	9	1	10	6		10	7	10	10	6	10

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

INDIAN CREEK WATER QUALITY *
ICB
APPENDIX F

2010** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20101013	0	240	63.17	0	3	457		246	0.32	0	21.48	0	0	8.32	1.08	4.37	13	25	288
2009**																			
MEAN		246	68		2	480		267	0.41		24	0.000		8.35	1.1	4.34	13	14	261
2008**																			
MEAN	7	236	66	0	2	465		259	0.25		23	0.006		8.27	0.9	3.99	11	0	276
2007**																			
MEAN		237	64.9		2.0	466		258	1.43		23	0.046		8.09	1.01	3.73	14.0	37	286
2006**																			
MEAN		239	72.0		3.0	527		268	0.24		22	0.005		8.25	0.61	3.62	9.0		278
2005**																			
MEAN		238	68.2	5	2.0	534	9	258	0.20		21	0.013		8.41	1.00	4.29	10.0	9	268
2004**																			
MEAN		258	73.4		2.0	490		271	0.72		21	0.025		7.94	0.75	3.29	12.0	10	284
2003**																			
MEAN		276	59.3		2.0	427		236	0.37		21			8.13	0.93	3.41	11.0	21	216
2002**																			
MEAN		282	57.0		2.0	432		233	0.40		22			8.21		4.00	8.0		235
2001**																			
MEAN		293	59.0		2.4	559		234	0.20		21			8.26		3.00	7.7	6	253
2000**																			
MEAN	12	301	65.0		2.0	468		245	0.10		20			8.19	1.00	3.00	9.0	9	266
HISTORICAL 2000-2009																			
MIN	0.0	236	57.0	0.0	2.0	427		233	0.10	0.00	20	0.000	0.0	7.94	0.61	3.00	7.7	0.0	216
MAX	12.0	301	73.4	5.0	3.0	559		271	1.43	0.00	24	0.023	0.0	8.41	1.05	4.34	14.0	37.0	286
MEAN	6.3	261	65.2	1.7	2.1	485		253	0.43	0.00	22	0.009	0.0	8.21	0.91	3.67	10.5	13.3	262.3
No. of Analysis	3	10	10	3	10	10		10	10		10	6		10	8	10	10	8	10

*** Quality parameters are reported as mg/l unless otherwise noted.**

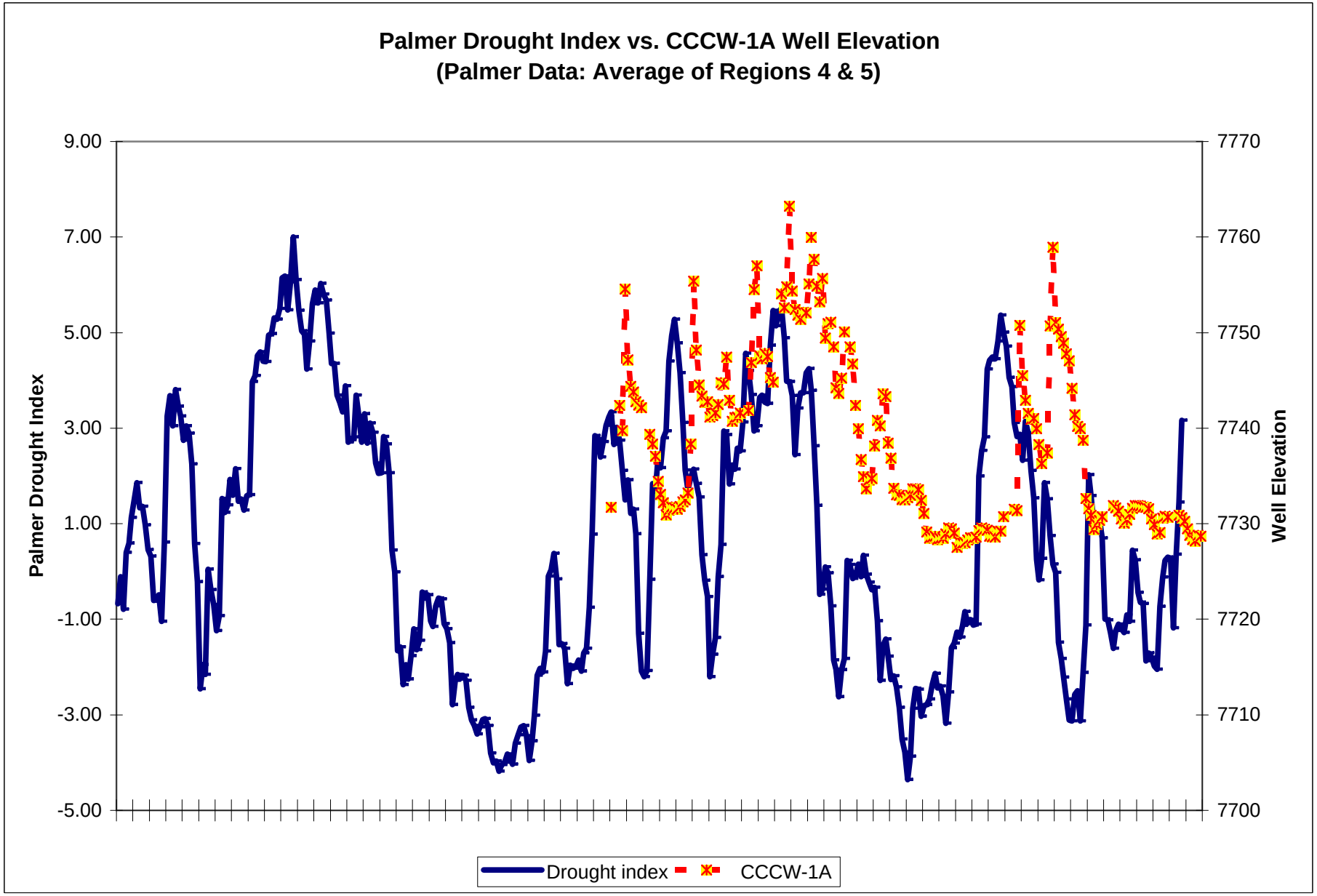
**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

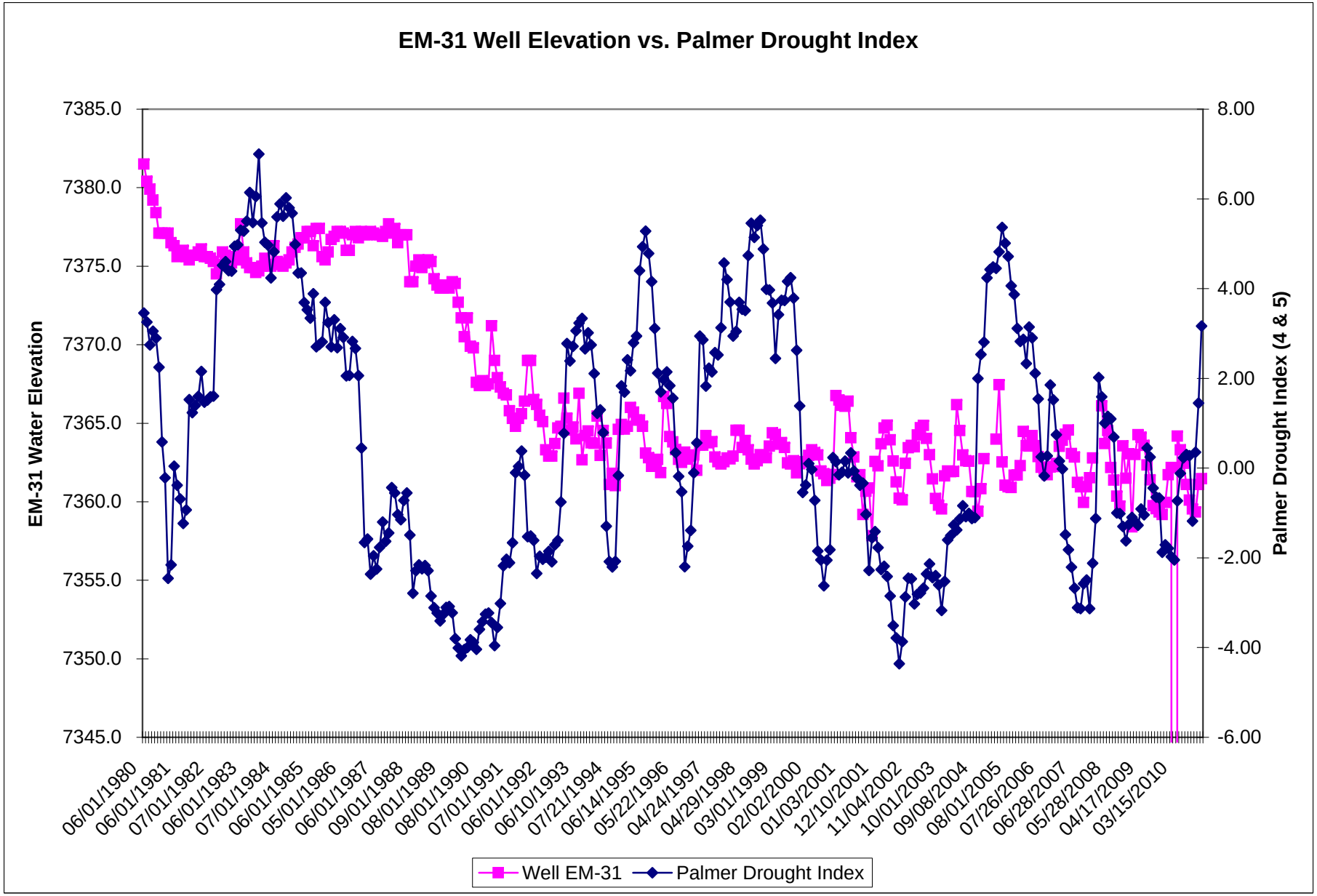
INDIAN CREEK WATER QUALITY *
ICD
APPENDIX F

2010** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20101013	0	273	93.72	0	5	671		365	0.28	0	31.72	0	0	8.3	1.11	10.72	108	10	456
2009**																			
MEAN																			
2008**																			
MEAN		279	85.77		4	628		350	0.06		33.04	0.005	0	9.43	1.19	10.15	66	0	395
2007**																			
MEAN		256	96.8	6.0	4.0	717		388	0.12		35.60	0.02		8.17	1.39	10.30	130.0		484
2006**																			
MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
2005**																			
MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
No Flow During 2004																			
2003**																			
MEAN		307	81.5		3	624		329	0.13		30	0.009		8.21	1.05	8.87	108		367
2002**																			
MEAN		266	96.0		3	740		384	0.30		35			8.28		10.00	188		528
2001**																			
MEAN		379	80.0		4	753		323	0.10		30			8.29		10.00	43	10	369
2000**																			
MEAN		321	92.0		5	689		362			32			8.00	1.00	10.00	125		459
HISTORICAL 2000-2008																			
MIN	0	256.0	80.0	0.0	3	624		323.00	0.06		30.00	0.003	0.00	8.00	1.00	8.86	23.0	0	367
MAX	9	379.0	108.0	6.0	7	813		413.00	0.38		35.60	0.054	4.00	9.43	2.45	11.2	188.0	10	528
MEAN	5	307.11	91.05	2.0	4.34	706		362.78	0.18		32.92	0.023	1.33	8.29	1.39	9.94	90.78	6.25	426.44
No. of Analysis	1	9	9	2	9	9		9	8		9	6	2	9	7	9	9	4	9

*** Quality parameters are reported as mg/l unless otherwise noted.**

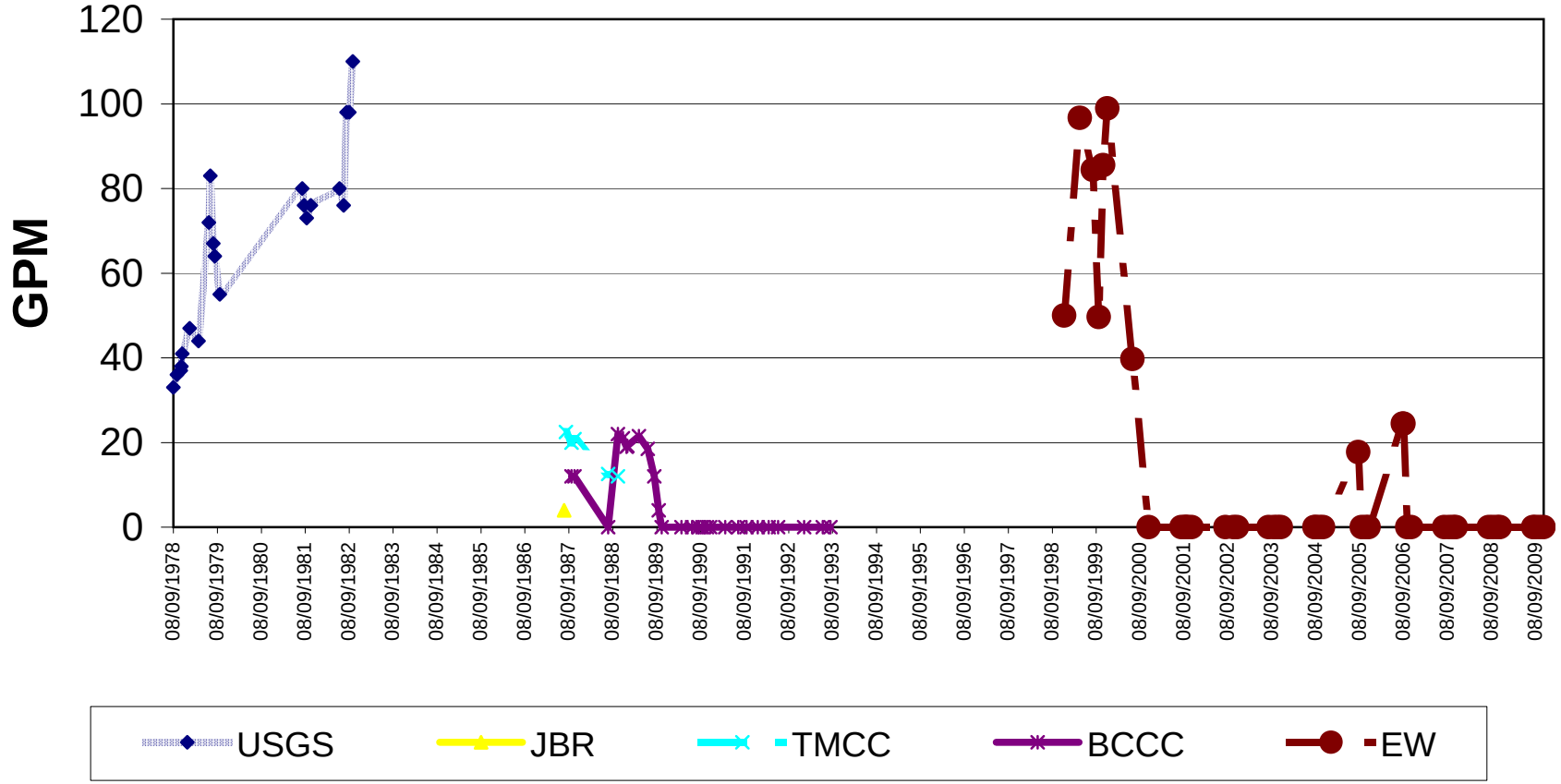
**** Data: Database input restricted to values greater then laboratory minimum detection limit.**


Palmer Drought Index vs. CCCW-1A Well Elevation
(Palmer Data: Average of Regions 4 & 5)
Palmer Drought Index
Well Elevation
9.00
7.00
5.00
3.00
1.00
-1.00
-3.00
-5.00
7770
7760
7750
7740
7730
7720
7710
7700
Drought index
CCCW-1A


EM-31 Well Elevation vs. Palmer Drought Index
EM-31 Water Elevation
Palmer Drought Index (4 & 5)
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
7355.0
7350.0
7345.0
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
06/01/1980
06/01/1981
07/01/1982
06/01/1983
07/01/1984
06/01/1985
05/01/1986
06/01/1987
09/01/1988
08/01/1989
08/01/1990
07/01/1991
06/01/1992
06/10/1993
07/21/1994
06/14/1995
05/22/1996
04/24/1997
04/29/1998
03/01/1999
02/02/2000
01/03/2001
12/10/2001
11/04/2002
10/01/2003
09/08/2004
08/01/2005
07/26/2006
06/28/2007
05/28/2008
04/17/2009
03/15/2010
Well EM-31
Palmer Drought Index

Cottonwood Spring: TM-23

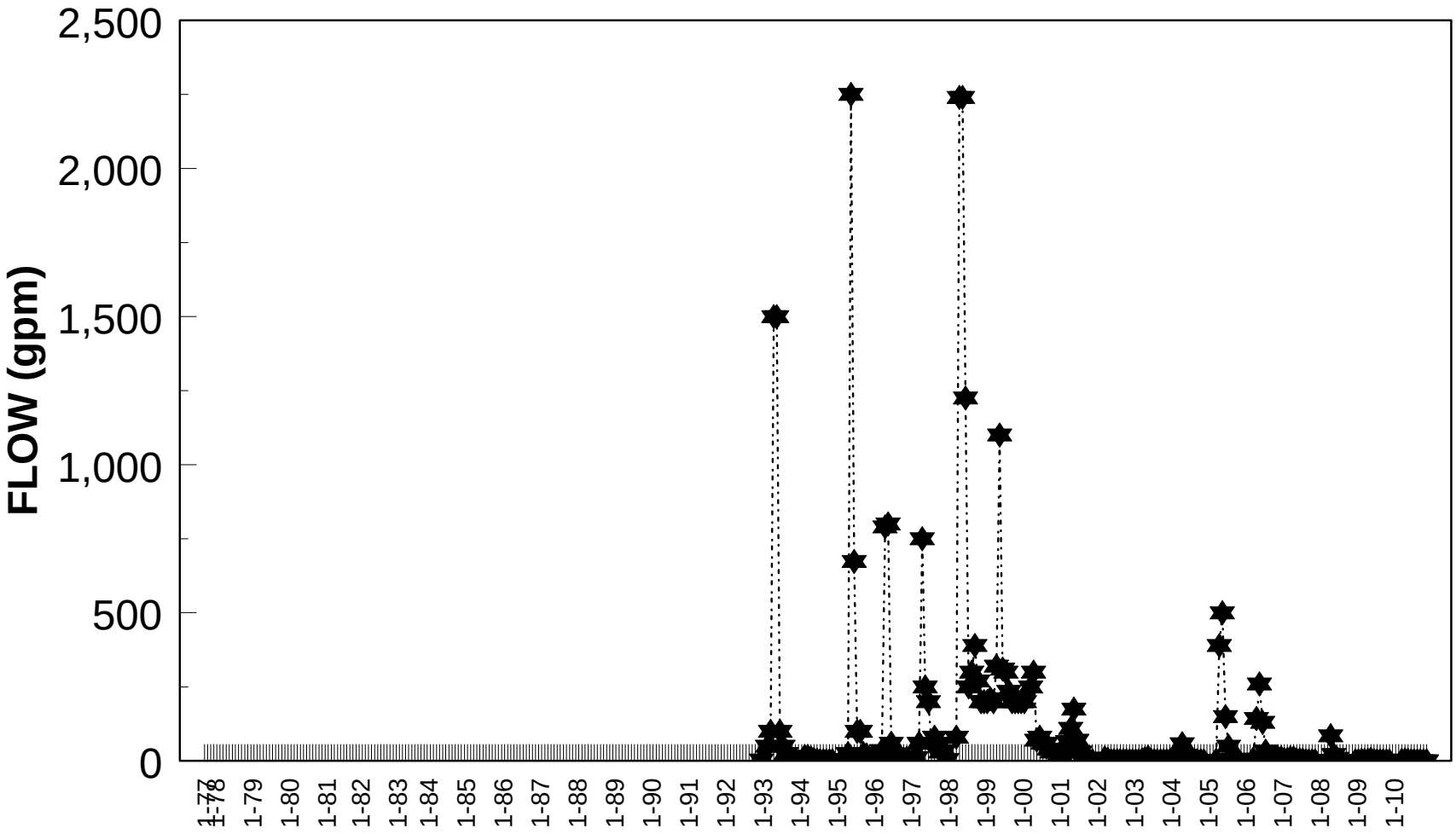
Water Right No. 93-701: U.S.F.S. (0.011 cfs)



COTTONWOOD CANYON CREEK

SW-1

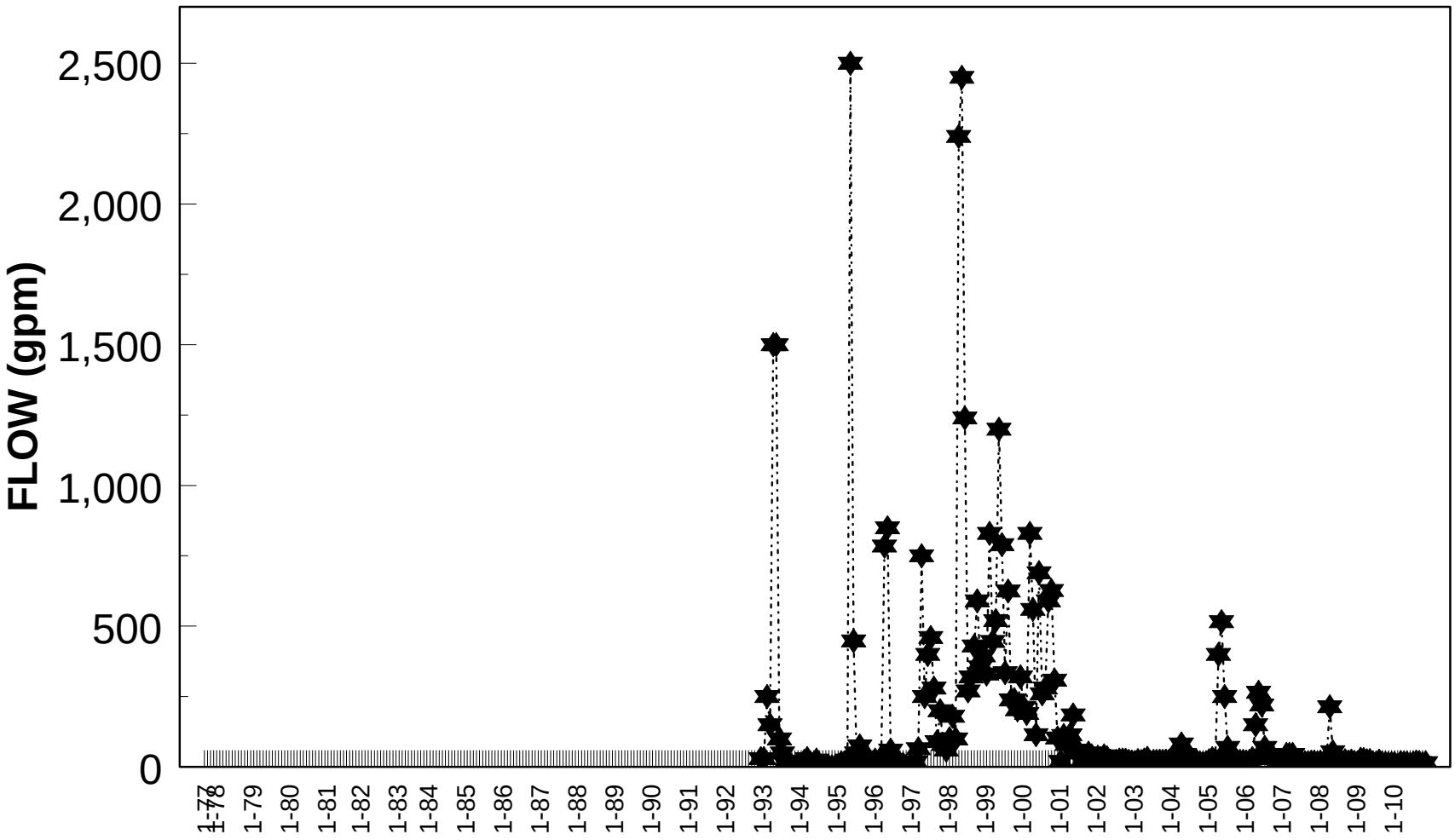
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

SW-2

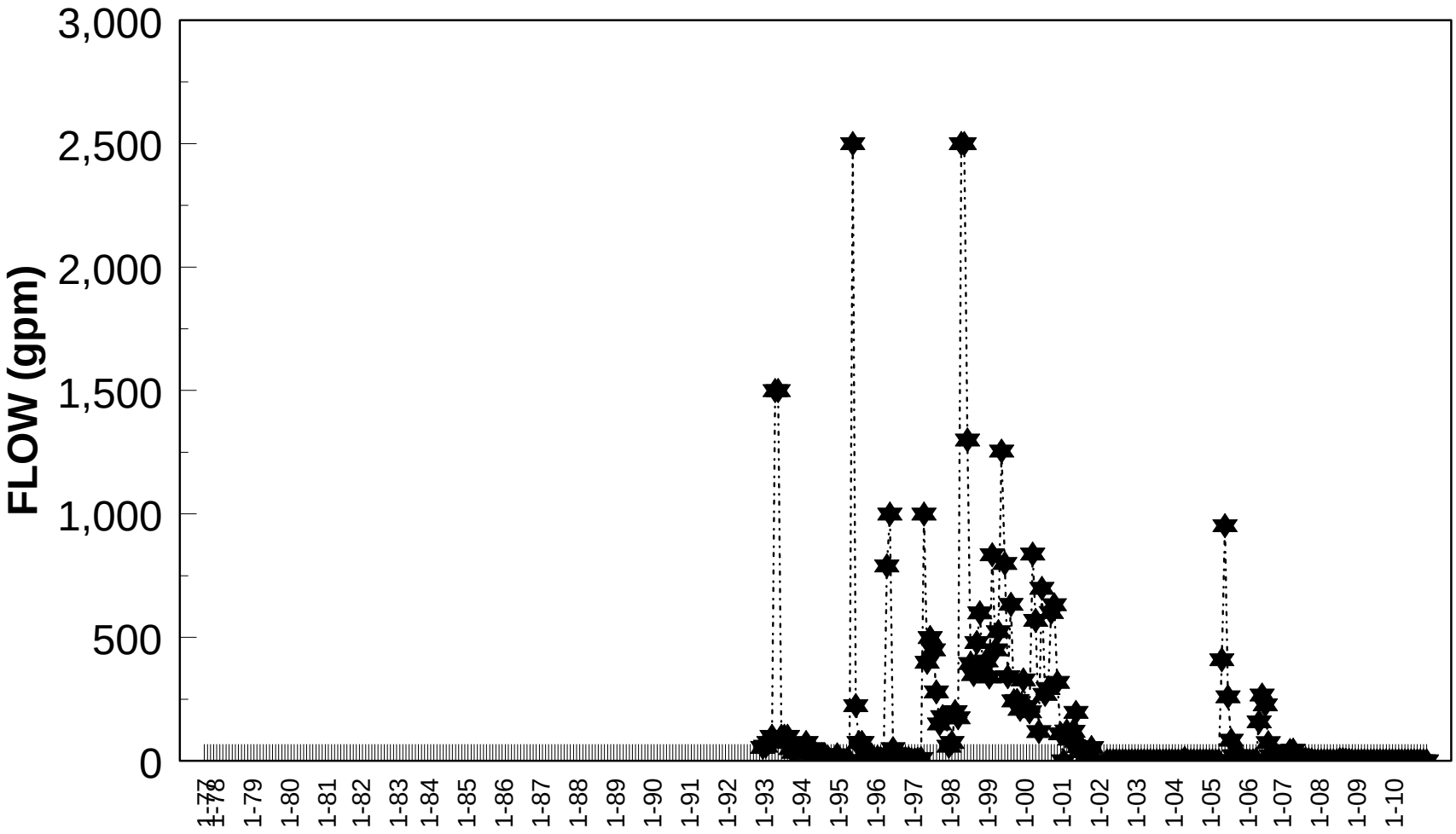
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

SW-3

DISCHARGE RECESSION CURVE



STRAIGHT CANYON WATER QUALITY *

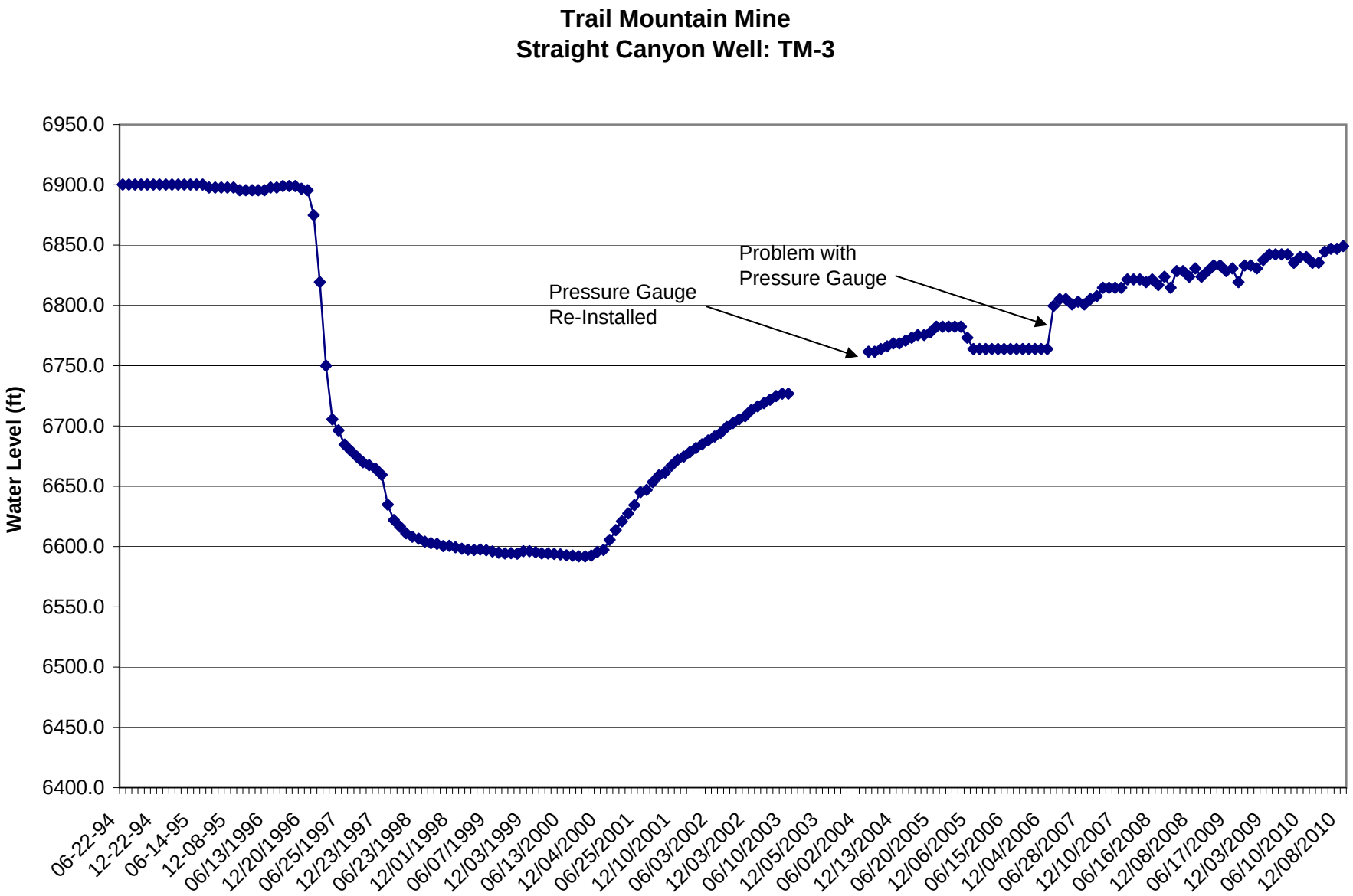
T-19

APPENDIX F

2010* SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20100315	0	310	73.07	35	38	1322	636	0	0	110.21	0	0	8.39	5.74	87.43	374	0	931
20100610	0	330	73.05	38	37	1419	678	0	0	120.31	0	0	8.44	7.68	78.22	422	14	982
20100909	0	412	88.18	0	37	1591	857	0	0	154.72	0.004	0	8.4	10.39	72.49	481	6	1138
20101208	0	354	76.7	20	37	1420	662	0	0	114.23	0	0	8.27	6.59	91.27	424	0	1021
2010**																		
MIN	0	310	73	0	37	1322	636	0	0	110	0	0	8	6	72	374	0	931
MAX	0	412	88	38	38	1591	857	0	0	155	0	0	8	10	91	481	14	1138
MEAN	0.00	351.50	77.75	23.25	37.25	1438.00	708.25	0.00	0.00	124.87	0.00	0.00	8.38	7.60	82.35	425.25	5.00	1018.00
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2009**																		
MIN	0	190	14	0	19	581	178	0	0	24	0	0	7	1	12	39	0	340
MAX	14	500	99	78	68	1840	993	5	0	162	0	5	9	30	125	609	420	1256
MEAN	5.76	362.59	53.42	15.06	36.63	1068.63	448.23	0.72	0.13	73.57	0.05	3.28	8.42	4.14	73.80	218.94	79.27	671.09
2008**																		
MIN		286	53	0	30	959	434	0		73	0		8	4	60	182	0	577
MAX		368	78	22	36	1494	732	0		131	0		9	8	78	434	7	1016
MEAN		326	66	7	33	1210	538	0		96	0		8	5	70	303	4	794
2007**																		
MIN	9	322	56	6	29	1016	420	2		68	0		8	3	68	179	158	622
MAX	9	364	99	49	43	1840	836	2		143	0		8	9	90	518	158	1154
MEAN	9	350	73	23	37	1398	611	2		104	0		8	6	82	355	158	898
2006**																		
MIN		290	43	13	19	843	338	0		56	0		8	2	36	99	13	456
MAX		312	62	13	30	1127	461	1		75	0		9	3	66	203	51	658
MEAN		298	52	13	25	944	387	1		62	0		8	3	51	139	31	526
2005**																		
MIN		287	42	17	22	827	360	0		62	0		9	2	44	124	33	498
MAX		329	68	24	37	1493	552	1		93	0		9	5	92	341	338	879
MEAN		306	55	20	28	1097	438	1		73	0		9	3	64	211	135	657
2004**																		
MIN		334	51.9	8	33	1060	429	0.07		73			8.41	3.93	63	271	10	698
MAX		430	95.7	8	38	1716	906	2.54		162			8.46	10.10	88	609	177	1256
MEAN		381	70.4	8	36	1326	617	0.90		107			8.43	6.09	78	393	94	913
2003**																		
MIN		376	64.1	5	32	1324	605	0.03	0.04	107		2	8.42	5.46	77	362	5	885
MAX		500	86.7	19	43	1646	836	0.08	0.04	154		2	8.67	9.48	90	542	8	1205
MEAN		425	74.7	12	36	1462	706	0.06	0.04	126		2	8.54	7.14	84	440	7	1026
2002**																		
MIN		410	58.0	5	33	1252	495	0.50		85			8.38	4.00	88	303	46	816
MAX		498	79.0	14	40	1674	786	0.50		143			8.55	9.00	90	520	46	1198
MEAN		459	68.0	8	37	1423	622	0.50		110			8.46	6.00	89	397	46	983
2001**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
2000**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
HISTORICAL 1988-2009																		
MIN	0.0	190	14.3	0.0	19.0	581	178	0.000	0.00	24	0.000	0.0	7.44	0.70	12	39.0	0.0	340
MAX	14.0	500	98.9	78.0	67.9	1840	993	5.10	0.38	162	0.20	5.0	8.87	30.20	125	609.0	420.0	1256
MEAN	4.7	362	54.5	14.6	36.6	1084	460	0.68	0.10	76	0.04	2.6	8.42	4.29	73.70	227.5	74.3	685.557
No. of Analysis	13	71	71	49	71	67	71	54	14	71	21	12	70	69	71	71	54	71

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**


Trail Mountain Mine
Straight Canyon Well: TM-3
Water Level (ft)
6950.0
6900.0
6850.0
6800.0
6750.0
6700.0
6650.0
6600.0
6550.0
6500.0
6450.0
6400.0
Pressure Gauge
Re-Installed
Problem with
Pressure Gauge
06-22-94
12-22-94
06-14-95
12-08-95
06/13/1996
12/20/1996
06/25/1997
12/23/1997
06/23/1998
12/01/1998
06/07/1999
12/03/1999
06/13/2000
12/04/2000
06/25/2001
12/10/2001
06/03/2002
12/03/2002
06/10/2003
12/05/2003
06/02/2004
12/13/2004
06/20/2005
12/06/2005
06/15/2006
12/04/2006
06/28/2007
12/10/2007
06/16/2008
12/08/2008
06/17/2009
12/03/2009
06/10/2010
12/08/2010