Table 12: Material Damage Limits and Hydrologic Balance Thresholds

Category			Definition
General	Quantity	Limit	irretrievable loss of the water resource to support existing or reasonably foreseeable uses outside of the lease area that cannot be provided by alternate water supplies
General	Quantity	Threshold	long term loss of the water resource that does not preclude the current or potential future use potential of the resource or short term loss of the water resource to support existing uses that can be mitigated by reclamation or by provision of alternate water supplies
General	Quality	Limit	long-term changes in water quality outside the lease area that preclude existing or reasonably foreseeable uses that cannot be provided by alternate water supplies
General	Quality	Threshold	long term changes in water quality that occasionally exceed the water quality observed in the baseline fluctuations but that do not preclude the current or potential future use potential of the resource or short term changes in water quality that consistently exceed the water quality observed in the baseline fluctuations but that do not preclude the current use or can be mitigated by reclamation or by provision of alternate water supplies
Criteria Applied to the Navajo Mine		Limit	**Long-term** (impact remains after final reclamation and bond-release) Impact Designation of **Major** as defined in Table 7, and which **Preclude** Existing or Reasonably Foreseeable **Uses Outside** of the Lease area that **Cannot be Mitigated** by Reclamation or Provision of Alternate Water Supplies
Criteria Applied to the Navajo Mine		Threshold	**Long-term** (impact remains after final reclamation and bond-release) Impact Designation of **Moderate or Major** as defined in Table 7 **Outside of the Lease area** that **Does NOT Preclude** Existing or Reasonably Foreseeable **Uses** **OR** **Short-term** (impact occurs only during active mining and reclamation prior to final bond release) Impact Designation of **Major** as defined in Table 7, which **may Preclude** Existing or Reasonably Foreseeable **Uses Outside of the Lease area** that **Can be Mitigated** by Reclamation or Provision of Alternate Water Supplies

A summary of OSMRE's material damage assessment and findings is presented in Table 13 and further discussed below. For clarity in the discussion hydrologic balance **threshold** and material damage **limit** will be bolded, and the impact designations of *negligible, minor, moderate*, and *major* will be italicized.

Table 13: Assessment of Material Damage for the Waters of the Navajo Mine and Pinabete Permit Areas

Water Resource	Assessment Approach	Hydrologic Balance Threshold Reached	Material Damage Limit Reached	Impact Mitigation	Adequate Monitoring Program
Fruitland & PCS Quantity	Evaluation of potentiometric surface contour maps	No	No	Contemporaneous Reclamation	Yes
Alluvial Quantity	Comparison of water levels at individual wells over-time	No	No	Contemporaneous Reclamation; mining limited to ephemeral channels; stream buffer zones	Yes
Surface Water Quantity	SEDCAD modeling-assessment of pre- and post-mining impacts; Percent of HUC12 Watersheds controlled with impoundments	**Yes**	No		Yes
Fruitland & PCS Quality	Comparison of baseline water quality to potentially impacted or non-baseline wells, including spoil and CCB wells	No	No	Contemporaneous Reclamation; mixing of overburden/ backfill materials	Yes
Alluvial Quality	Comparison baseline (upstream/pre-mining) water quality to non-baseline (post-mining/downstream) water quality	**Yes**	No	Contemporaneous Reclamation; mining limited to ephemeral channels; stream buffer zones	Yes
Surface Water Quality		No	No	Contemporaneous Reclamation; mining limited to ephemeral channels; stream buffer zones; Sedimentation Ponds	Yes

6.6.1 Material Damage Assessment

6.6.1.1 Surface Water

Surface water quantity impacts are assessed as a relative percentage of the watershed controlled through the use of sediment impoundments compared to the corresponding Hydrologic Unit Code (HUC) 12 watershed delineation. Hydrologic balance **thresholds** and material damage **limits** have not been reached for any of the assessed HUC 12 watersheds, since all impact designations are *negligible* or *minor.*

When modeled pre-mining peak flows are compared to-post-mining peak flows, the comparison indicates that hydrologic balance **thresholds** and material damage **limits** have not been reached for the Chinde Wash Watershed, Coal Creek-Chaco River Watershed, or Cottonwood Arroyo Watershed.

In the Chinde-Chaco River Watershed a long-term impact designation of *moderate* has been determined for the area outside of the permit boundary. This *moderate* impact designation is due to a reduction in post-mining peak flow. Therefore, the hydrologic balance **threshold** has been reached for this watershed. The material damage **limit** has not been reached since the impact designation has not been determined to be *major* current designated water uses are not expected to be precluded. NTEC and OSMRE are currently discussing modifications to the reclamation plan that may be needed for this area to ensure material damage to the hydrologic balance is prevented outside of the permit area over the long-term.

Relative to Chinde Wash surface water quality, the hydrologic balance **threshold** and material damage **limit** have not been reached, since impacts are not long-term, not determined to be *major*, and will not preclude designated water uses.

6.6.1.2 Alluvium

The material damage assessment for alluvial water quantity confirms that hydrologic balance **thresholds** and material damage **limits** have not been reached, since all impact designations are *negligible*.

It has also been determined that the alluvial water quality hydrologic balance **threshold** has been reached in the Chinde Wash alluvium, since a short-term *major* impact designation has been assigned, which may preclude designated water use. The material damage **limit** has not been reached since impacts are not considered long-term. The alluvial monitoring plan in this area was augmented in 2012-13 to further assess and verify the duration of coal mining impacts in the Chinde Wash alluvium outside the permit area.

Relative to Cottonwood alluvial water quality, the hydrologic balance **thresholds** and material damage **limits** have not been reached since all impact designations are *negligible*.

6.6.1.3 Fruitland Formation and PCS

Relative to Fruitland formation and PCS quantity and quality, hydrologic balance **thresholds** and material damage **limits** have not been reached since impact designation is *negligible* and designated water use is not expected to be precluded. See Section 6.2 Historic Mining North of NTEC Operations for CCB disposal determination.

6.6.2 Conclusion

OSMRE finds that NTEC's Navajo Mine and Pinabete Permit monitoring programs have supplied sufficient information in the approved PAPs for this CHIA and finding. OSMRE finds that the operations of Navajo Mine and proposed Pinabete Permit Area have been designed to minimize impacts within the permit area and to prevent material damage to the hydrologic balance outside of the permit area.

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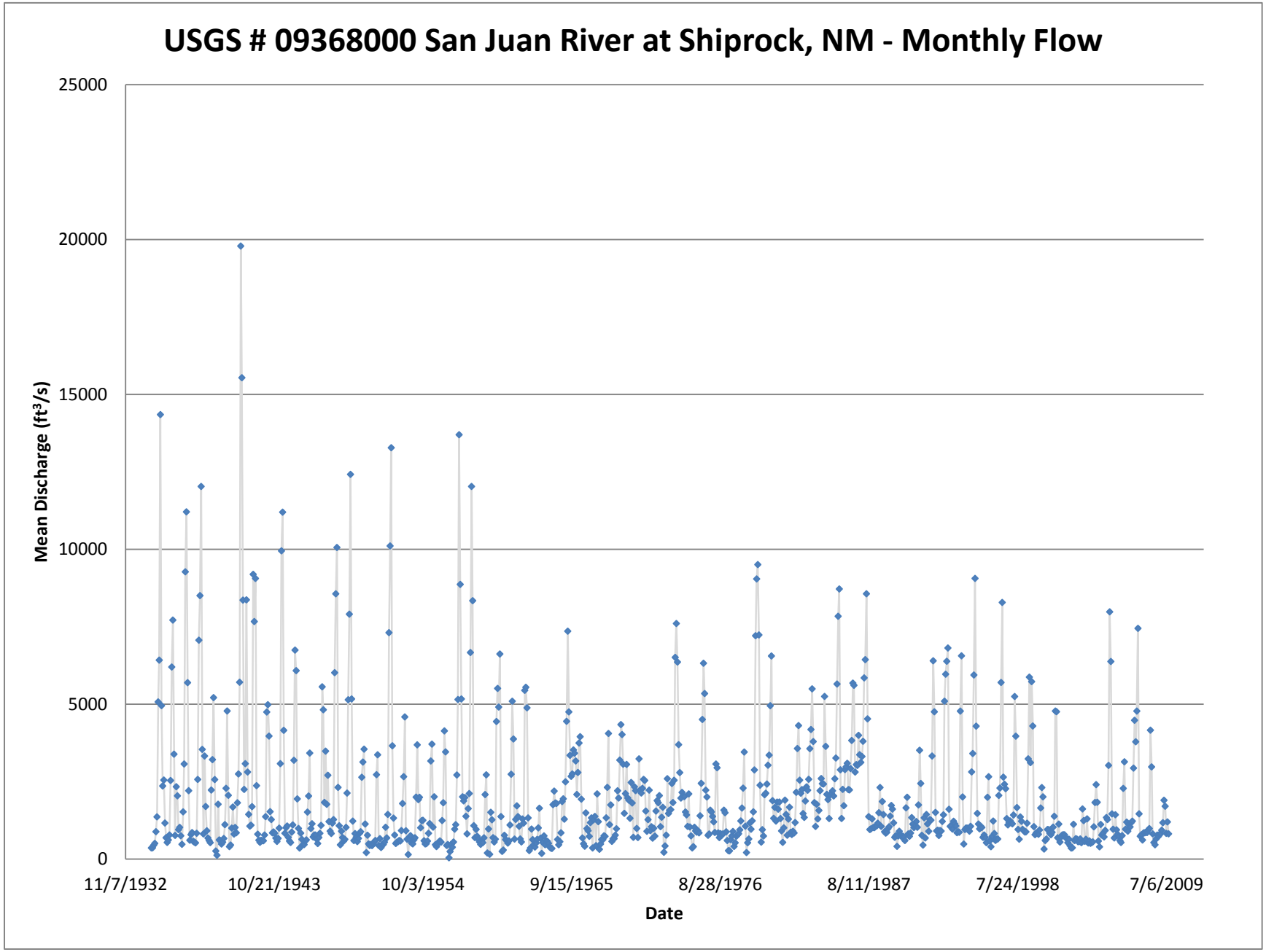
Appendix A - USGS Stations
USGS # 09368000



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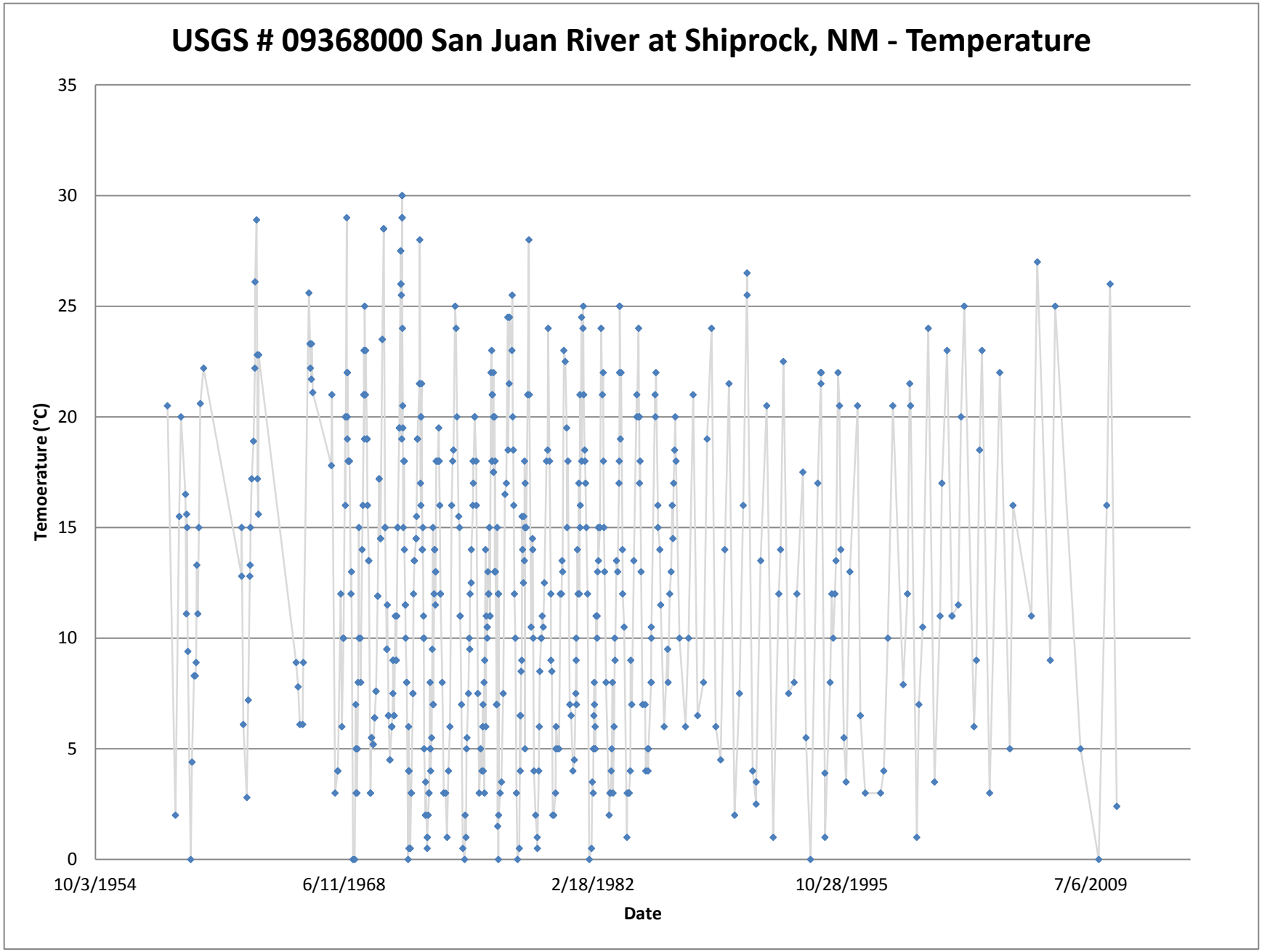
USGS # 09368000



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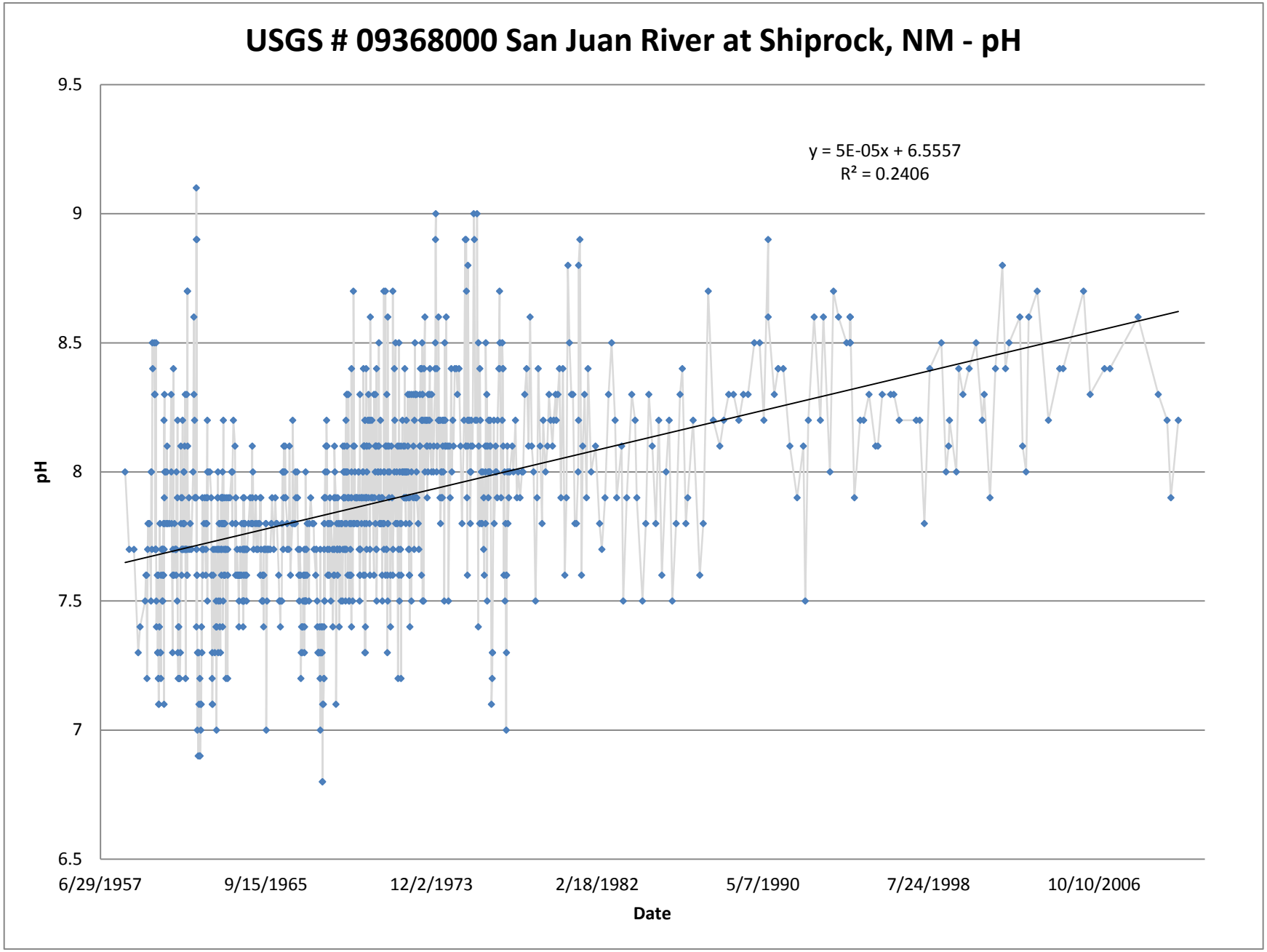

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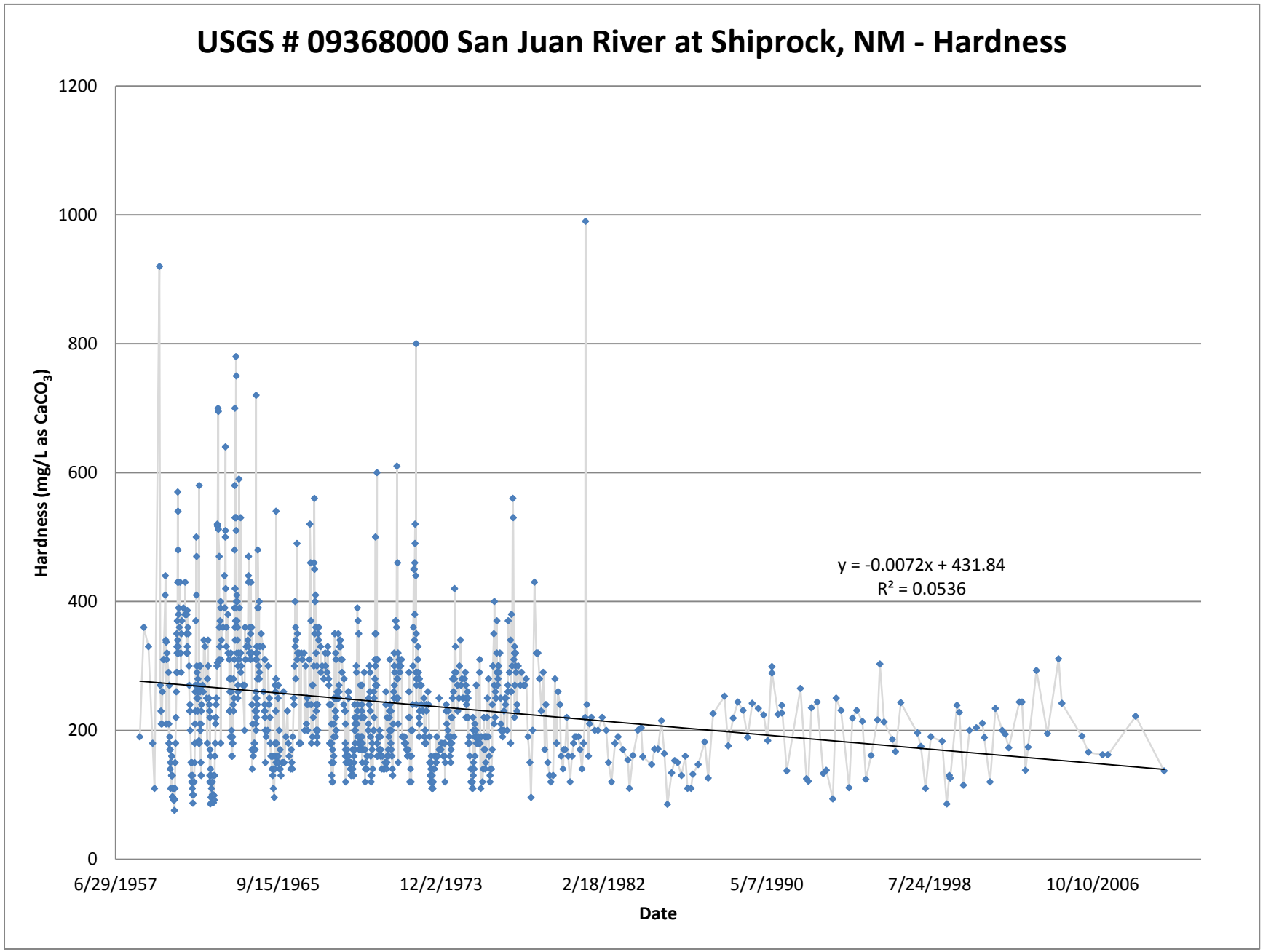

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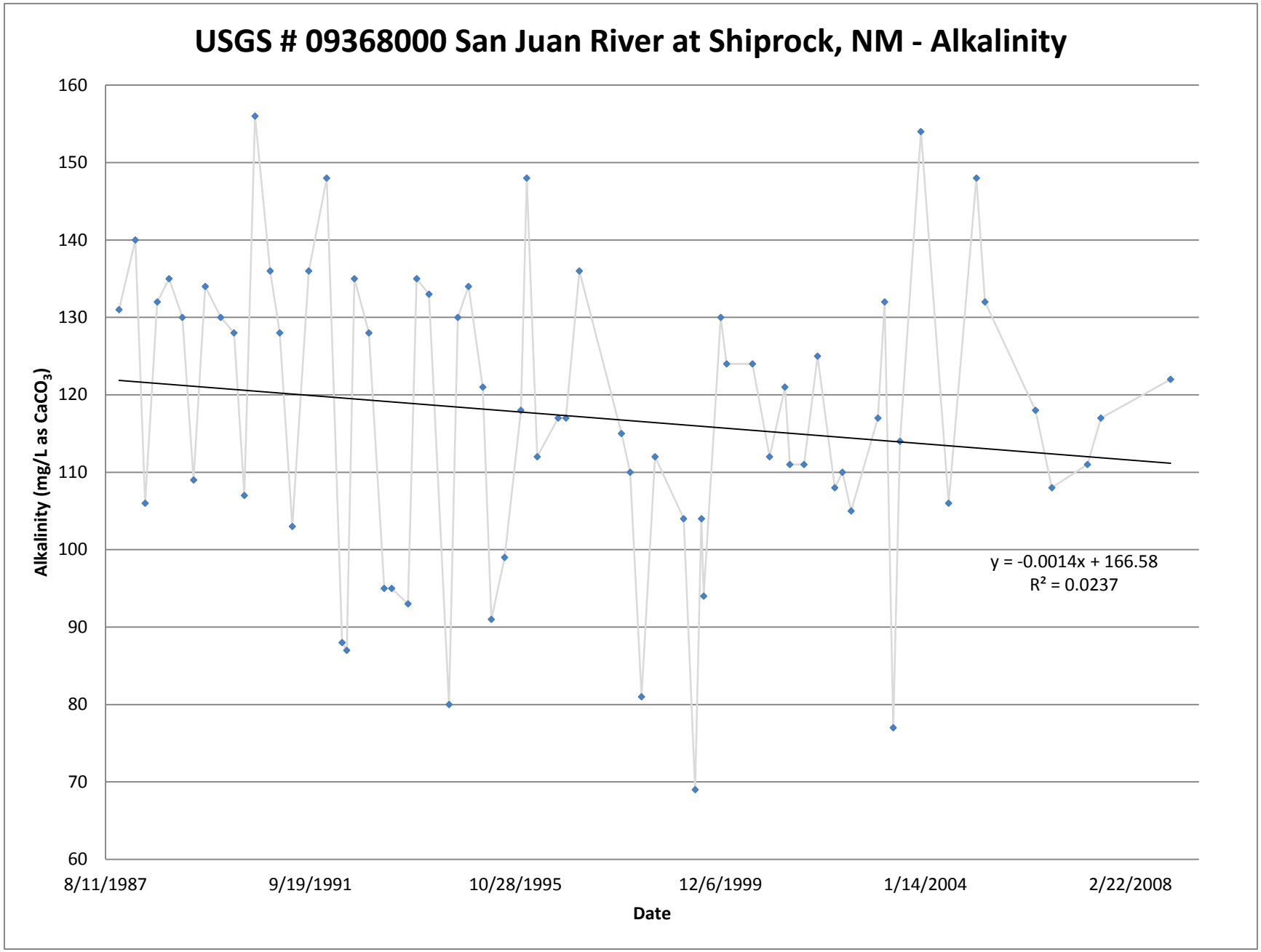
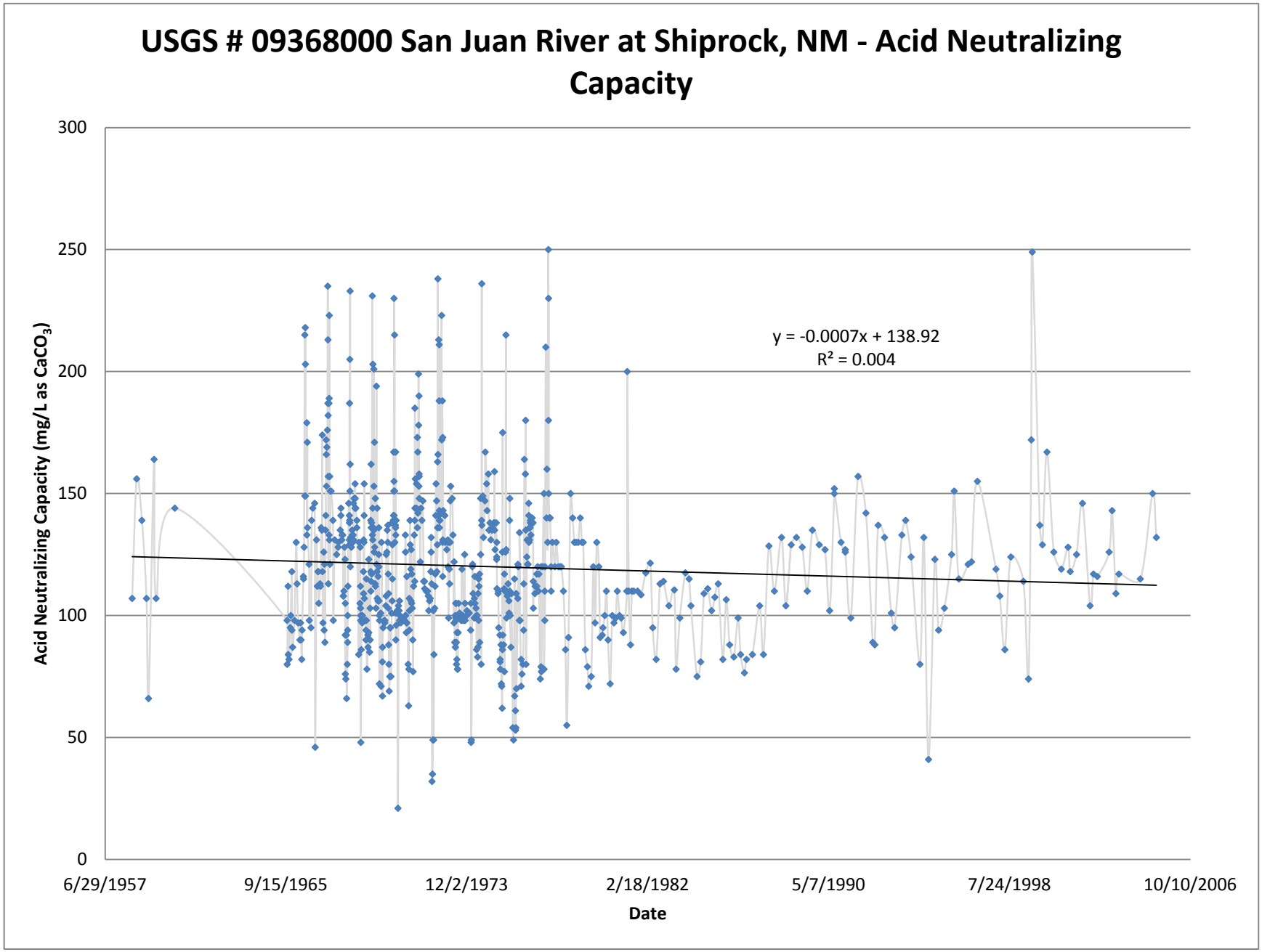
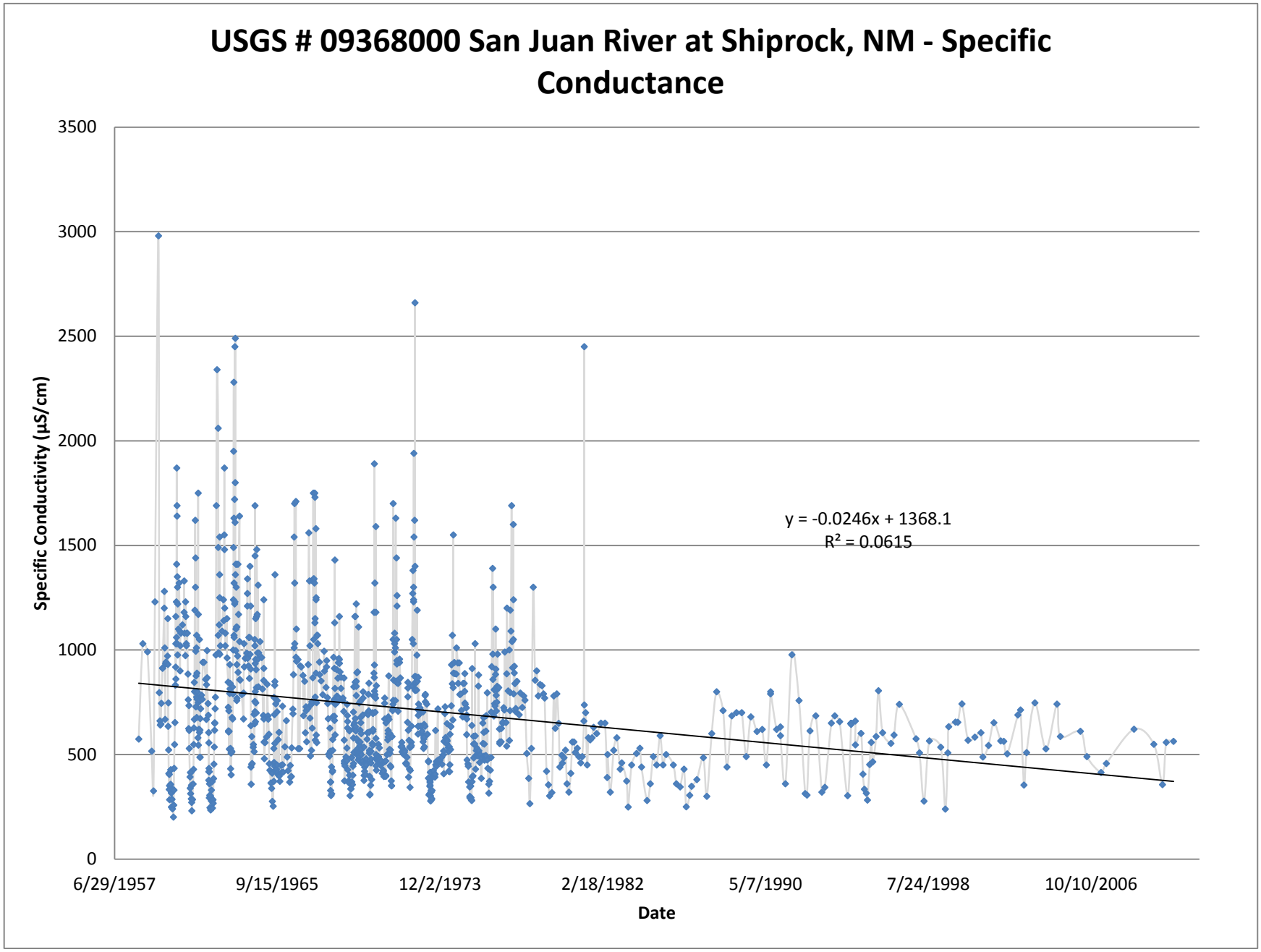
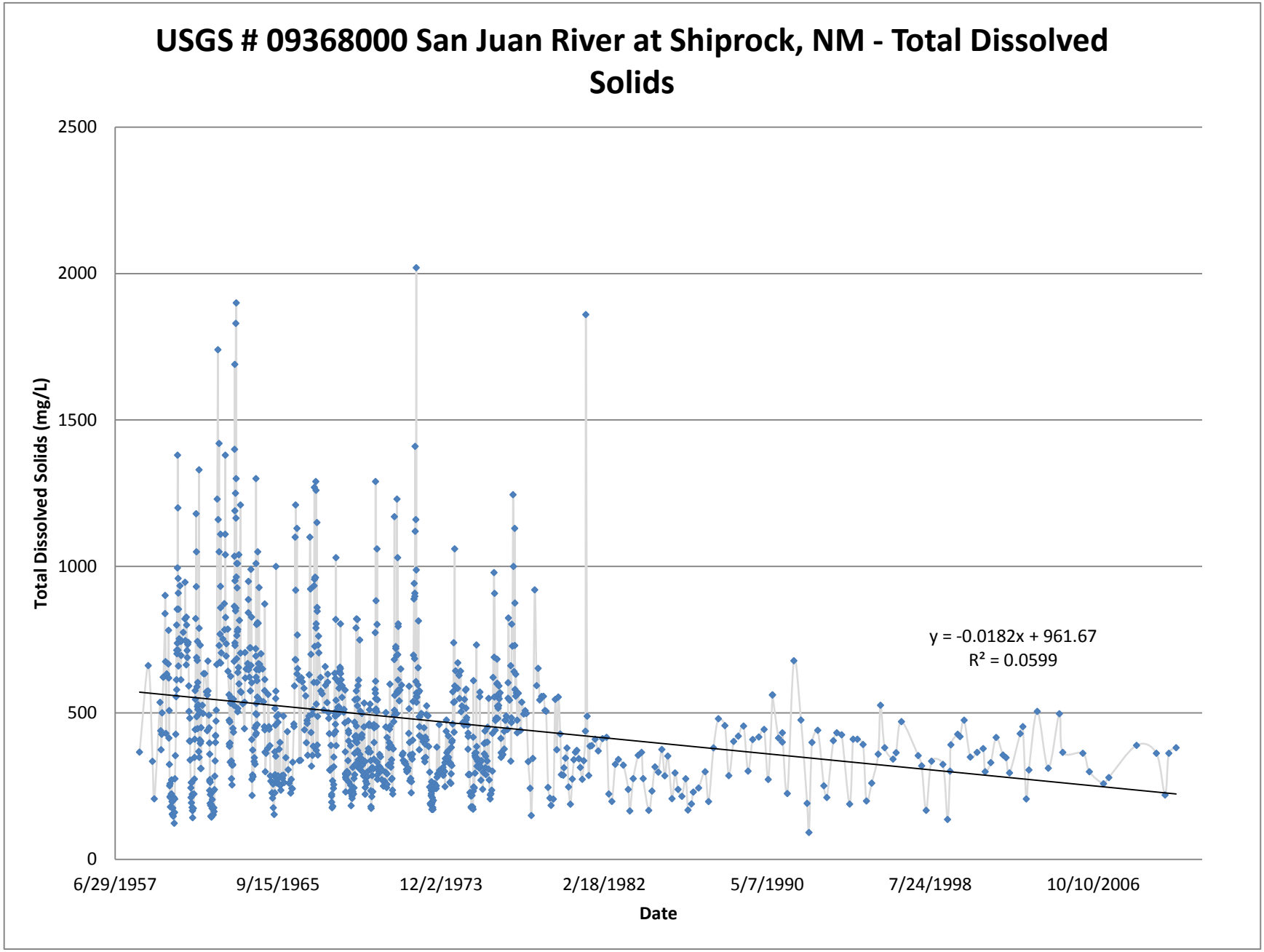


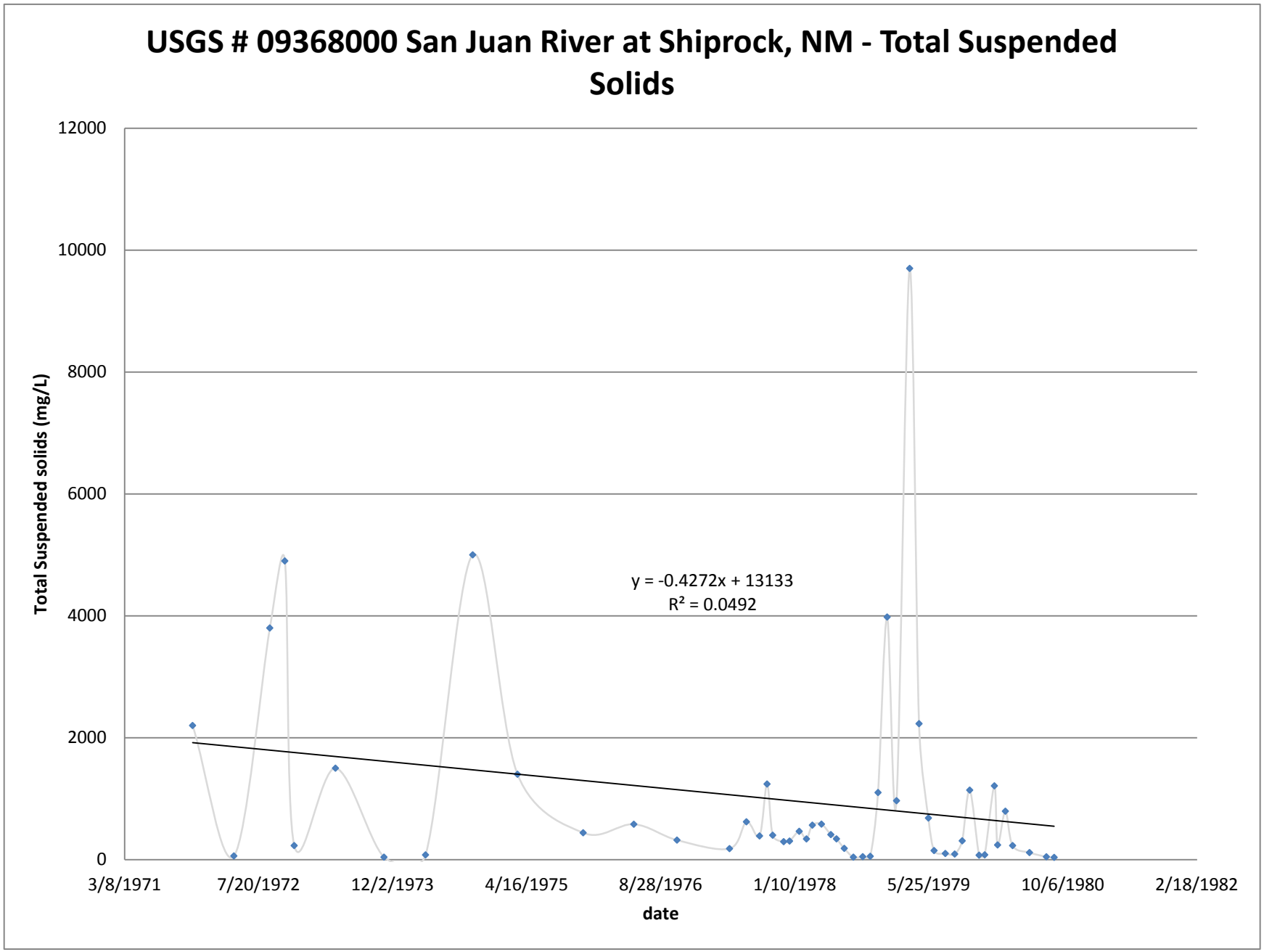

USGS # 09368000 San Juan River at Shiprock, NM - Acid Neutralizing Capacity
Acid Neutralizing Capacity (mg/L as $CaCO_3$)
300
250
200
150
100
50
0
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date
y = -0.0007x + 138.92
R^2 = 0.004

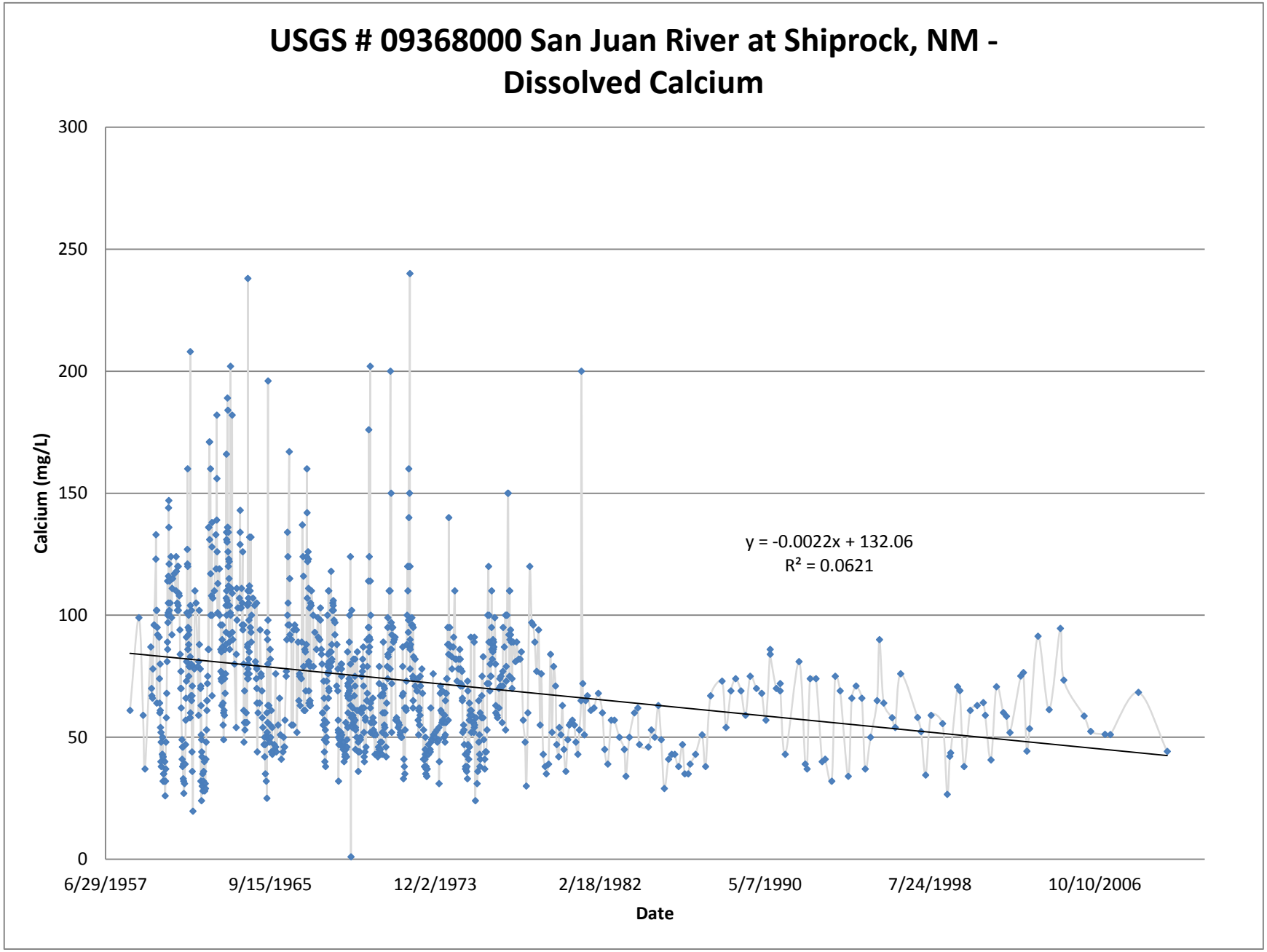
Appendix A - USGS Stations
USGS # 09368000



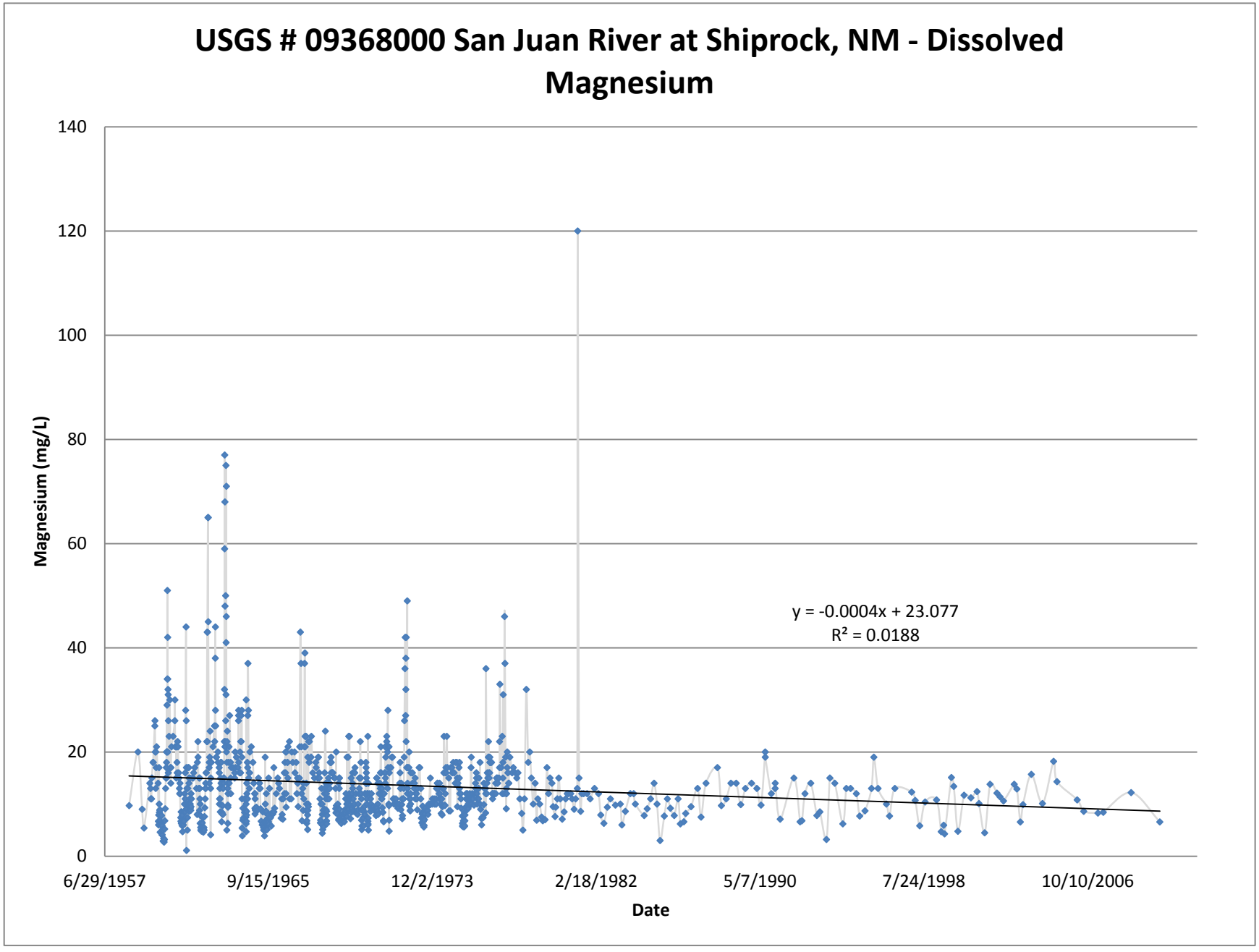

USGS # 09368000 San Juan River at Shiprock, NM - Total Dissolved Solids
Total Dissolved Solids (mg/L)
2500
2000
1500
1000
500
0
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date
y = -0.0182x + 961.67
R² = 0.0599

Appendix A - USGS Stations
USGS # 09368000




USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Calcium
Calcium (mg/L)
300
250
200
150
100
50
0
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date
y = -0.0022x + 132.06
R² = 0.0621

Appendix A - USGS Stations
USGS # 09368000



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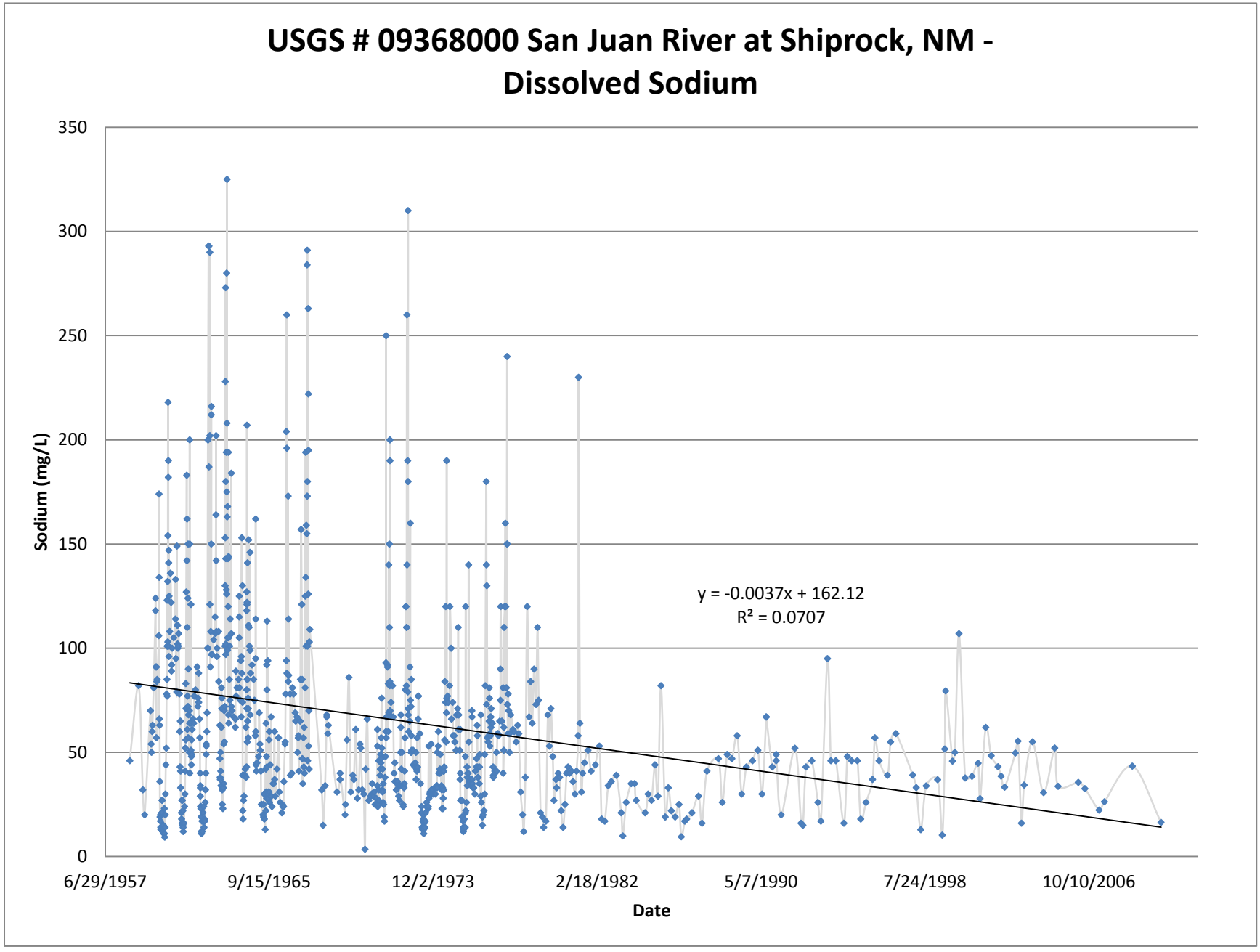

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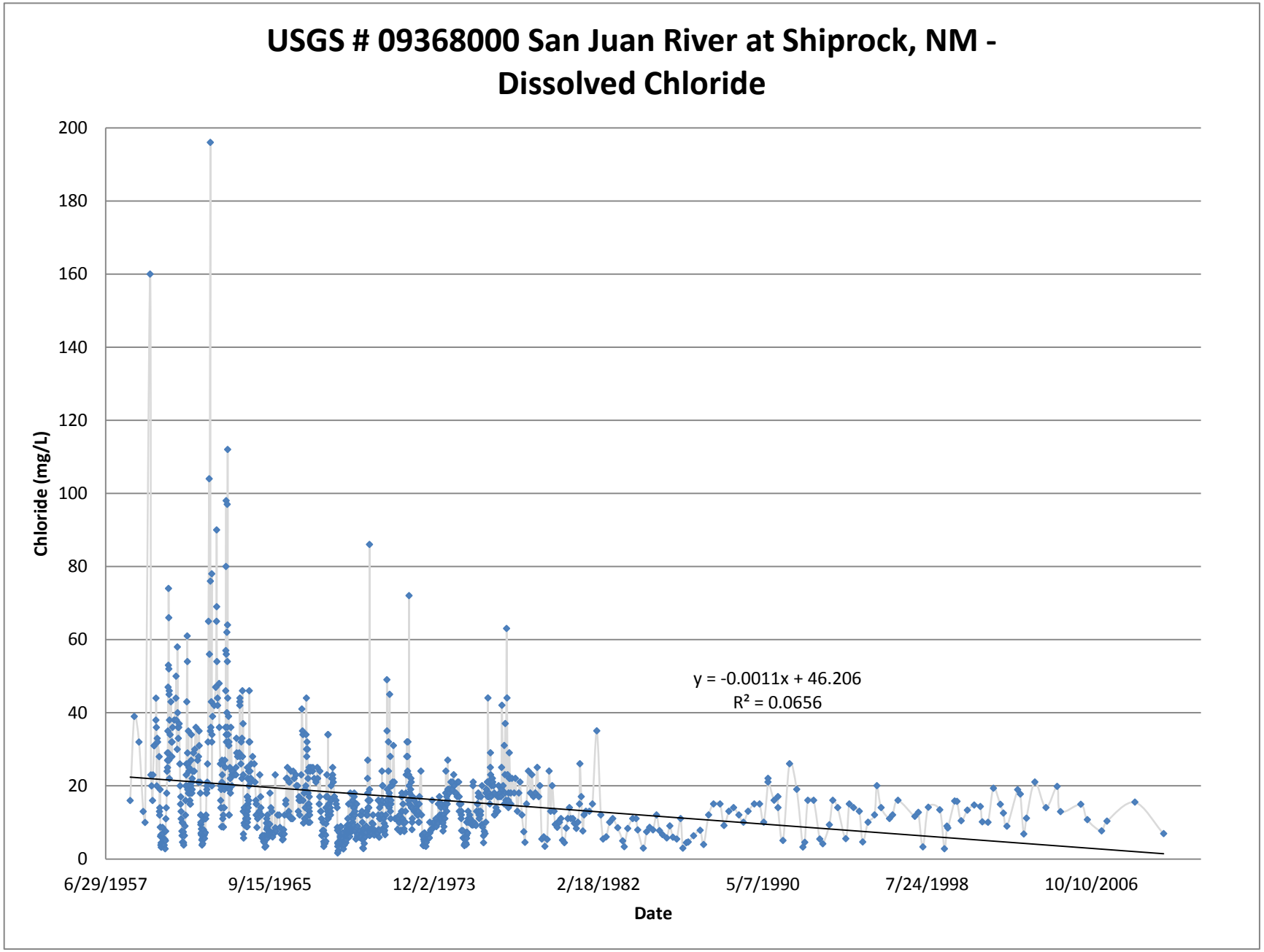

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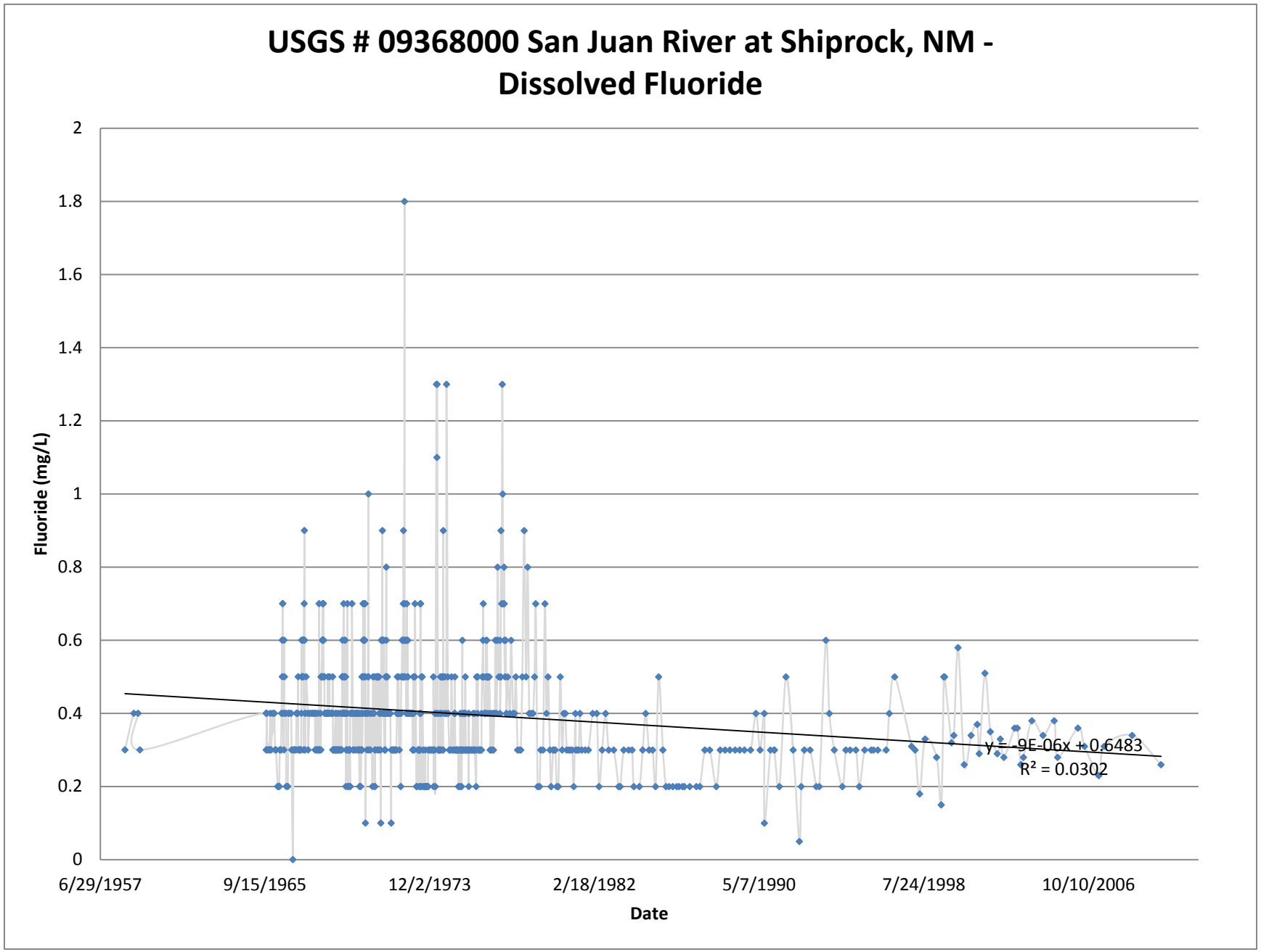

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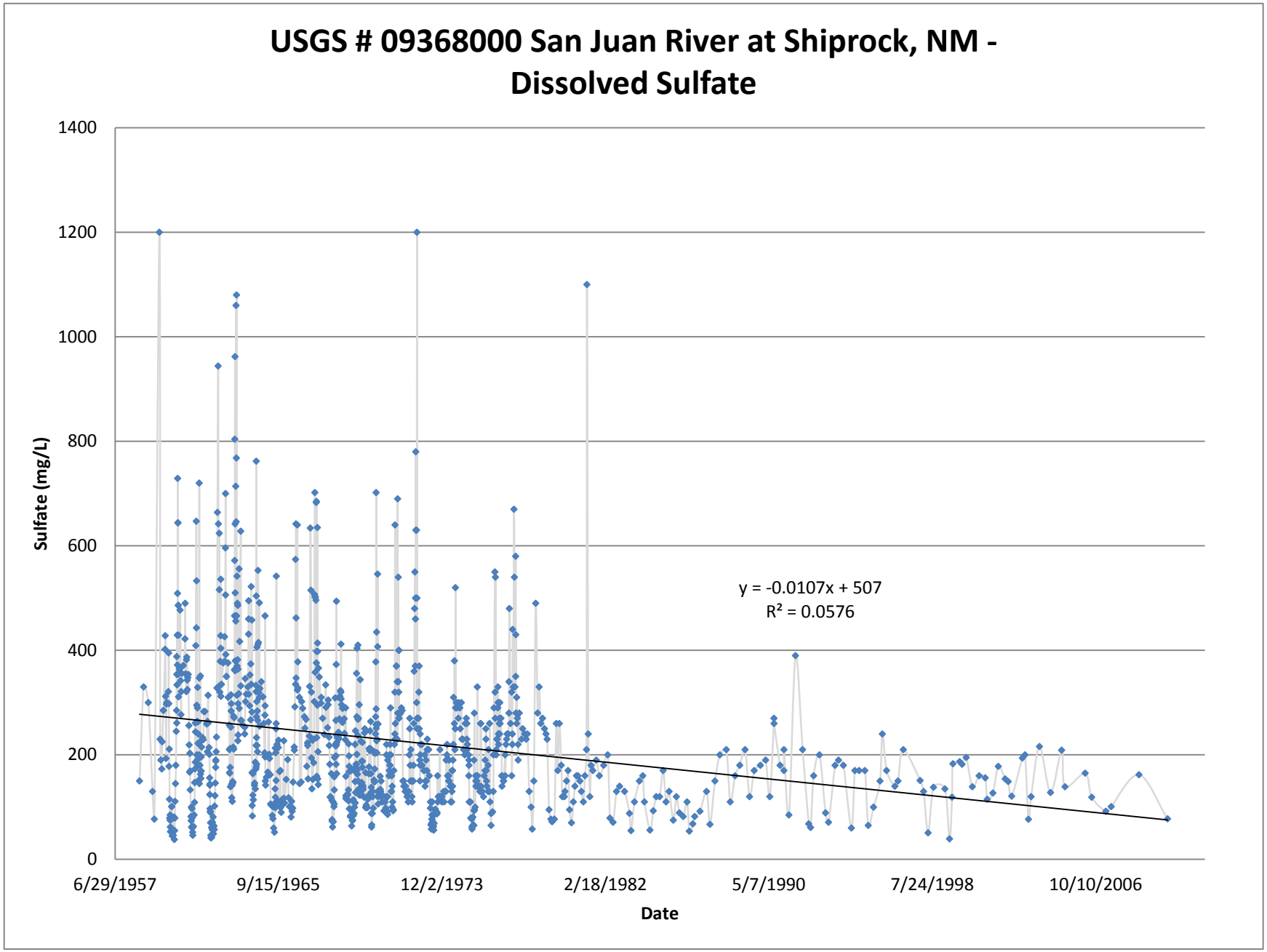
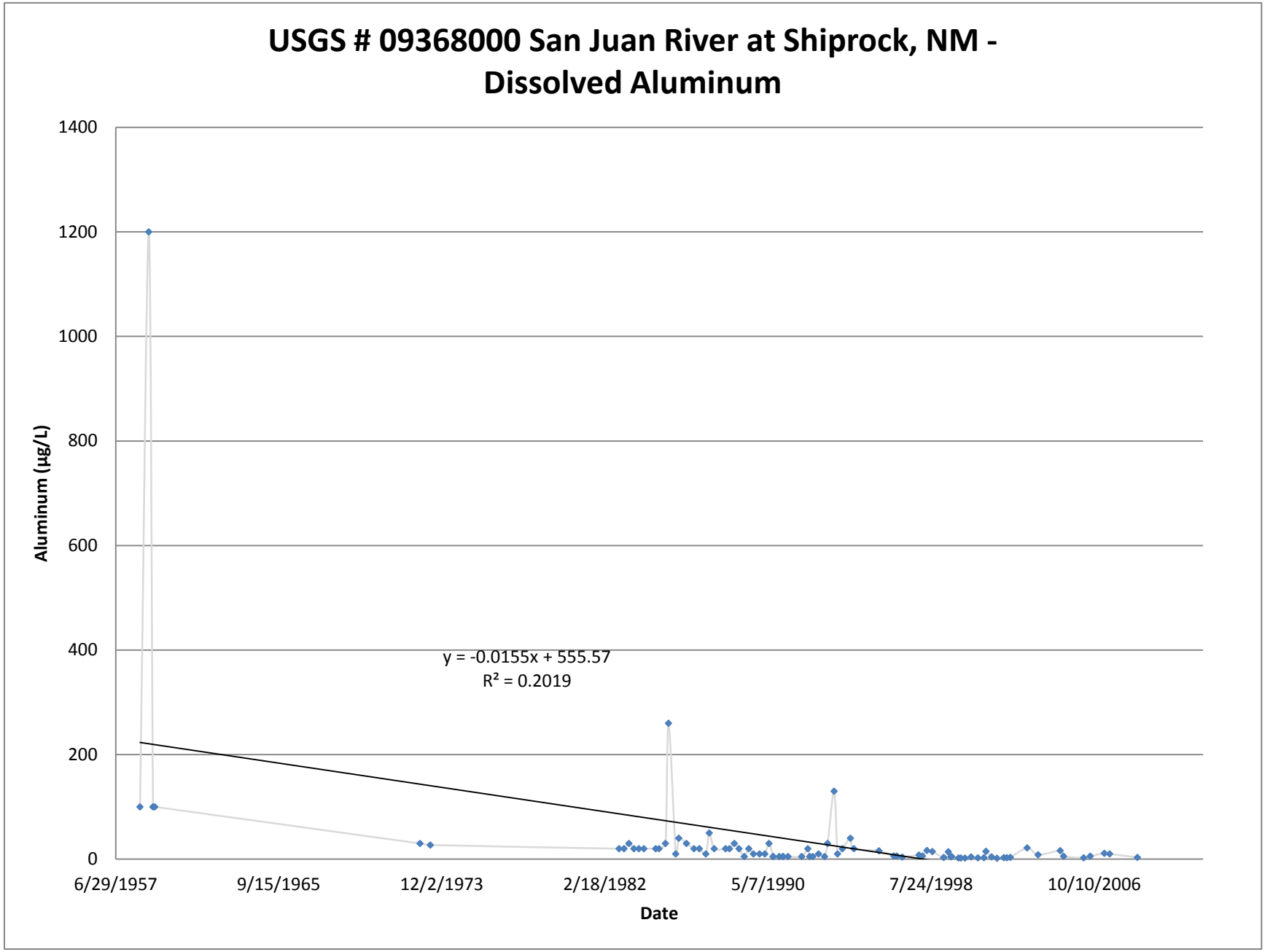
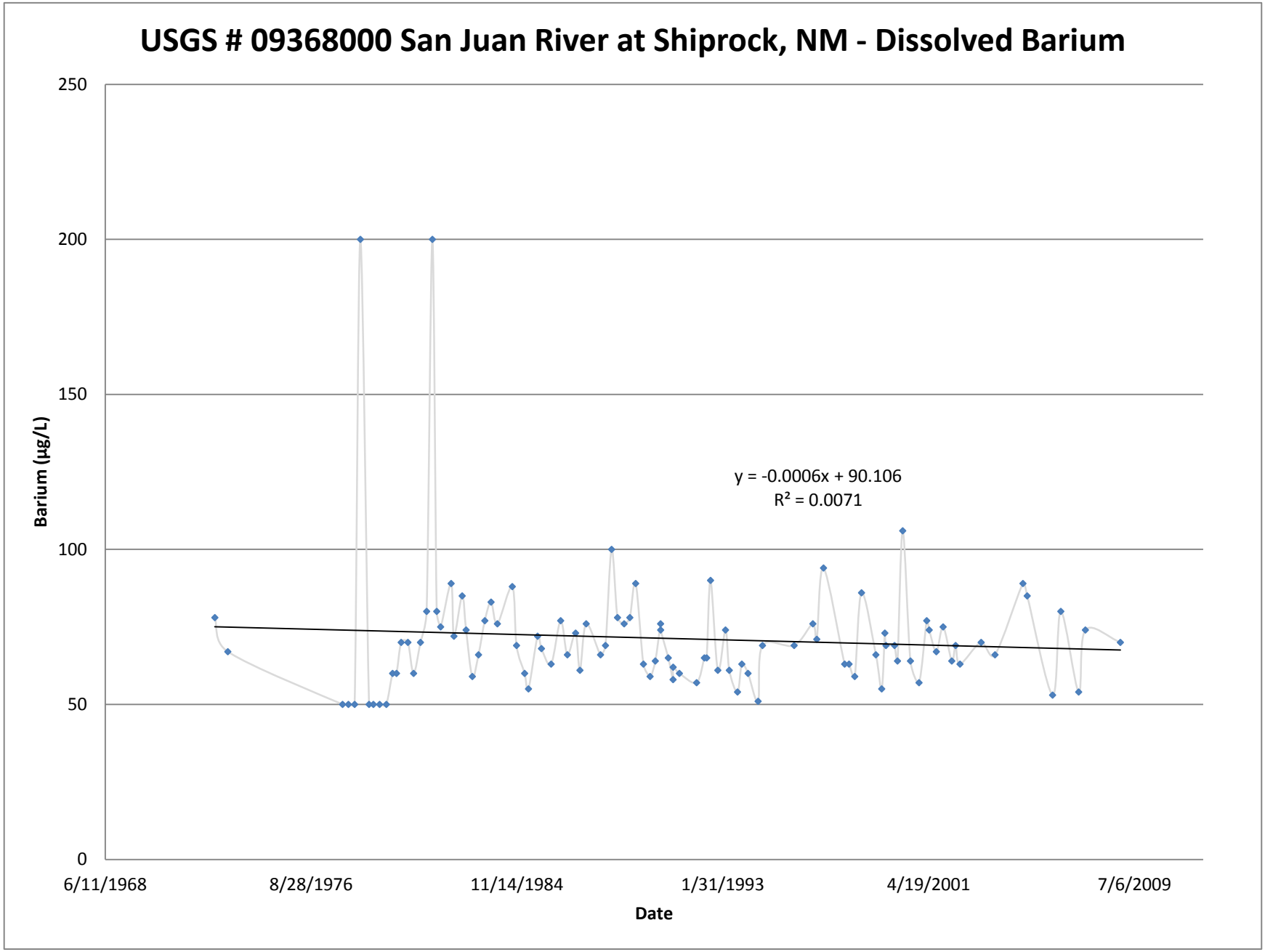
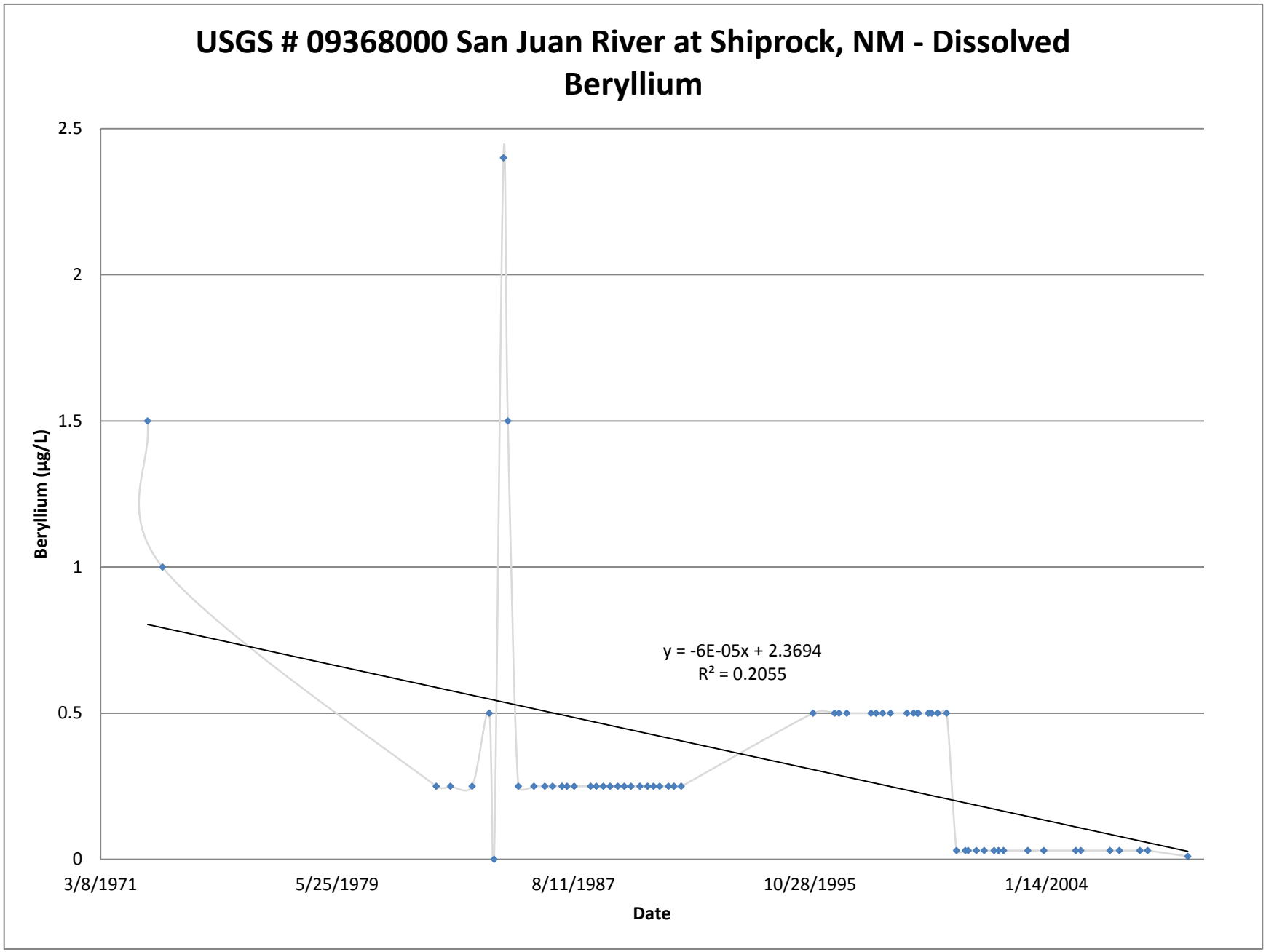
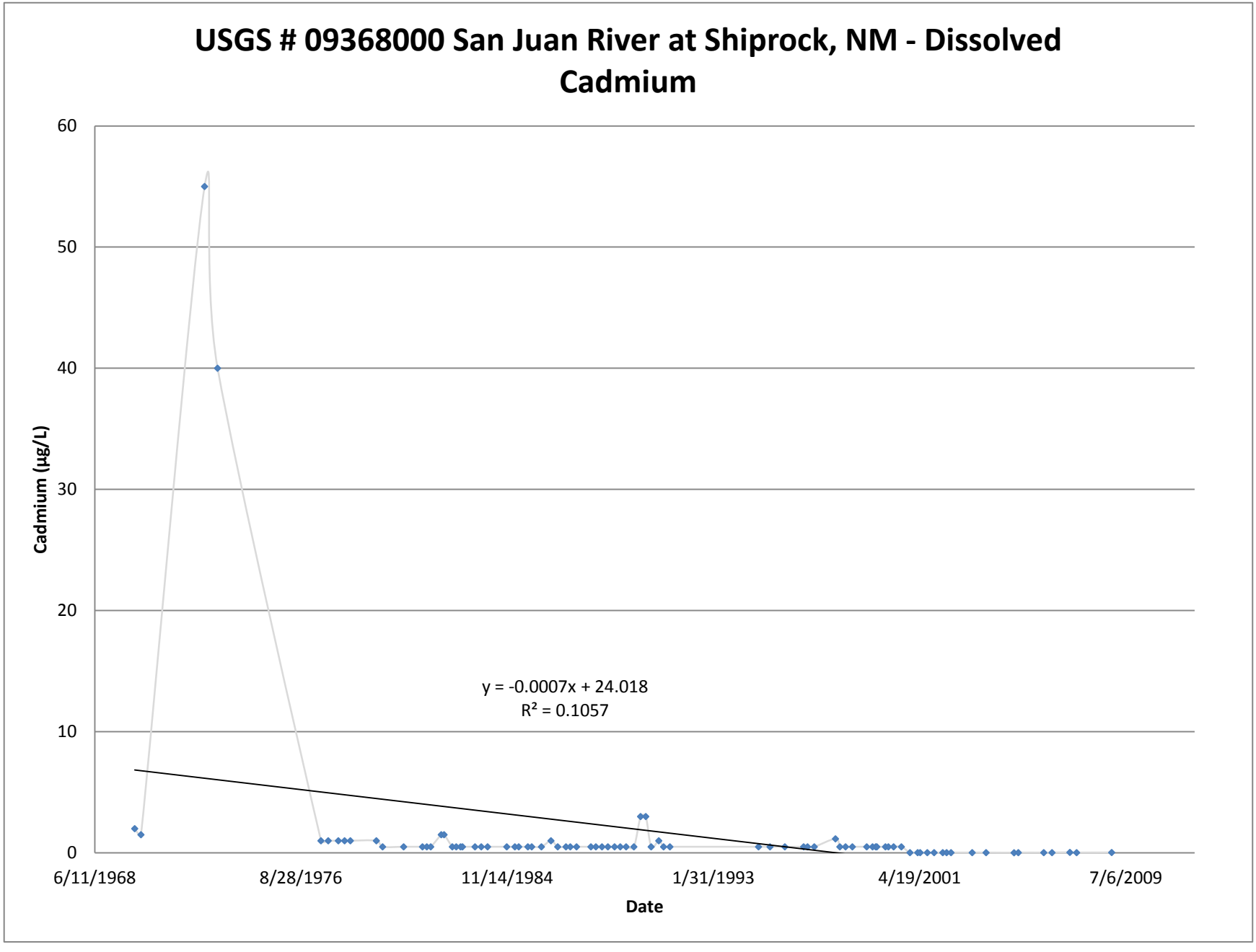


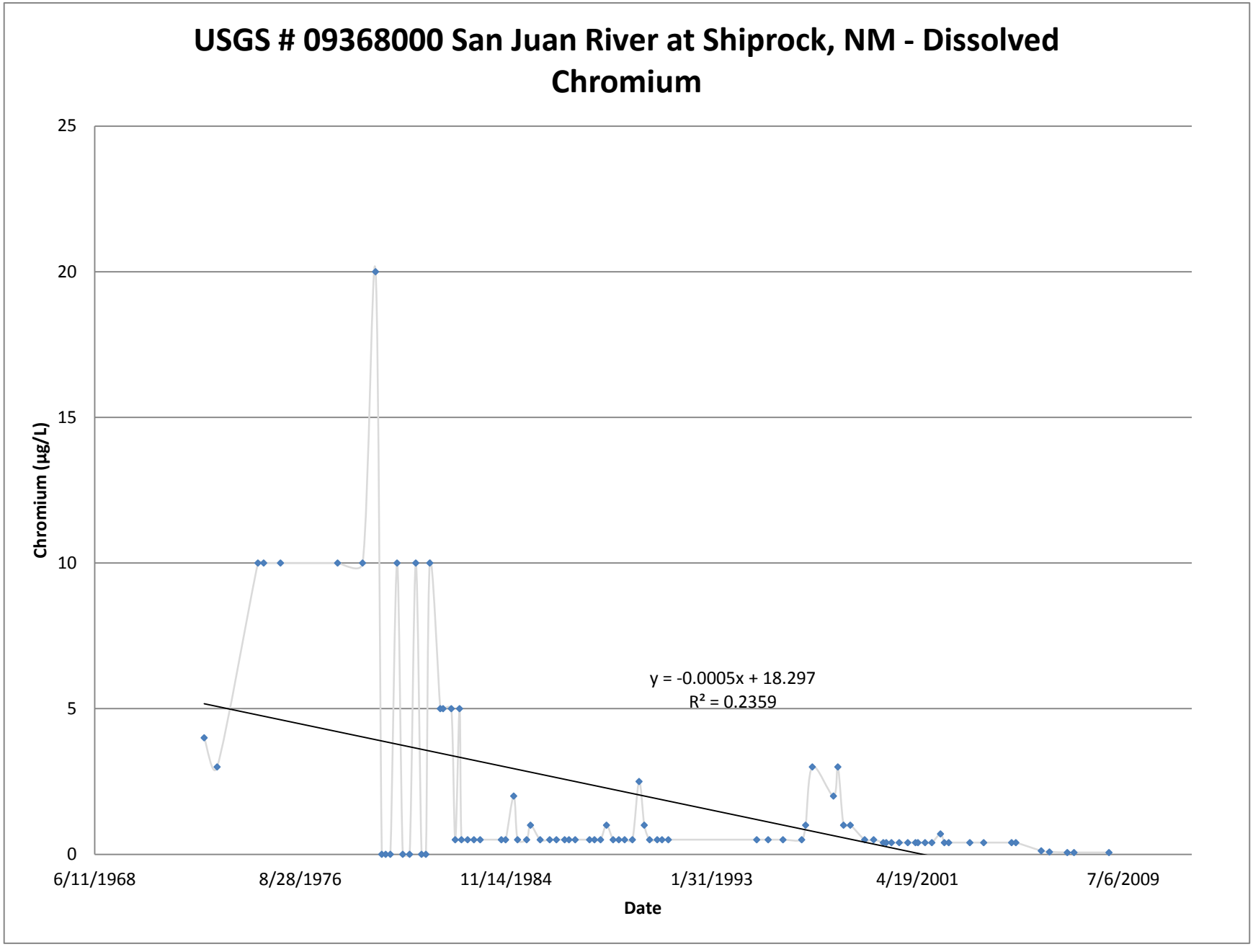

USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Aluminum
Aluminum (µg/L)
1400
1200
1000
800
600
400
200
0
y = -0.0155x + 555.57
R² = 0.2019
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date

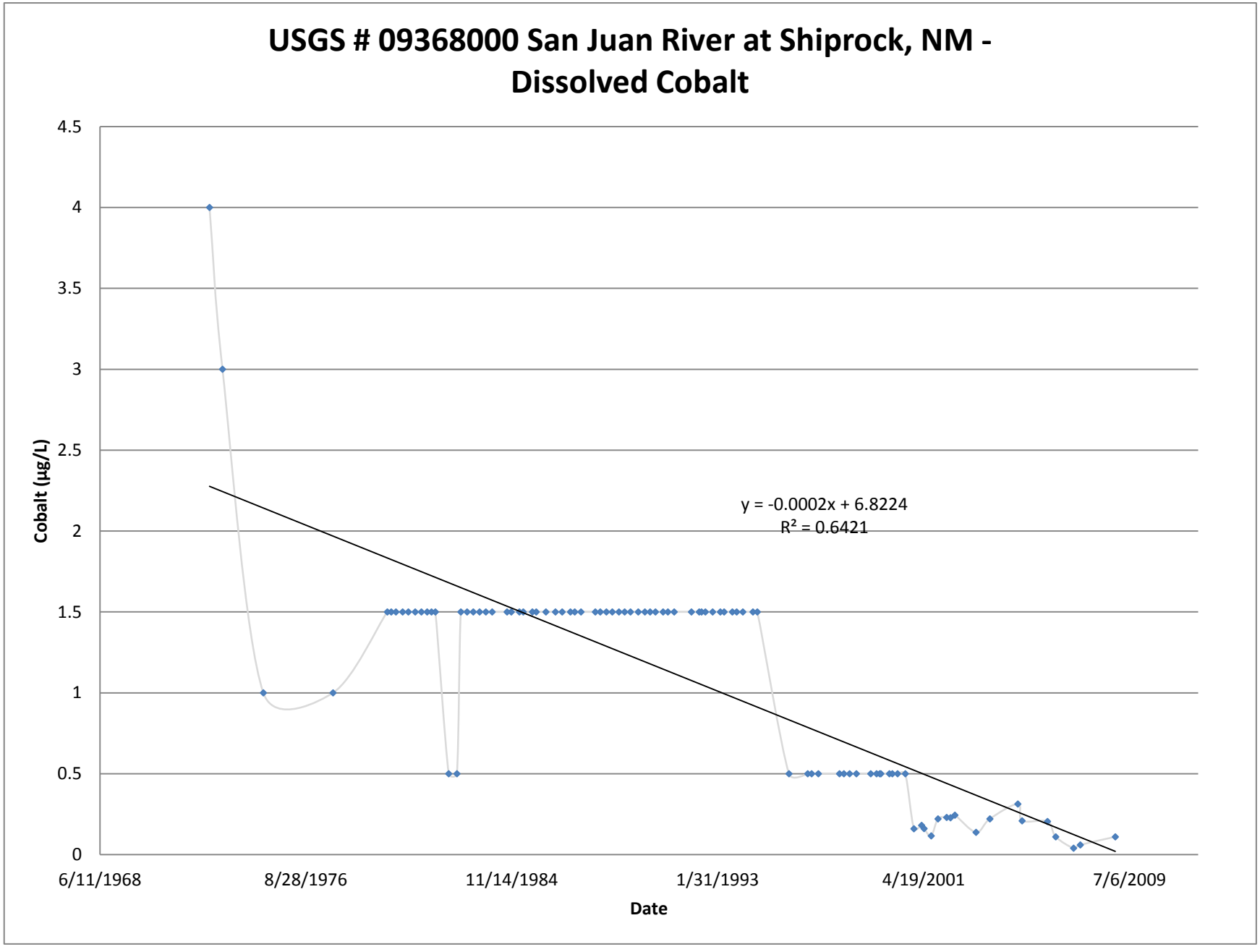
Appendix A - USGS Stations
USGS # 09368000



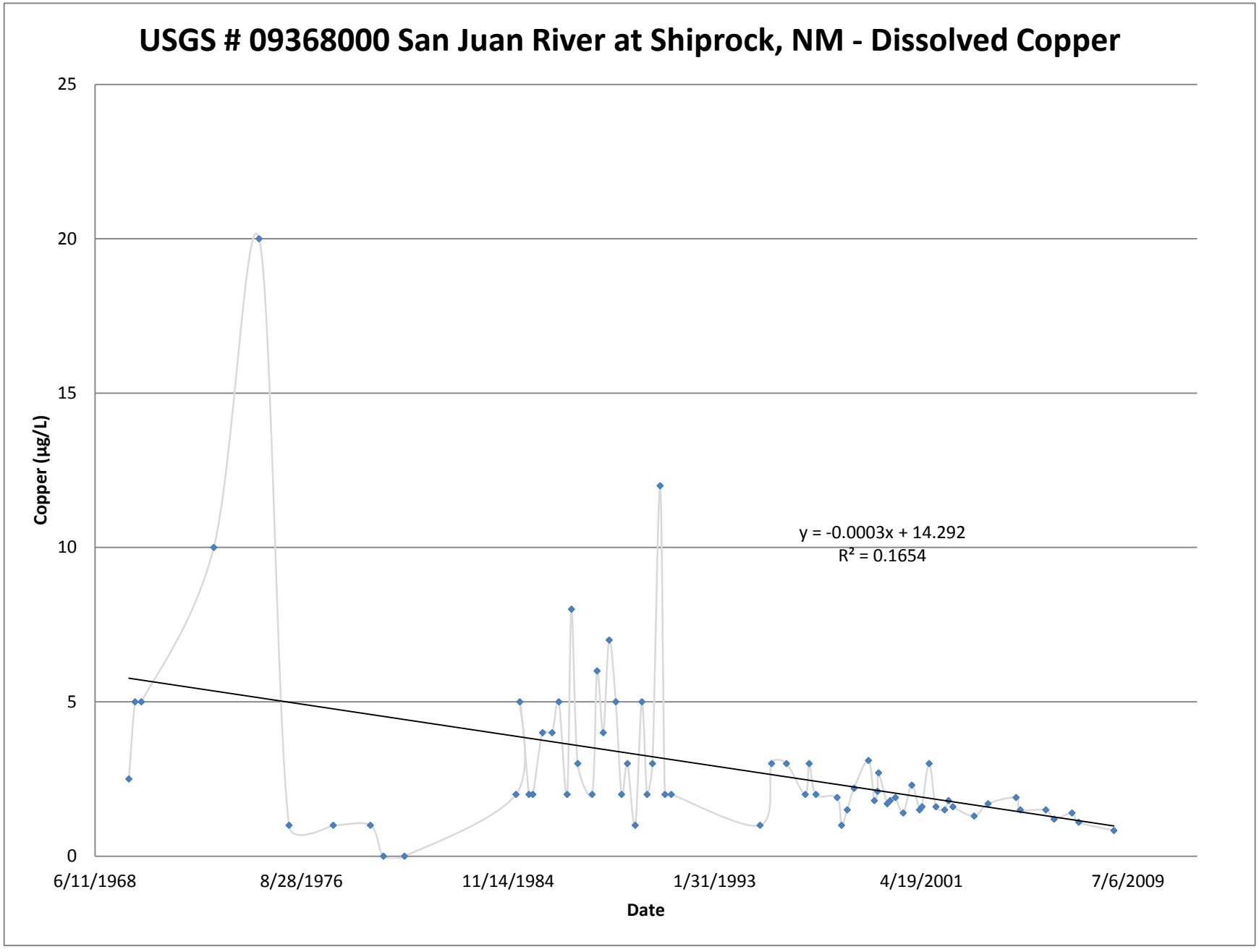

USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Beryllium
2.5
2
1.5
1
0.5
0
Beryllium (µg/L)
y = -6E-05x + 2.3694
R² = 0.2055
3/8/1971
5/25/1979
8/11/1987
10/28/1995
1/14/2004
Date


USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Cadmium
Cadmium (µg/L)
60
50
40
30
20
10
0
y = -0.0007x + 24.018
R² = 0.1057
6/11/1968
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date

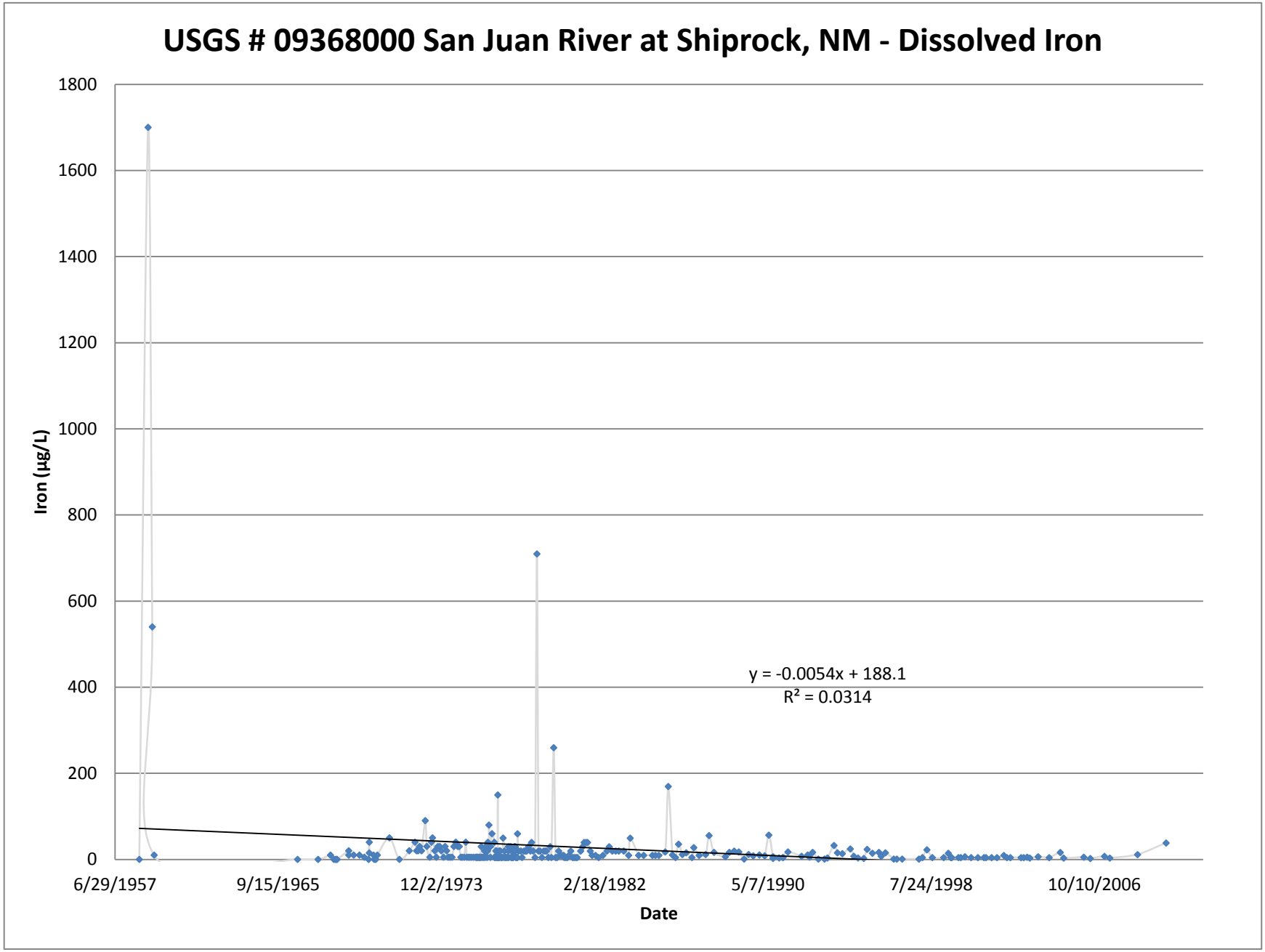

USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Chromium
Chromium (µg/L)
25
20
15
10
5
0
6/11/1968
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date
y = -0.0005x + 18.297
R² = 0.2359


USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Cobalt
Cobalt (µg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
y = -0.0002x + 6.8224
R² = 0.6421
6/11/1968
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date

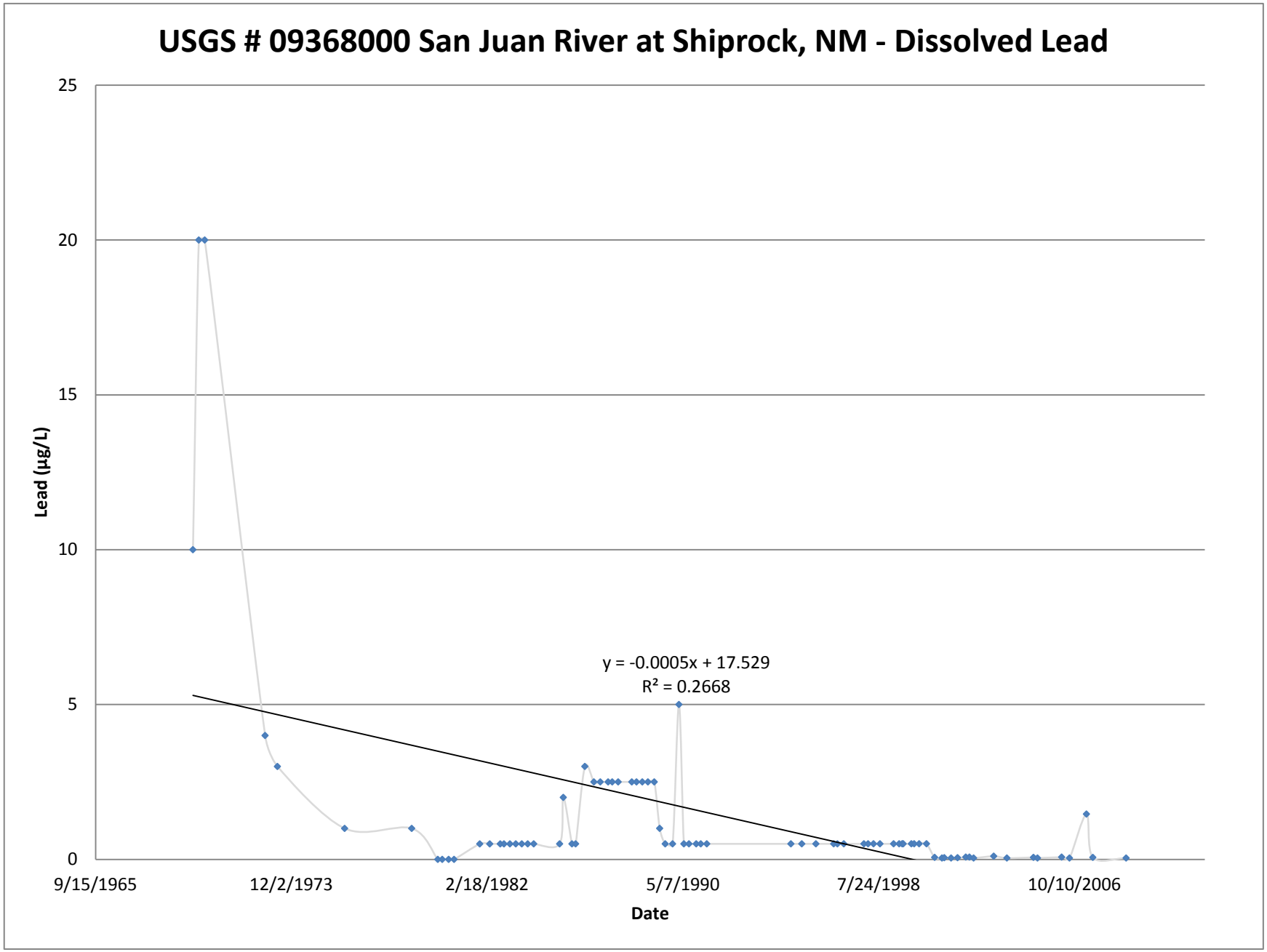
Appendix A - USGS Stations
USGS # 09368000

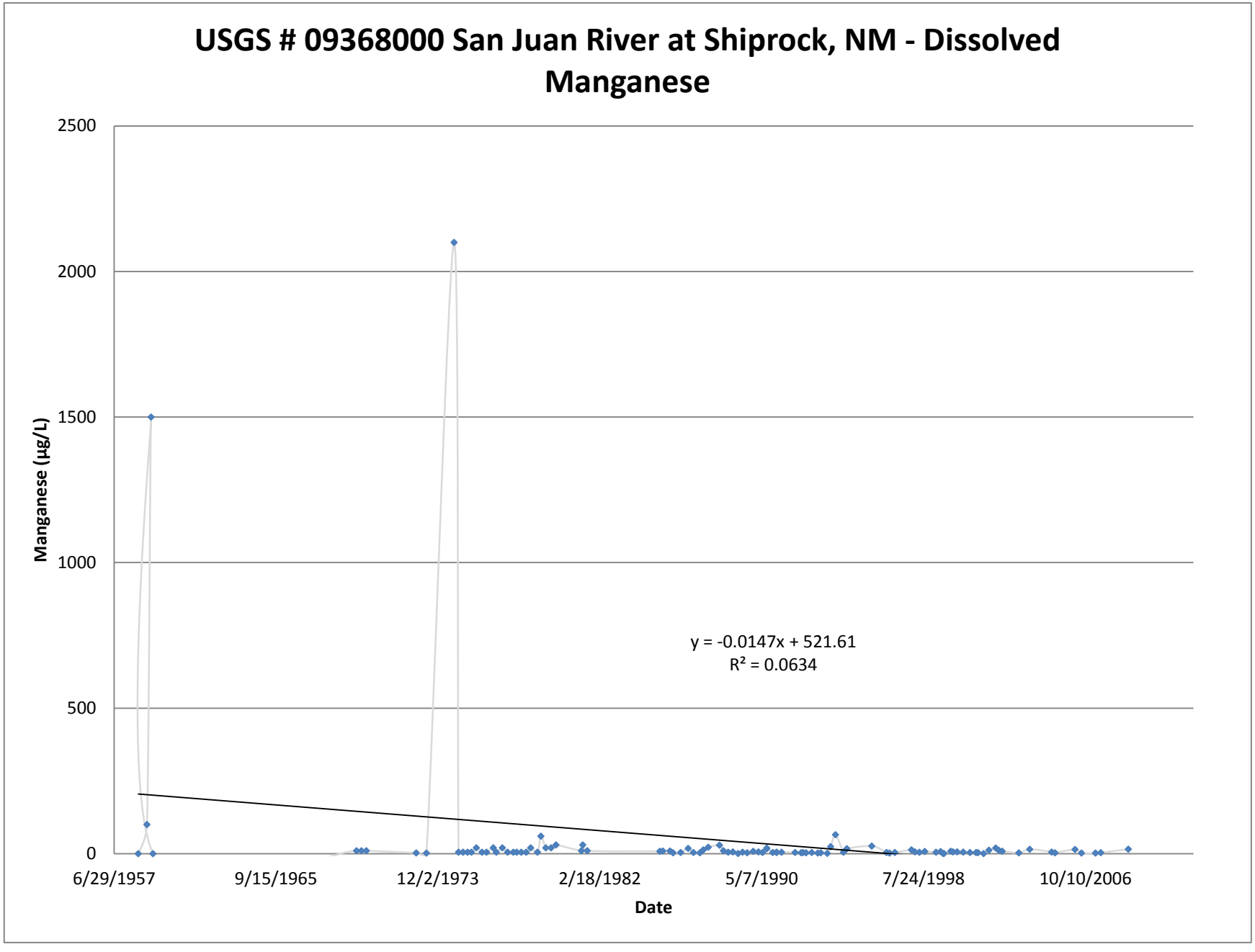


Appendix A - USGS Stations
USGS # 09368000

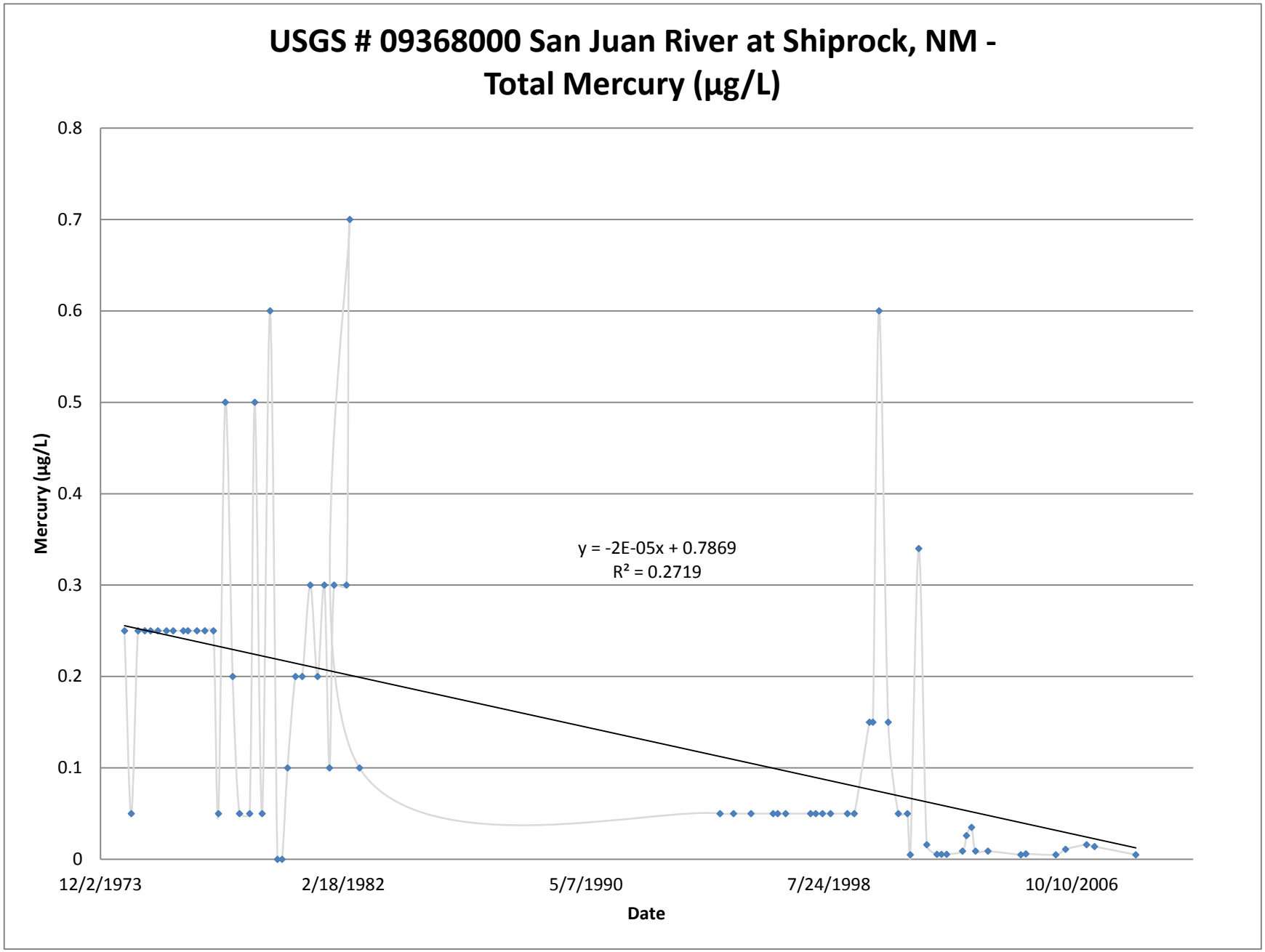


Appendix A - USGS Stations
USGS # 09368000

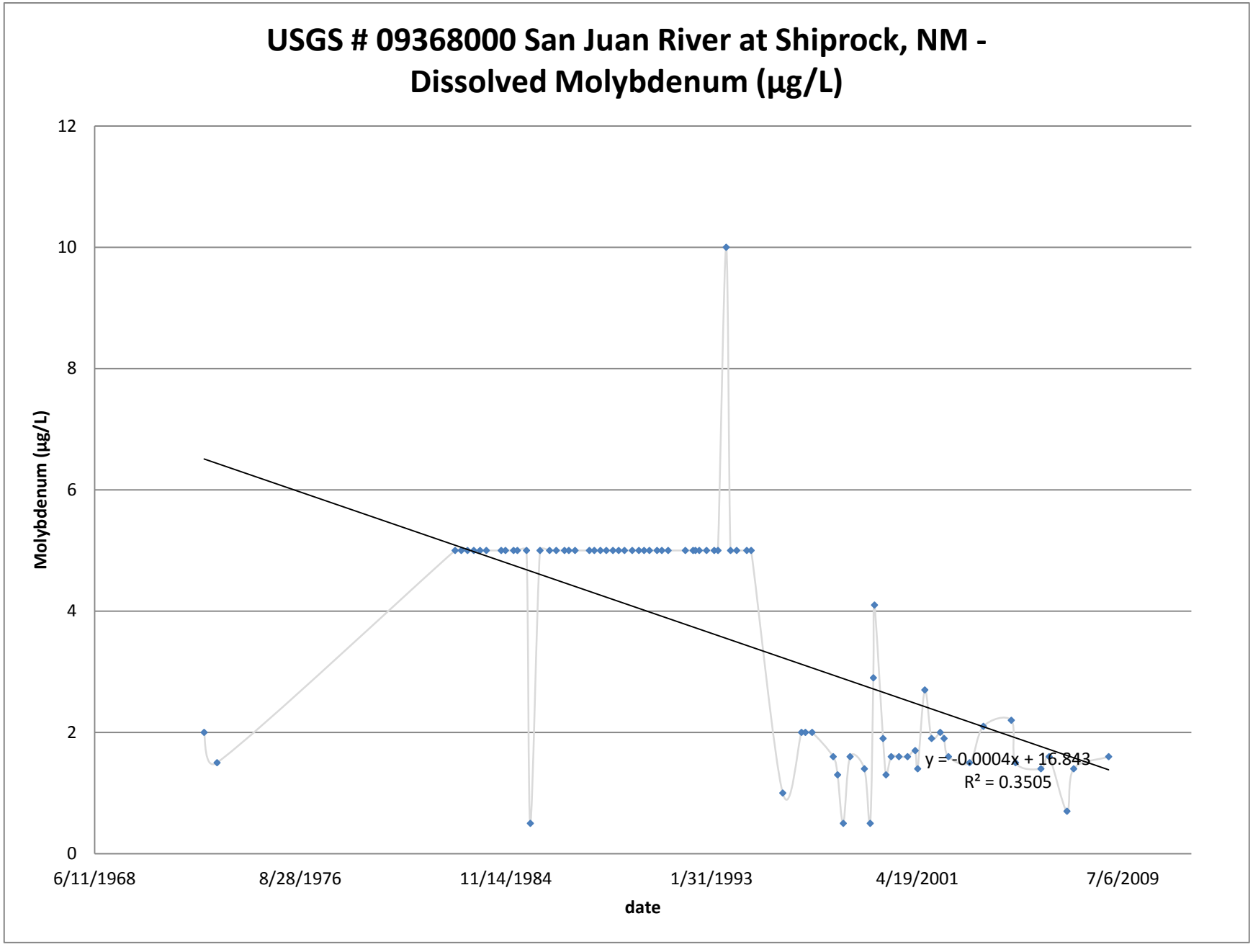


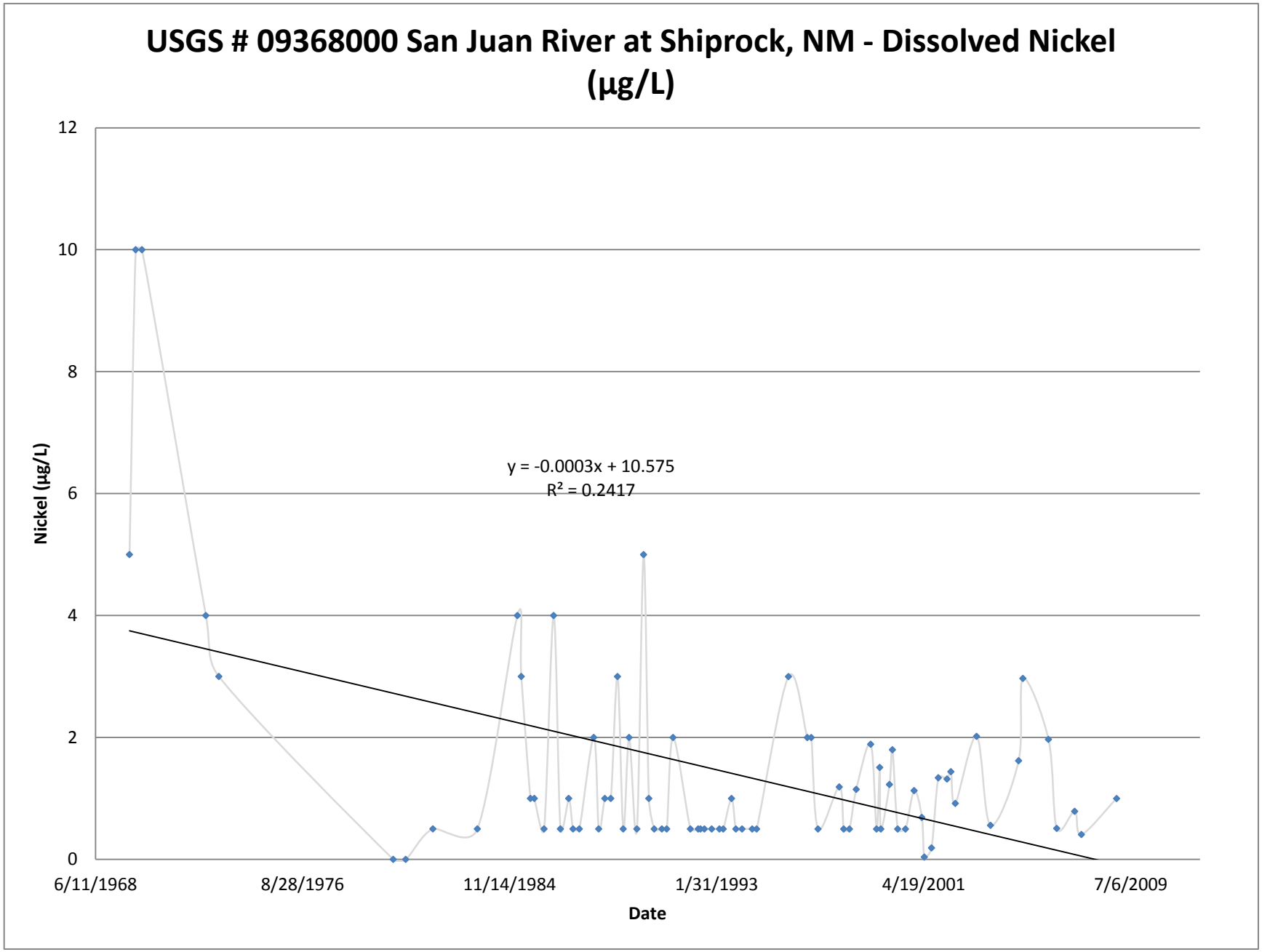

USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Manganese
2500
2000
1500
1000
500
0
Manganese (µg/L)
y = -0.0147x + 521.61
R² = 0.0634
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date

Appendix A - USGS Stations
USGS # 09368000

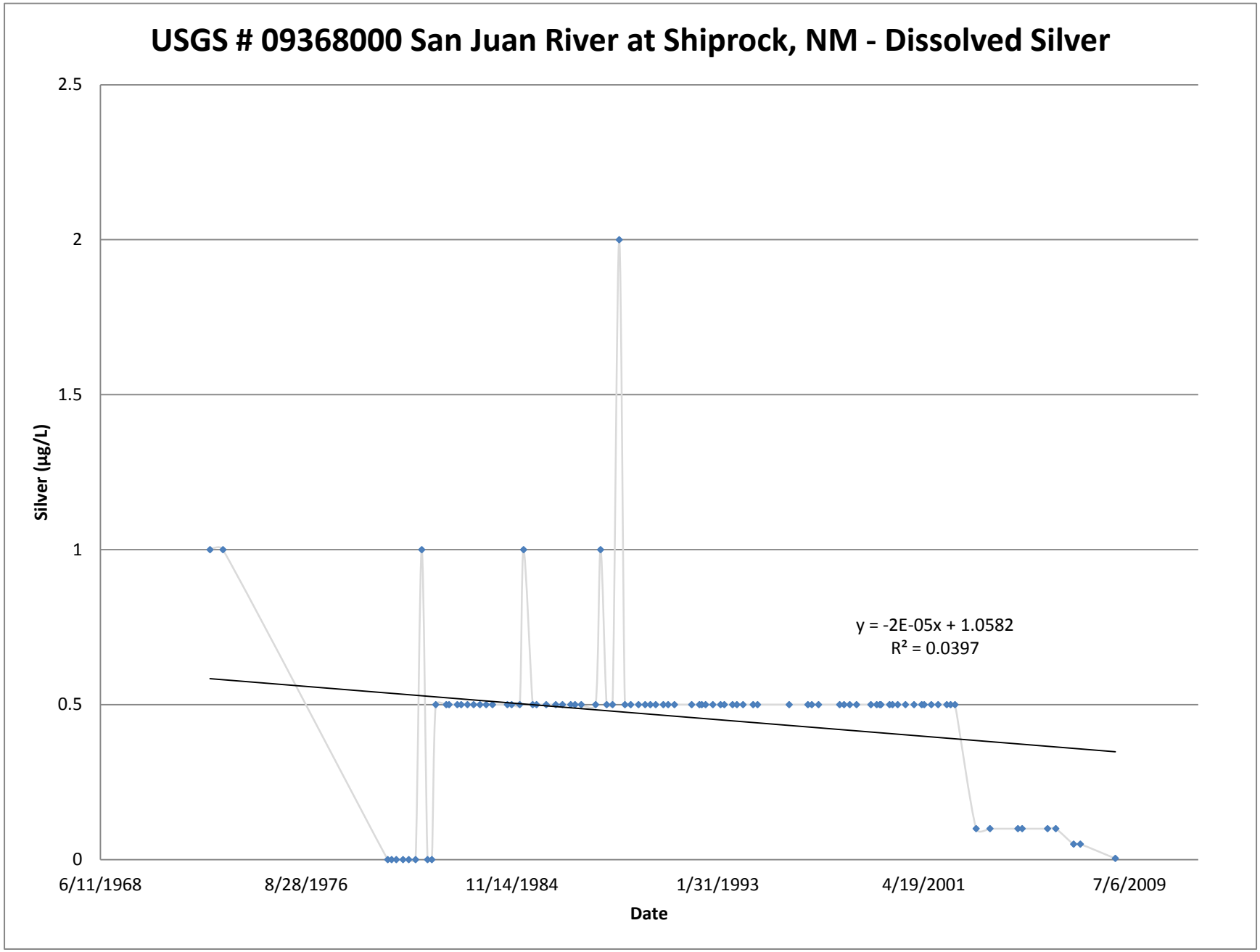


Appendix A - USGS Stations
USGS # 09368000

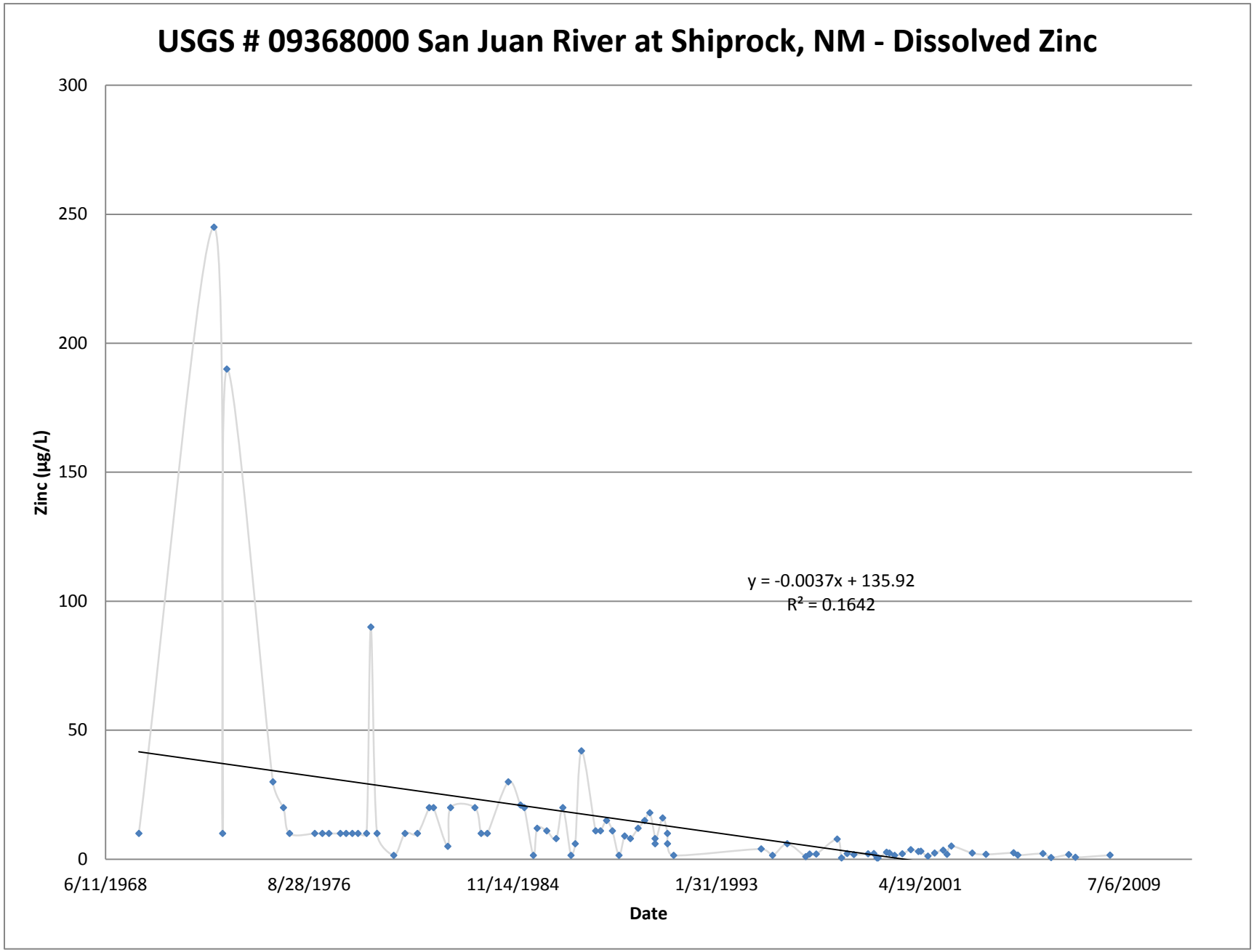



USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Nickel (µg/L)
12
10
8
6
4
2
0
Nickel (µg/L)
y = -0.0003x + 10.575
R² = 0.2417
6/11/1968
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date

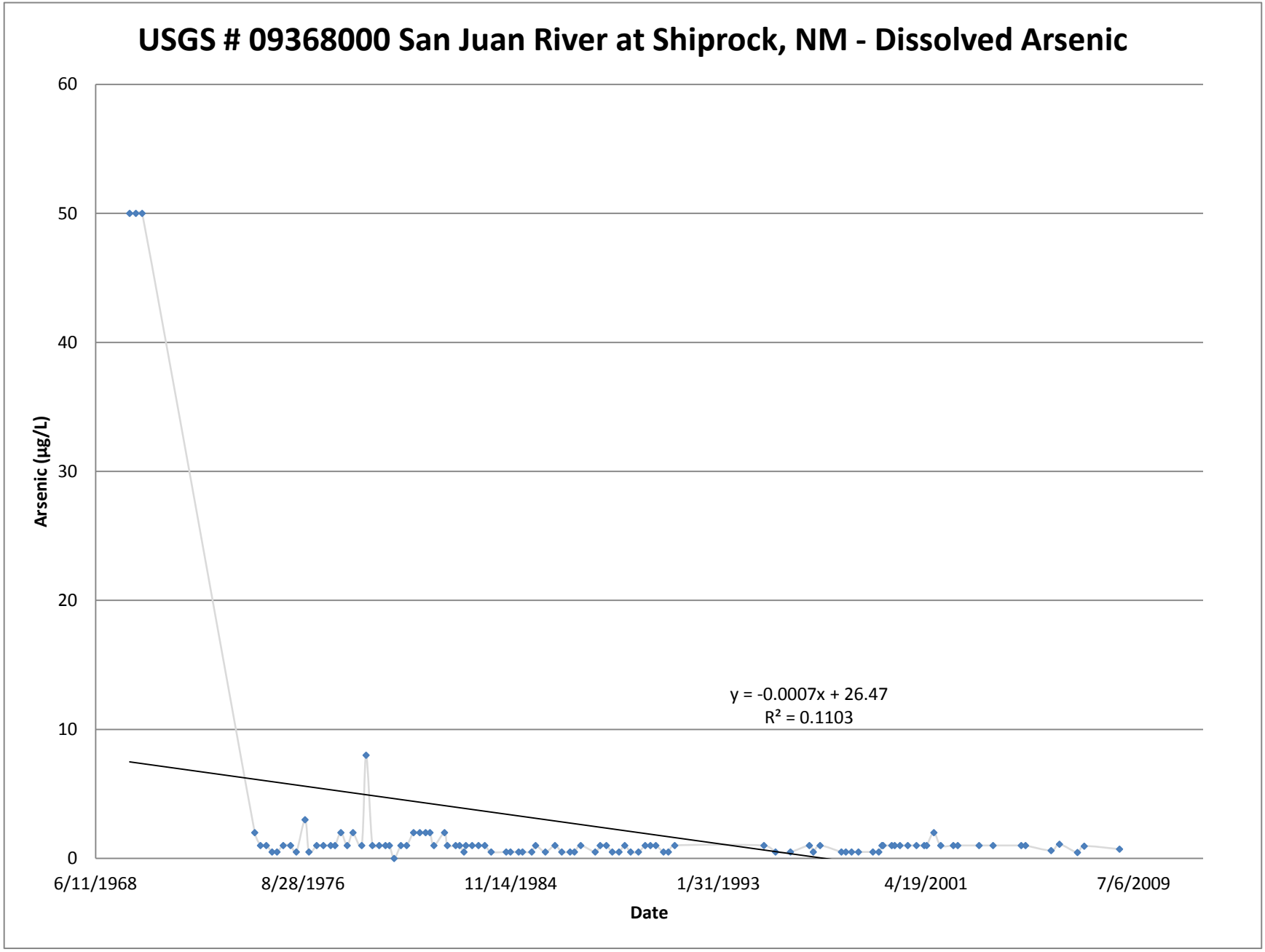
Appendix A - USGS Stations
USGS # 09368000



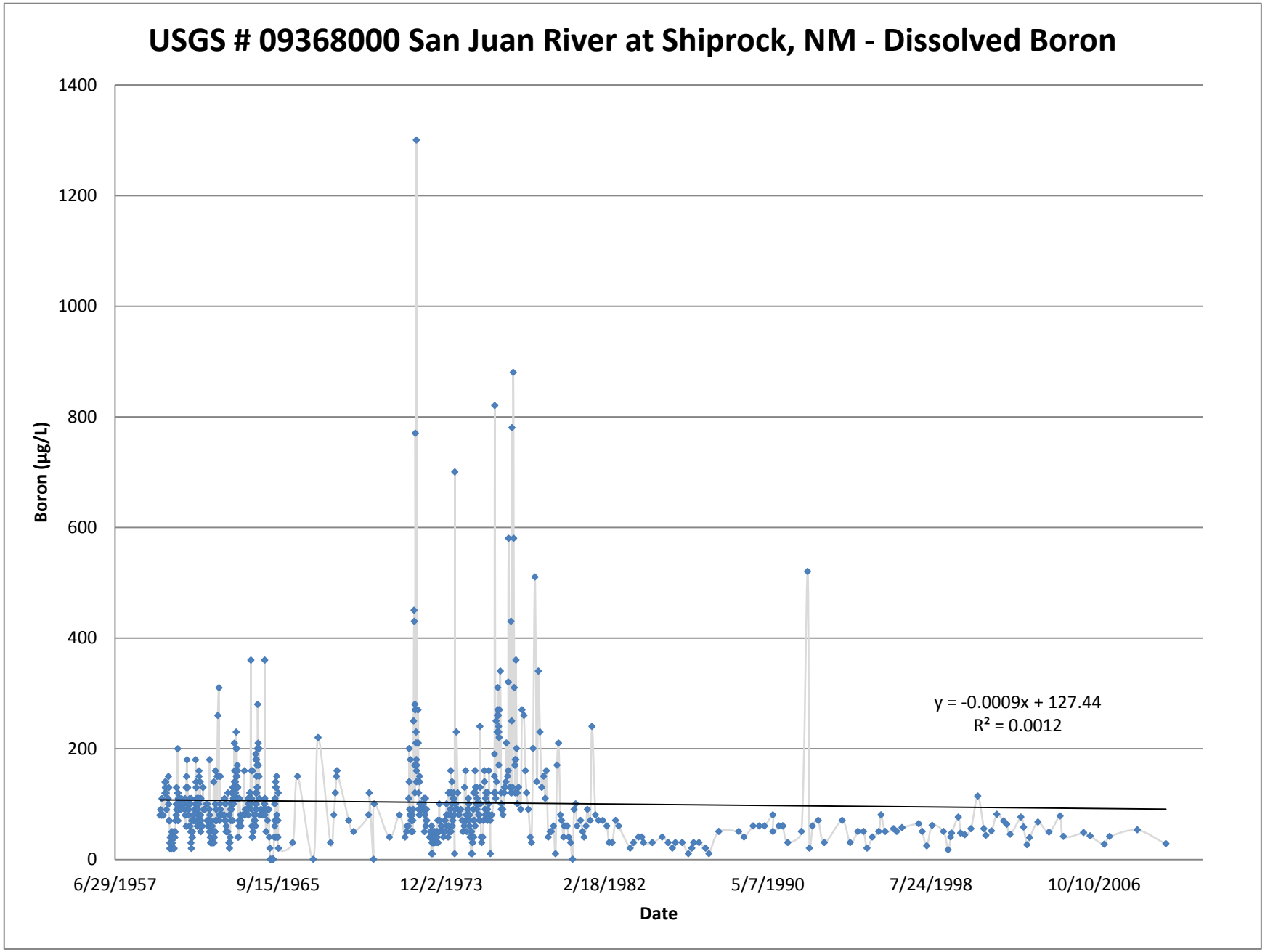
Appendix A - USGS Stations
USGS # 09368000

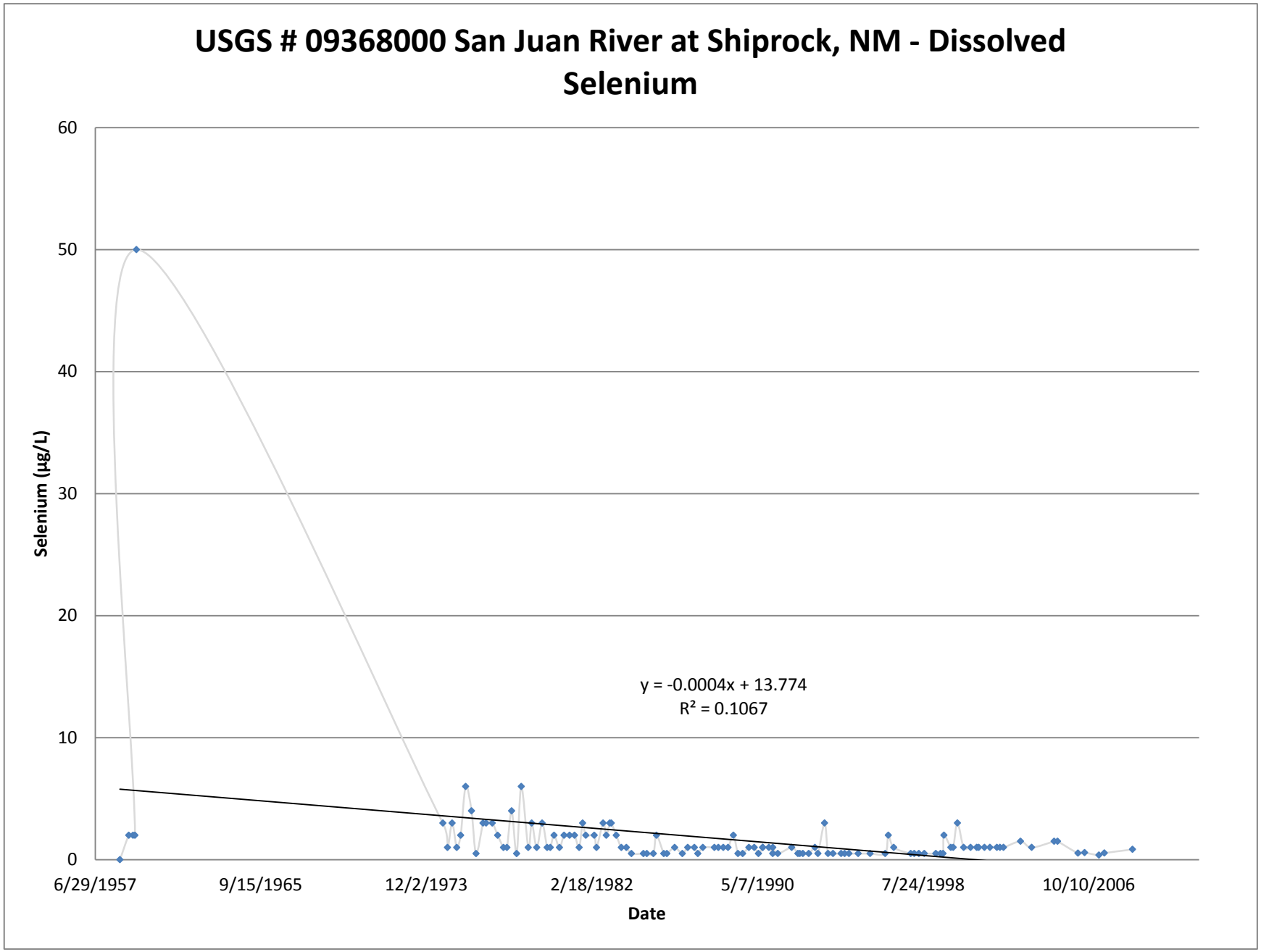


Appendix A - USGS Stations
USGS # 09368000

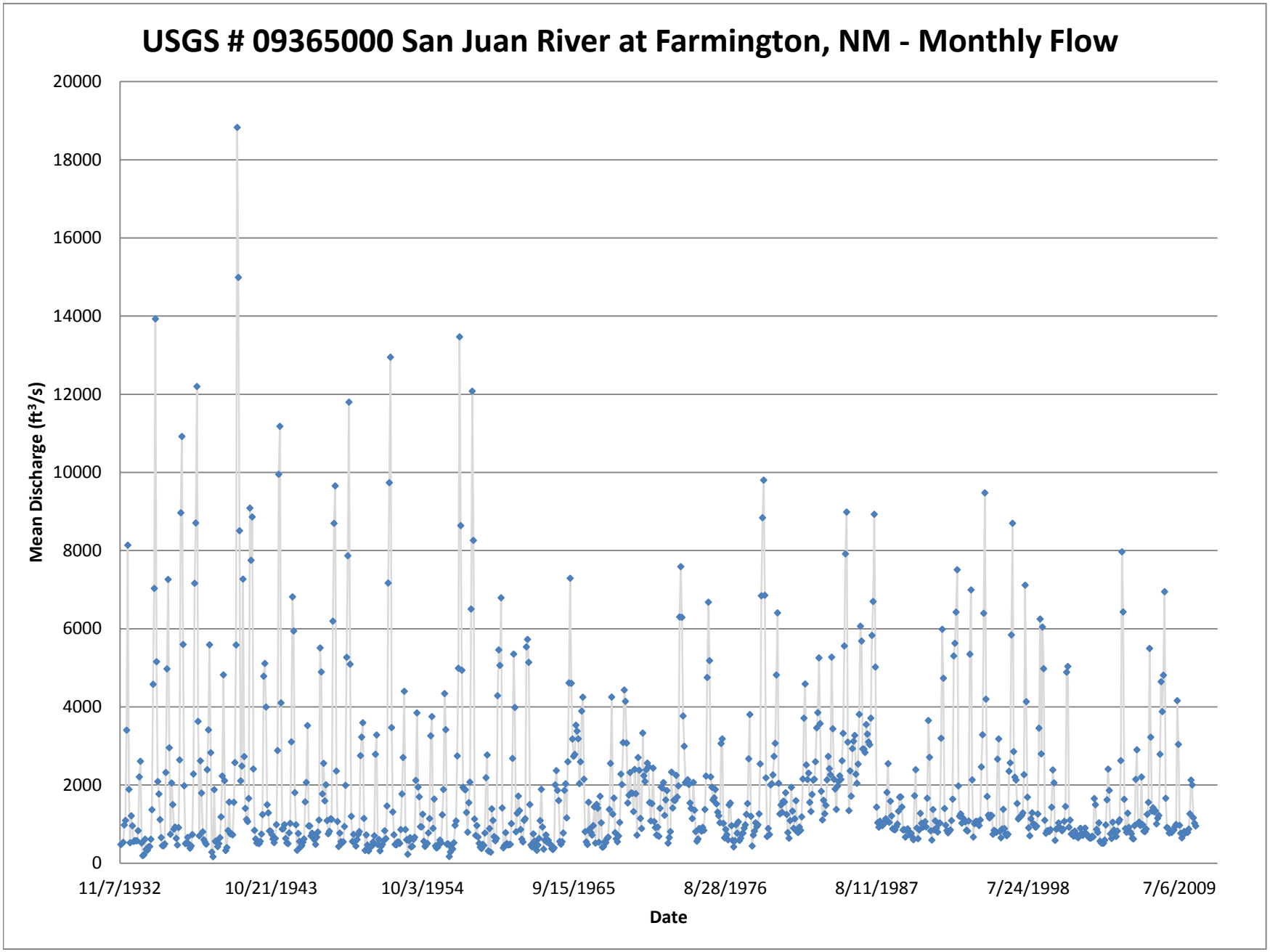


Appendix A - USGS Stations
USGS # 09368000

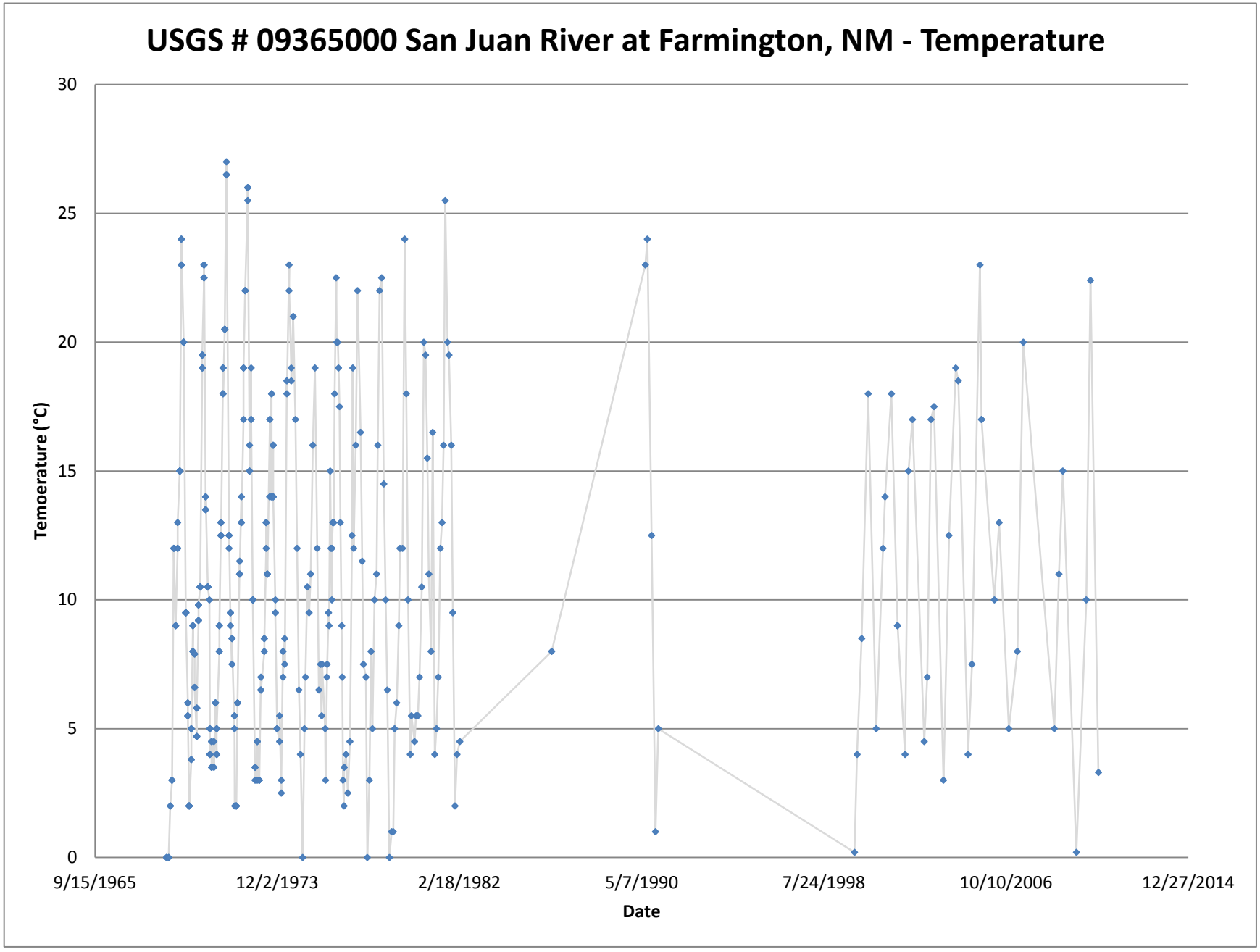



USGS # 09368000 San Juan River at Shiprock, NM - Dissolved Selenium
Selenium (µg/L)
60
50
40
30
20
10
0
y = -0.0004x + 13.774
R² = 0.1067
6/29/1957
9/15/1965
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date

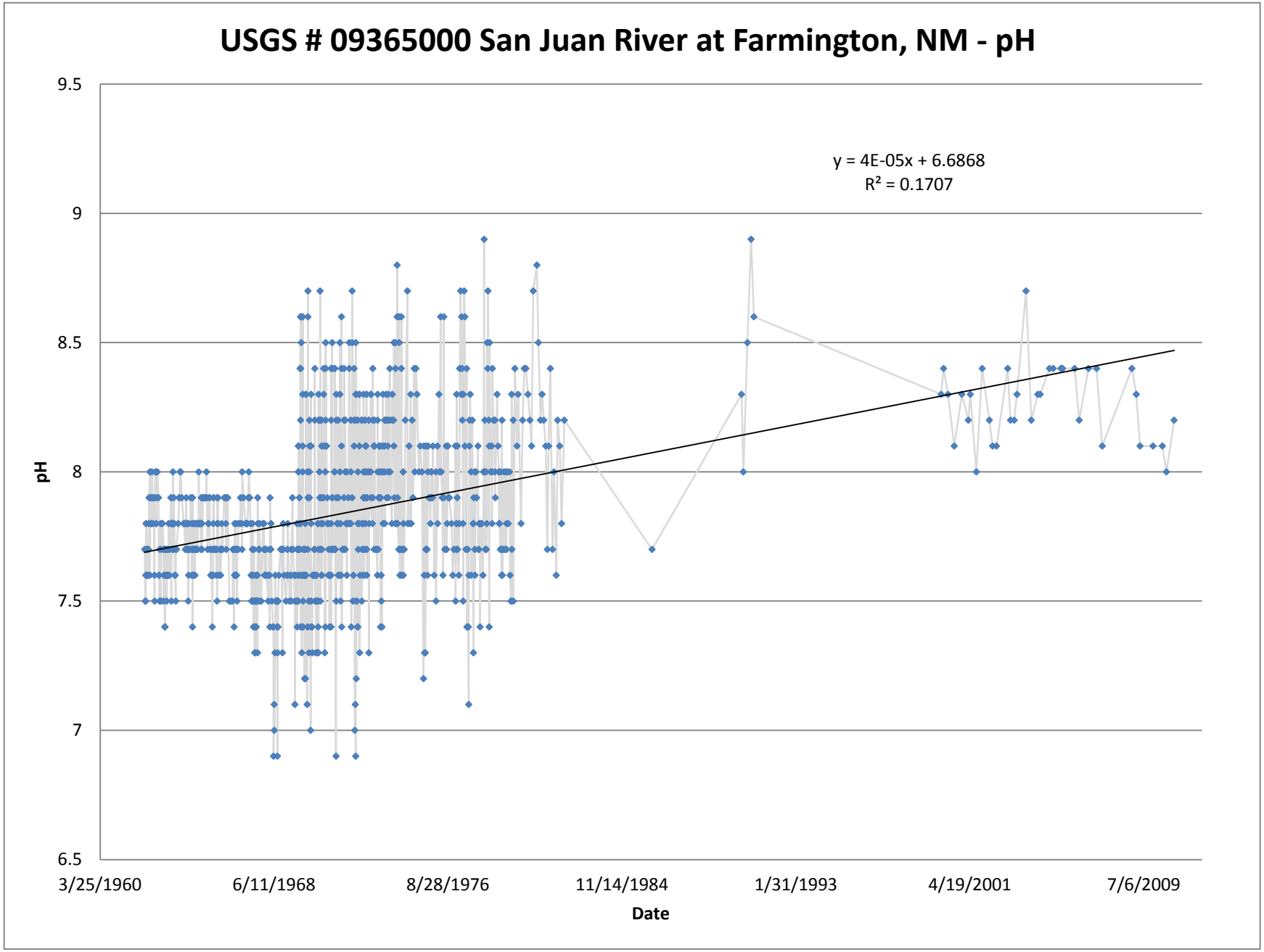
Appendix A - USGS Stations
USGS # 09365000



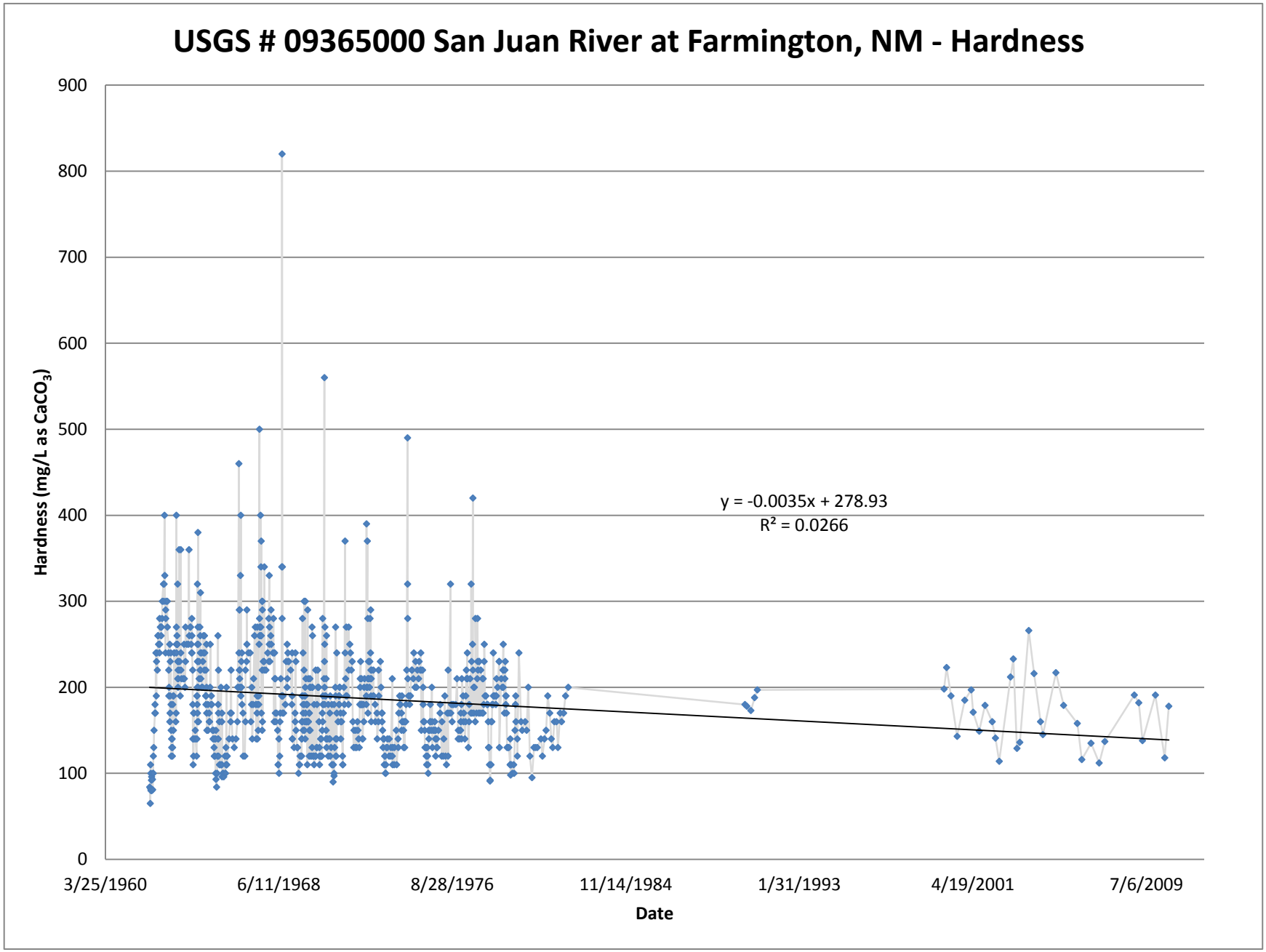
Appendix A - USGS Stations
USGS # 09365000



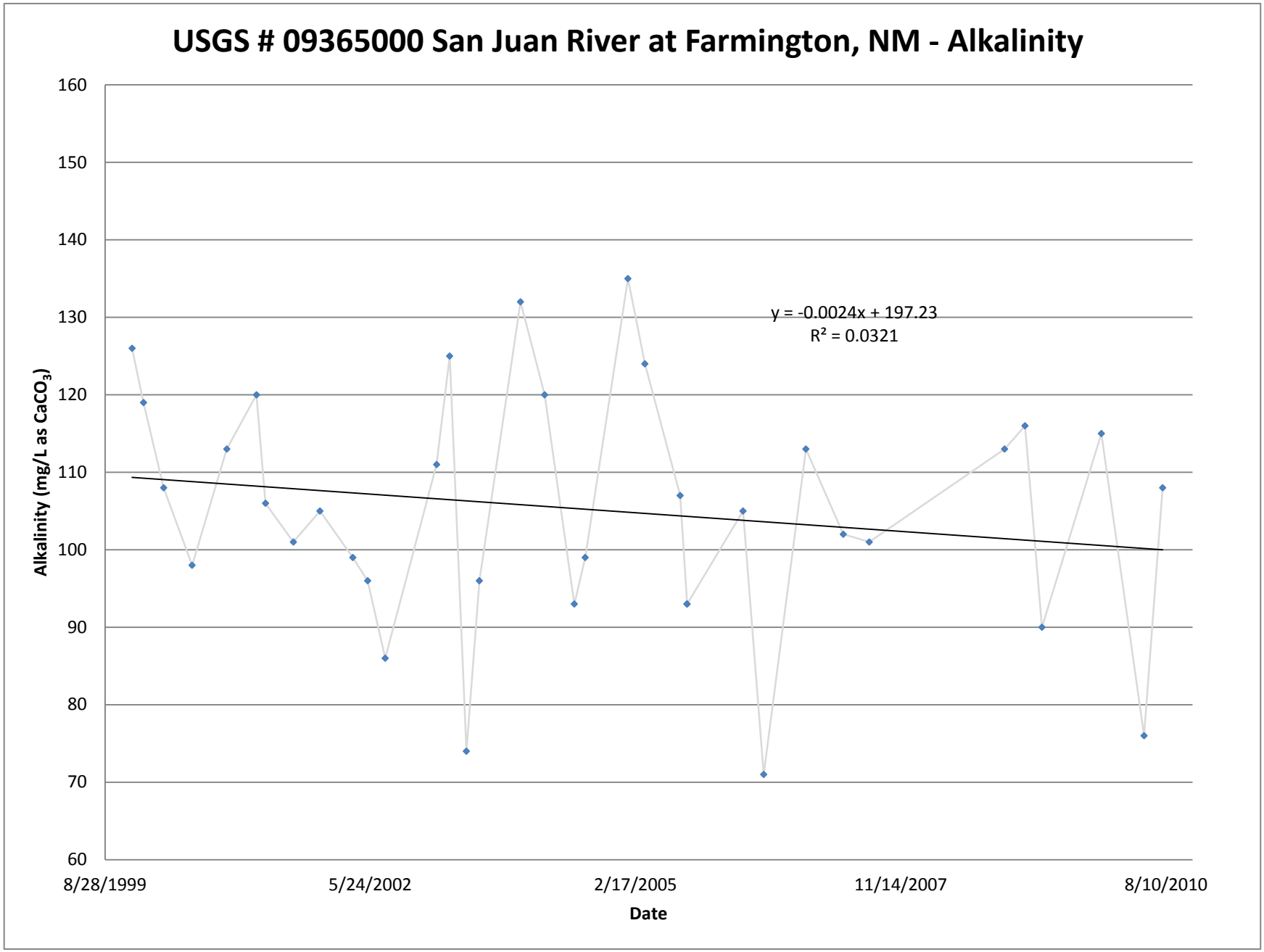
Appendix A - USGS Stations
USGS # 09365000

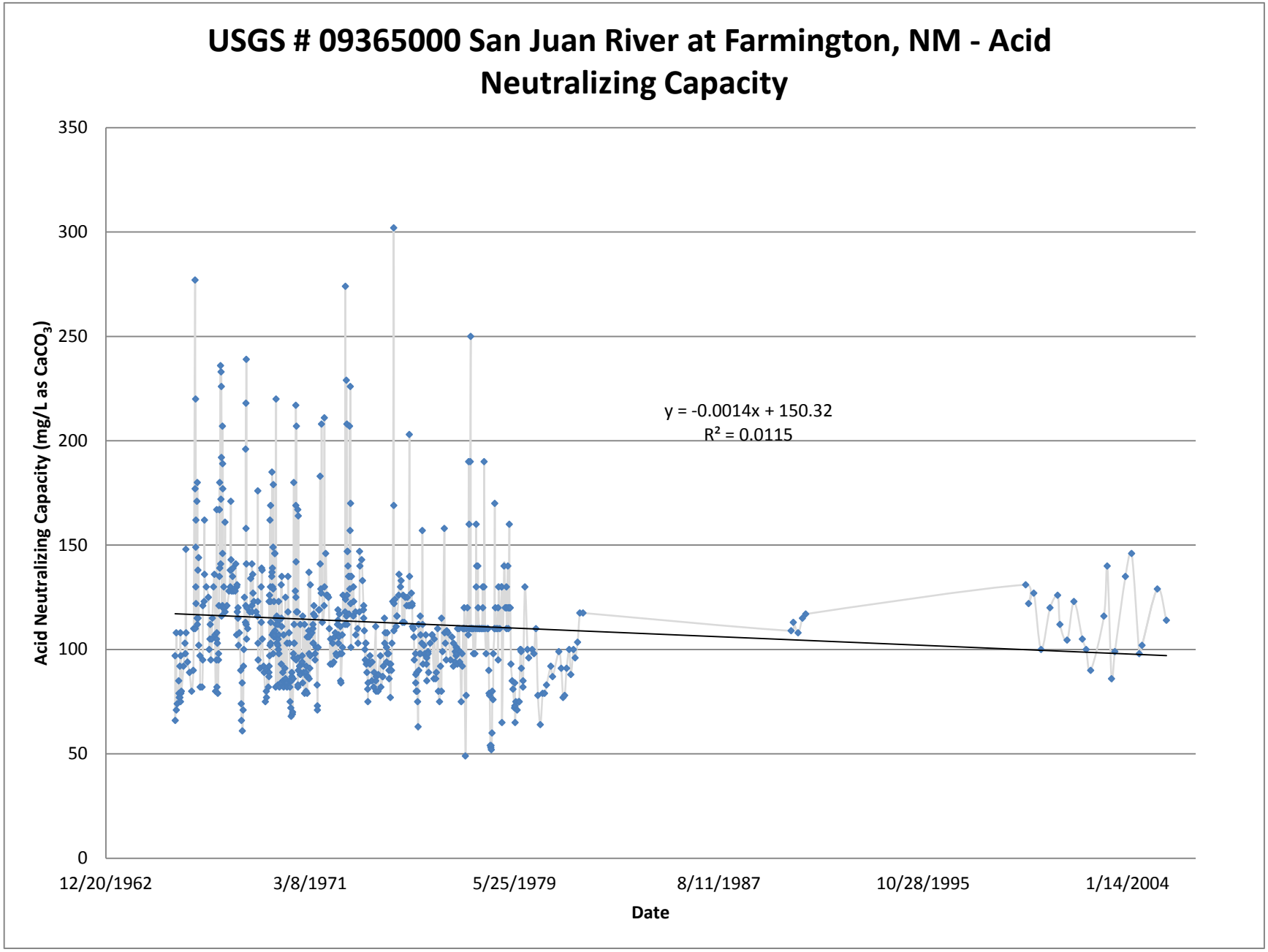


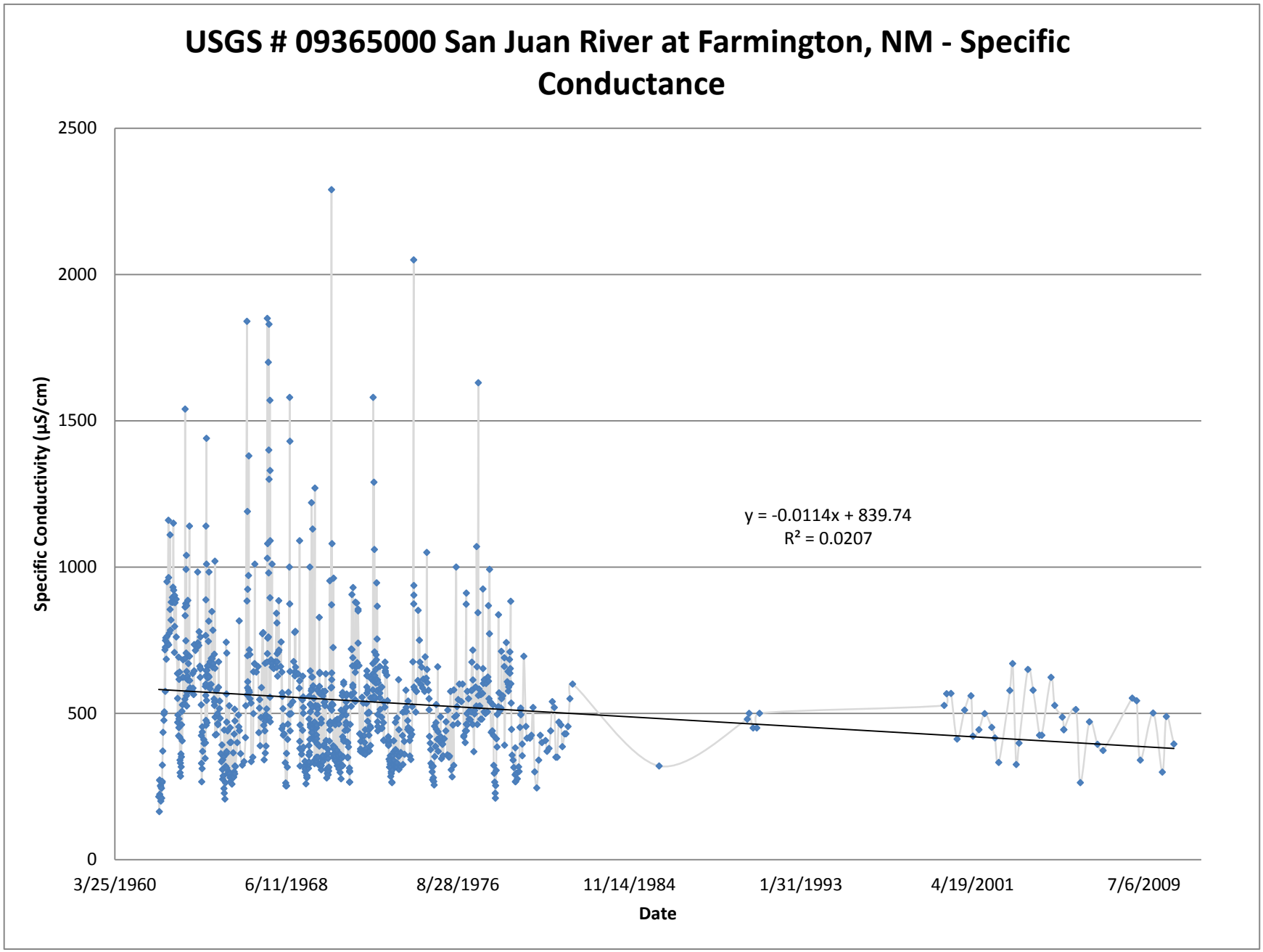
Appendix A - USGS Stations
USGS # 09365000



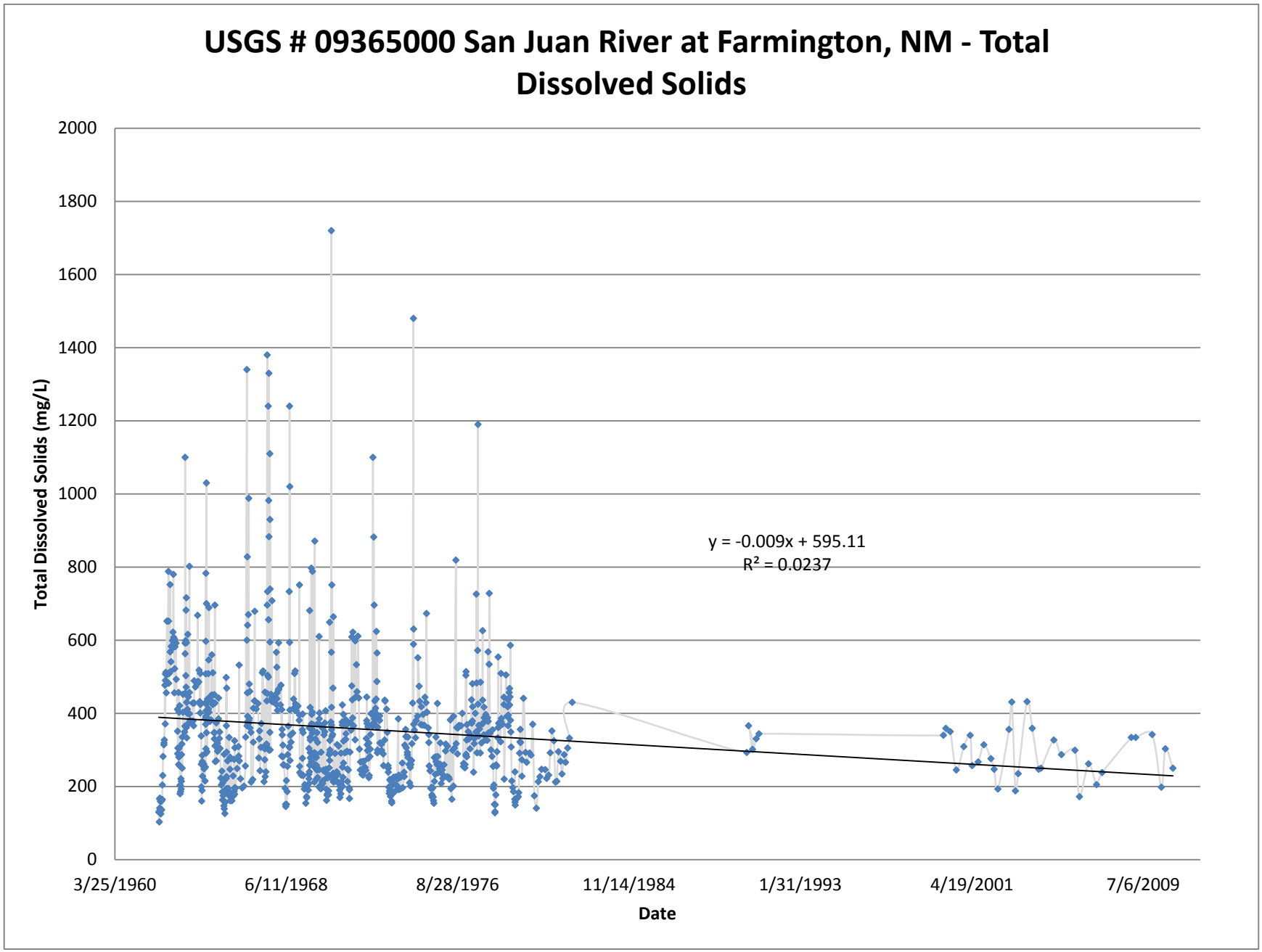
Appendix A - USGS Stations
USGS # 09365000



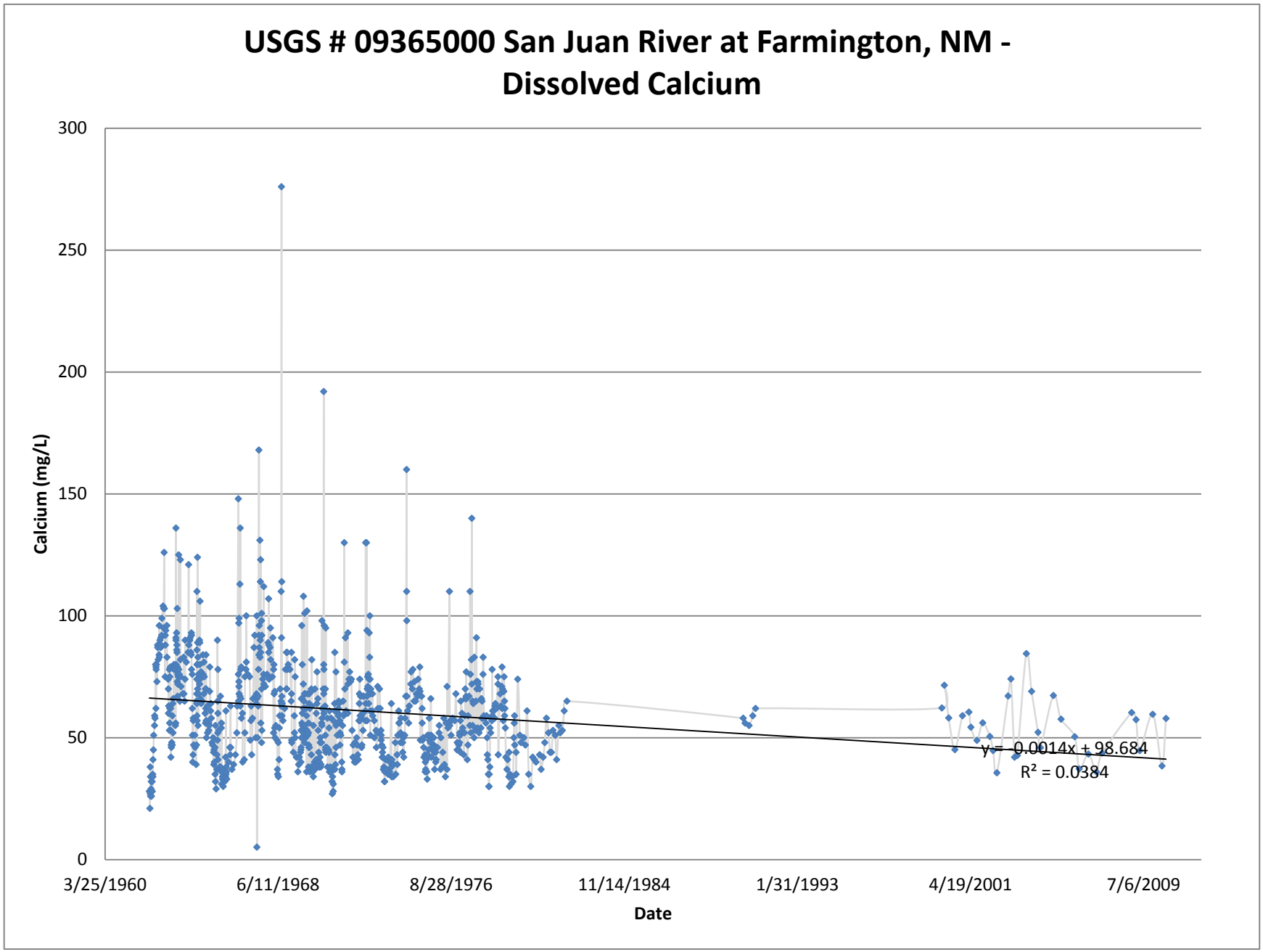

USGS # 09365000 San Juan River at Farmington, NM - Acid Neutralizing Capacity
Acid Neutralizing Capacity (mg/L as CaCO3)
350
300
250
200
150
100
50
0
y = -0.0014x + 150.32
R² = 0.0115
12/20/1962
3/8/1971
5/25/1979
8/11/1987
10/28/1995
1/14/2004
Date


USGS # 09365000 San Juan River at Farmington, NM - Specific Conductance
Specific Conductivity (µS/cm)
2500
2000
1500
1000
500
0
y = -0.0114x + 839.74
R² = 0.0207
3/25/1960
6/11/1968
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date

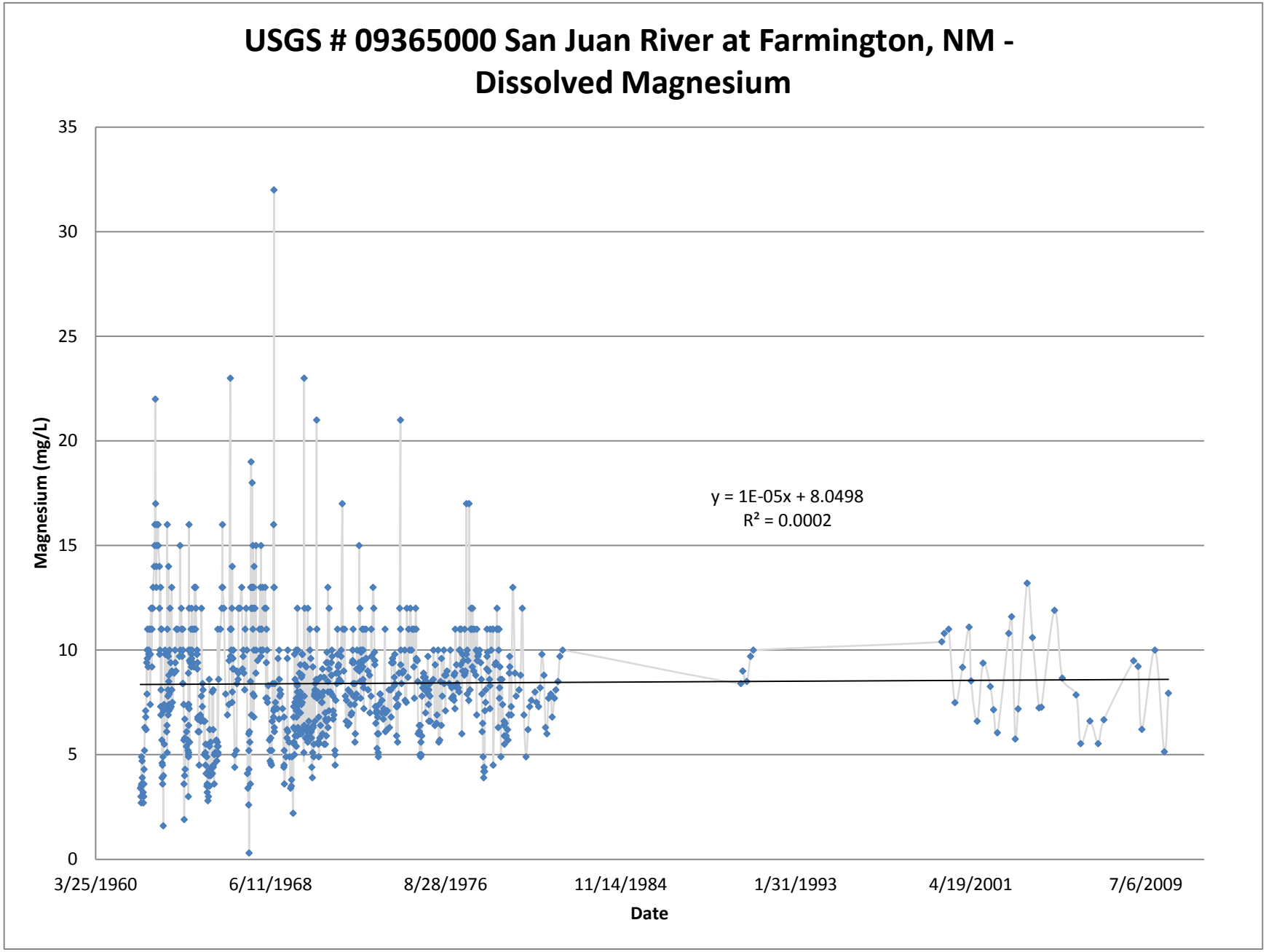
Appendix A - USGS Stations
USGS # 09365000



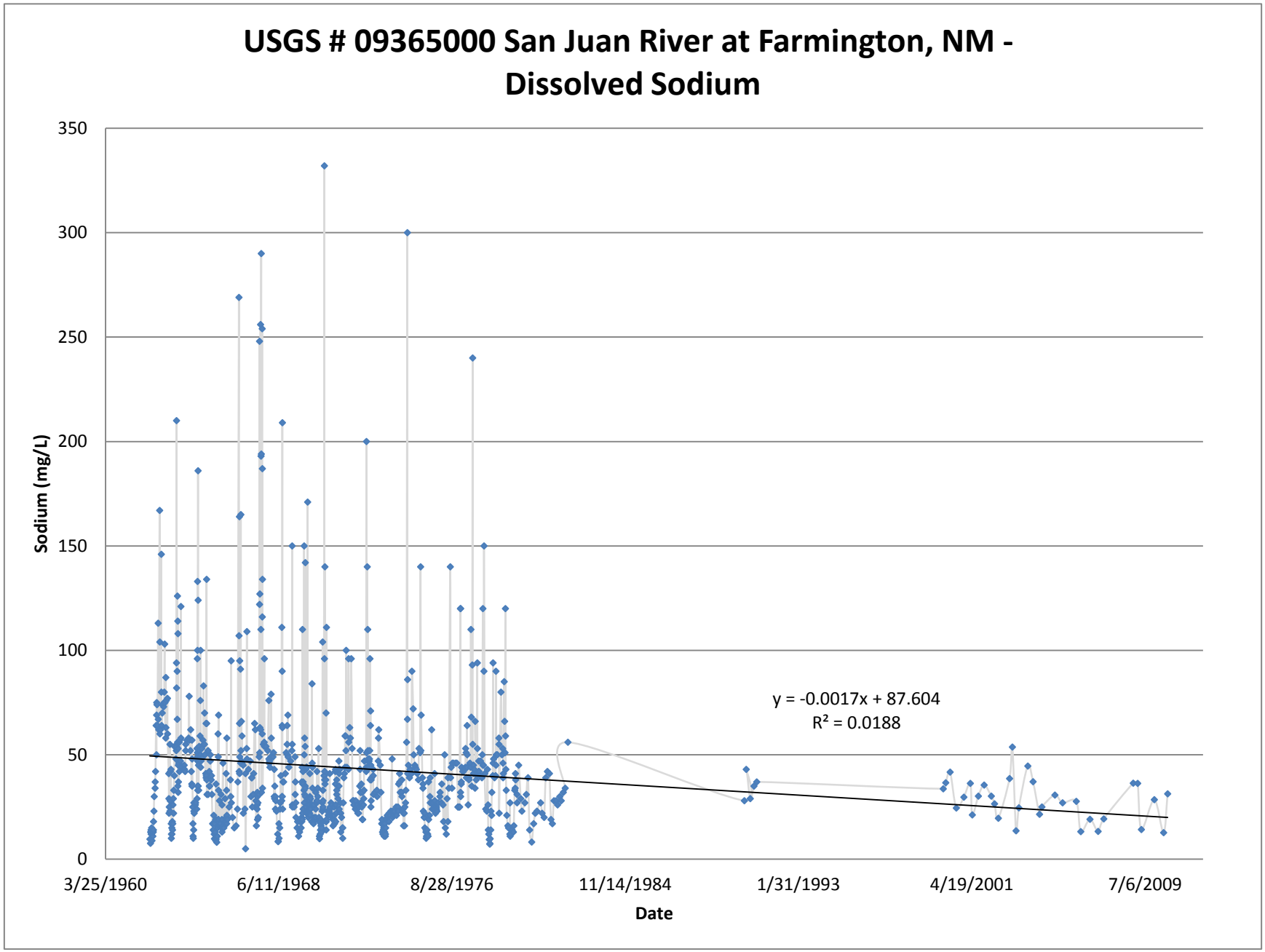
Appendix A - USGS Stations
USGS # 09365000



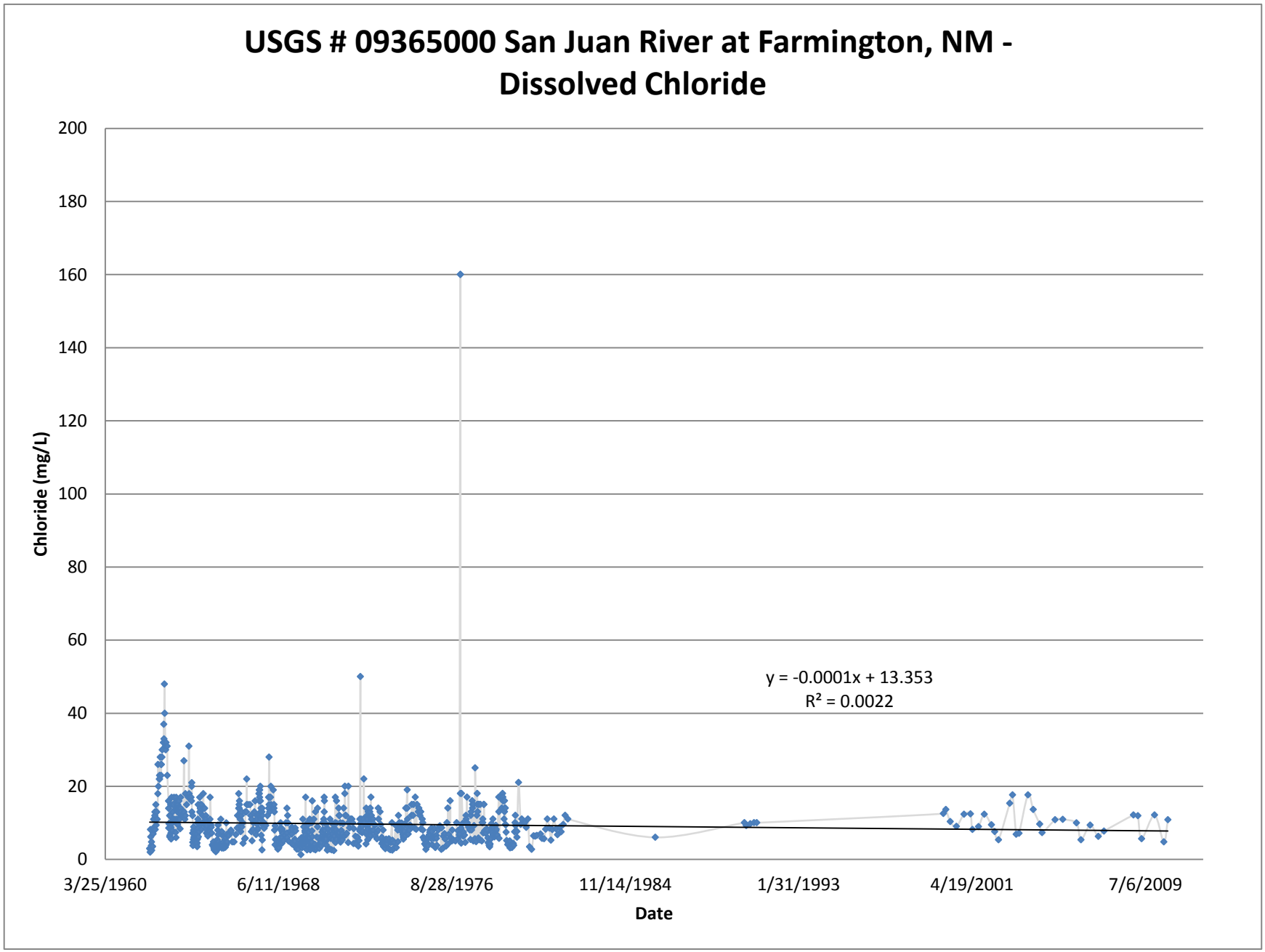
Appendix A - USGS Stations
USGS # 09365000



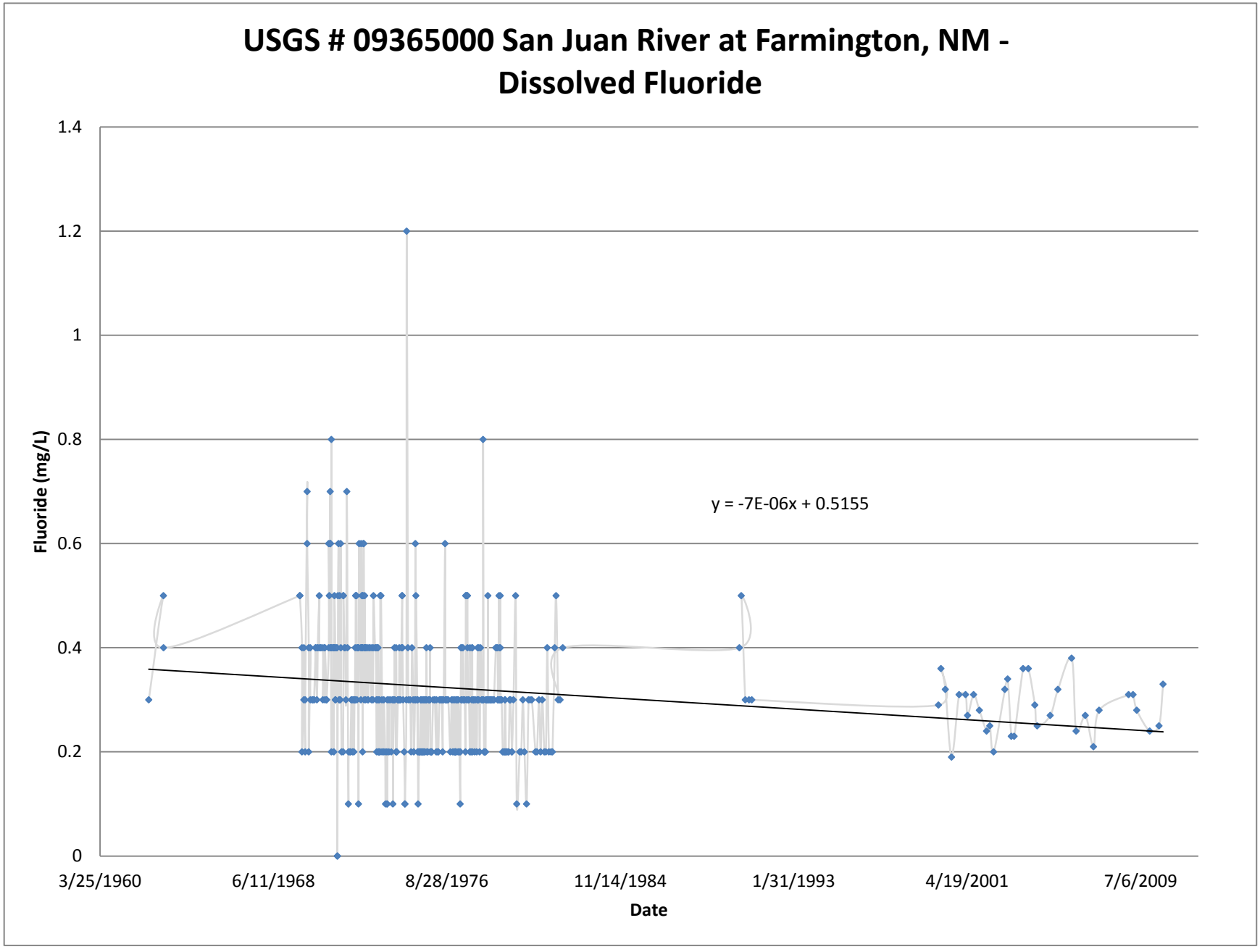
Appendix A - USGS Stations
USGS # 09365000



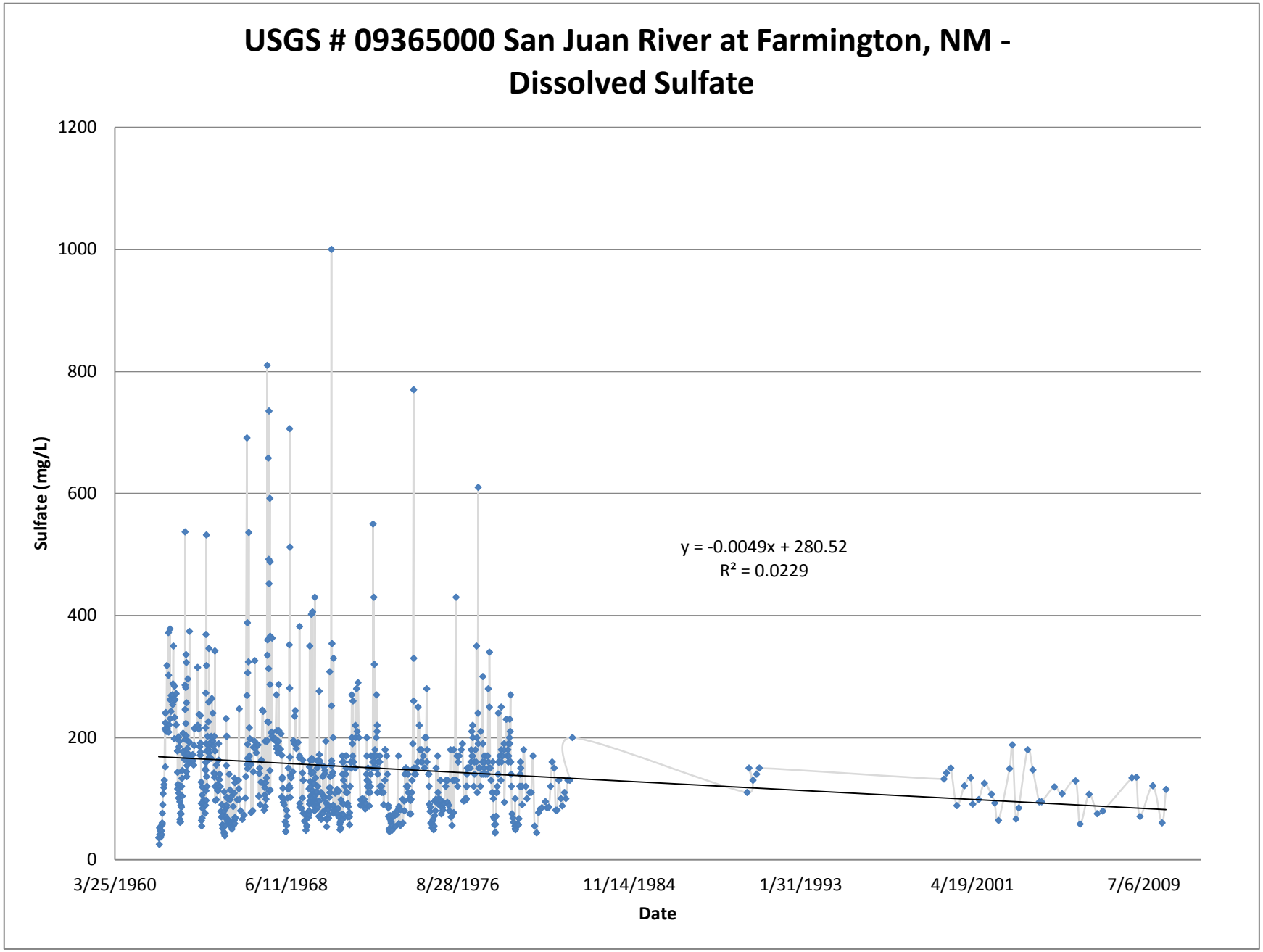
Appendix A - USGS Stations
USGS # 09365000



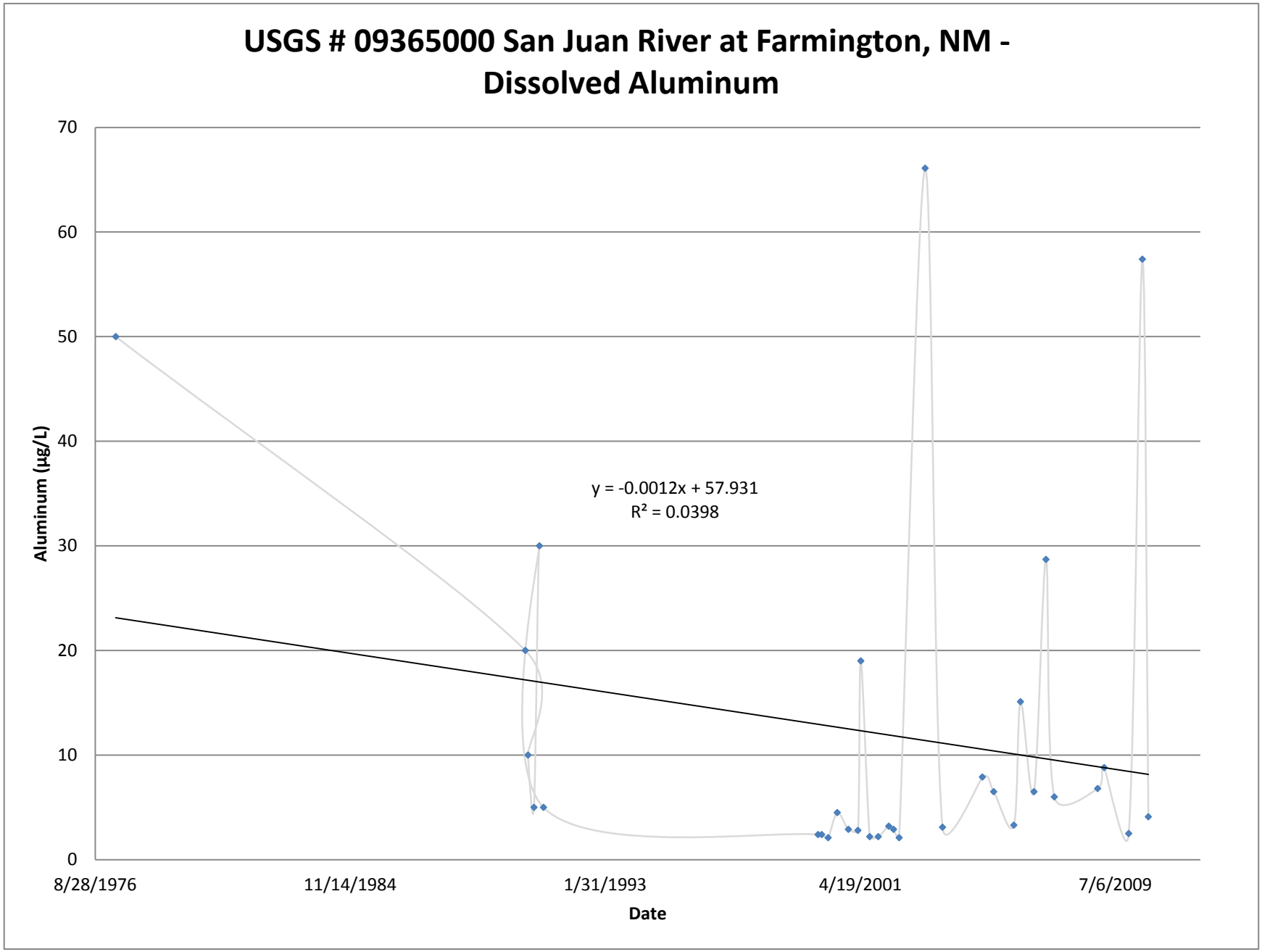
Appendix A - USGS Stations
USGS # 09365000



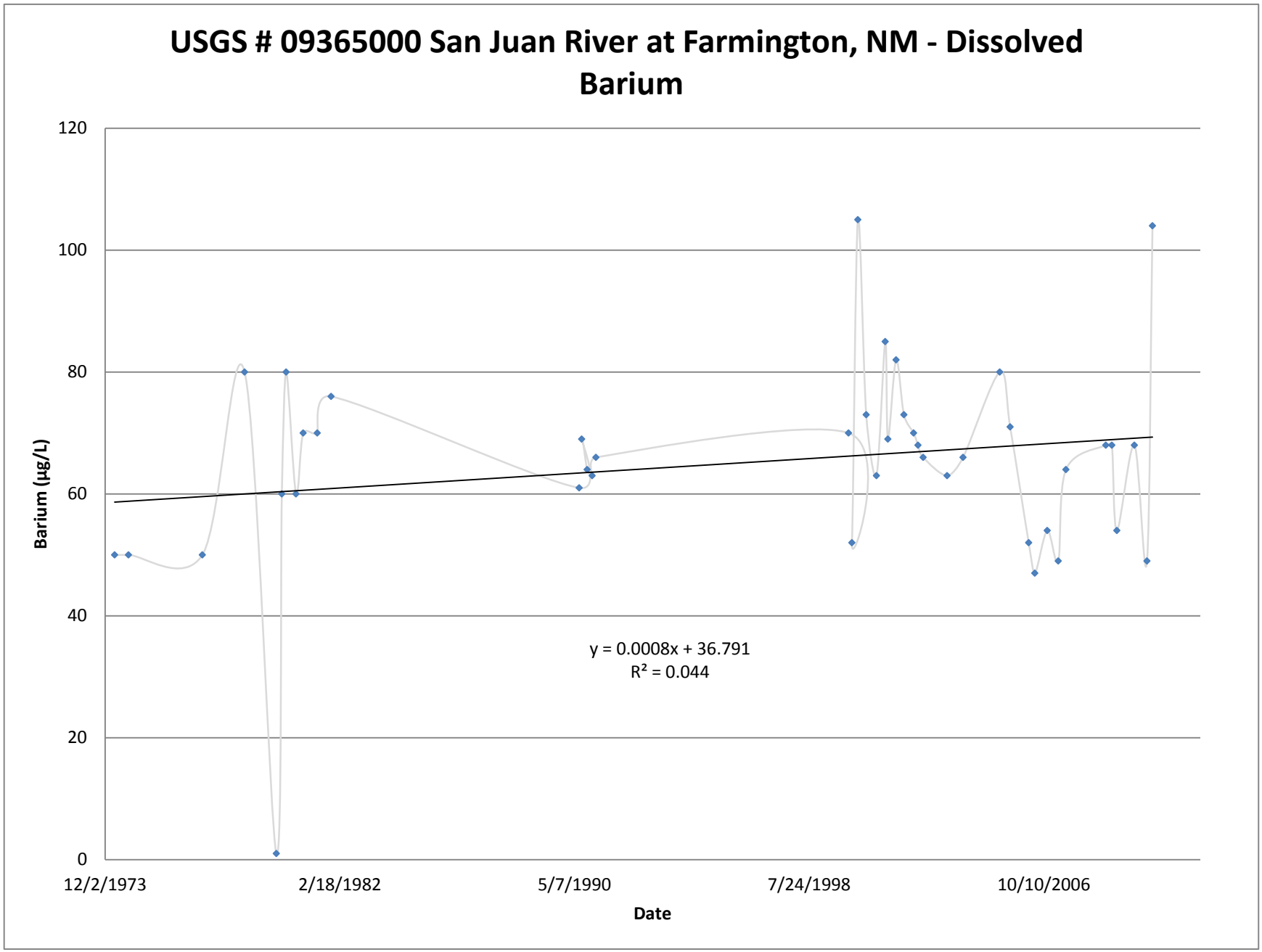
Appendix A - USGS Stations
USGS # 09365000



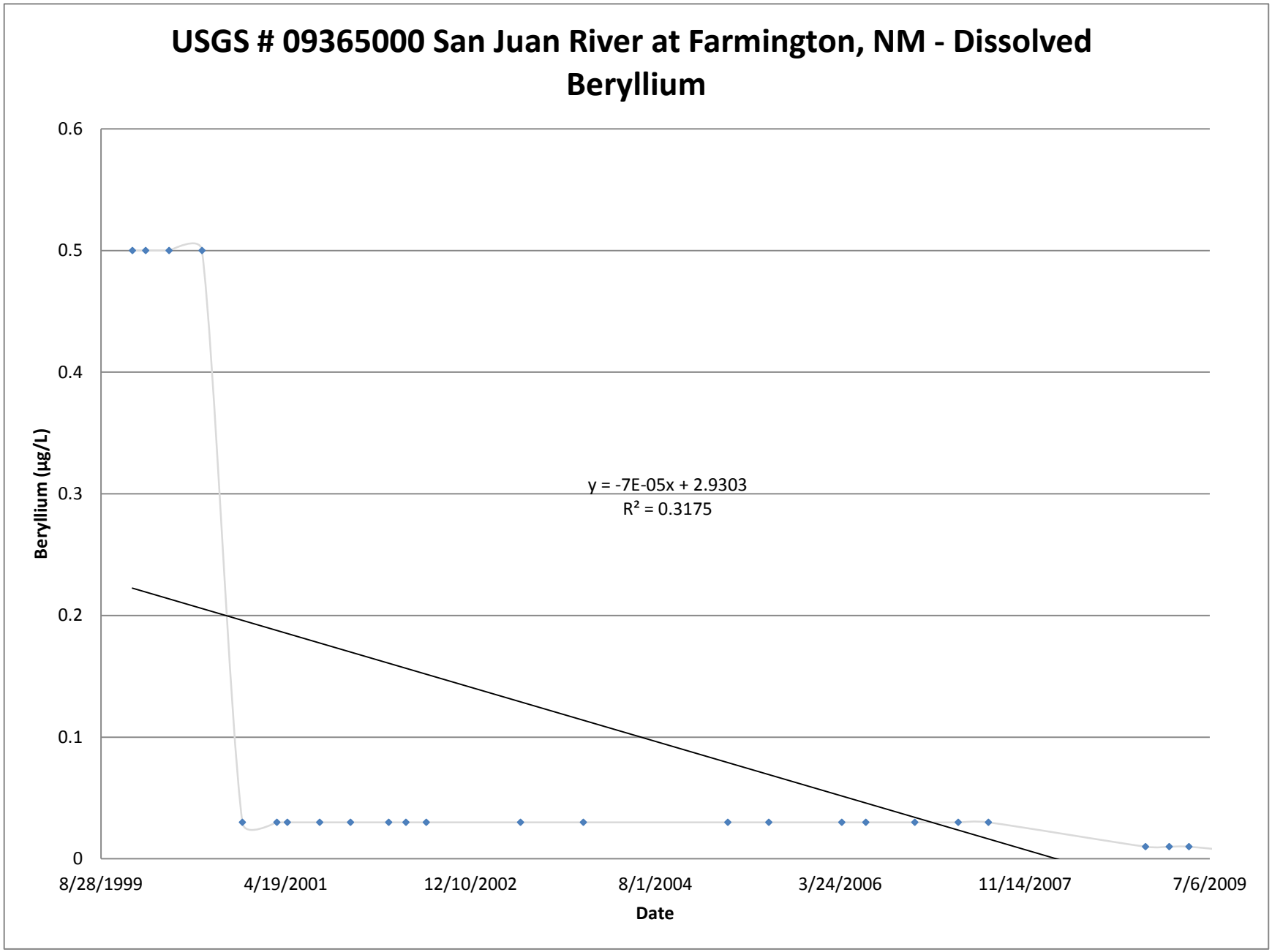
Appendix A - USGS Stations
USGS # 09365000



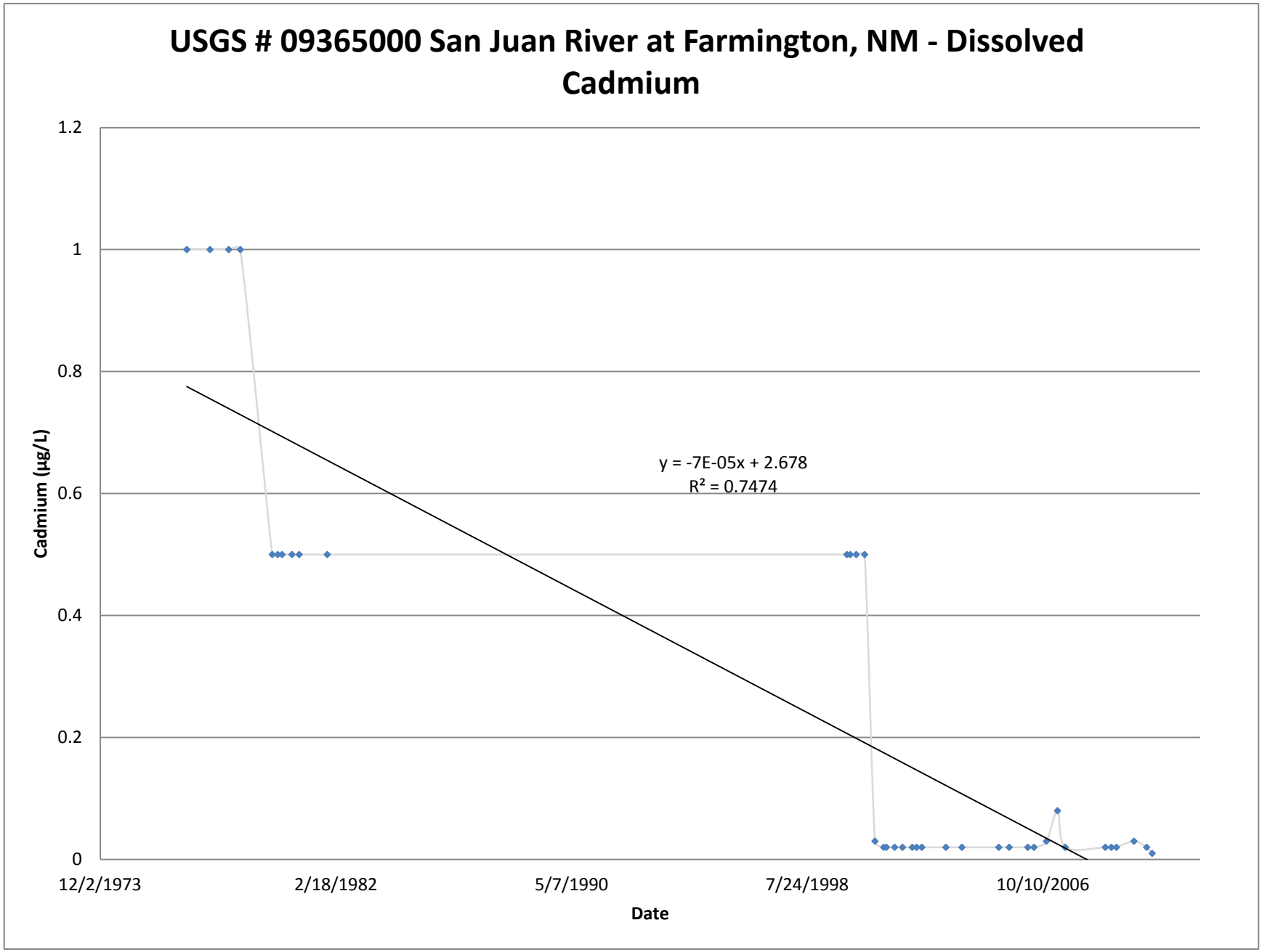
Appendix A - USGS Stations
USGS # 09365000



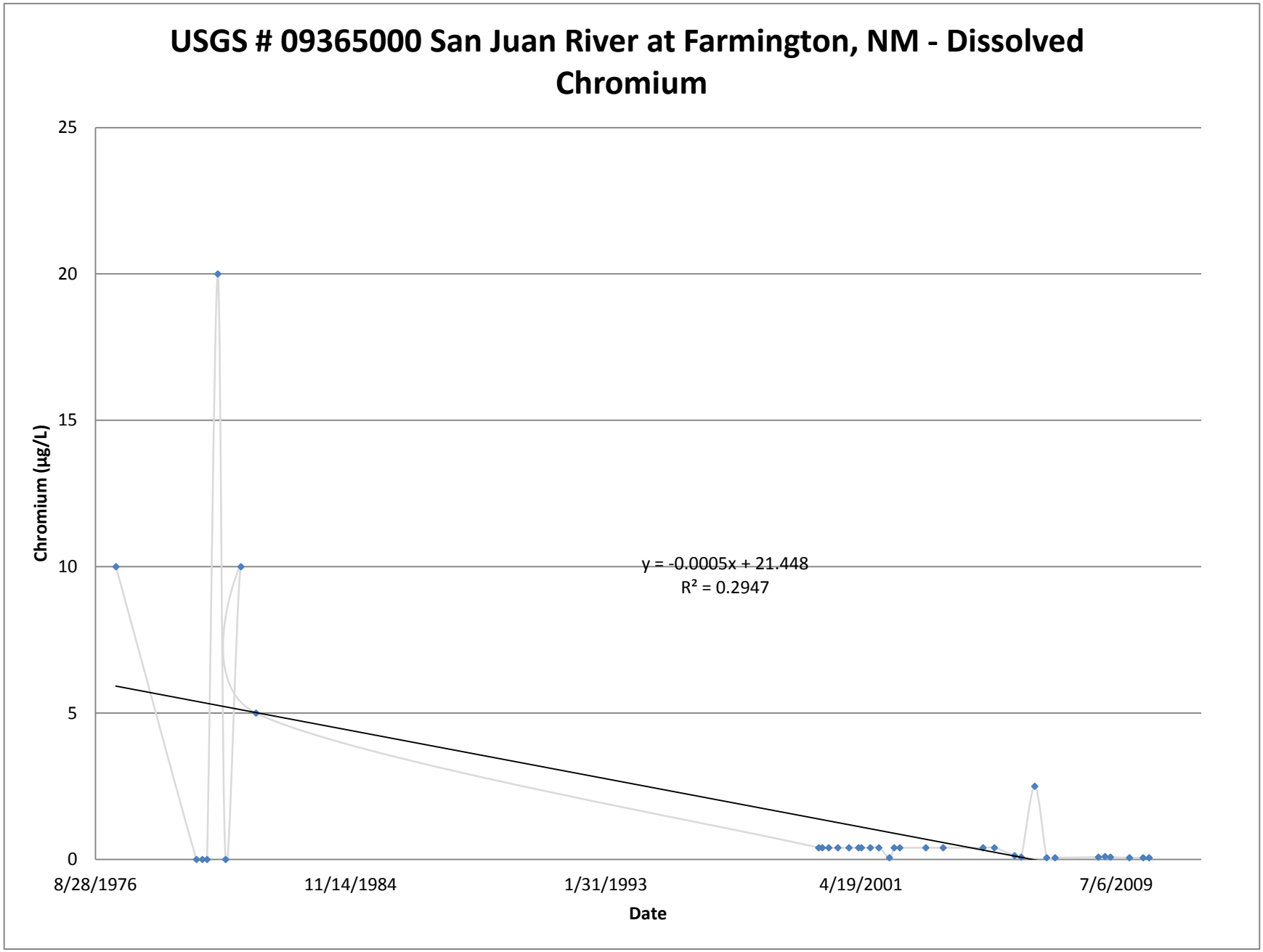
Appendix A - USGS Stations
USGS # 09365000

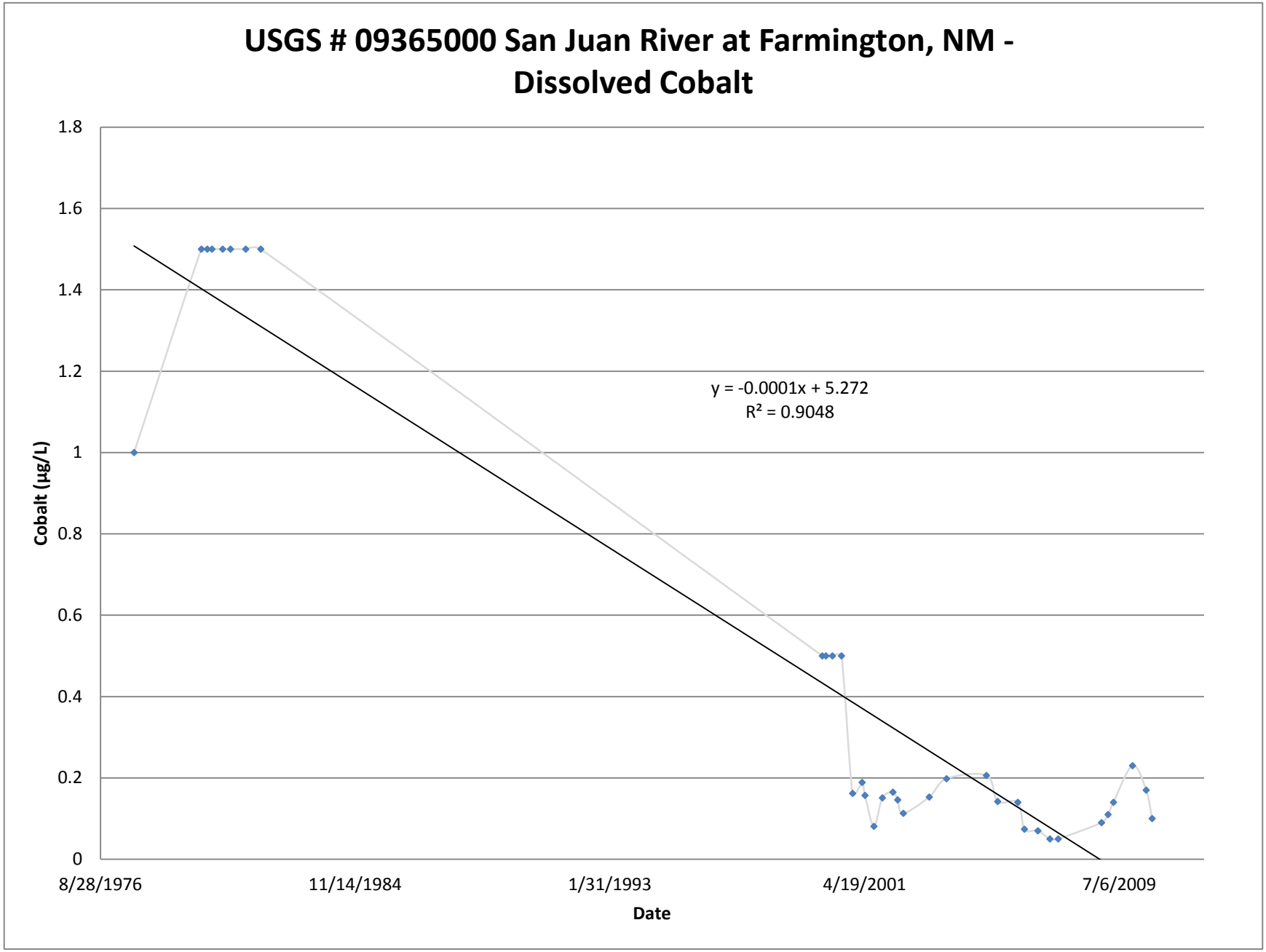


Appendix A - USGS Stations
USGS # 09365000

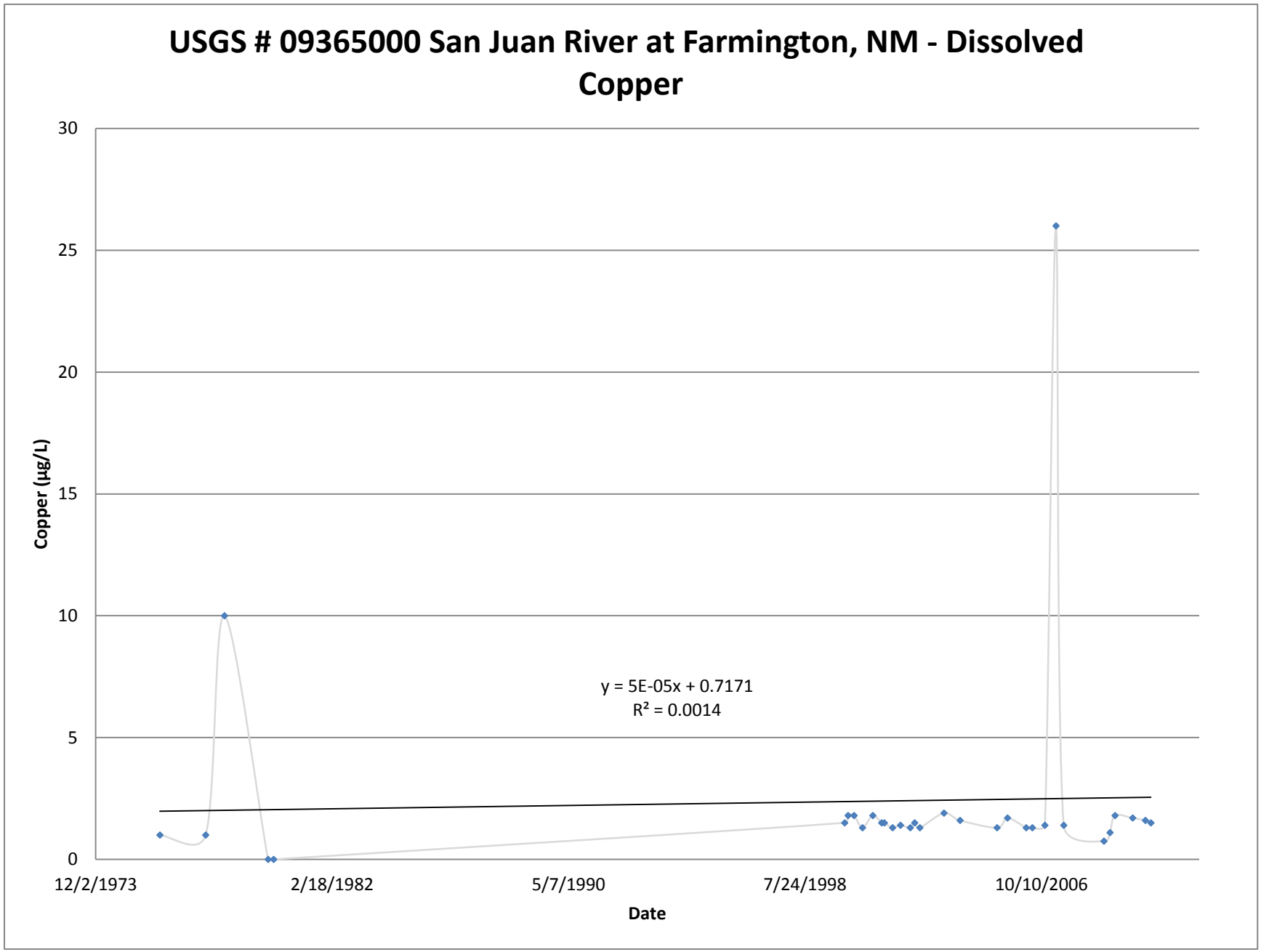


Appendix A - USGS Stations
USGS # 09365000

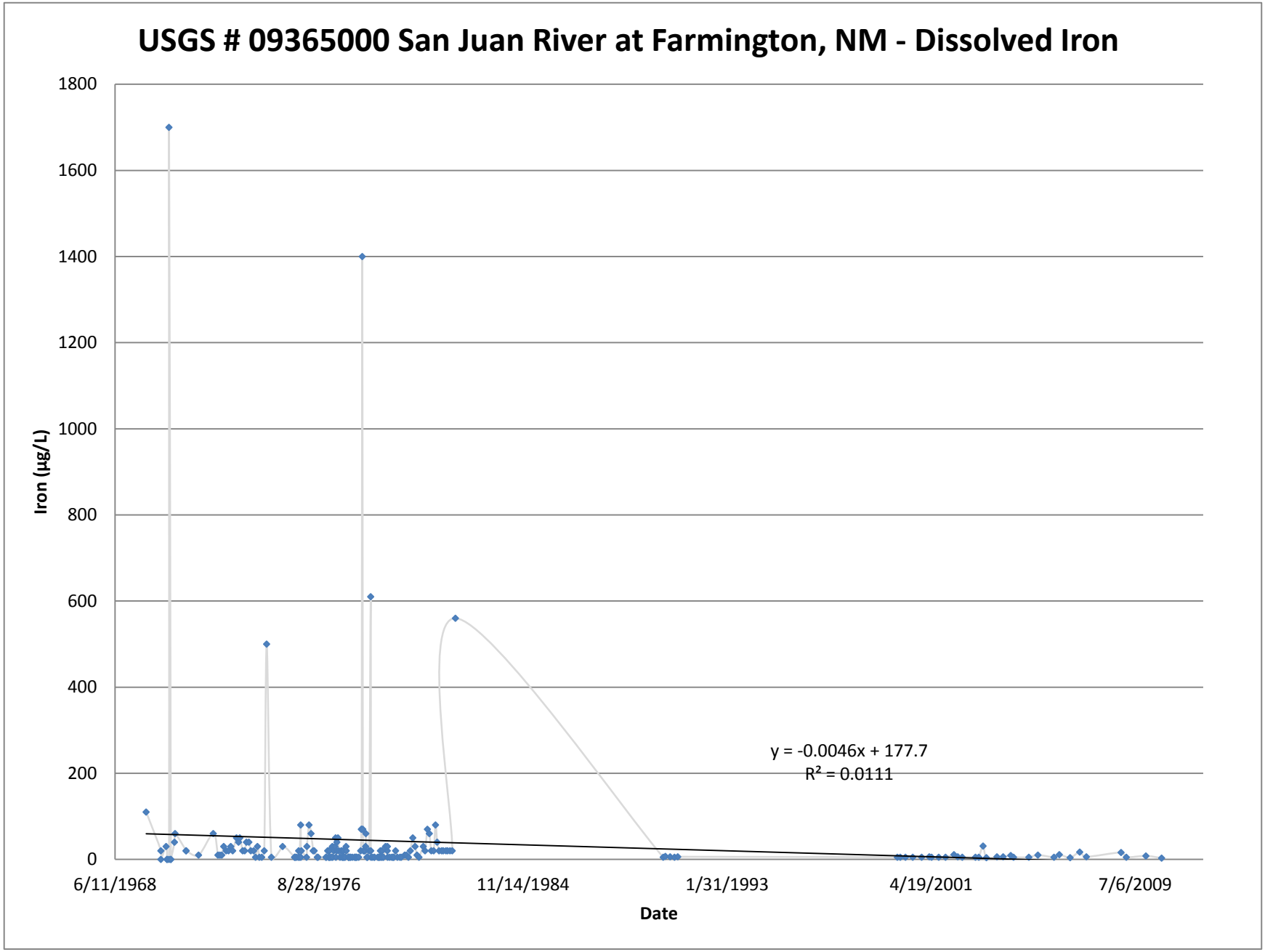


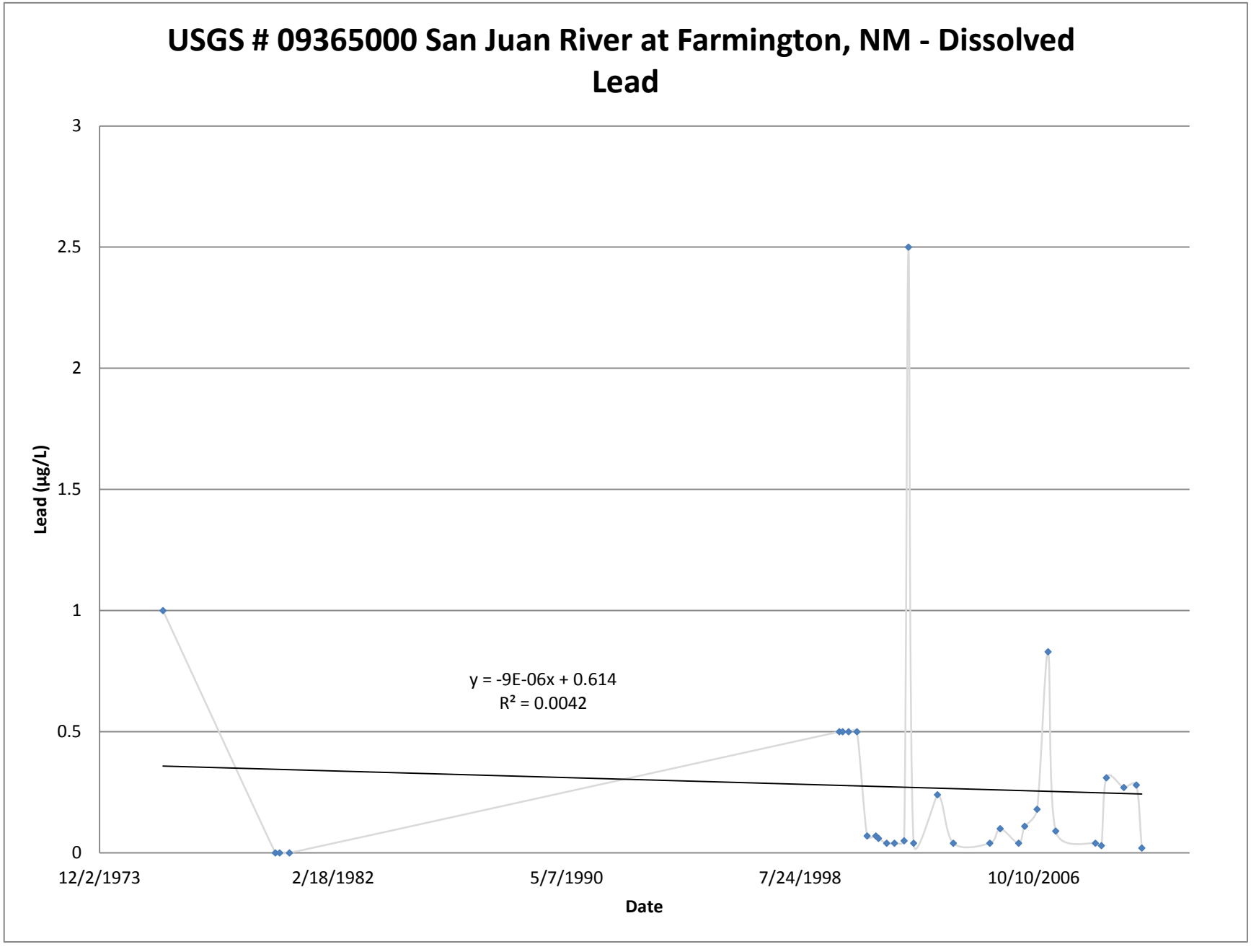

USGS # 09365000 San Juan River at Farmington, NM - Dissolved Cobalt
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Cobalt (µg/L)
y = -0.0001x + 5.272
R² = 0.9048
8/28/1976
11/14/1984
1/31/1993
4/19/2001
7/6/2009
Date

Appendix A - USGS Stations
USGS # 09365000

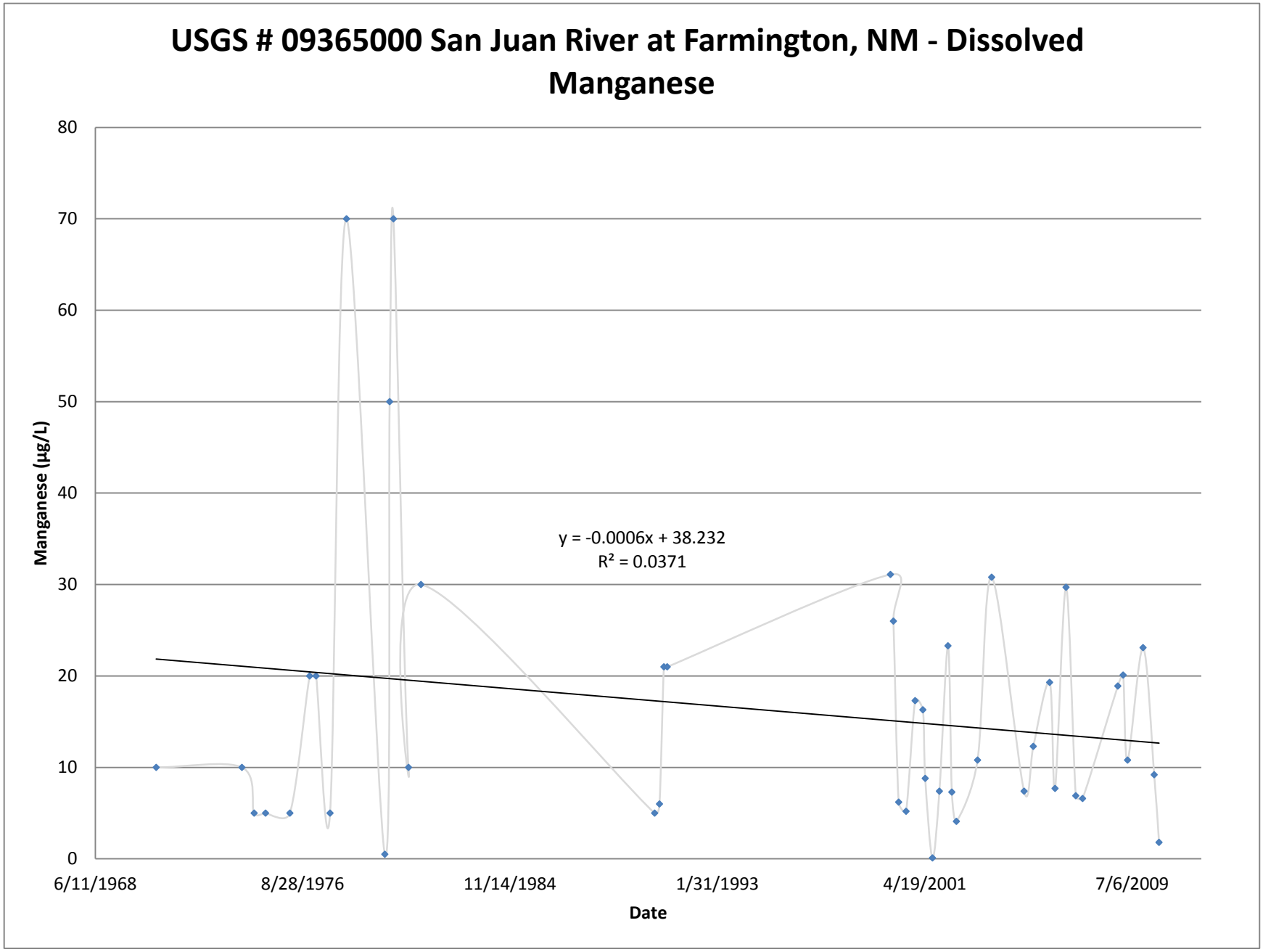


Appendix A - USGS Stations
USGS # 09365000

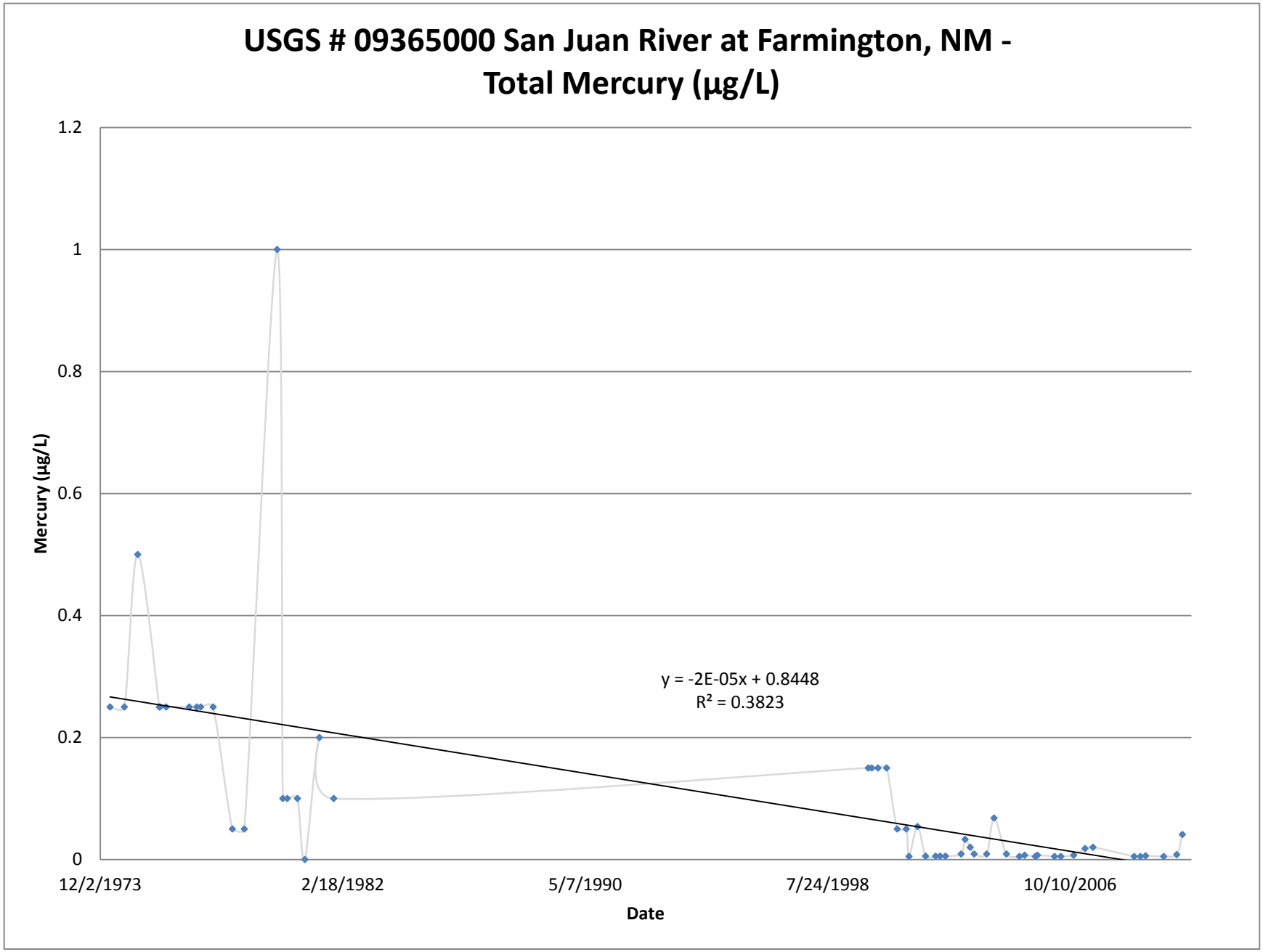



USGS # 09365000 San Juan River at Farmington, NM - Dissolved Lead
Lead (µg/L)
3
2.5
2
1.5
1
0.5
0
y = -9E-06x + 0.614
R² = 0.0042
12/2/1973
2/18/1982
5/7/1990
7/24/1998
10/10/2006
Date

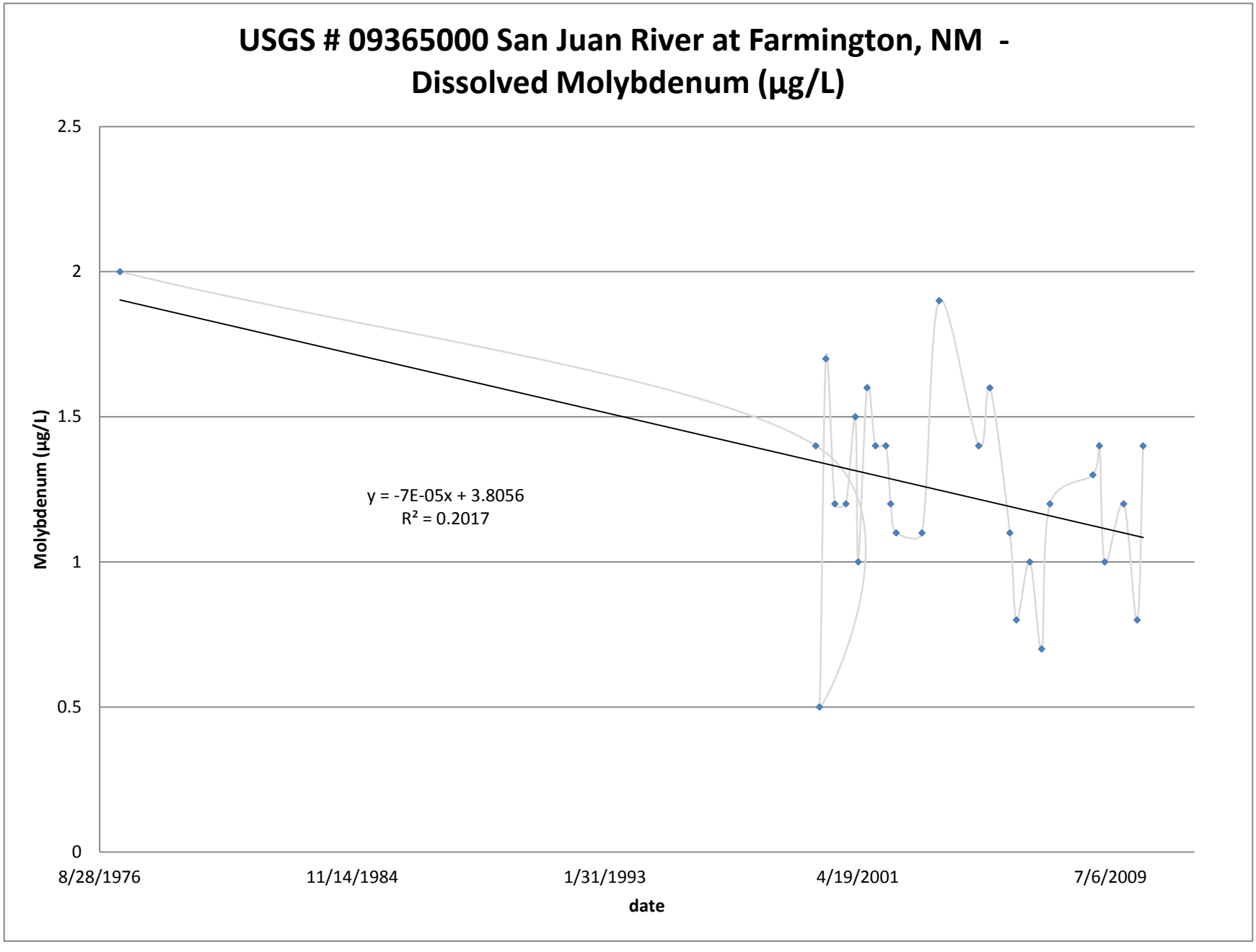
Appendix A - USGS Stations
USGS # 09365000



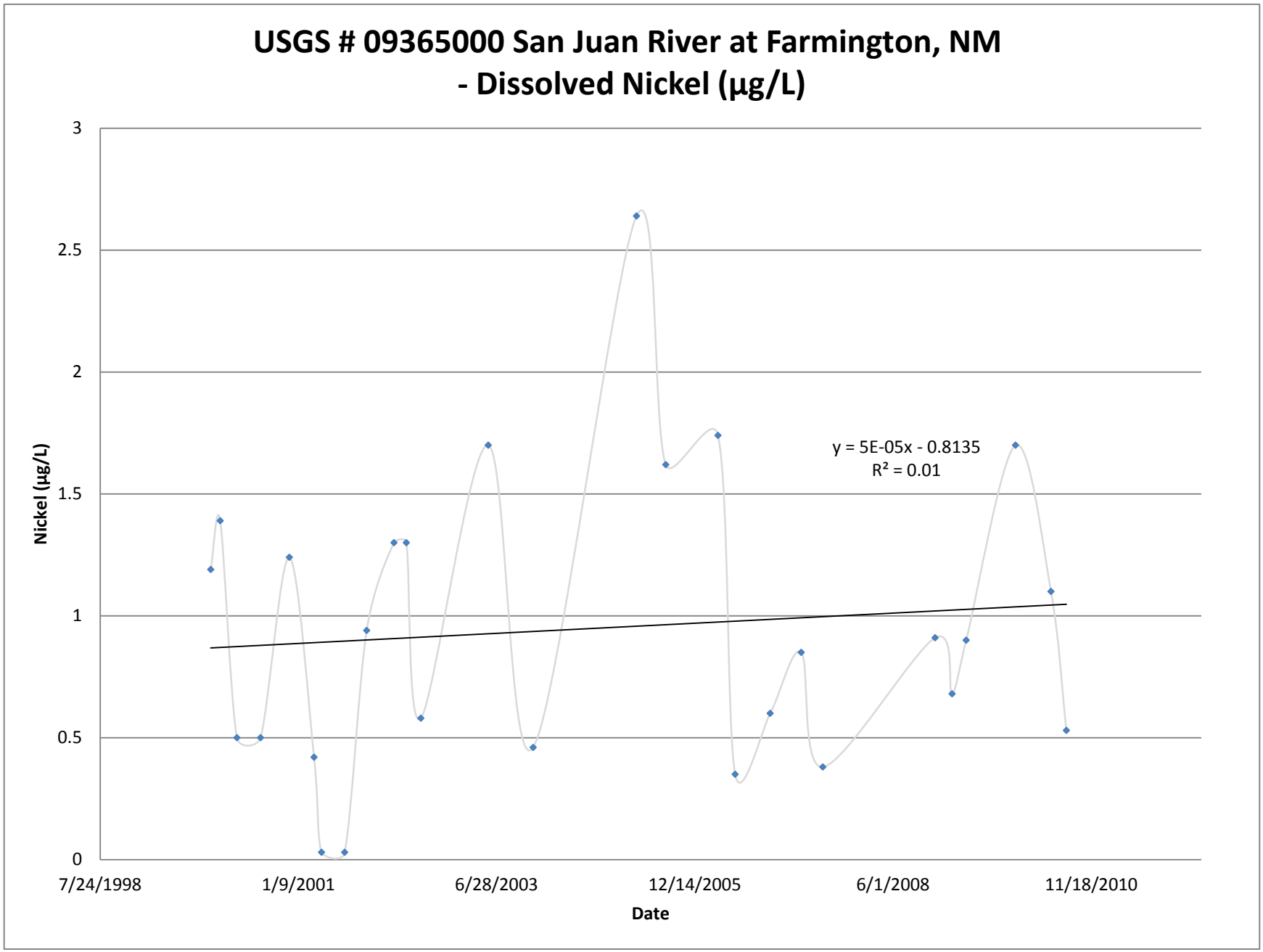
Appendix A - USGS Stations
USGS # 09365000



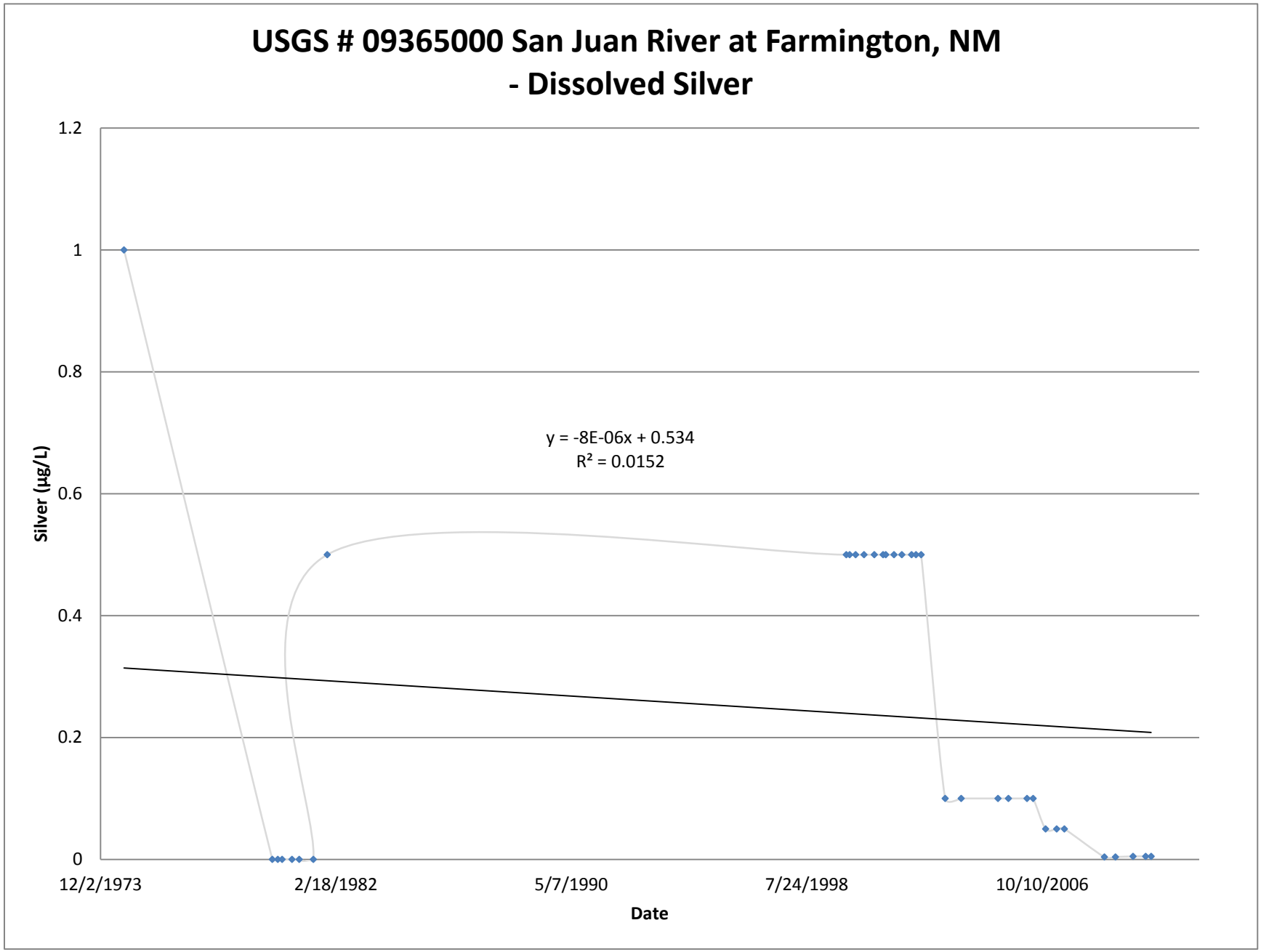
Appendix A - USGS Stations
USGS # 09365000



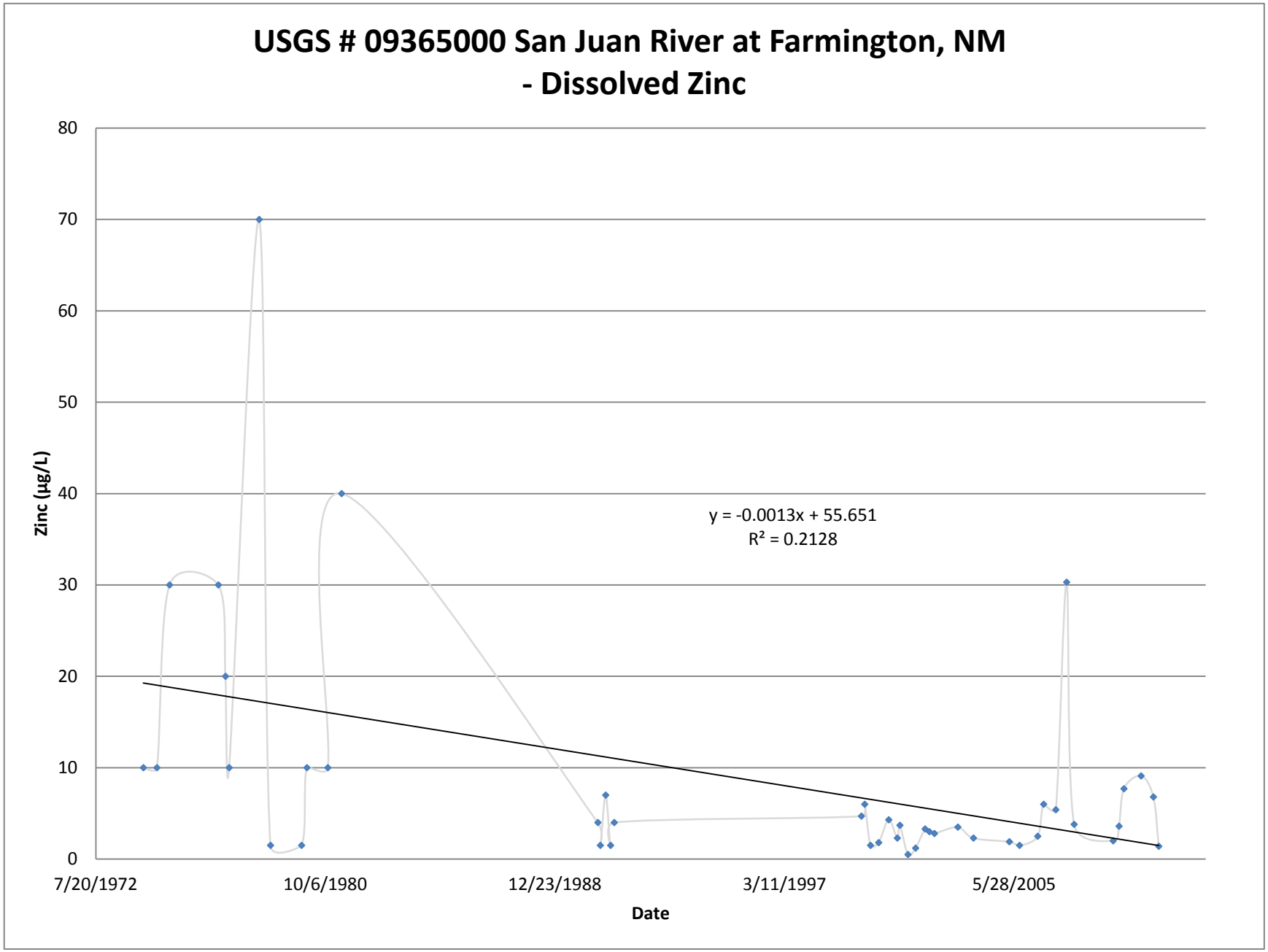
Appendix A - USGS Stations
USGS # 09365000



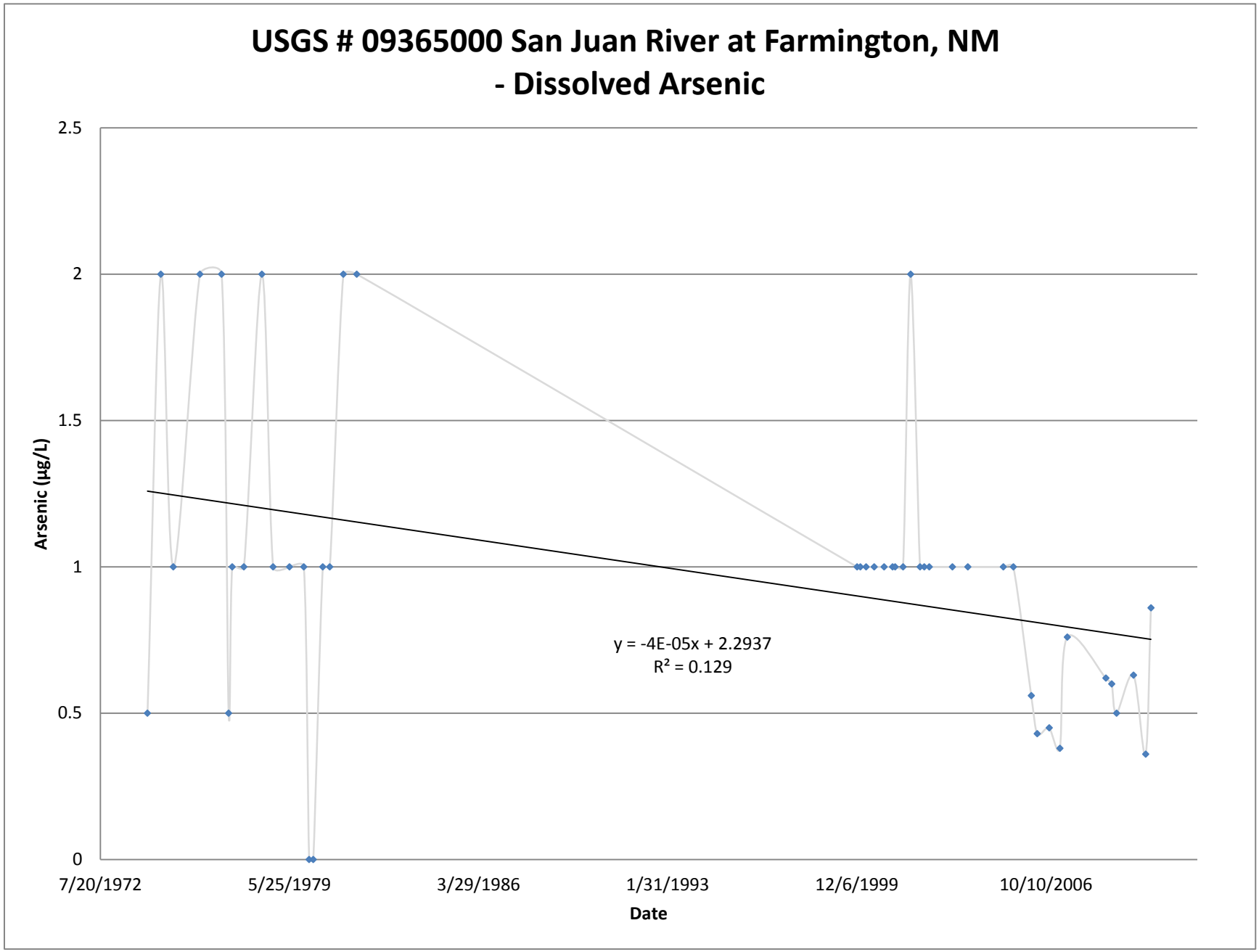
Appendix A - USGS Stations
USGS # 09365000



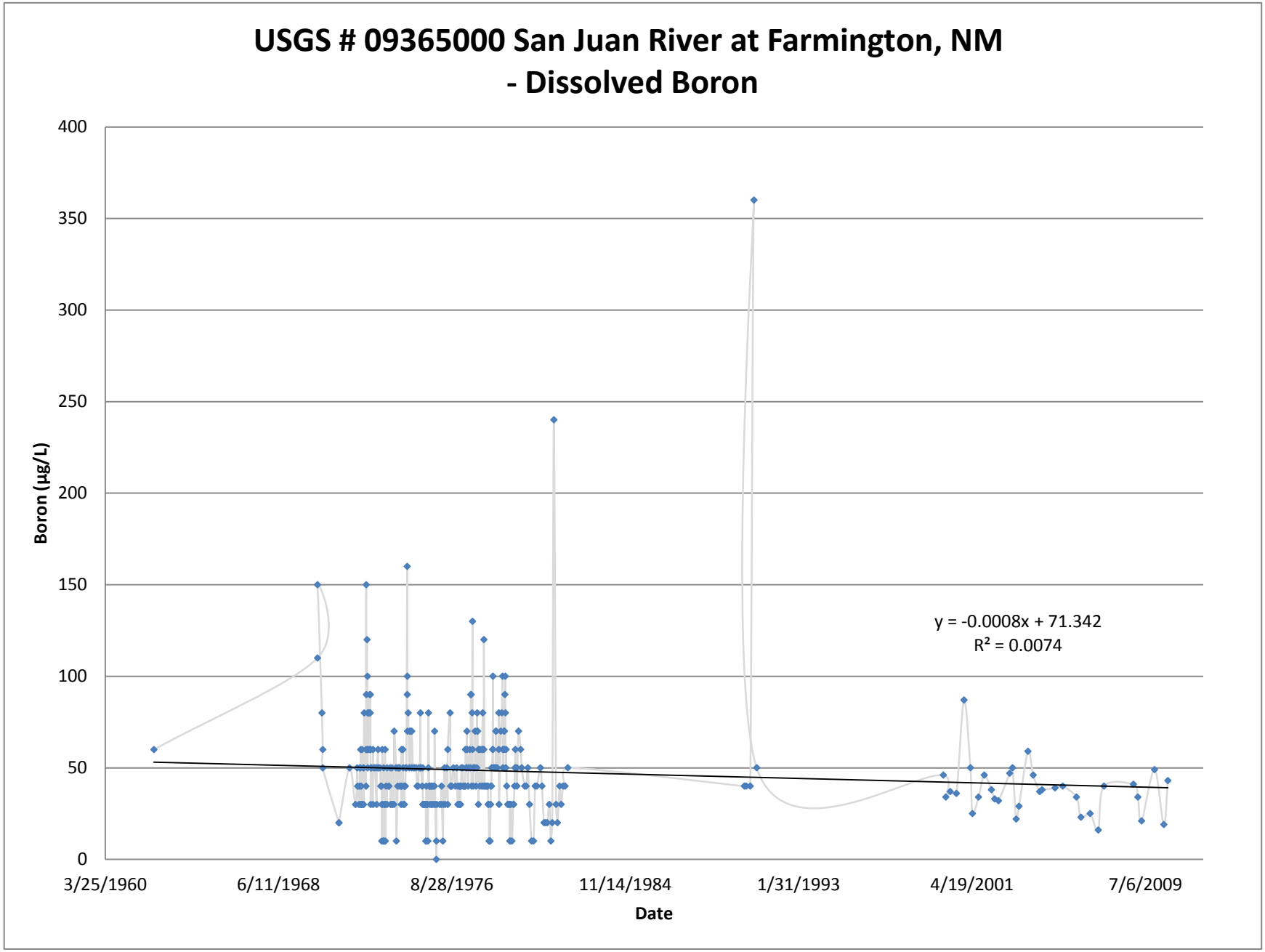
Appendix A - USGS Stations
USGS # 09365000



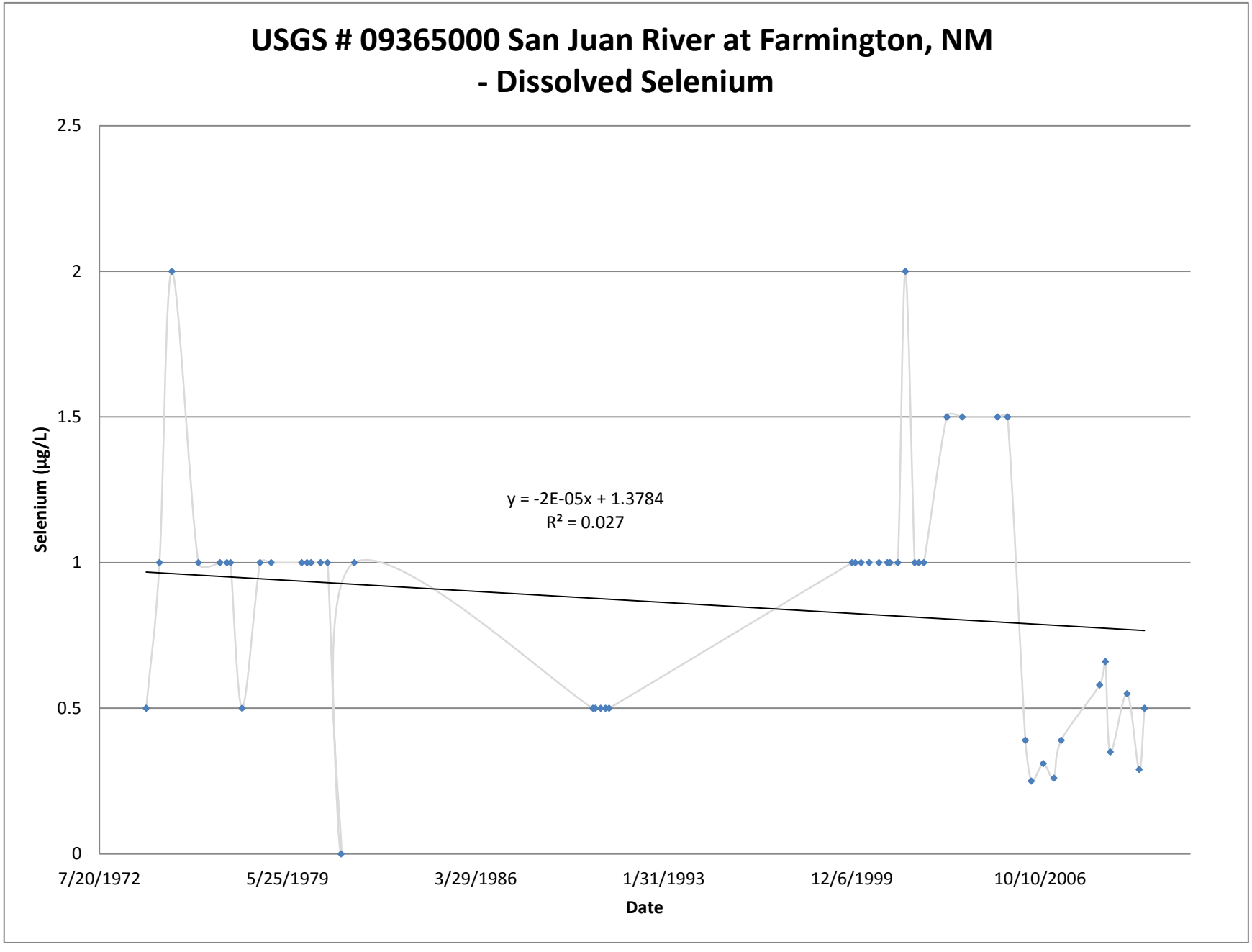
Appendix A - USGS Stations
USGS # 09365000



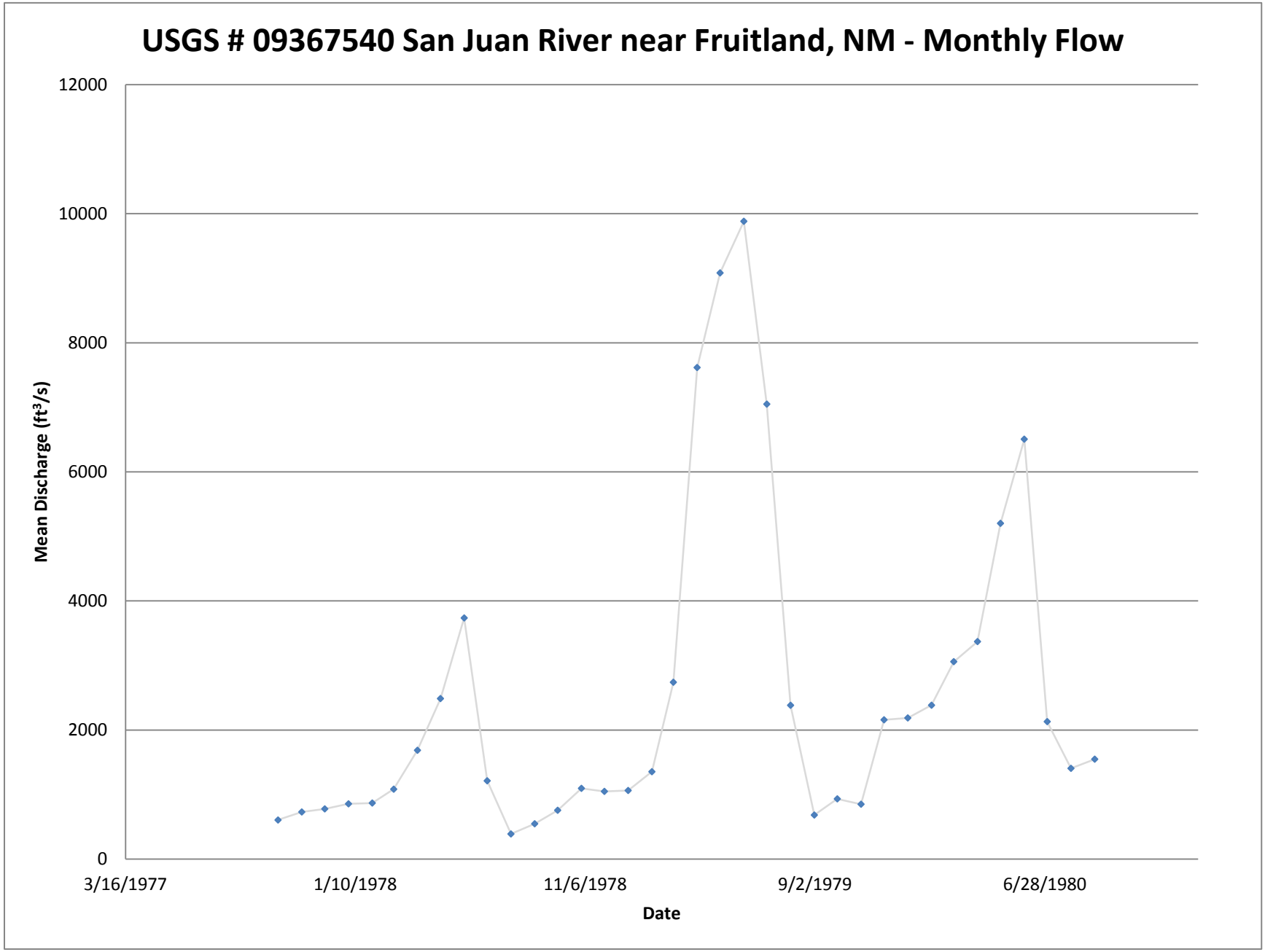
Appendix A - USGS Stations
USGS # 09365000



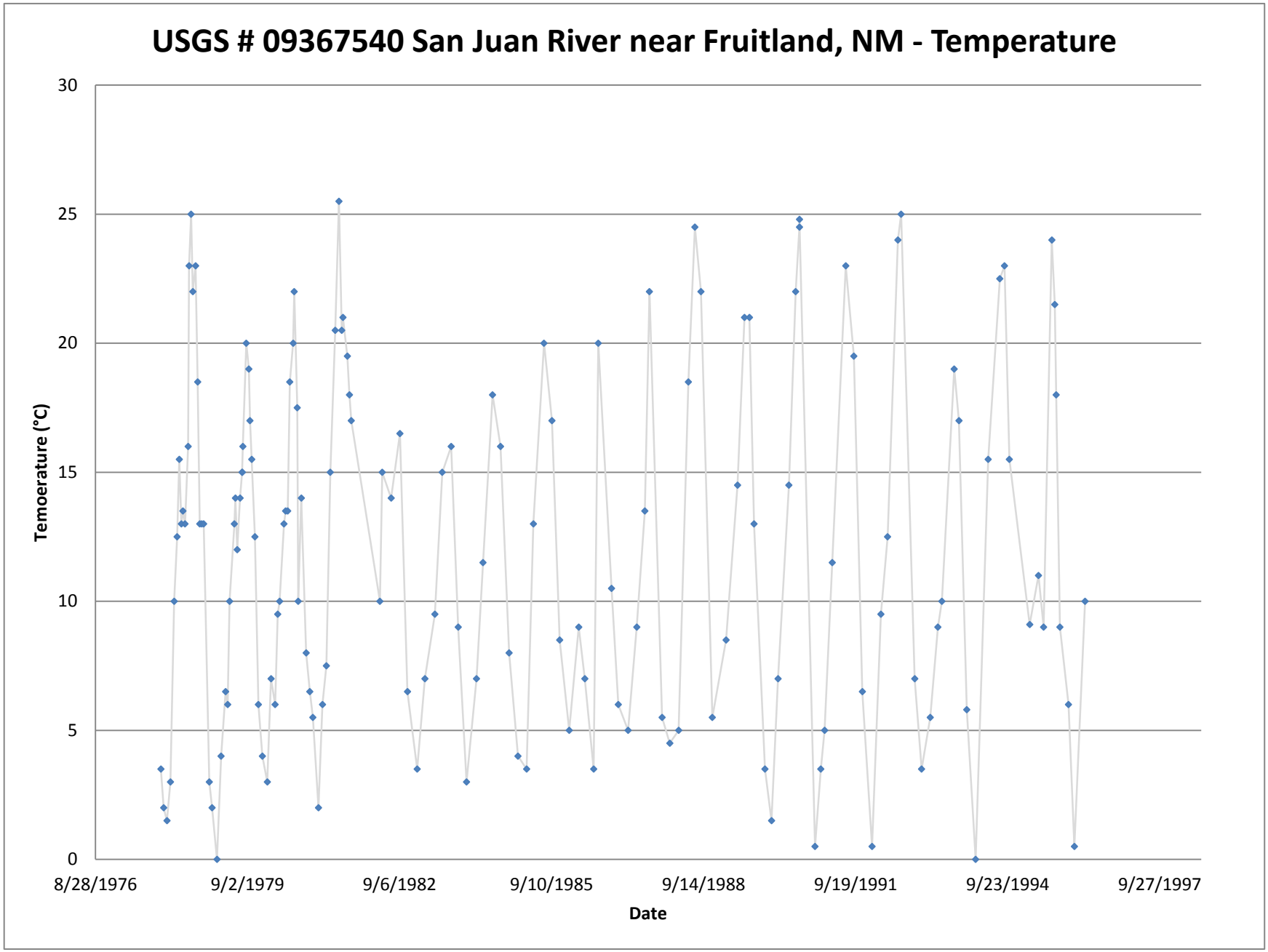
Appendix A - USGS Stations
USGS # 09365000



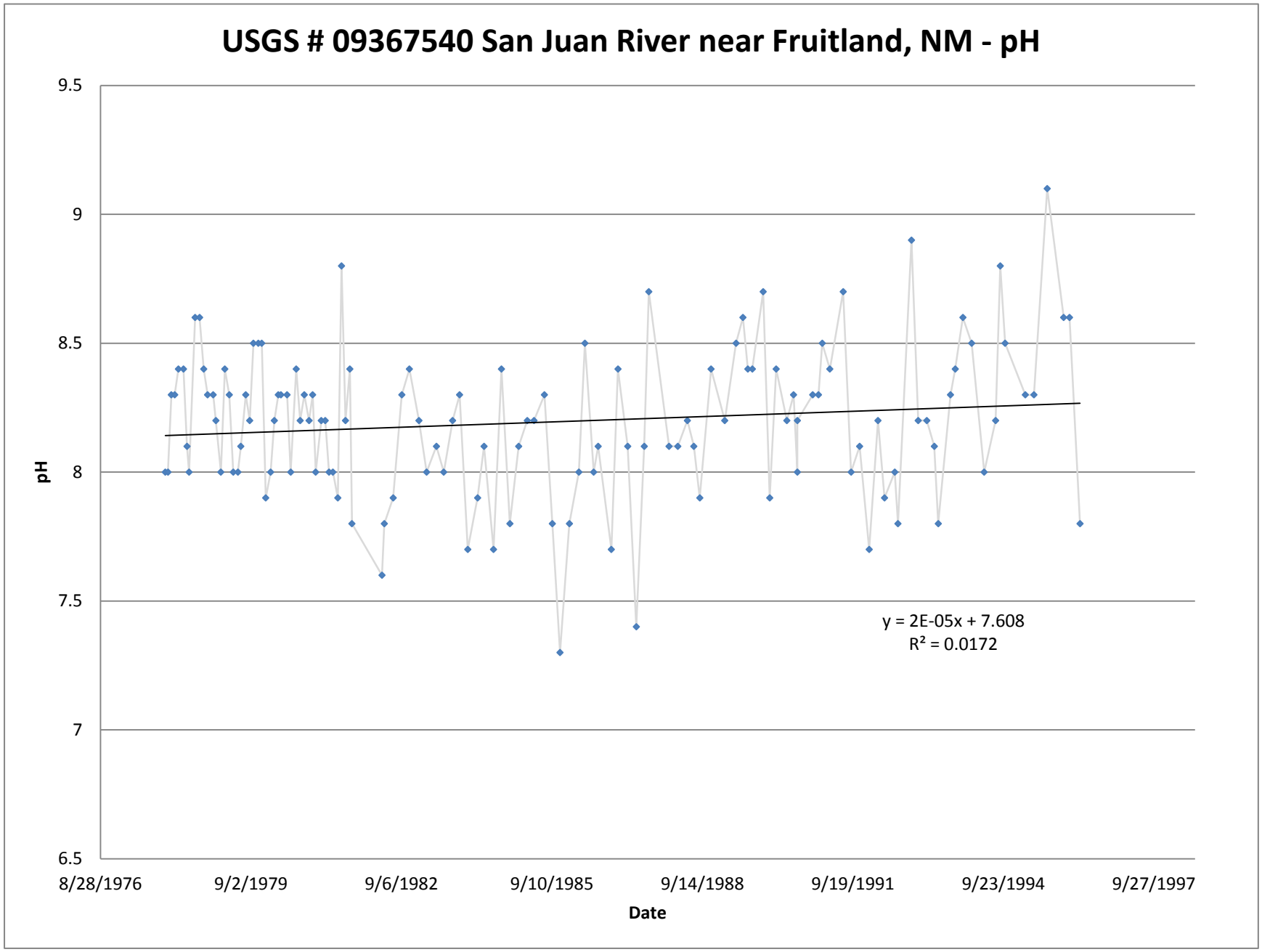
Appendix A - USGS Stations
USGS # 09367540



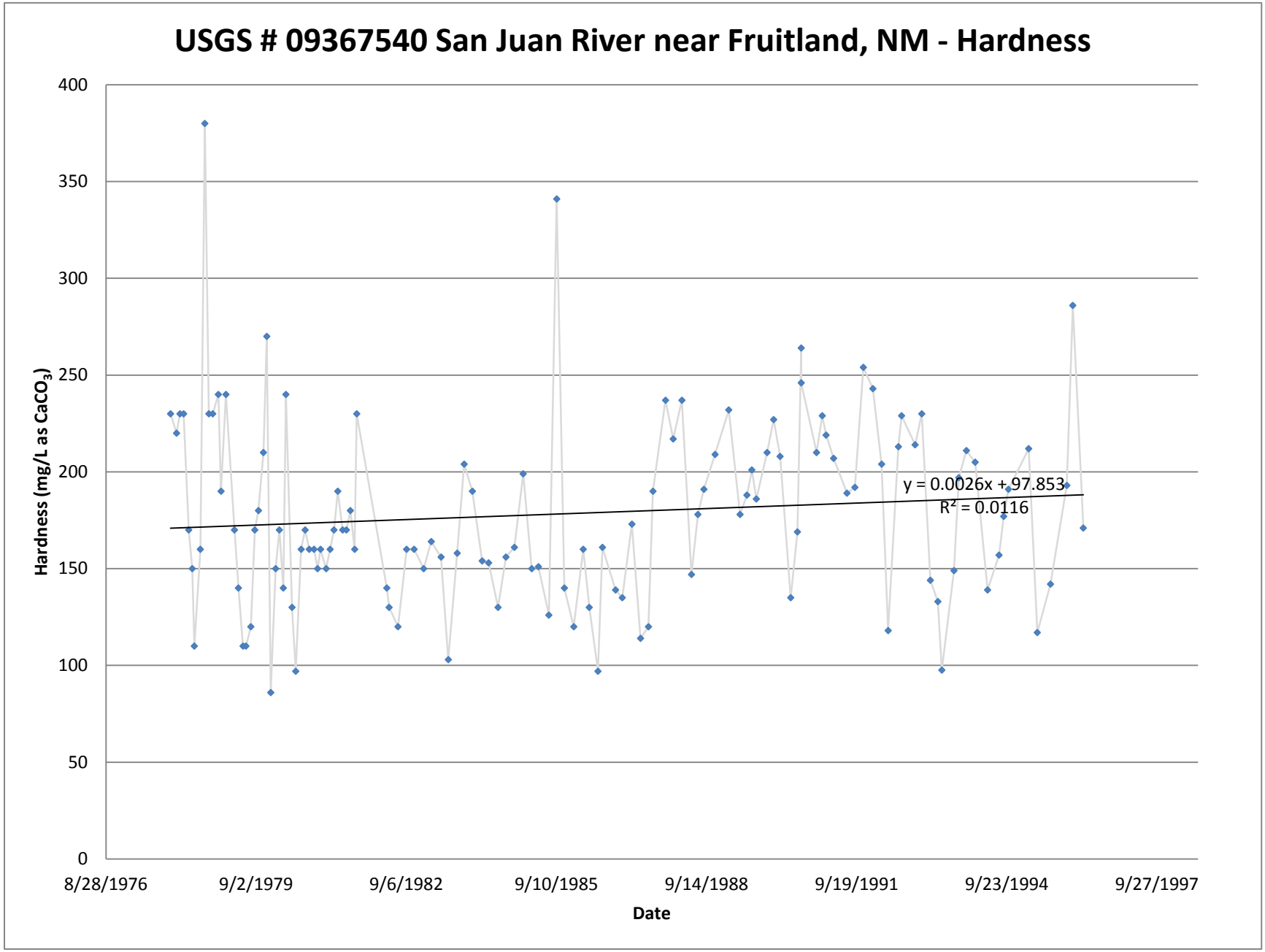
Appendix A - USGS Stations
USGS # 09367540



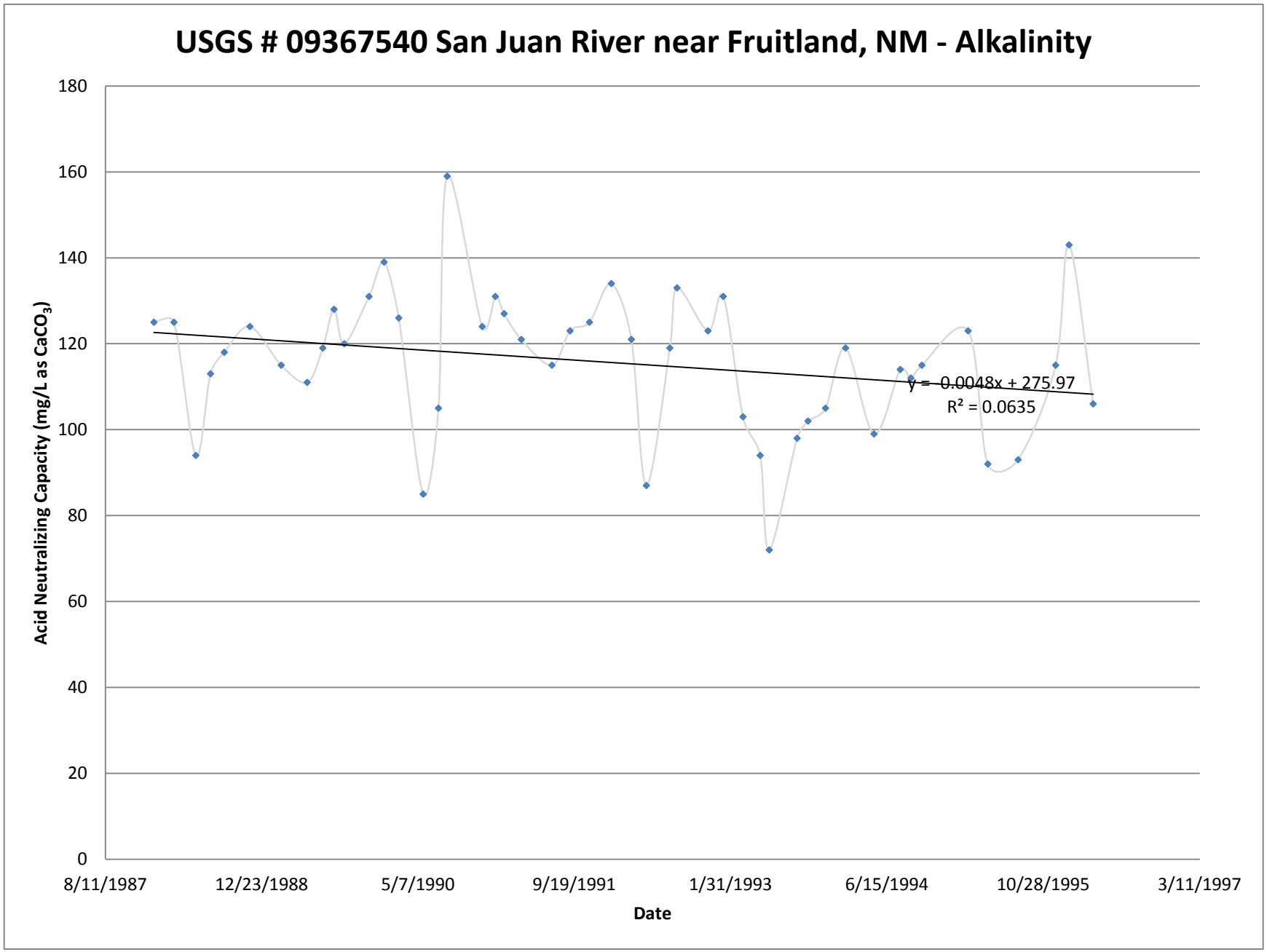
Appendix A - USGS Stations
USGS # 09367540

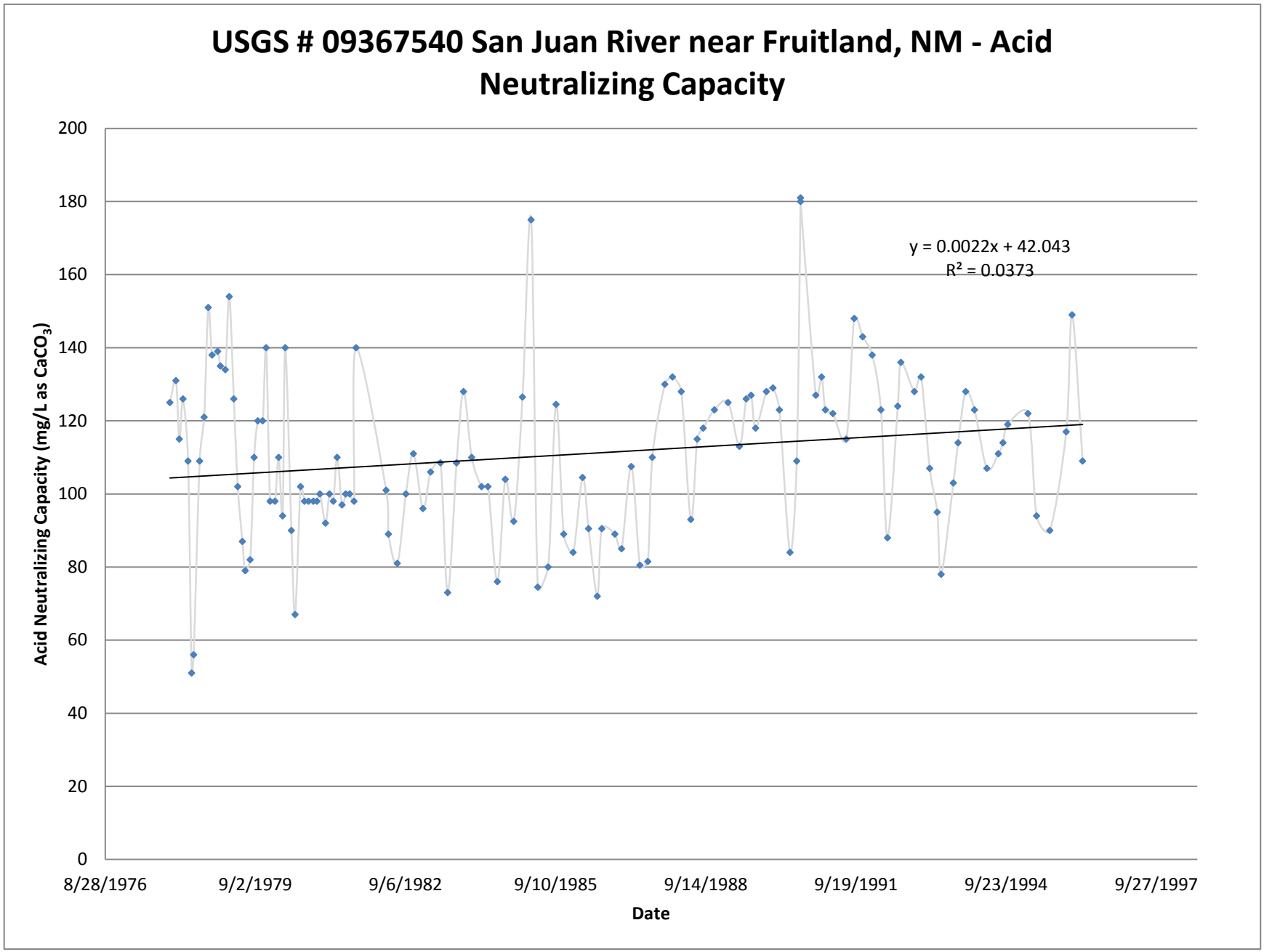


Appendix A - USGS Stations
USGS # 09367540

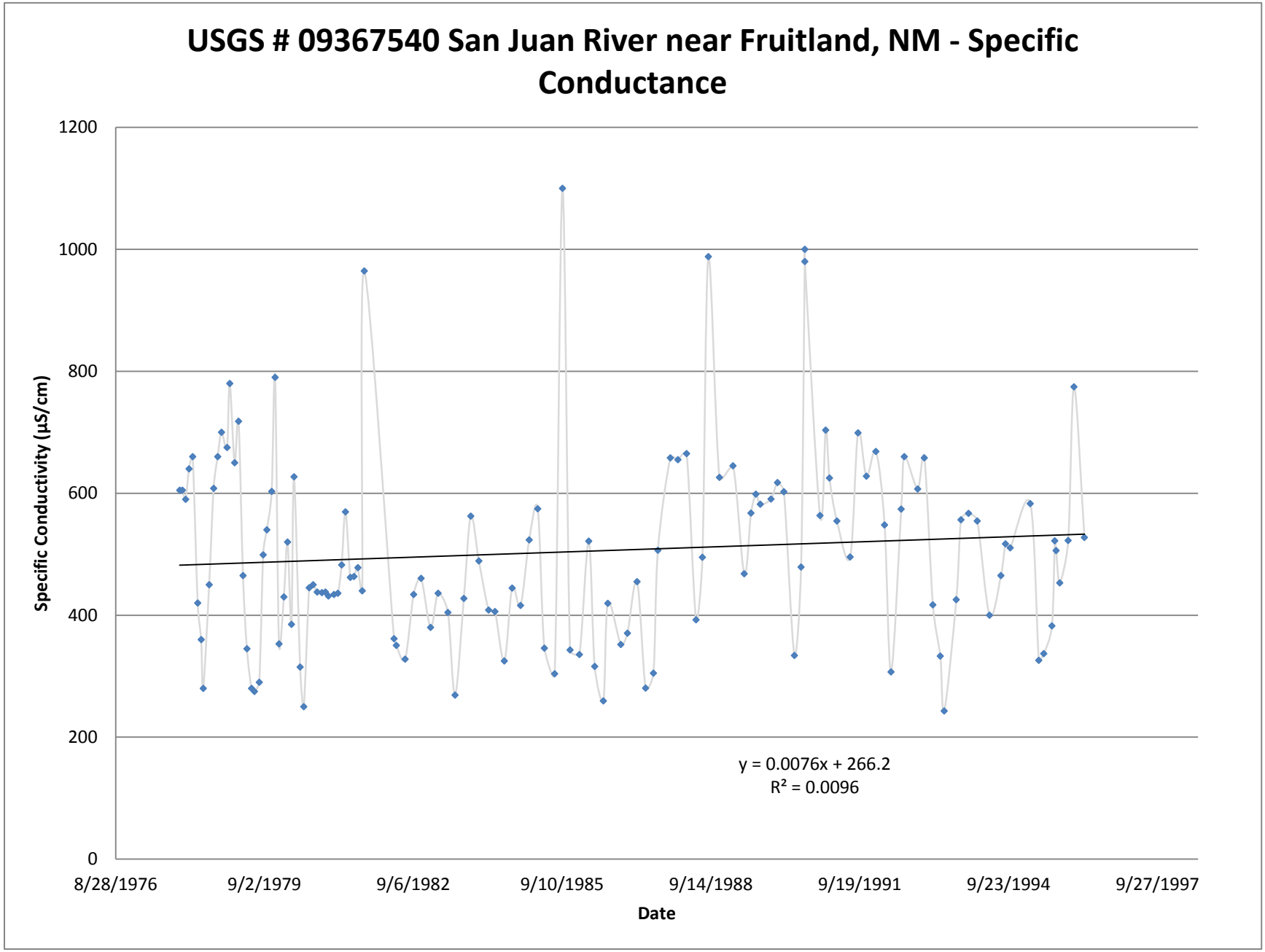


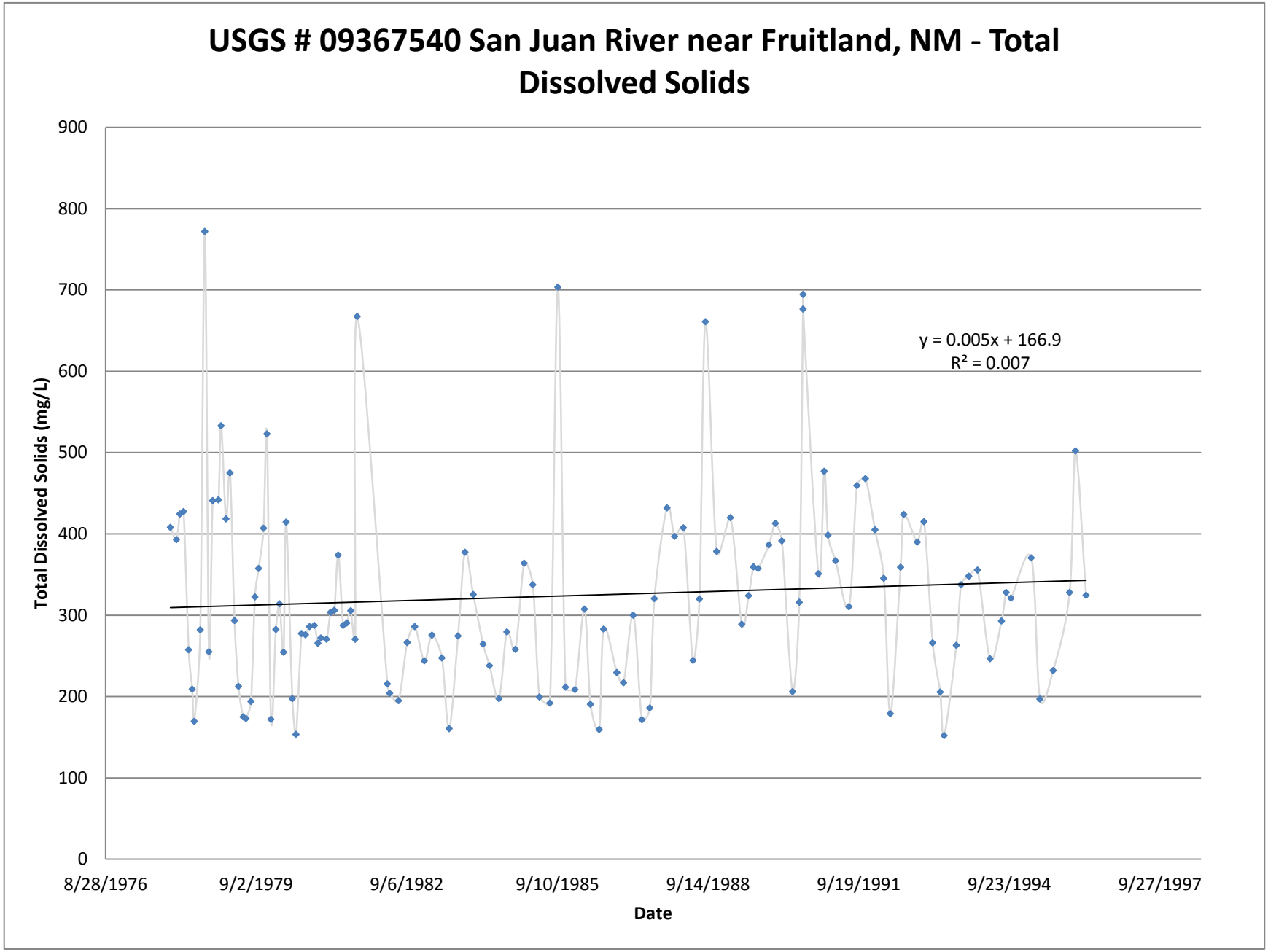
Appendix A - USGS Stations
USGS # 09367540

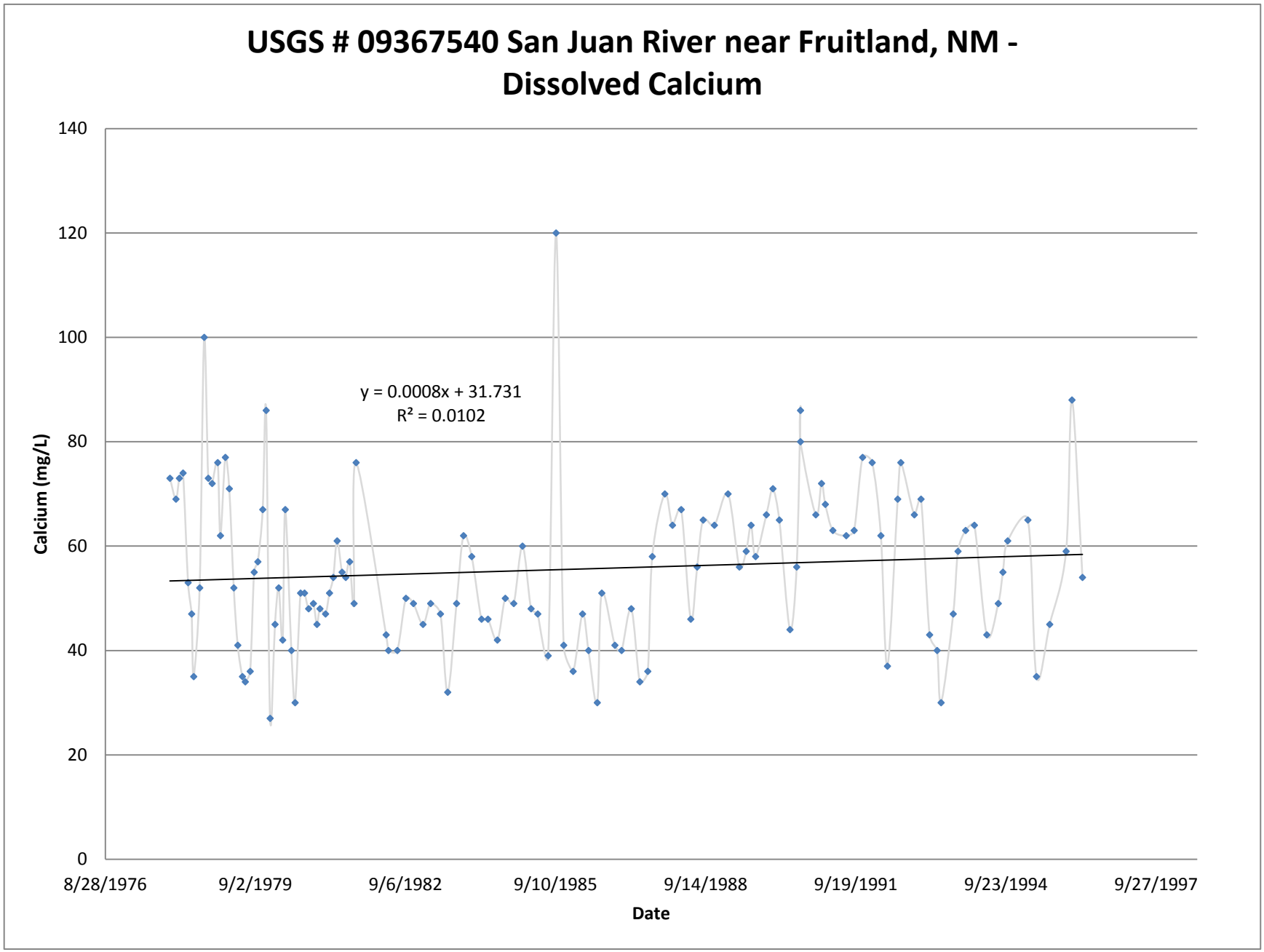


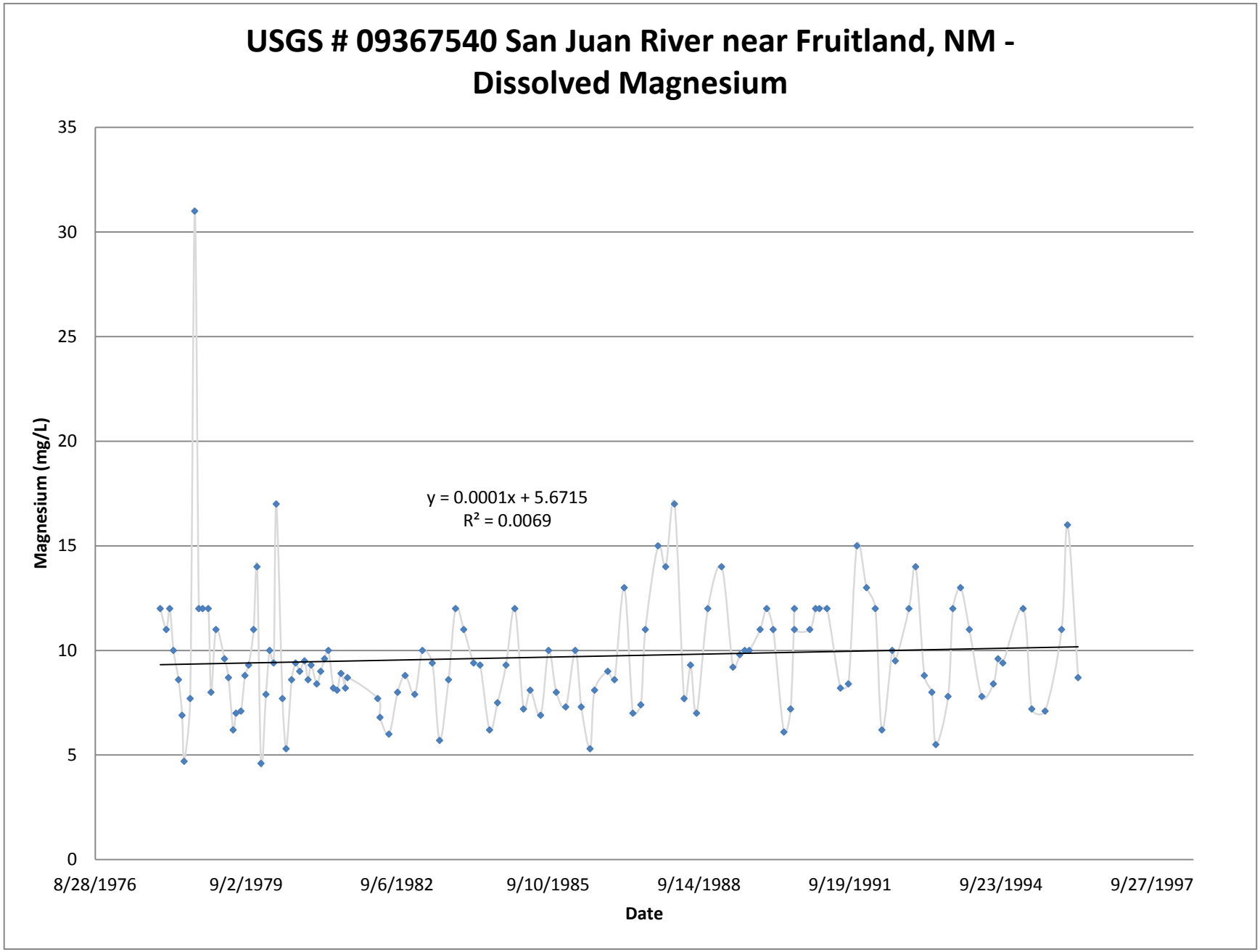

USGS # 09367540 San Juan River near Fruitland, NM - Acid Neutralizing Capacity
y = 0.0022x + 42.043
R² = 0.0373
Acid Neutralizing Capacity (mg/L as CaCO3)
200
180
160
140
120
100
80
60
40
20
0
8/28/1976
9/2/1979
9/6/1982
9/10/1985
9/14/1988
9/19/1991
9/23/1994
9/27/1997
Date

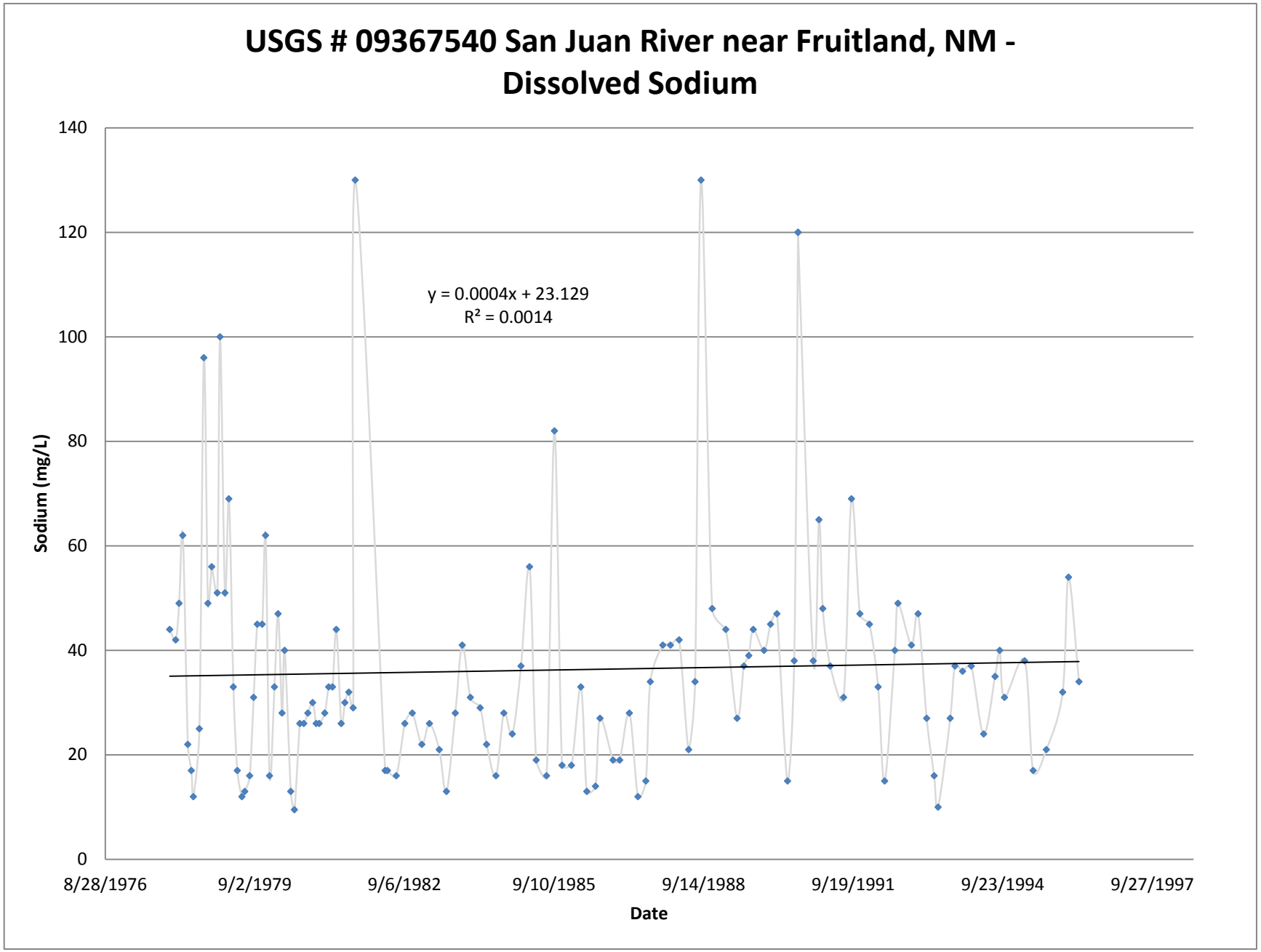
Appendix A - USGS Stations
USGS # 09367540



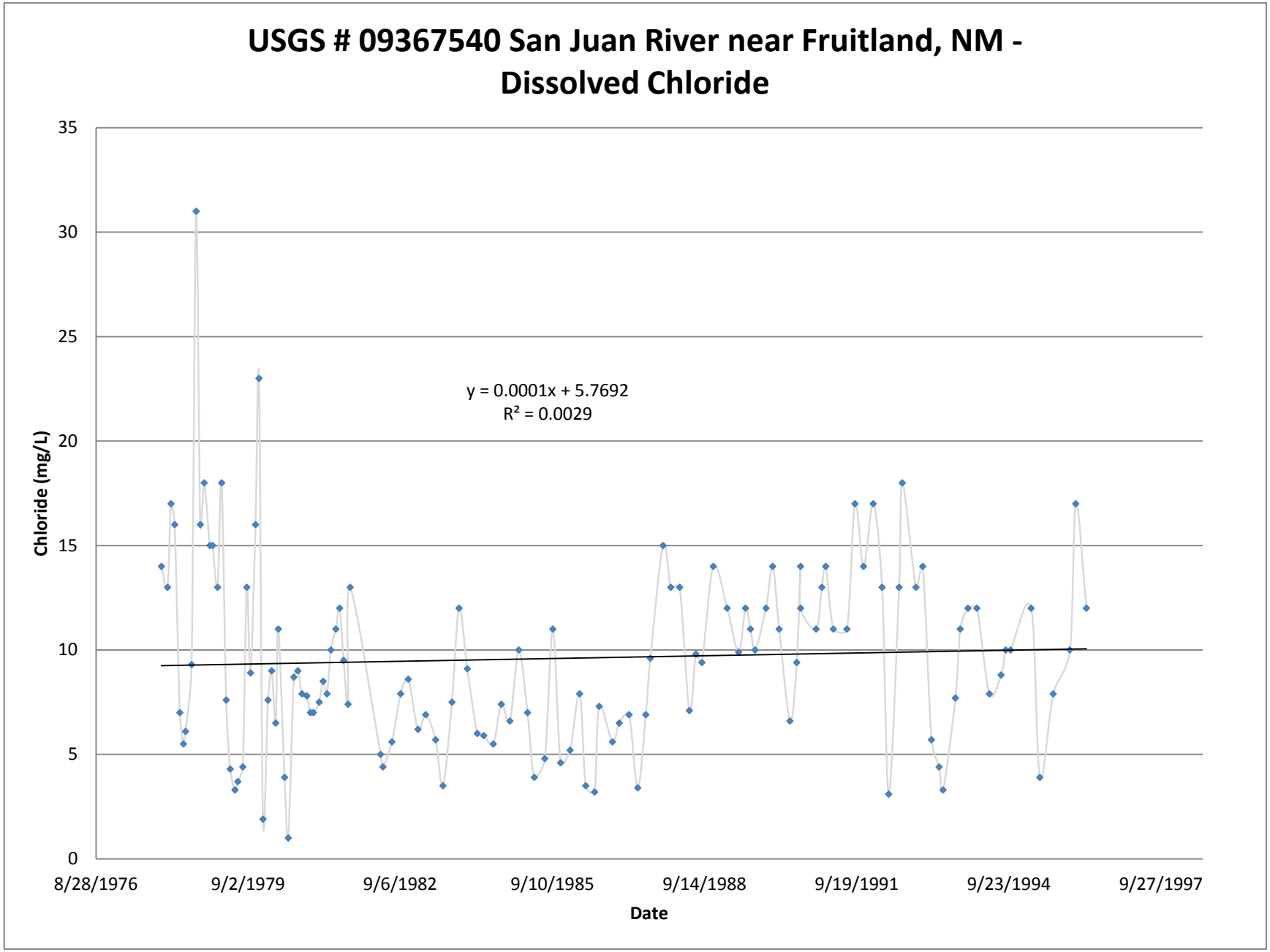

USGS # 09367540 San Juan River near Fruitland, NM - Total Dissolved Solids
Total Dissolved Solids (mg/L)
900
800
700
600
500
400
300
200
100
0
8/28/1976
9/2/1979
9/6/1982
9/10/1985
9/14/1988
9/19/1991
9/23/1994
9/27/1997
Date
y = 0.005x + 166.9
R² = 0.007


USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Calcium
y = 0.0008x + 31.731
R² = 0.0102
Calcium (mg/L)
140
120
100
80
60
40
20
0
8/28/1976
9/2/1979
9/6/1982
9/10/1985
9/14/1988
9/19/1991
9/23/1994
9/27/1997
Date

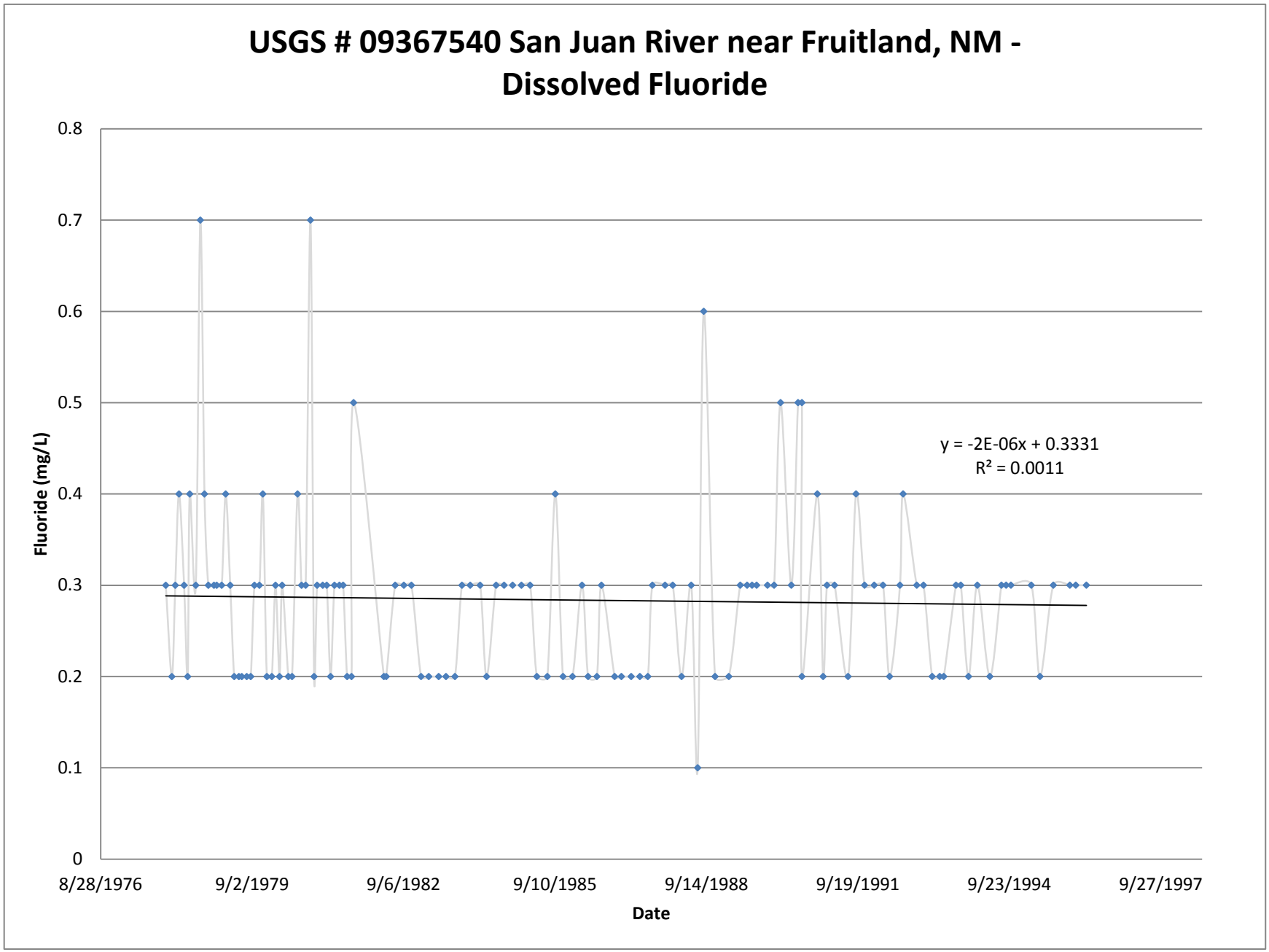

USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Magnesium
Magnesium (mg/L)
35
30
25
20
15
10
5
0
y = 0.0001x + 5.6715
R² = 0.0069
8/28/1976
9/2/1979
9/6/1982
9/10/1985
9/14/1988
9/19/1991
9/23/1994
9/27/1997
Date


USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Sodium
y = 0.0004x + 23.129
R² = 0.0014
Sodium (mg/L)
0
20
40
60
80
100
120
140
8/28/1976
9/2/1979
9/6/1982
9/10/1985
9/14/1988
9/19/1991
9/23/1994
9/27/1997
Date

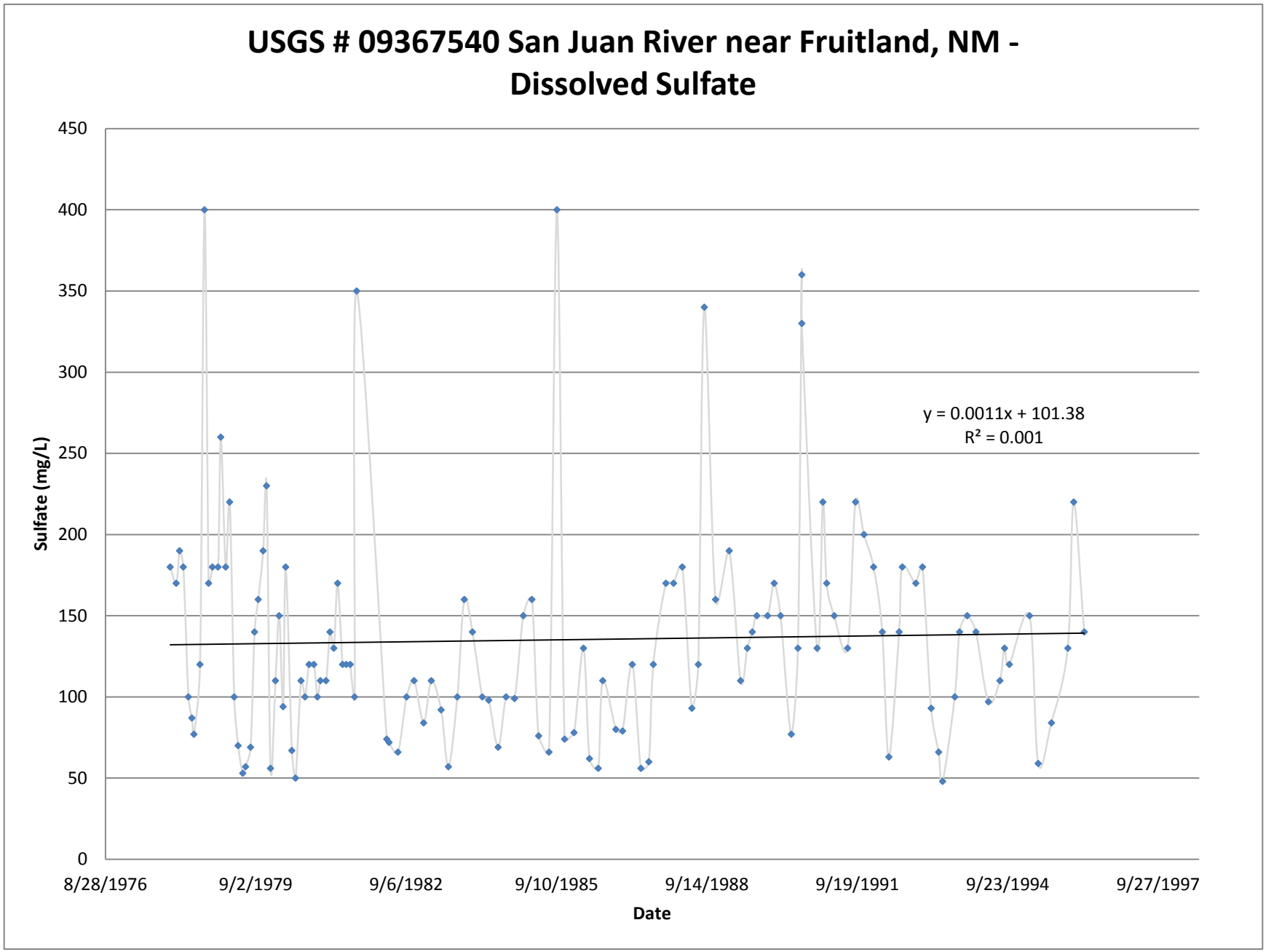
Appendix A - USGS Stations
USGS # 09367540



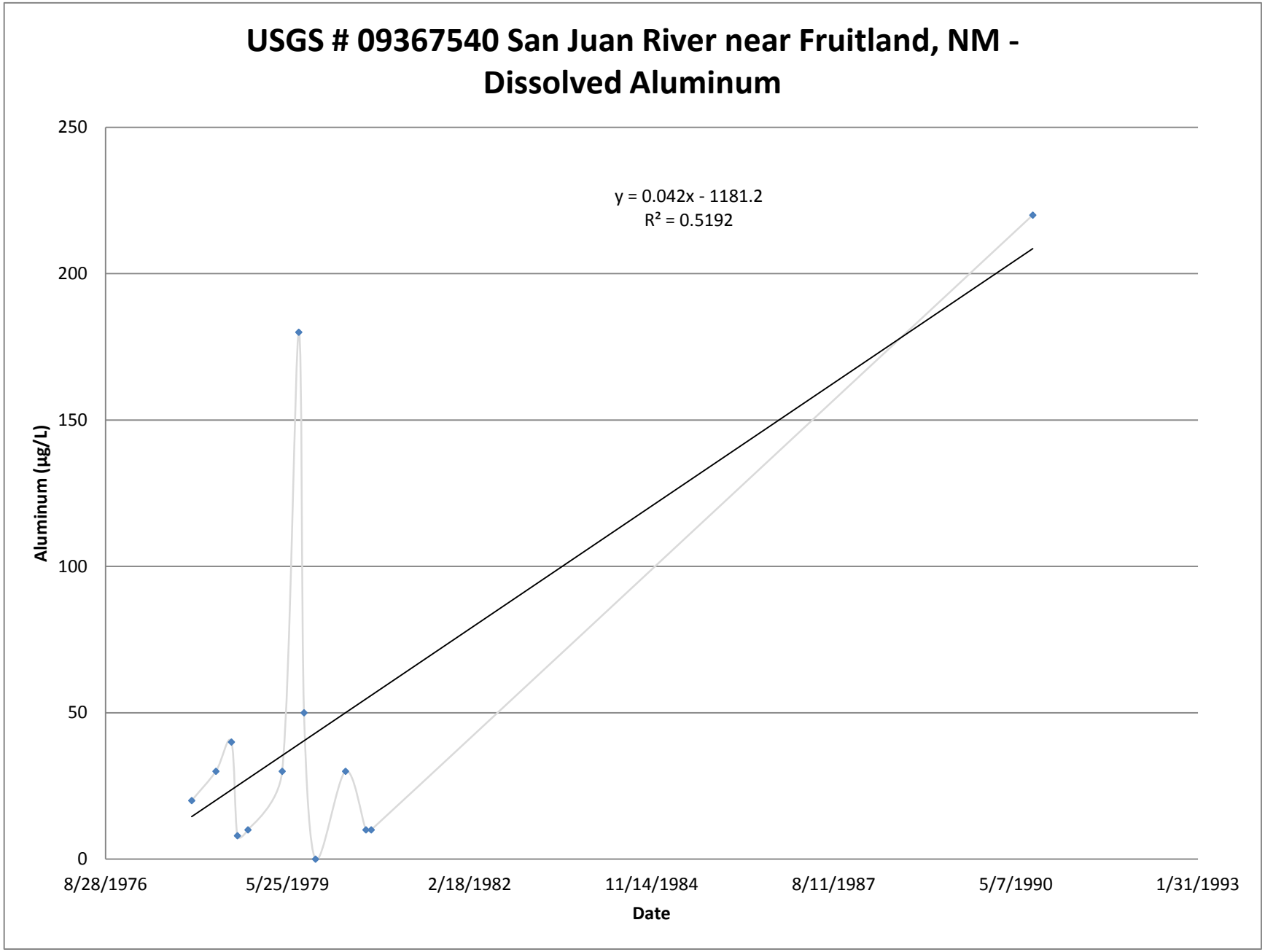
Appendix A - USGS Stations
USGS # 09367540



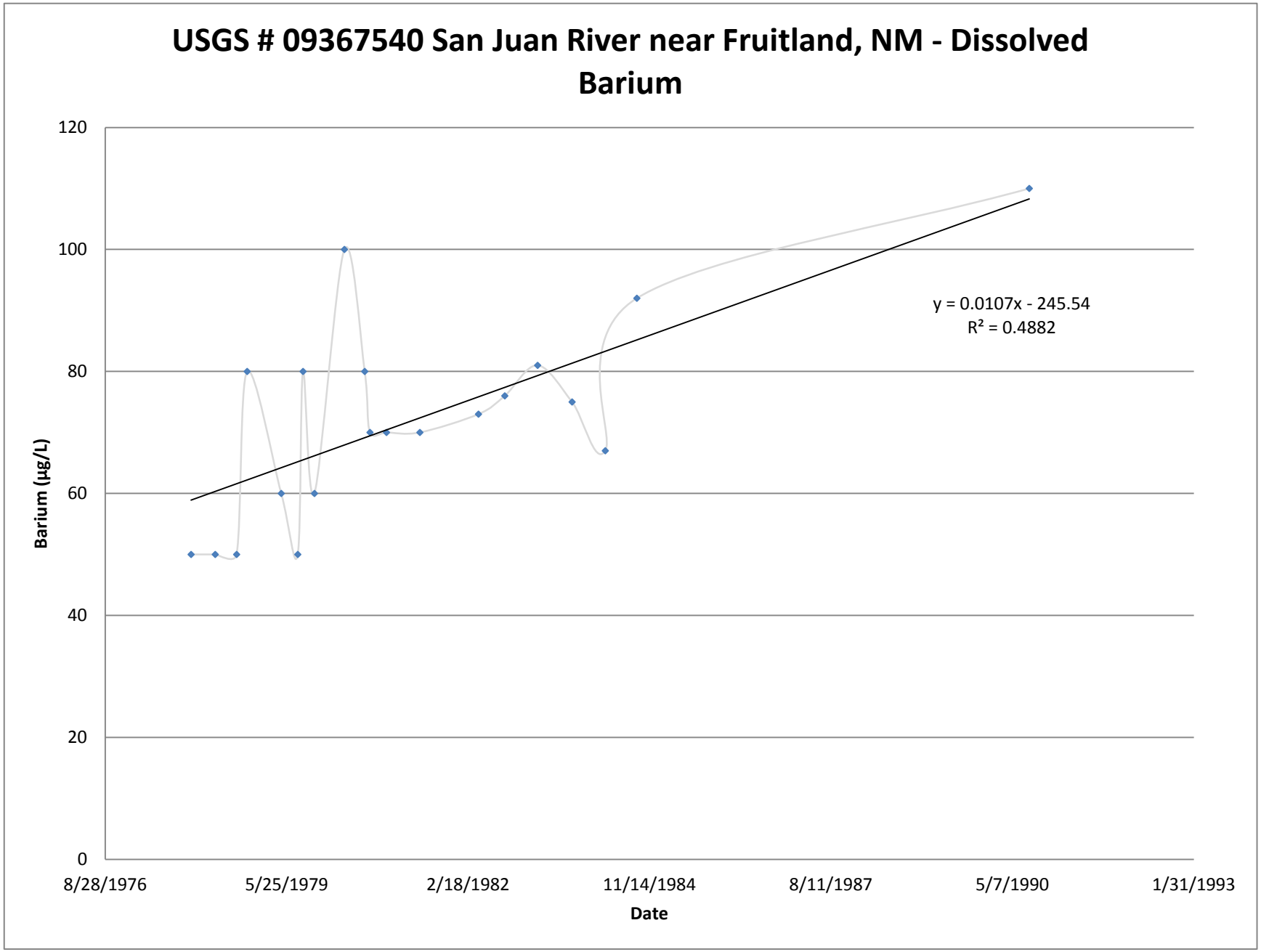
Appendix A - USGS Stations
USGS # 09367540



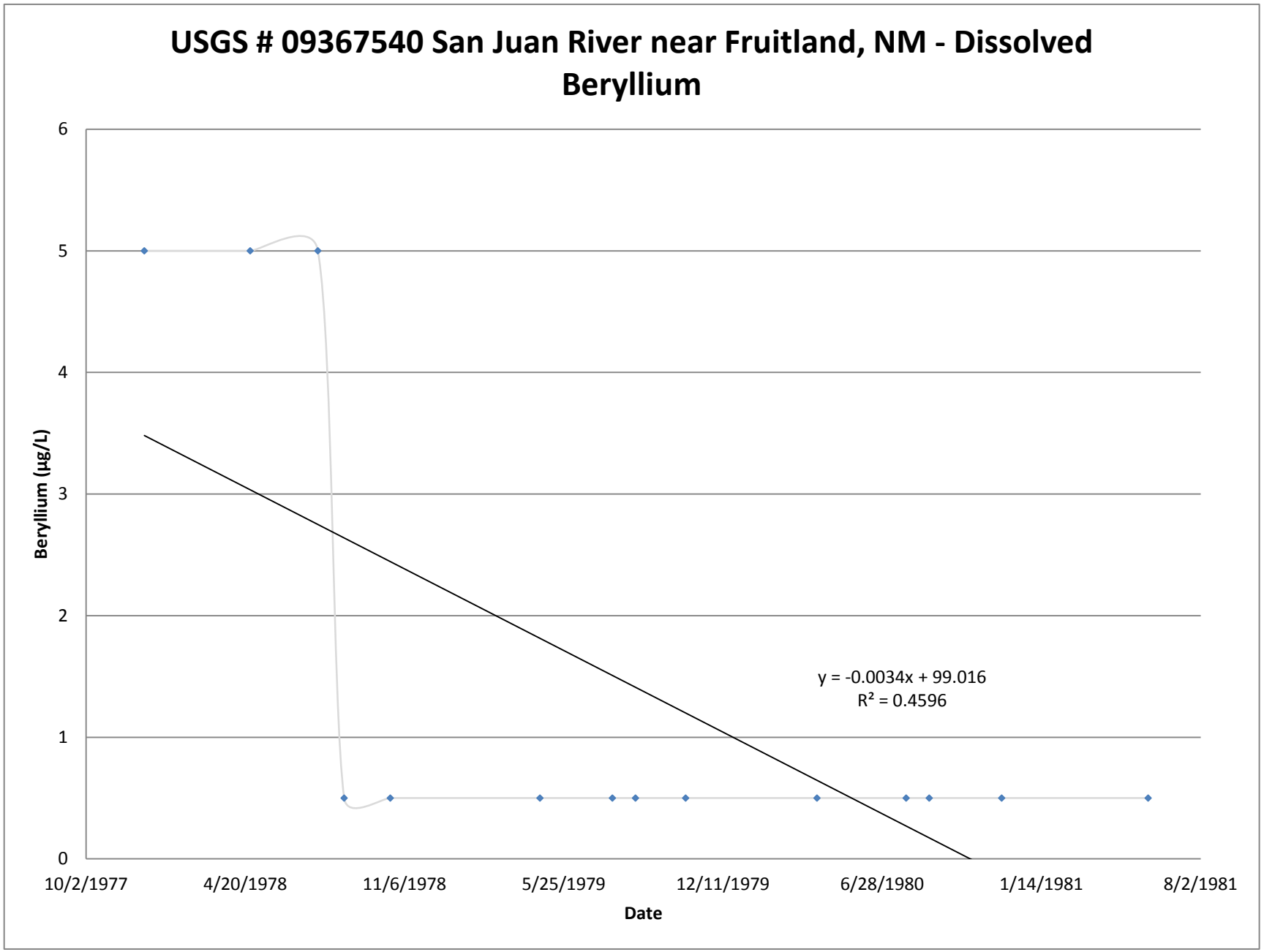
Appendix A - USGS Stations
USGS # 09367540



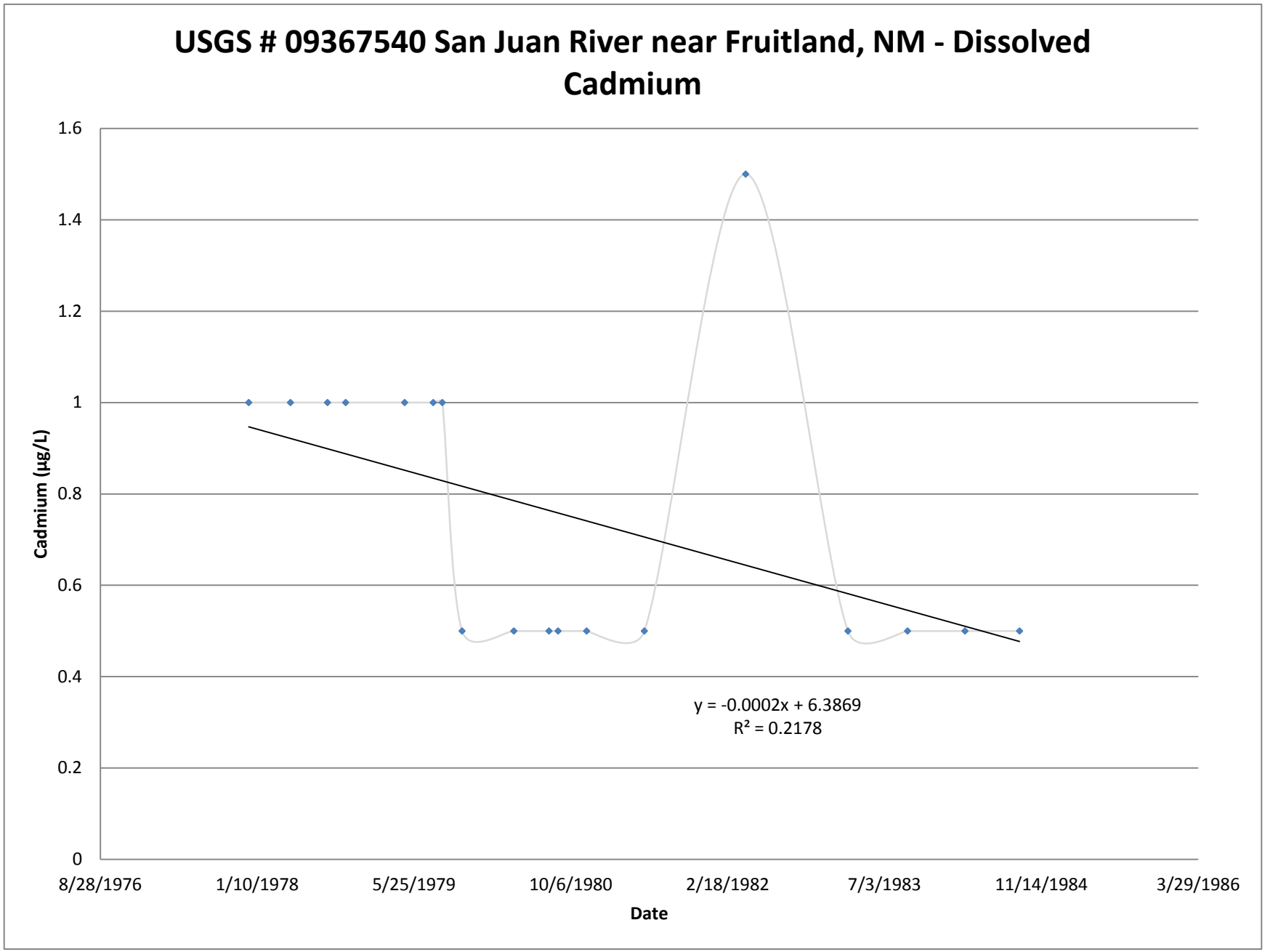
Appendix A - USGS Stations
USGS # 09367540



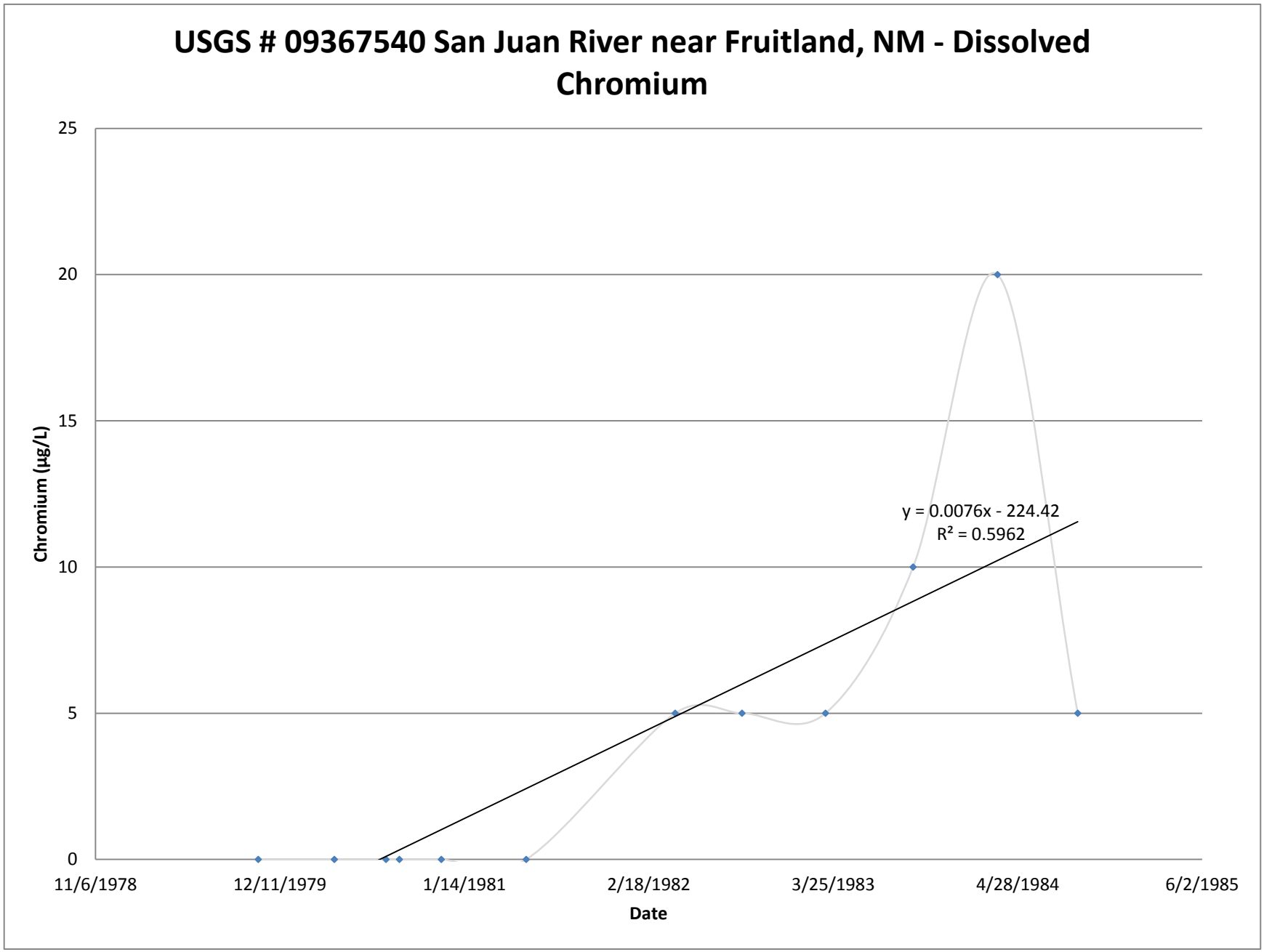
Appendix A - USGS Stations
USGS # 09367540

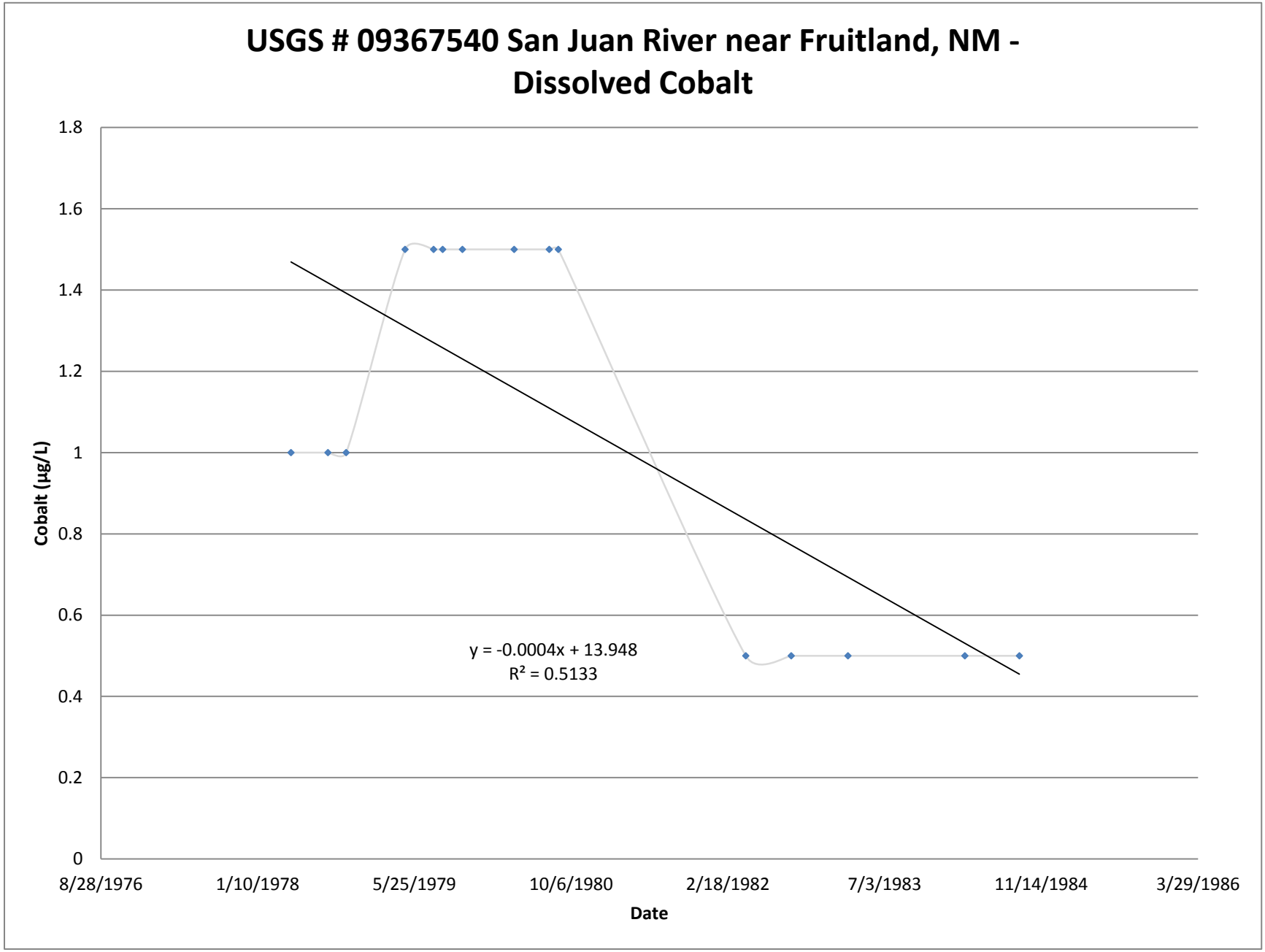


Appendix A - USGS Stations
USGS # 09367540

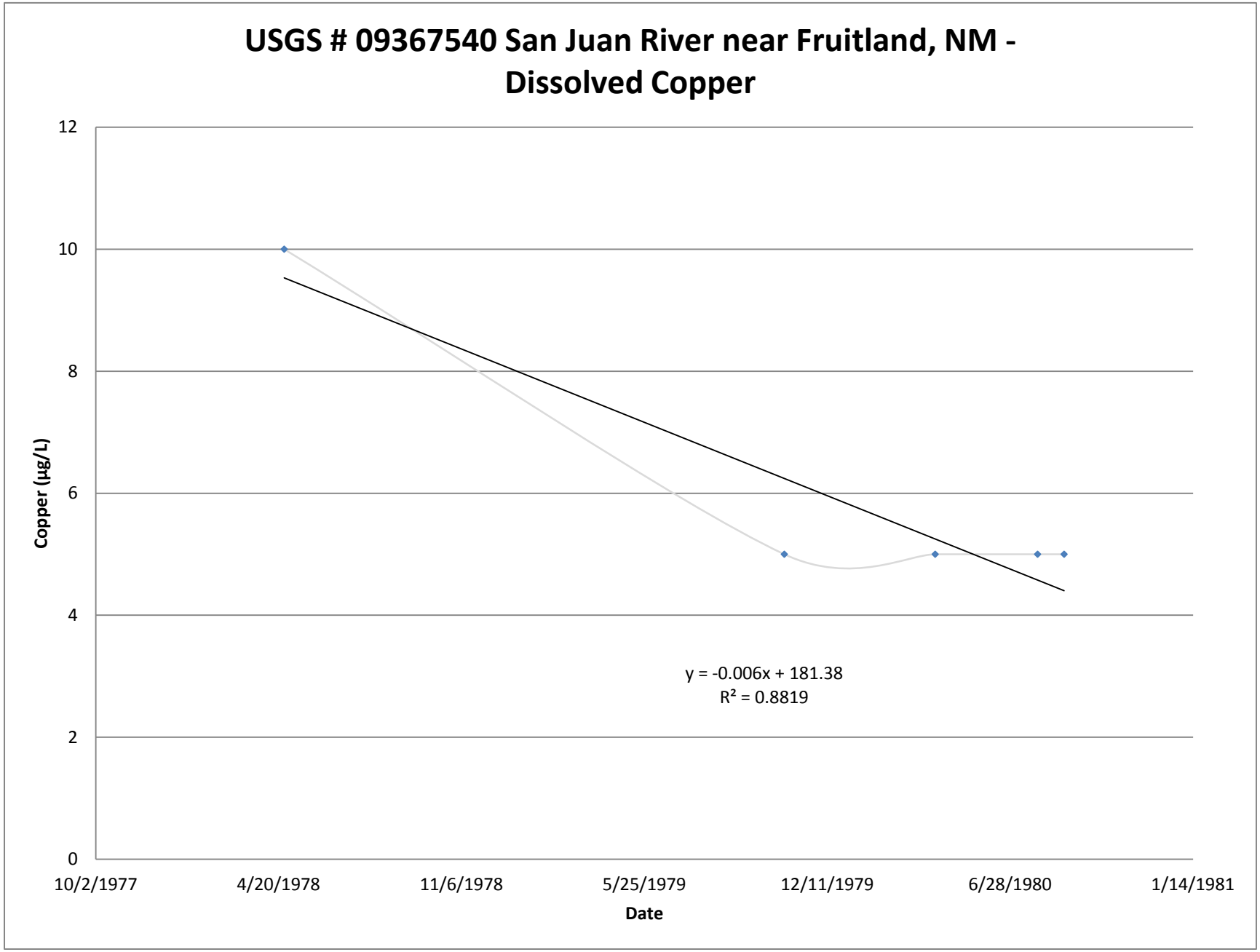


Appendix A - USGS Stations
USGS # 09367540

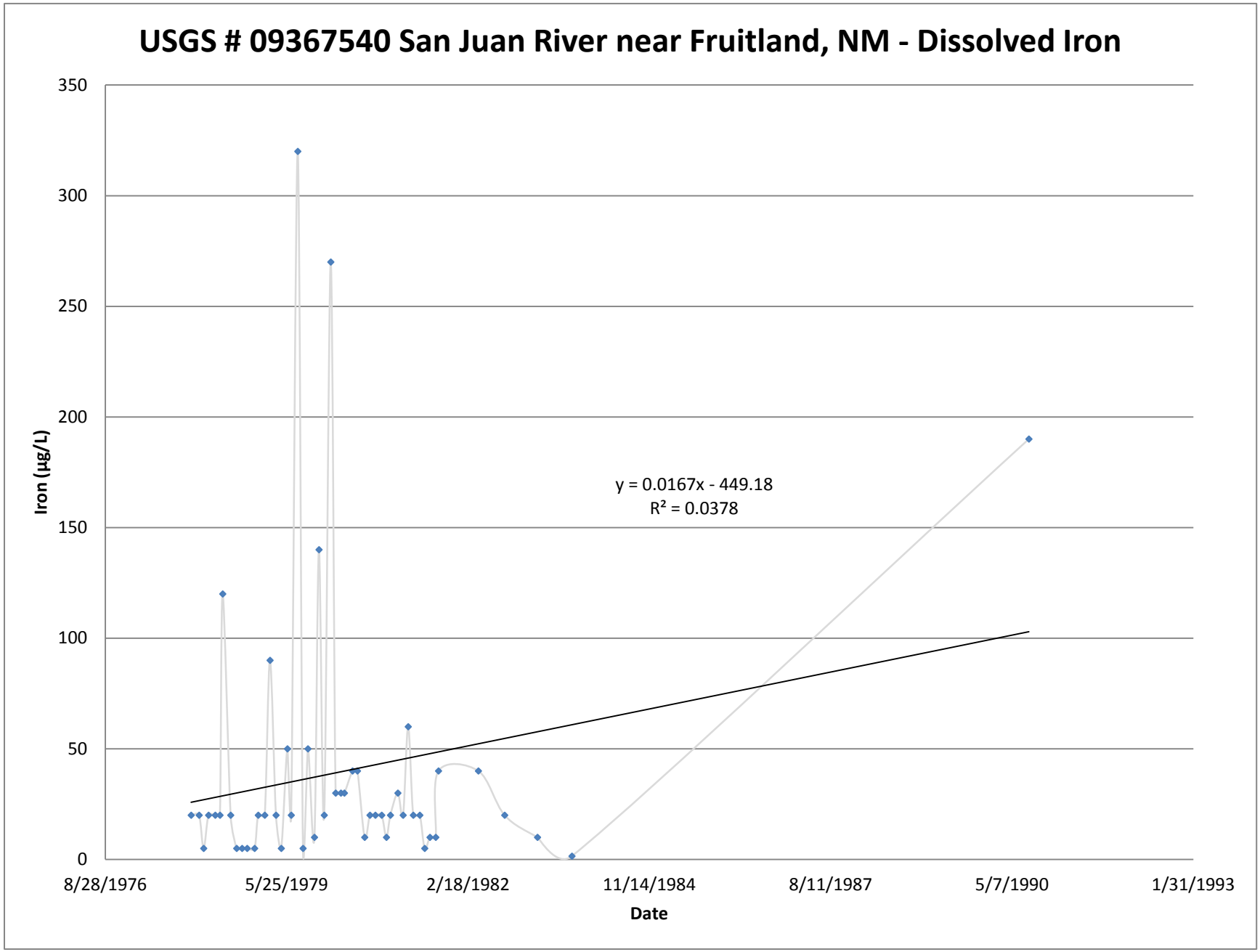



USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Cobalt
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Cobalt (µg/L)
y = -0.0004x + 13.948
R² = 0.5133
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
11/14/1984
3/29/1986
Date

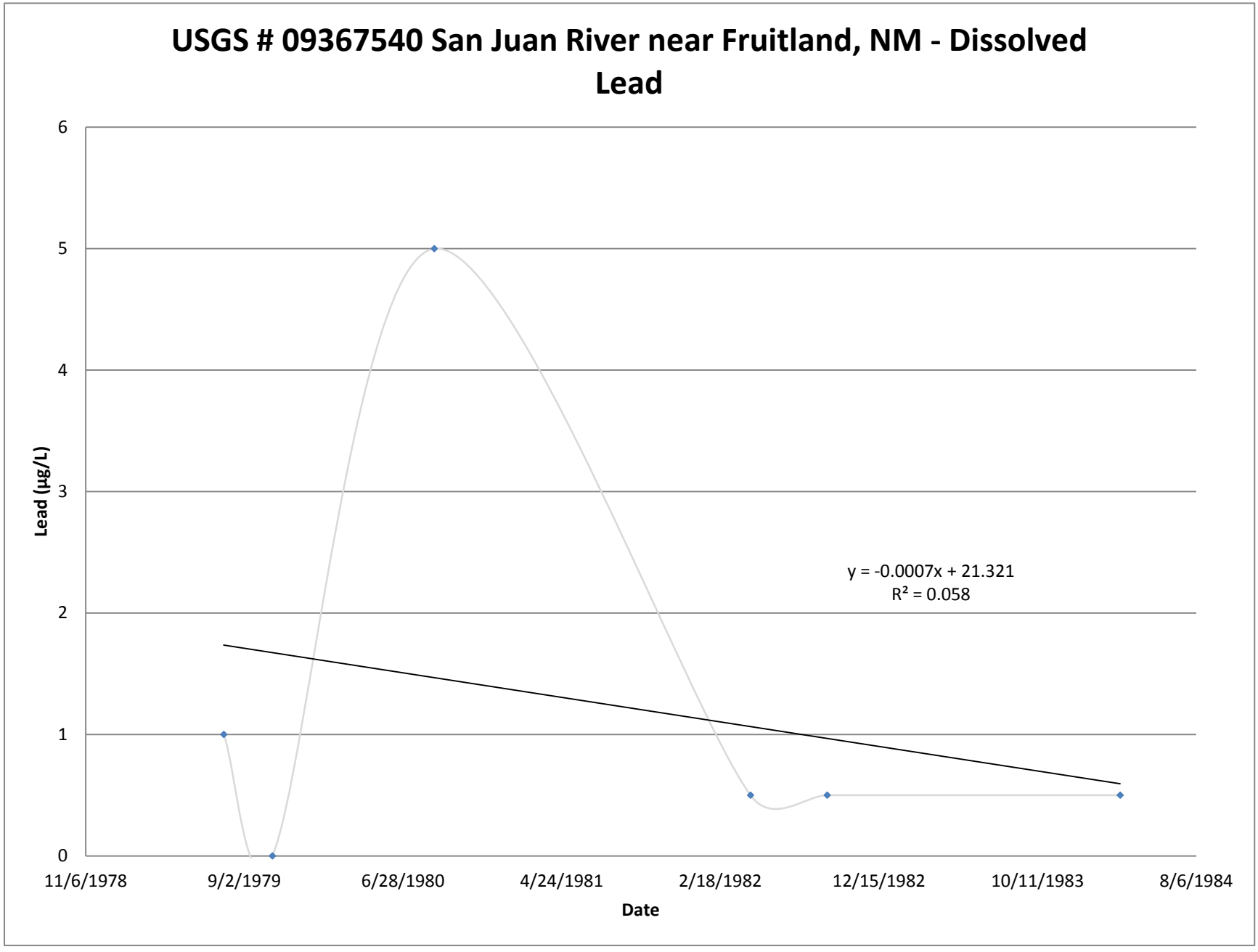
Appendix A - USGS Stations
USGS # 09367540



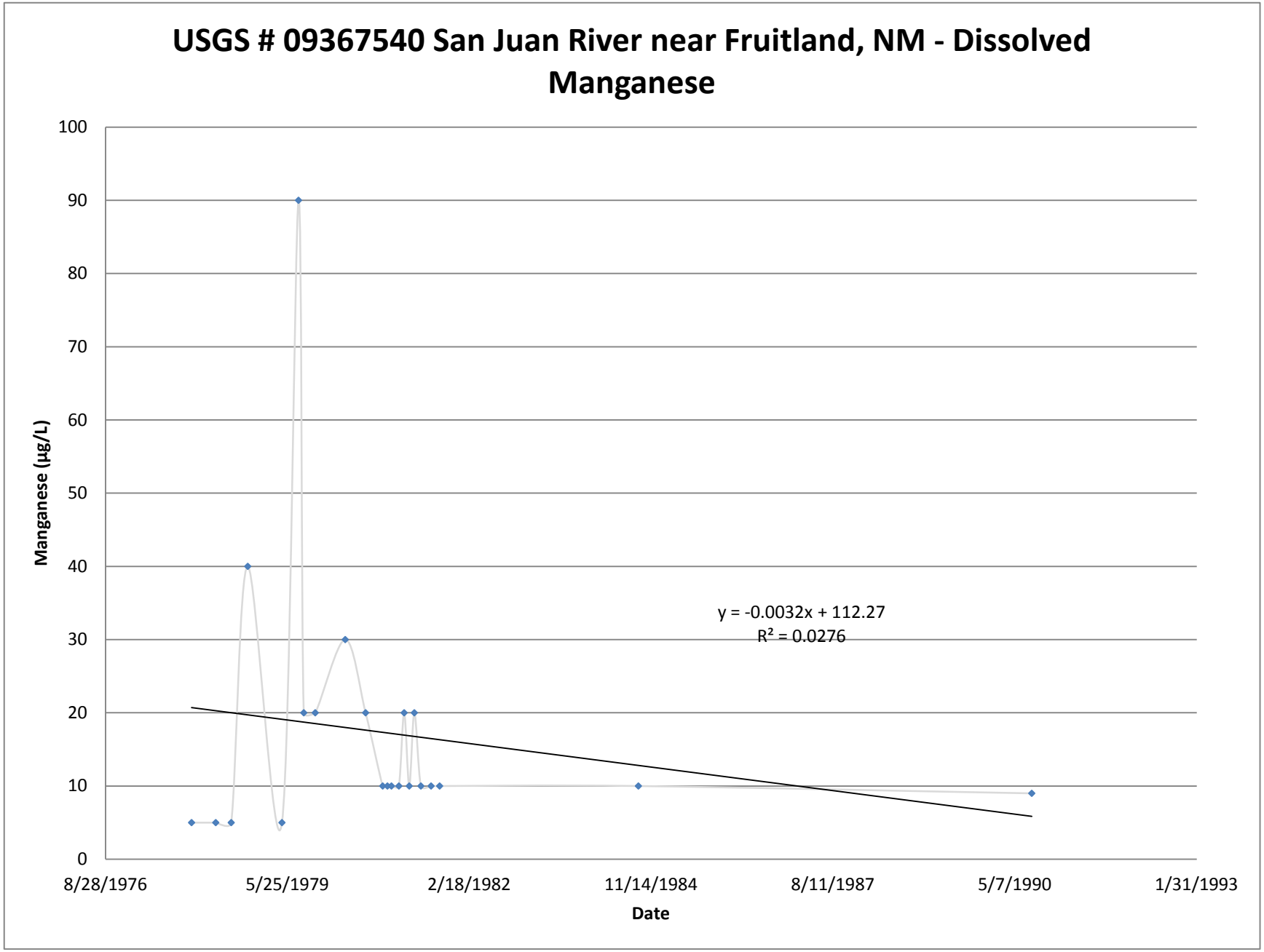
Appendix A - USGS Stations
USGS # 09367540



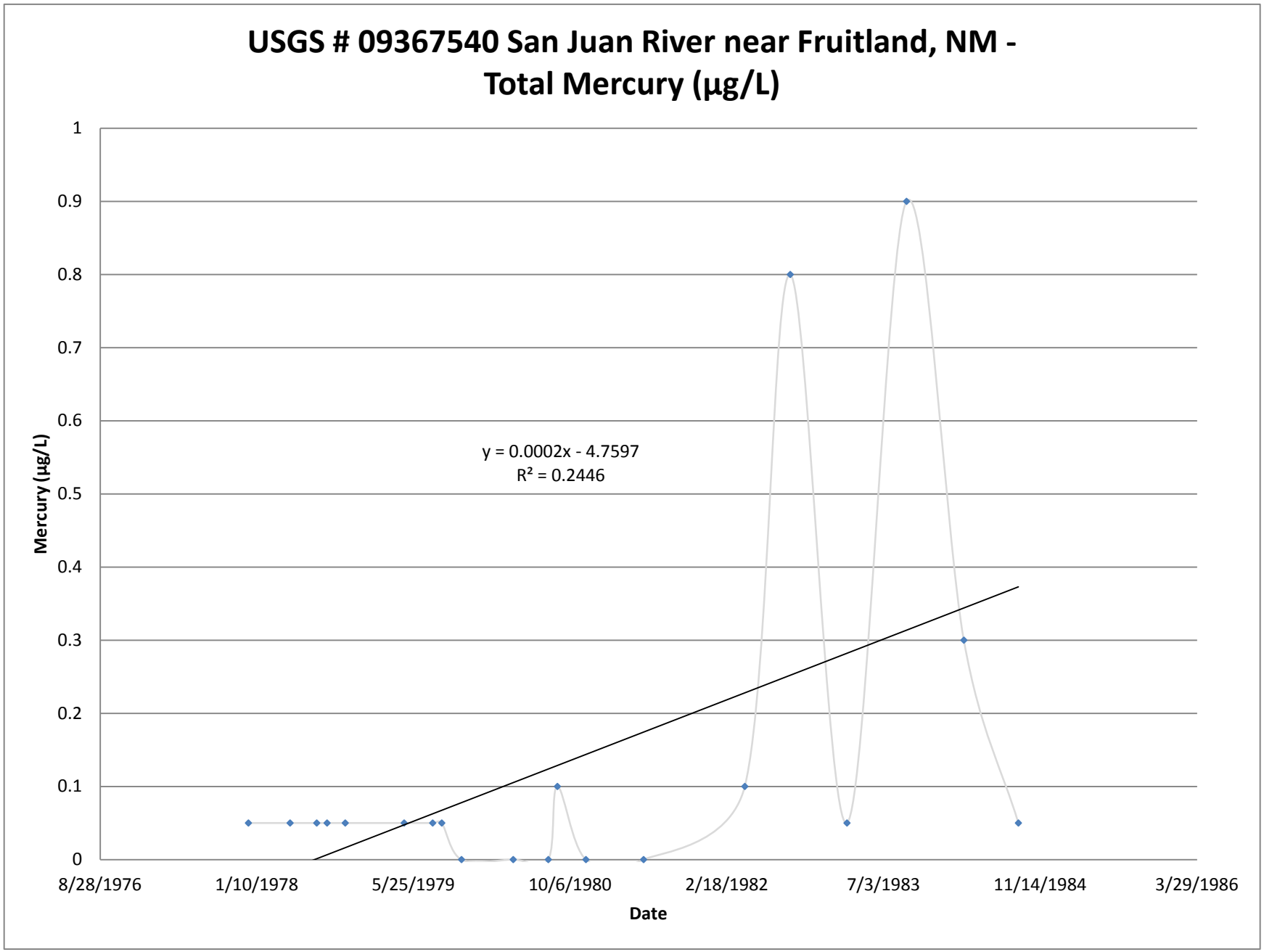
Appendix A - USGS Stations
USGS # 09367540



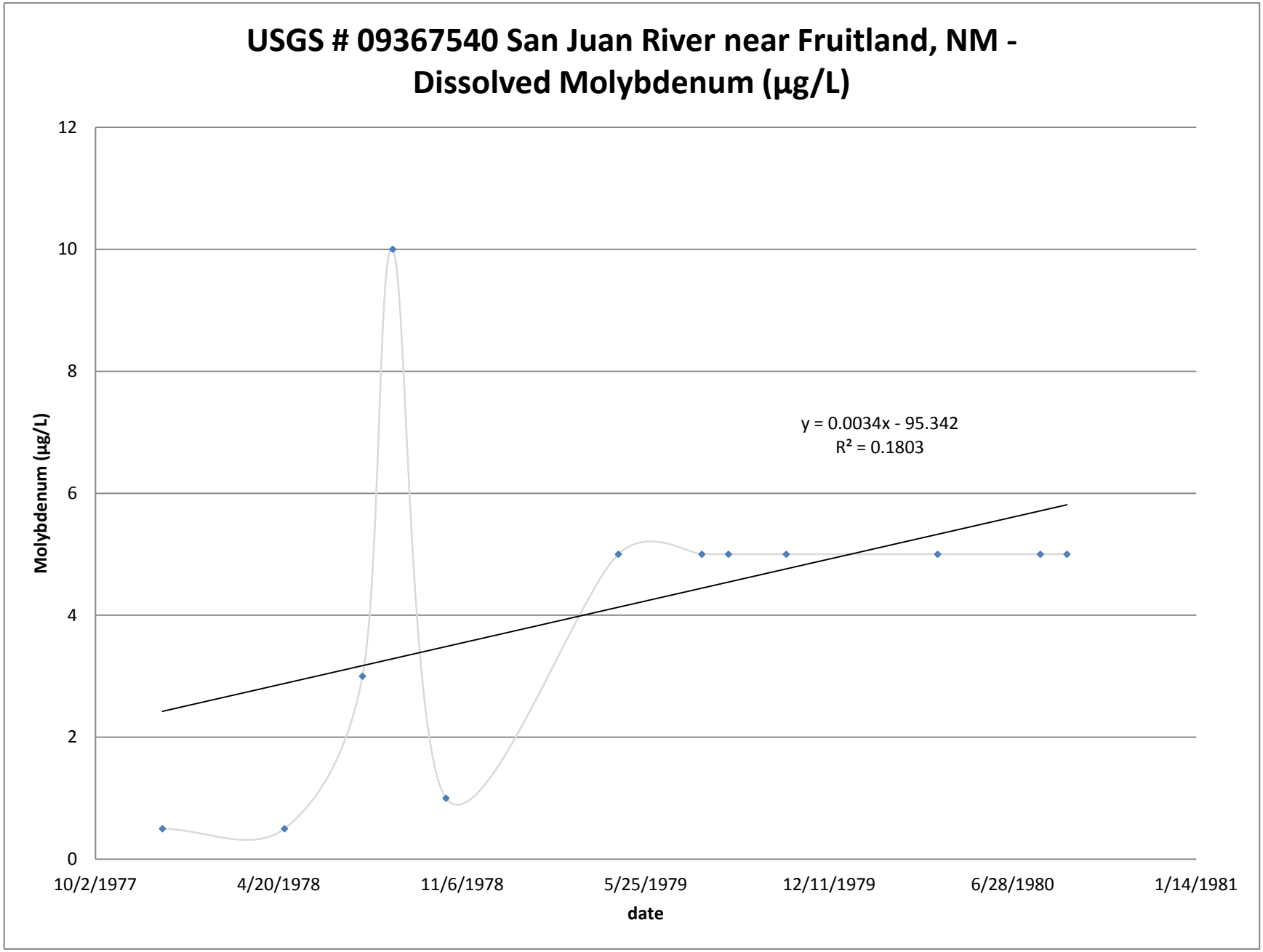
Appendix A - USGS Stations
USGS # 09367540

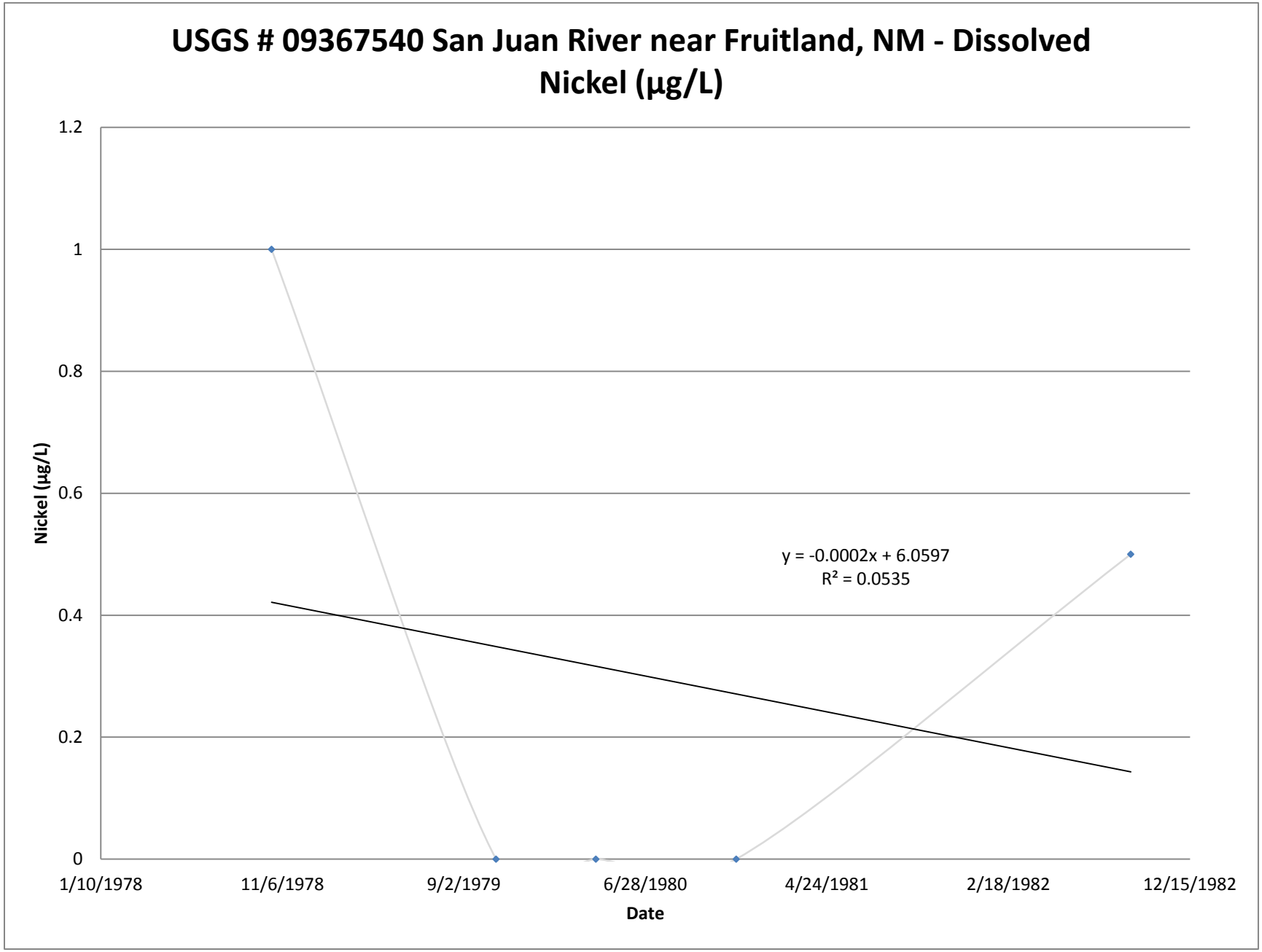


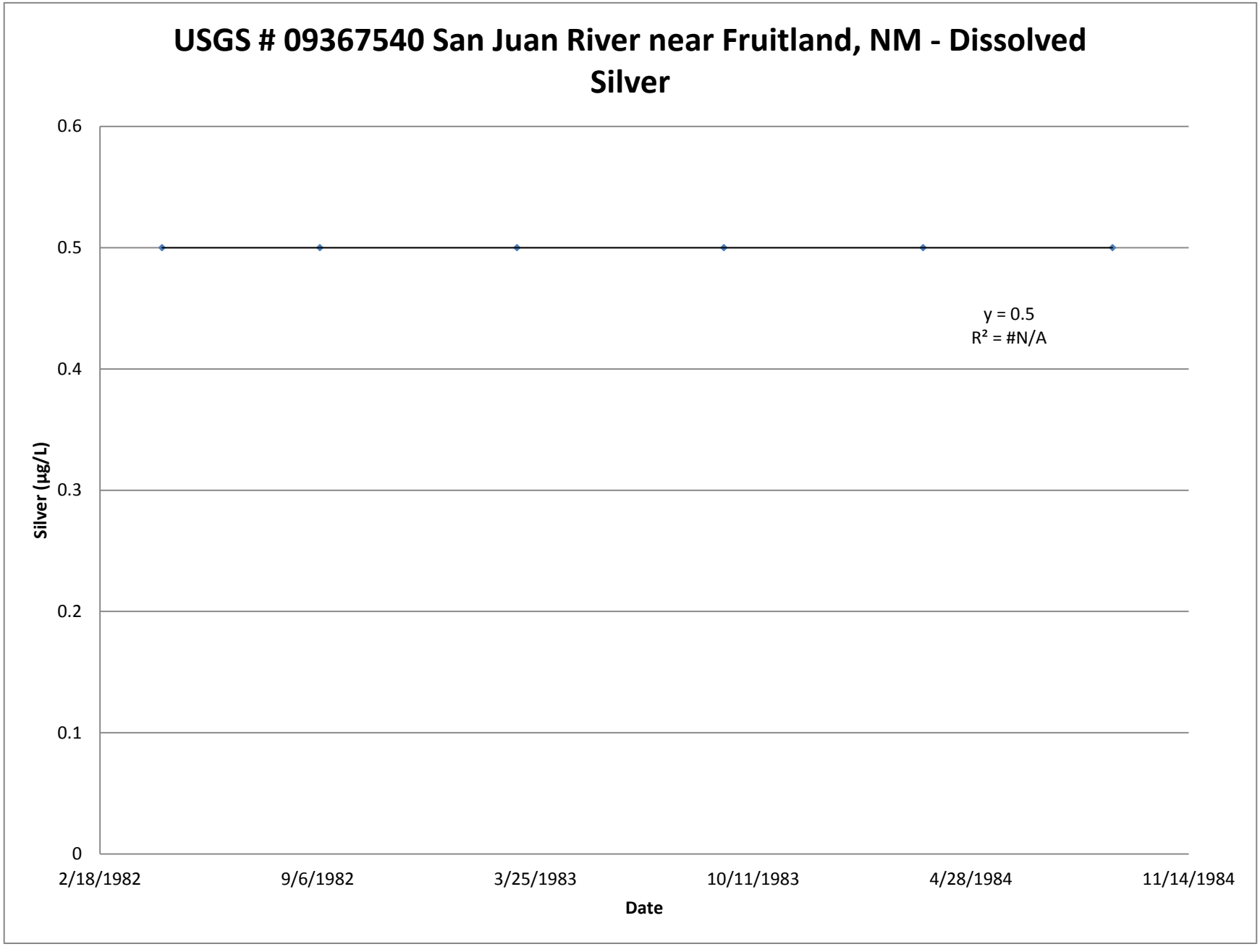
Appendix A - USGS Stations
USGS # 09367540



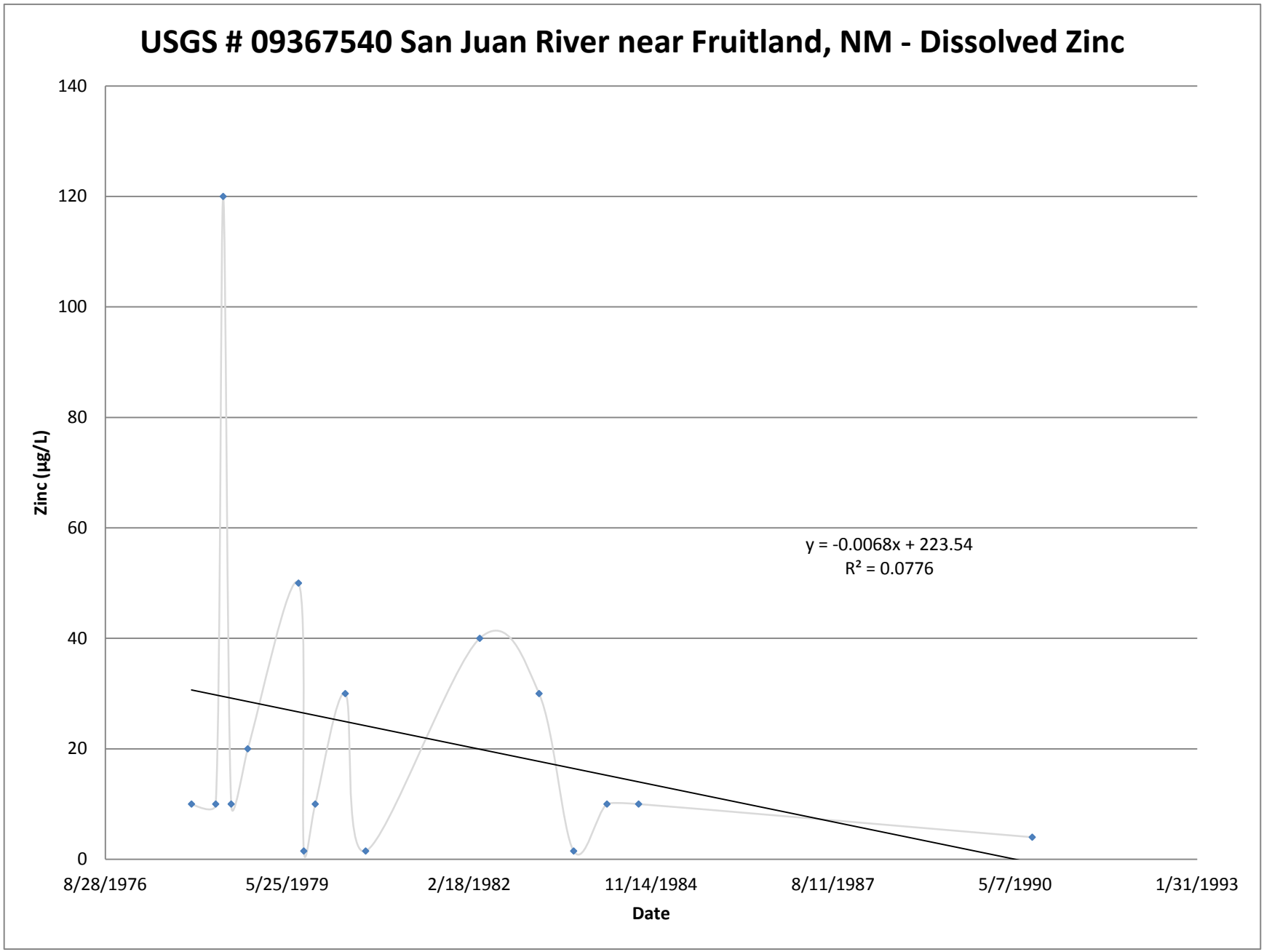
Appendix A - USGS Stations
USGS # 09367540



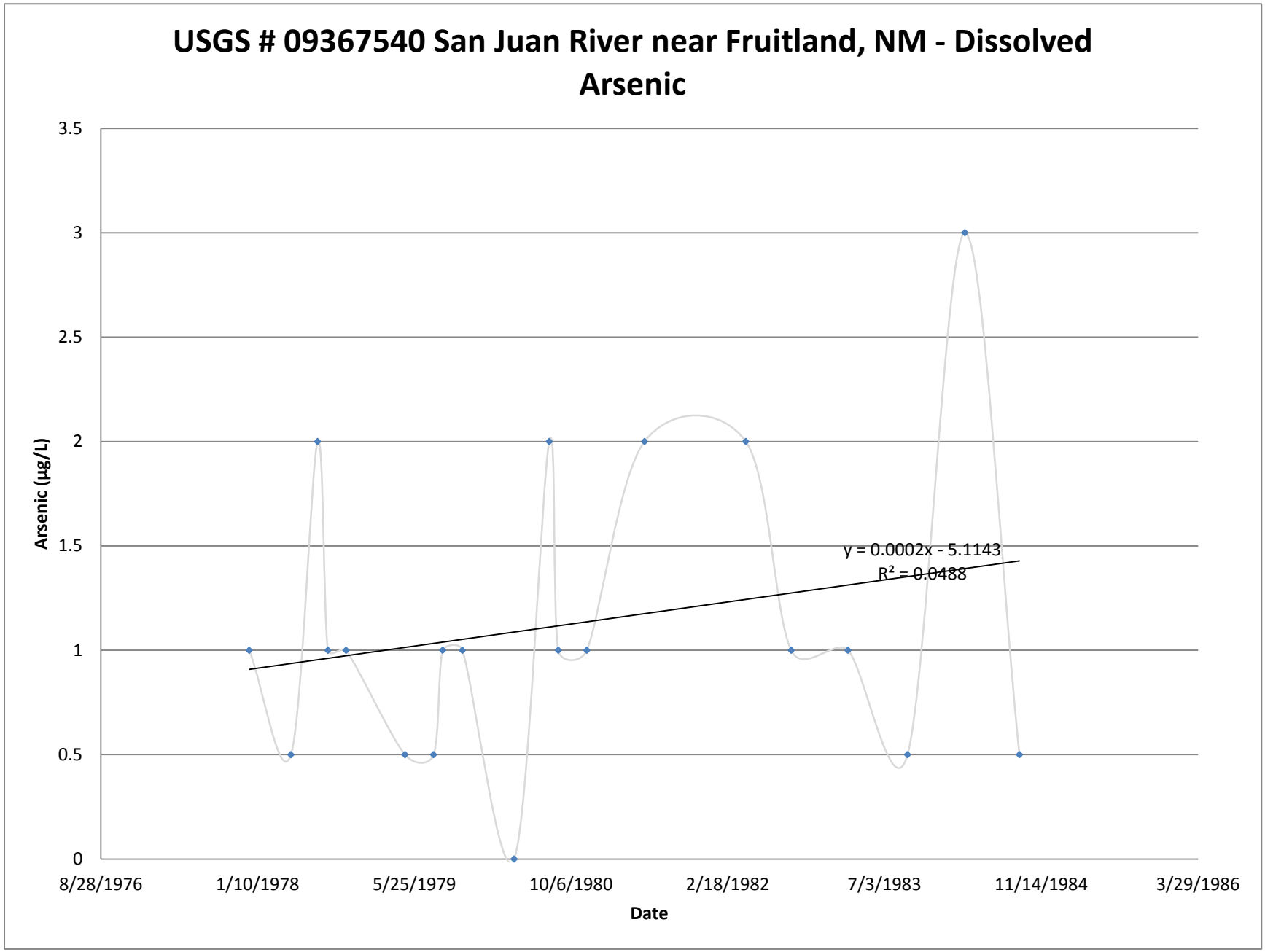

USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Nickel (µg/L)
1.2
1
0.8
0.6
0.4
0.2
0
Nickel (µg/L)
y = -0.0002x + 6.0597
R² = 0.0535
1/10/1978
11/6/1978
9/2/1979
6/28/1980
4/24/1981
2/18/1982
12/15/1982
Date


USGS # 09367540 San Juan River near Fruitland, NM - Dissolved Silver
0.6
0.5
0.4
0.3
0.2
0.1
0
Silver (µg/L)
y = 0.5
R² = #N/A
2/18/1982
9/6/1982
3/25/1983
10/11/1983
4/28/1984
11/14/1984
Date

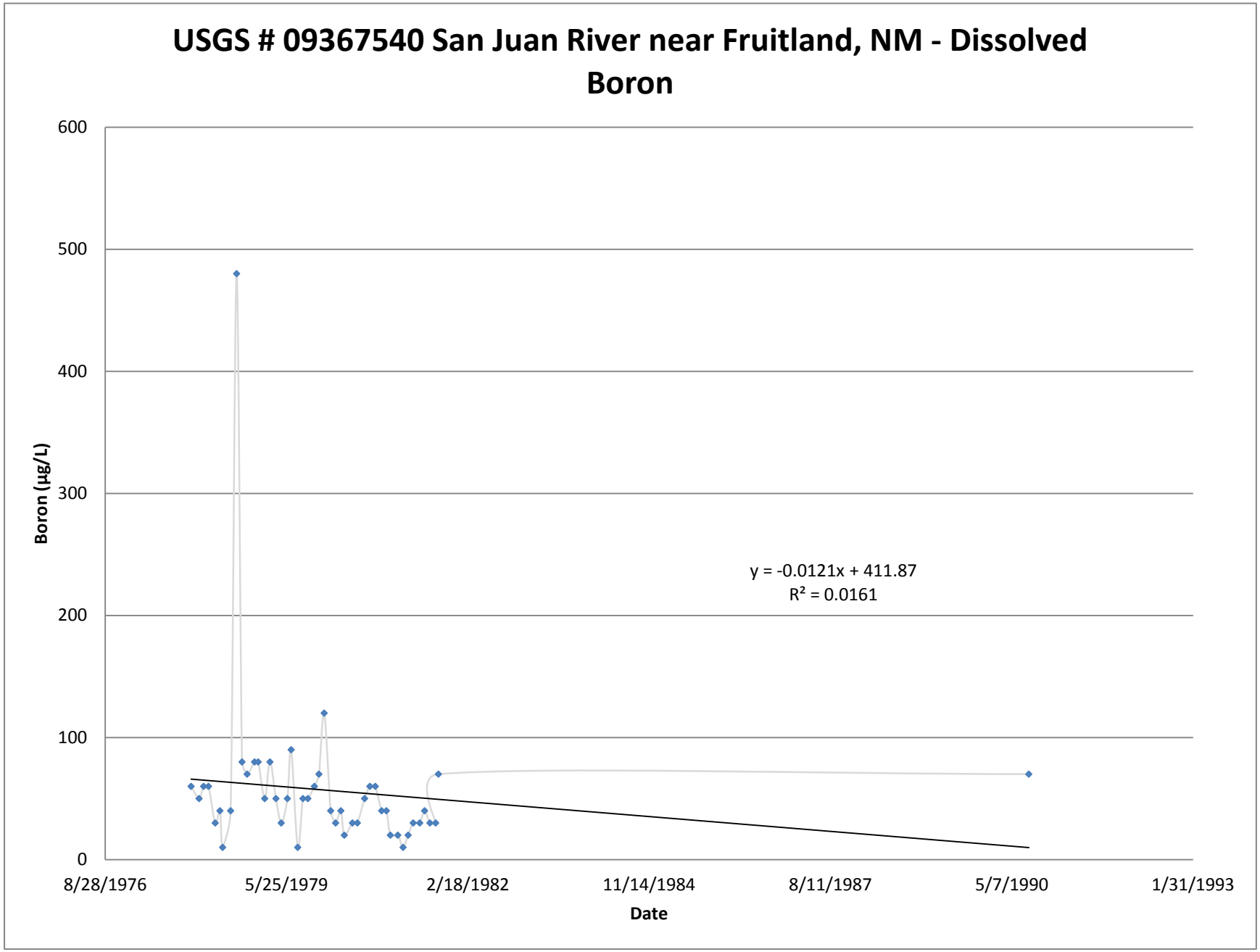
Appendix A - USGS Stations
USGS # 09367540



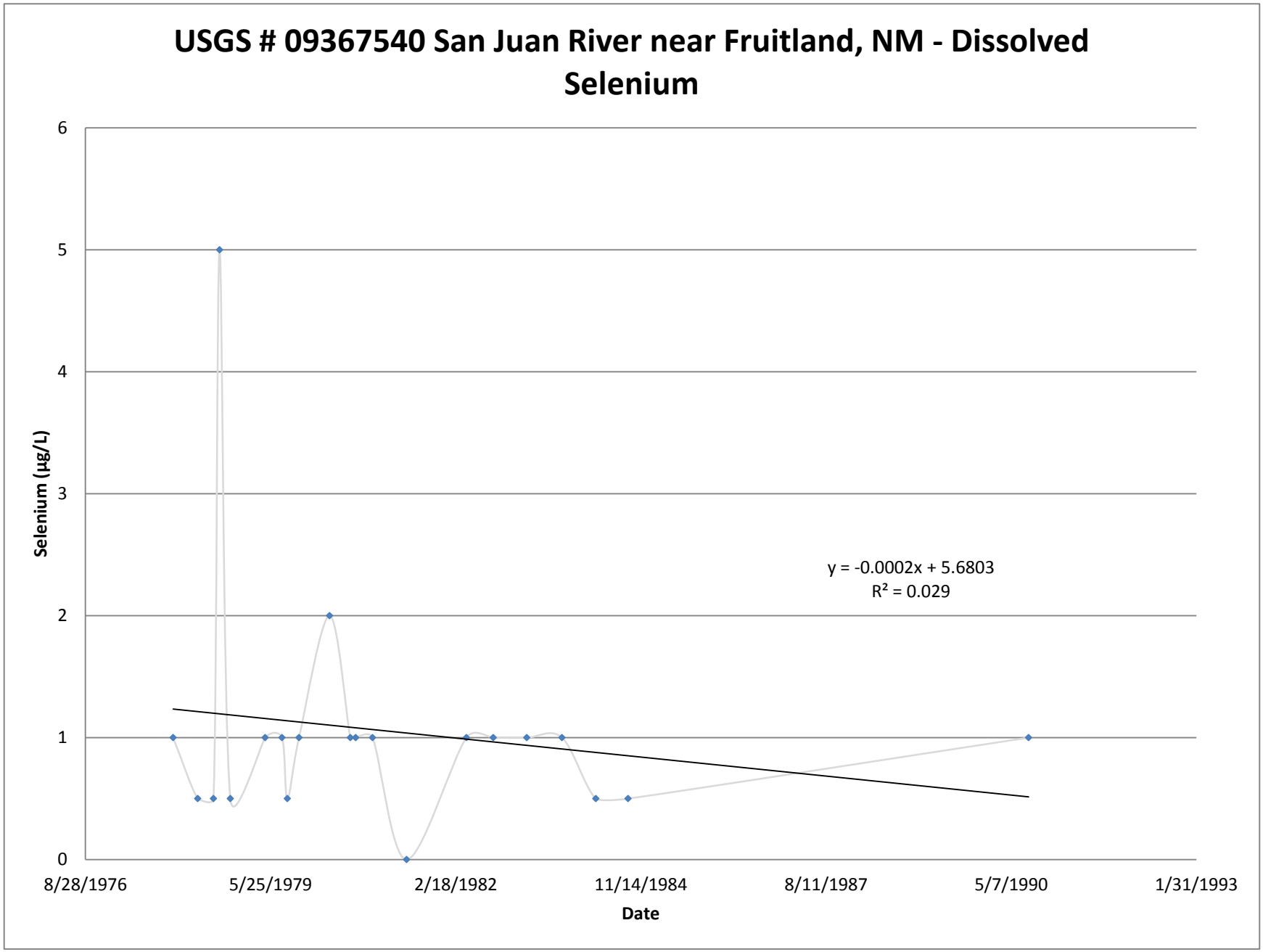
Appendix A - USGS Stations
USGS # 09367540



Appendix A - USGS Stations
USGS # 09367540



Appendix A - USGS Stations
USGS # 09367540



Appendix B

Table B-1:Groundwater Uses

Site Type	*Site Name (Aliases, # BAI report number)*	*Status*	*Completion*	*Stream Drainage*	*Depth to Water (ft)*	*Total Depth (ft)*	*Primary Use*	*Data Source*
Well	**#41**		Kirtland (Farmingt.)		40	60		[8]
Well	**#46**		Alluvium		70	9		[8]
Well	**#51**	Dry	Alluvium			8		[8]
Spring	**#54**							[8]
Spring	**#56**		PCS					[8]
Well	**#57**		Alluvium	San Juan	7	27		[8]
Well	**#70**		Alluvium		7	9		[8]
Well	**#90**		PCS			131	Stock, Domestic	[8]
Spring	**S-0767**		Improved Spring				Stock Water	[3]
Well	**W-0147**		Well				Stock Water	[3]
Well	**W-0148**		Well				Stock Water	[3]
Well	**W-0202**		Alluvium	Chaco		7	Stock Water	[3]
Well	**W-0313**		Well				Stock Water	[3]
Well	**W-0342**		Well	Chaco			Stock Water	[3]
Well	**W-0344 (#93)**		Alluvium	Pinabete	7	9	Stock Water	[3]
Well	**W-0520 (G-3, #36)**		Well	Chaco			Stock Water	[3]
Well	**W-0593**		Windmill	San Juan			Stock Water	[3]
Well	**W-0603**		Windmill				Stock Water	[3]
Well	**W-0607**		Windmill-Alluvial	Chaco	18	25	Stock Water	[3]
Well	**W-0695 (G-2)**		Alluvium	San Juan			Stock Water	[3]
Well - Permitted	**46 (W-0618,13R-28, #35)**	Destroyed	Alluvium	Cottonwood	5	16	Stock Water	[3], [10]
Well	**W-0203 (13-15-5)**	Unpermit	Alluvium	Chaco		8	Stock Water	[3], [10]
Well	**W-0204 (13-15-6)**	Unpermit	Alluvium	Chaco		14	Stock Water	[3], [10]
Well	**W-0343 (13-5-1, 13-15-2, Stevenson)**	Permitted	Alluvium				Stock Water	[3], [10]
Well	**W-0346 (13R-37, 13-8-4)**	Unpermit	Alluvium	Pinabete	6	7.5	Stock Water	[3], [10]
Well	**W-0348 (13-8-1)**	Unpermit	Alluvium	Pinabete	9	13	Stock Water	[3], [10]
Well	**W-0519 (13R-31 #17, G4, 13-14-7)**	Unpermit	Alluvium	Chaco	16	16	Stock Water	[4], [10]
Well	**W-0691 (13-15-8)**	Unpermit	Alluvium				Stock Water	[3], [10]
Well	**W-0345 (13R-48, 13-15-3)**	Permitted	Alluvium	Pinabete	7	10	Stock Water	[3],[10]
Well	**W-0606 (13-15-1)**	Unpermit	Windmill				Stock Water	[3],[10]

Appendix B

Table B-1:Groundwater Uses

Site Type	*Site Name (Aliases, # BAI report number)*	*Status*	*Completion*	*Stream Drainage*	*Depth to Water (ft)*	*Total Depth (ft)*	*Primary Use*	*Data Source*
Well	**W-0645 (13R-29, 13-14-6, #61)**	Permitted	Alluvium	Chaco	12	16	Stock Water	[3],[10]
Well	**W-0644 (13R-28A, QACW-2B, CWAP-1, #126)**		Alluvium	Cottonwood		22	Stock Water	[3],[10], [8]
Well	**#146**		Qal	San Juan	3	9		[7]
Well	**W-0312**		NTUA Well				Domestic	[2]
Well	**W-0349**			Pinabete			Domestic, Stock Water	[2]
Well	**W-0314**			Brimhall			Stock Water	[3]
Well	**W-0520**			Chaco			Stock Water	[3]
Well	**W-0537**			Brimhall			Stock Water	[3]
Well	**W-0538**		Well	Chaco			Stock Water	[3]
Well	**W-0539**		Well	Chaco			Stock Water	[3]
Well	**W-0540**			Brimhall			Stock Water	[3]
Well	**W-0544**						Stock Water	[3]
Well	**W-0545**						Stock Water	[3]
Well	**W-0624**			Brimhall			Stock Water	[3]
Well	**SJ 00264 (#7)**		Alluvium	San Juan	10	35	Stock Water	[1]
Well	**SJ 00248 (G7, #6)**		Alluvium	San Juan	10	35	DOM	[1], [5]
Well	**G5**		Alluvium	Chaco				[5]
Spring	**Little Geyser Spring (G9)**							[5]
Well	**13-7-2**	Abandoned	PCS	Brimhall				[9], [10]
Well	**#45**		Alluvium	Pinabete	8			[6]
Well	**13-15-4(#60)**	Unpermit	Alluvium		8	11		[10]
Well	**13-7-4**	Permitted		Brimhall				[10]
Well	**13-AW (13T-513, #58)**	Unpermit	Alluvium - Artesian		11	530	OG well converted to Livestock	[10]
Well	**GM-22 (13R-38)**	Permitted	Alluvium	Pinabete	11	47	Monitoring/ Livestock	[10]
Well	**GM-32 (13-15-7)**	Unpermit	Alluvium	Chaco	8	9	Monitoring/ Livestock	[10]
Well	**GM-34**	Unpermit		Chaco				[10]
Well	**GM-35**	Unpermit		Brimhall				[10]
Well	**GM-36 (13-7-5)**	Unpermit		Brimhall				[10]

Data Source:

Appendix B

Table B-1:Groundwater Uses

Site Type	***Site Name*** *(Aliases, # BAI report number)*	***Status***	***Completion***	***Stream Drainage***	***Depth to Water (ft)***	***Total Depth (ft)***	***Primary Use***	***Data Source***

[1] NMSEO: (NMOSE 2011.xls)

New Mexico State Engineer's Office Record (NMOSE 2011.xls)

[2] NMSEO: Navajo Hydrographic Survey (2010) - Table D-1

New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table D-1 (http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj_notice2010.html)

[3] NMSEO: Navajo Hydrographic Survey (2010) - Table M-1

New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table M-1 (http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj_notice2010.html)

[4] USGS: OFR 93-84 (Table 2)

Thorn, C.R., 1993, Water-quality data from the San Juan and Chaco Rivers and selected alluvial aquifers, San Juan County, New Mexico: U.S. Geological Survey Open-File Report 93-84, Table 2

[5] USGS: OFR 93-84 (Table 3)

Thorn, C.R., 1993, Water-quality data from the San Juan and Chaco Rivers and selected alluvial aquifers, San Juan County, New Mexico: U.S. Geological Survey Open-File Report 93-84, Table 3

[6] USGS: WRIR 85-4251

Myers, R.G., and Villanueva, E.D., 1986, Geohydrology of the aquifers that may be affected by the surface mining of coal in the Fruitland Formation in the San Juan Basin, northwestern New Mexico: U.S. Geological Survey Water-Resources Investigations Report 85-4251, (#45 in Figure 14 - Table 7)

[7] New Mexico Bureau of Mines and Mineral Resources

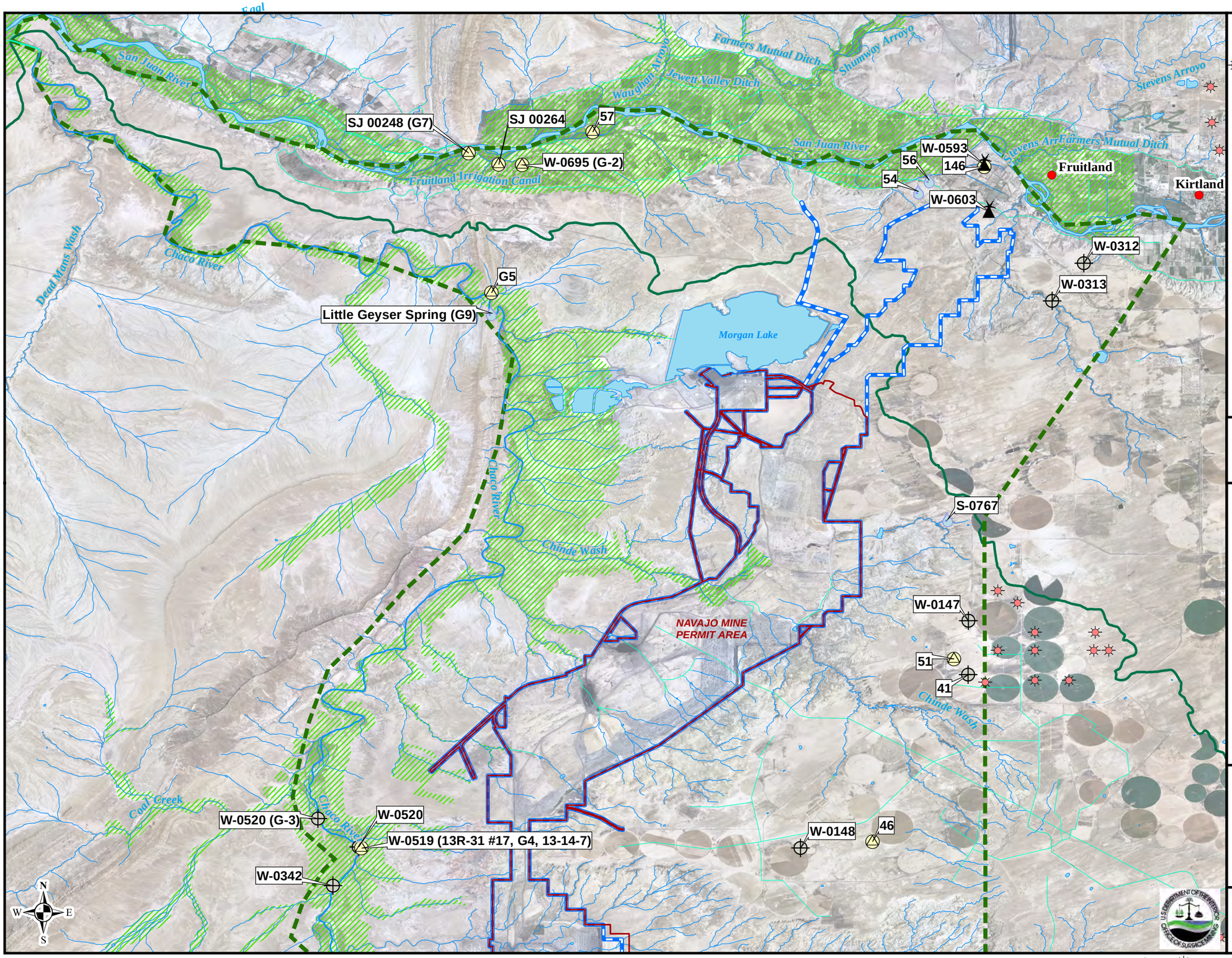
Stone, W. J. Lyford, F. P., Frenzel, P. F., Mizell, N. H., and Padgett, E. T., 1983, Hydrogeology and water resources of the San Juan Basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6, Table 1

[8] BHP: Addendum 12-D-A

1985 Reogranization ICR Response 01/89, 12-D-6 (Addendum 12-D-Af, Figure 12- D2)

[9] BHP: Wells_Combined_2011.shp

[10] BHP: WW_Springs.shp (NMEP PAP Ex 18.2-1)



Water Wells & Springs[1]

- Spring &Seep
- Alluvial Well
- Well
- Windmill
- Gas Wells [4]
- Groundwater CIA
- Navajo Mine Permit Area
- Pinabete Permit Area
- Coal Lease Area
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Alluvium [3]
- Population Centers

Data Sources:
Aerial Photography (San Juan County) 2009
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset
[3] USGS Geology Maps: MF-1026, MF-1076, MF-1077, MF-1080, MF-1092, MF-1093 & I-1978
[4] NM Oil & Gas wells (GO-TECH website 1/13/14)

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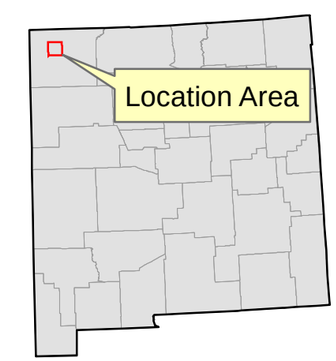
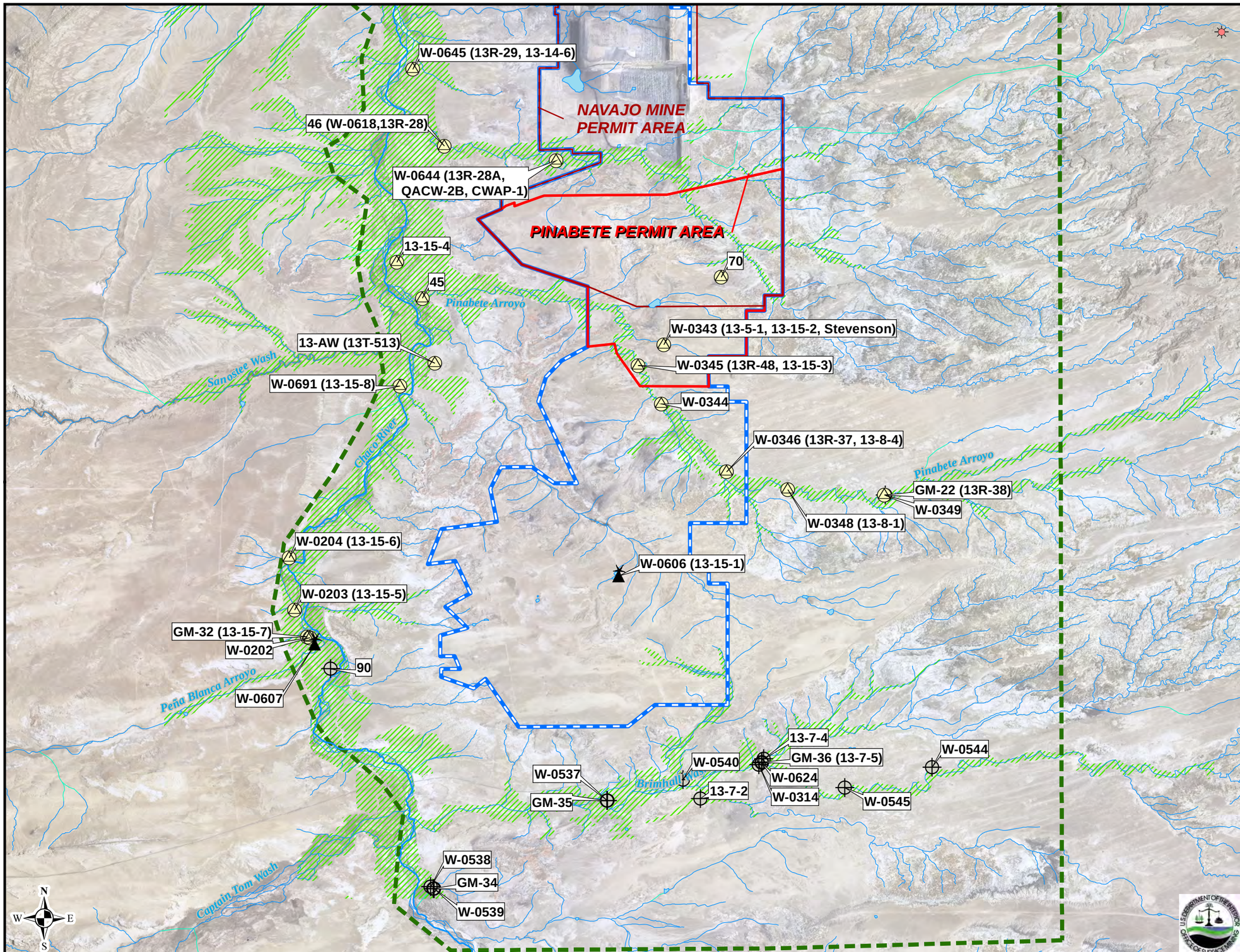


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Ground Water Cumulative Impacts Area San Juan County, NM

Figure B-1
(pg 1 of 2)



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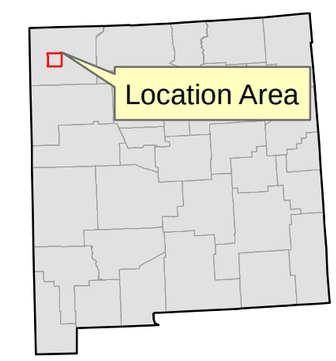

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Ground Water Cumulative Impacts Area San Juan County, NM

Figure B-1
(pg 2 of 2)

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0001	Irrigation, Stock Water	In Channel	0.12	0.3	2451511.29	1889412.05	[1]
P-0002	Irrigation, Stock Water	Improved Spring	0.05	0.11	2436054.53	1845725.12	[1]
P-0003	Irrigation, Stock Water	In Channel	1.32	3.2	2436534.58	1748249.09	[1]
P-0004	Irrigation, Stock Water	In Channel	4.35	15.57	2435539.87	1749944.73	[1]
P-0005	Irrigation, Stock Water	In Channel	0.12	0.25	2421175.7	1745916.35	[1]
P-0006	Irrigation, Stock Water	In Channel	0.76	1.89	2422509.66	1745339.91	[1]
P-0007	Irrigation, Stock Water	In Channel	0.54	1.71	2420542.33	1746018.26	[1]
P-0008	Irrigation, Stock Water	In Channel	1.17	1.82	2446014.91	1718449.97	[1]
P-0009	Irrigation, Stock Water	In Channel	0.51	1.23	2487443.8	1714168.45	[1]
P-0010	Irrigation, Stock Water	In Channel, Well	0.67	1.03	2640730.3	1702635.66	[1]
P-0011	Irrigation, Stock Water	In Channel	0.27	0.27	2540845.54	1754986.86	[1]
P-0012	Irrigation, Stock Water	In Channel	1.57	8.99	2437906.49	1701658.72	[1]
P-0013	Irrigation, Stock Water	Well	0.64	2.15	2464629.35	1706566.77	[1]
P-0014	Irrigation, Stock Water	Improved Spring	0.31	1.23	2435995.6	1845658.98	[1]
P-0015	Irrigation, Stock Water	In Channel	3.07	18.72	2436698.98	1848223.60	[1]
P-0016	Industrial, Stock Water, Recreation	San Juan River	1261.02	39000*	2531409.91	2074481.22	[2]
P-0017	Stock Water	In Channel	388.41	2905.4	2626302.47	1853524.17	[3]
P-0018	Stock Water	In Channel	9.49	22.41	2534837.94	1757900.27	[3]
P-0019	Irrigation, Stock Water	In Channel	4.13	10.58	2625133.31	1755222.55	[1]
P-0020	Irrigation, Stock Water	In Channel	2.65	7.83	2604643.28	1718546.32	[1]
P-0021	Irrigation, Stock Water	In Channel	1.88	4.07	2484631.42	1720546.99	[1]
P-0022	Industrial	Industrial	12.86	20.25	2535626.46	2071563.23	[2]
P-0023	Industrial	Industrial	1.45	2.86	2535910.92	2071414.44	[2]
P-0024	Industrial	Industrial	8.91	38.57	2536137.30	2071414.39	[2]
P-0027	Irrigation, Stock Water	In Channel	47.02	101.82	2651957.56	1770806.69	[1]
P-0028	Stock Water	In Channel	0.22	0.21	2554792.19	1761185.83	[3]
P-0029	Irrigation, Stock Water	In Channel	0.66	1.95	2580410.85	1759142.87	[1]
P-0030	Irrigation, Stock Water	In Channel	1.74	3.43	2604075.32	1718735.24	[1]
P-0031	Irrigation, Stock Water	In Channel	0.98	1.74	2604752.78	1719035.81	[1]
P-0032	Irrigation, Stock Water	In Channel	0.65	2.17	2486945.76	1714222.47	[1]
P-0033	Stock Water	In Channel	31.37	135.85	2675304.85	1717997.80	[3]
P-0034	Irrigation, Stock Water	In Channel	10.41	57.38	2748760.88	1750689.24	[1]
P-0036	Irrigation, Stock Water	In Channel	97.57	1056.38	2453304.33	1926914.19	[1]
P-0037	Irrigation, Stock Water	In Channel	4.33	13.62	2397077.23	1894150.34	[1]
P-0039	Stock Water	In Channel, Well	57.94	125.45	2440315.76	1923282.02	[3]
P-0040	Stock Water	In Channel	24.47	250.47	2417393.66	2028566.61	[3]
P-0041	Stock Water	In Channel	28.39	61.48	2422548.94	1825540.27	[3]
P-0042	Stock Water, Recreation	In Channel	300.48	1200.00*	2428800.95	1821300.73	[3]
P-0043	Irrigation, Stock Water, Recreation	In Channel	223.59	8000.00*	2432247.9	1810750.53	[1]
P-0138	Stock Water	In Channel	0.78	8.9	2495763.03	1776357.29	[3]
P-0141	Stock Water	In Channel	2.82	10.28	2542632.09	1779176.25	[3]
P-0142	Stock Water	In Channel	9.23	16.53	2494898.90	1776349.13	[3]
P-0143	Stock Water	In Channel	0.78	4.55	2511683.91	1772220.47	[3]
P-0145	Stock Water	In Channel	2.12	4.43	2540788.56	1765414.57	[3]
P-0146	Stock Water	Well	0.34	1.38	2521349.76	1778358.62	[3]
P-0147	Stock Water	Well	0.13	0.21	2521282.70	1778535.64	[3]
P-0148	Stock Water	Well	0.14	0.42	2521181.09	1778424.71	[3]
P-0149	Stock Water	In Channel	0.77	1.61	2549485.83	1759833.31	[3]
P-0150	Stock Water	In Channel	0.33	1.28	2566776.37	1761133.98	[3]
P-0151	Stock Water	In Channel	0.2	0.27	2550167.93	1744563.73	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0152	Stock Water	In Channel	2.44	25.08	2550846.58	1744565.86	[3]
P-0153	Stock Water	Off Channel	0.43	0.46	2573140.33	1719883.65	[3]
P-0157	Stock Water	In Channel	1.11	2.74	2547535.97	1754151.72	[3]
P-0158	Stock Water	In Channel	3.76	8.51	2538987.14	1747611.40	[3]
P-0159	Sewer Settling	Sewer	0.41	1.66	2565719.30	1749463.82	[4]
P-0160	Irrigation, Stock Water	In Channel	6.54	54.62	2569548.3	1744298.42	[1]
P-0161	Irrigation, Stock Water	In Channel	1.37	8.96	2553774.57	1742127.39	[1]
P-0162	Irrigation, Stock Water	In Channel	1.17	8.01	2553435.09	1741847.33	[1]
P-0163	Stock Water	In Channel	4.05	40.15	2544650.99	1743462.50	[3]
P-0164	Stock Water	In Channel	0.21	0.6	2571254.26	1735828.86	[3]
P-0165	Stock Water	Well	0.11	0.67	2565618.30	1747643.00	[3]
P-0166	Stock Water	Well	0.77	4.36	2565012.49	1747449.79	[3]
P-0167	Stock Water	Well	0.7	2.25	2565527.78	1747470.84	[3]
P-0168	Stock Water	In Channel	1.07	2.33	2510232.17	1798353.70	[3]
P-0169	Stock Water	In Channel	0.71	2.36	2509542.82	1805063.77	[3]
P-0170	Stock Water	In Channel	0.71	3.07	2499752.55	1802015.58	[3]
P-0171	Stock Water	In Channel	1.23	2.67	2499406.27	1790462.41	[3]
P-0172	Stock Water	In Channel	0.57	1.23	2498449.15	1791562.86	[3]
P-0173	Stock Water	Well	0.34	1.08	2490484.35	1789234.22	[3]
P-0174	Stock Water	In Channel	0.46	1.44	2482504.90	1792560.28	[3]
P-0175	Stock Water	Well	0.34	0.68	2482219.12	1803569.79	[3]
P-0176	Stock Water	In Channel	1.96	2.32	2491179.32	1807975.01	[3]
P-0177	Stock Water	In Channel	0.58	1.71	2492588.41	1809573.62	[3]
P-0178	Stock Water	In Channel	17.19	57.52	2564410.82	1851600.14	[3]
P-0179	Stock Water	Well	0.36	0.86	2482198.39	1779041.07	[3]
P-0180	Stock Water	In Channel	0.96	2.47	2520391.48	1784659.65	[3]
P-0181	Stock Water	In Channel	0.33	0.52	2521826.68	1793092.97	[3]
P-0182	Stock Water	In Channel	0.43	1.28	2523610.54	1793767.08	[3]
P-0183	Stock Water	In Channel	1.39	2.2	2523658.94	1793766.66	[3]
P-0184	Stock Water	In Channel	0.88	3.47	2506578.12	1820705.99	[3]
P-0185	Stock Water	Well	0.76	2.25	2508623.19	1827704.80	[3]
P-0187	Stock Water	In Channel	9.12	23.33	2492456.13	1809383.80	[3]
P-0188	Stock Water	In Channel	23.86	89.23	2519355.87	1804017.54	[3]
P-0189	Stock Water	In Channel	0.35	0.69	2518528.85	1807632.06	[3]
P-0190	Stock Water	In Channel	8.49	15.05	2518599.81	1807627.27	[3]
P-0191	Stock Water	In Channel	0.59	2.21	2522914.13	1820817.17	[3]
P-0192	Stock Water	In Channel	8.52	25.17	2523081.11	1820488.26	[3]
P-0193	Stock Water	In Channel	0.35	0.55	2507332.99	1767680.08	[3]
P-0194	Stock Water	In Channel	0.9	4.77	2506883.94	1760785.08	[3]
P-0195	Stock Water	In Channel	4.84	11.81	2515769.35	1759872.15	[3]
P-0196	Stock Water	In Channel	1.44	3.32	2518802.91	1759949.12	[3]
P-0197	Stock Water	Off Channel	0.8	1.87	2532792.50	1758400.76	[3]
P-0198	Stock Water	In Channel	0.5	1.19	2530694.41	1754221.28	[3]
P-0199	Stock Water	In Channel	0.79	3.78	2536301.90	1727150.54	[3]
P-0200	Stock Water	In Channel	1	9.31	2499019.78	1725276.64	[3]
P-0201	Stock Water	In Channel	0.35	1.25	2493003.08	1726082.42	[3]
P-0202	Stock Water	In Channel	22.43	69.75	2483033.79	1727055.32	[3]
P-0203	Irrigation, Stock Water	In Channel	2.59	5.05	2482160.45	1724028.32	[1]
P-0204	Stock Water	Well	0.2	0.41	2491989.65	1758748.12	[3]
P-0205	Stock Water	Well	0.31	1.02	2486471.06	1721697.11	[3]
P-0206	Stock Water	Well	0.13	0.18	2486445.63	1721663.92	[3]
P-0207	Stock Water	In Channel	6.56	31.12	2507093.81	1760808.73	[3]
P-0208	Stock Water	Off Channel	0.37	2.06	2533050.36	1758440.94	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0209	Stock Water	Well	0.11	0.11	2515967.68	1745004.88	[3]
P-0211	Stock Water	In Channel, Well	0.39	0.43	2518776.02	1738502.76	[3]
P-0212	Sewer Settling	Sewer	0.41	0.33	2489786.60	1739686.99	[4]
P-0213	Sewer Settling	Sewer	0.49	0.83	2489780.62	1739671.12	[4]
P-0214	Sewer Settling	Sewer	0.36	0.62	2489766.00	1739687.44	[4]
P-0215	Sewer Settling	Sewer	0.3	0.71	2489730.17	1739533.84	[4]
P-0216	Stock Water	In Channel	0.08	0.19	2481833.78	1726088.71	[3]
P-0217	Stock Water	In Channel	4.99	30.64	2497745.07	1728462.84	[3]
P-0218	Stock Water	In Channel	0.07	0.17	2481833.22	1726063.17	[3]
P-0219	Stock Water	Well	0.12	0.29	2483426.33	1817676.05	[3]
P-0220	Stock Water	In Channel	0.91	2.51	2486075.31	1830250.34	[3]
P-0221	Stock Water	In Channel	0.72	2.85	2483477.87	1833497.57	[3]
P-0222	Stock Water	In Channel	3.07	7.87	2484498.05	1836666.20	[3]
P-0223	Stock Water	Well	0.89	2.82	2486266.33	1839825.90	[3]
P-0225	Stock Water	In Channel	7.96	20.36	2493174.36	1832090.25	[3]
P-0226	Stock Water	In Channel	80.39	648.79	2504149.78	1845641.49	[3]
P-0227	Stock Water	In Channel	16.64	52.42	2507177.70	1844875.33	[3]
P-0228	Stock Water	In Channel	47.45	205.49	2510335.83	1841731.75	[3]
P-0230	Stock Water	In Channel	18.24	61.03	2532201.60	1851283.01	[3]
P-0231	Stock Water	In Channel	0.56	2.22	2531837.84	1837987.84	[3]
P-0232	Stock Water	In Channel	3.77	13.36	2532112.69	1837523.56	[3]
P-0233	Stock Water	In Channel	8.49	31.76	2540305.51	1833740.22	[3]
P-0234	Stock Water	In Channel	25.45	140.29	2533217.21	1820162.37	[3]
P-0235	Stock Water	In Channel	0.54	1.5	2535913.66	1807066.02	[3]
P-0236	Stock Water	In Channel	5.08	17.98	2534533.27	1807519.25	[3]
P-0237	Stock Water	In Channel	1.17	5.78	2534447.87	1807780.18	[3]
P-0238	Stock Water	In Channel	7.93	31.23	2530283.51	1803146.39	[3]
P-0239	Stock Water	Well	1.49	7.06	2541461.47	1797342.75	[3]
P-0240	Stock Water	In Channel	2.93	10.94	2546348.33	1794074.57	[3]
P-0241	Stock Water	In Channel	3.05	9.01	2548401.58	1794434.47	[3]
P-0242	Stock Water	Well	0.07	0.07	2511674.55	1887662.94	[3]
P-0243	Stock Water	In Channel	0.43	1.1	2502317.37	1885135.33	[3]
P-0244	Stock Water	In Channel	0.59	1.29	2483828.40	1905796.22	[3]
P-0245	Stock Water	In Channel	1.76	12.13	2494670.87	1906614.53	[3]
P-0246	Stock Water	In Channel	1.22	3.12	2487187.40	1900326.13	[3]
P-0247	Stock Water	In Channel	41.28	32.5	2492824.53	1898303.59	[3]
P-0248	Stock Water	In Channel	1.81	9.6	2479238.40	1891024.32	[3]
P-0249	Stock Water	In Channel	1.14	2.69	2474039.36	1885857.76	[3]
P-0250	Stock Water	In Channel	1.48	8.45	2474092.53	1885673.22	[3]
P-0251	Stock Water	In Channel	15.49	106.7	2480471.59	1882716.68	[3]
P-0252	Stock Water	Well	0.39	0.31	2492624.71	1888948.42	[3]
P-0253	Stock Water	Well	0.06	0.11	2478841.09	1900437.67	[3]
P-0254	Stock Water	Well	0.16	0.34	2479044.09	1900432.38	[3]
P-0255	Stock Water	Well	0.07	0.2	2479225.93	1900550.00	[3]
P-0256	Stock Water	In Channel	0.37	1.81	2479956.67	1856181.86	[3]
P-0257	Stock Water	In Channel	23.37	104.88	2479897.17	1855766.84	[3]
P-0258	Stock Water	In Channel	1.75	3.38	2475449.76	1873277.47	[3]
P-0259	Stock Water	In Channel	0.64	0.43	2475575.99	1873383.33	[3]
P-0260	Stock Water	In Channel	1.79	5.74	2476568.61	1872372.62	[3]
P-0261	Stock Water	Well	0.06	0.11	2490739.88	1879527.63	[3]
P-0263	Stock Water	In Channel	11.5	28.3	2499574.91	1866625.77	[3]
P-0264	Stock Water	In Channel	3.05	6.07	2503214.71	1868277.37	[3]
P-0265	Stock Water	In Channel	2.05	5.32	2504000.42	1867883.30	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0267	Stock Water	In Channel	2.92	6.72	2492291.92	1855787.04	[3]
P-0268	Stock Water	In Channel	0.25	0.66	2503224.48	1865001.87	[3]
P-0269	Stock Water	In Channel	1.76	5.42	2501680.23	1867083.83	[3]
P-0271	Stock Water	Well	0.13	0.59	2499614.87	1869766.67	[3]
P-0274	Stock Water	Well	0.12	0.09	2499940.72	1869725.67	[3]
P-0278	Stock Water	In Channel	3.25	12.1	2567354.06	1882337.42	[3]
P-0279	Stock Water	Well	0.04	0.04	2527743.15	1898048.75	[3]
P-0280	Stock Water	Well	0.09	0.24	2550828.37	1901731.82	[3]
P-0281	Stock Water	In Channel	1.34	10.66	2541983.34	1869553.23	[3]
P-0282	Stock Water	In Channel	0.73	2.8	2567295.79	1882043.45	[3]
P-0283	Stock Water	In Channel	0.86	4.28	2527452.12	1880583.04	[3]
P-0284	Stock Water	In Channel	0.81	3.03	2569811.82	1861578.50	[3]
P-0285	Stock Water	In Channel	0.91	2.97	2563505.32	1860362.66	[3]
P-0286	Stock Water	In Channel	3.98	13.33	2563182.09	1859896.68	[3]
P-0287	Stock Water	In Channel	7.86	34.64	2524447.71	1853460.15	[3]
P-0288	Stock Water	In Channel	9.85	80.69	2564521.46	1914113.71	[3]
P-0289	Stock Water	In Channel	1.28	1.56	2546718.96	1916625.84	[3]
P-0290	Stock Water	In Channel	1.24	3.17	2512448.56	1968312.58	[3]
P-0291	Stock Water	In Channel	2.24	3.52	2503361.30	1968863.16	[3]
P-0292	Stock Water	In Channel	1.41	3.34	2511685.37	1967669.85	[3]
P-0293	Stock Water	In Channel	7.16	11.28	2495342.07	1987366.96	[3]
P-0294	Stock Water	In Channel	0.94	1.86	2478604.13	1986531.15	[3]
P-0295	Stock Water	In Channel	9.65	11.4	2475082.94	1980020.77	[3]
P-0298	Stock Water	Well	0.07	0.12	2485942.80	1973061.47	[3]
P-0299	Stock Water	In Channel	1.31	1.55	2571732.64	1936415.52	[3]
P-0300	Stock Water	In Channel	1.15	2.71	2567529.95	1932612.65	[3]
P-0301	Stock Water	In Channel	3.12	13.51	2567767.37	1931371.04	[3]
P-0302	Stock Water	In Channel	3.88	15.26	2561395.77	1930096.01	[3]
P-0303	Stock Water	In Channel	1.32	4.15	2552535.13	1929813.92	[3]
P-0304	Stock Water	In Channel	9.1	53.73	2541572.21	1930377.62	[3]
P-0305	Stock Water	In Channel	2.67	8.93	2535246.24	1934601.35	[3]
P-0306	Stock Water	In Channel	2.56	11.08	2522283.70	1924874.67	[3]
P-0307	Stock Water	Well	0.06	0.09	2492768.28	1923204.09	[3]
P-0308	Stock Water	In Channel	0.93	4.78	2481791.50	1925426.47	[3]
P-0309	Stock Water	Well	1.75	5.87	2478884.51	1927339.14	[3]
P-0310	Stock Water	Well	0.05	0.06	2485829.42	1935963.30	[3]
P-0311	Stock Water	Well	0.06	0.1	2477660.69	1944371.48	[3]
P-0312	Stock Water	Well	0.08	0.16	2489554.01	1955260.45	[3]
P-0313	Stock Water	In Channel	11.76	64.8	2491118.81	1960359.80	[3]
P-0314	Stock Water	In Channel	1.21	5.7	2491233.37	1960191.44	[3]
P-0315	Stock Water	In Channel	4.94	10.7	2476070.86	1955694.06	[3]
P-0316	Stock Water	In Channel	0.09	0.31	2522267.34	1800706.03	[3]
P-0317	Stock Water	Well	0.69	2.31	2523176.71	1800462.03	[3]
P-0319	Stock Water	In Channel	1.57	10.85	2559588.73	1796515.76	[3]
P-0321	Stock Water	Well	0.24	0.7	2555805.68	1813831.91	[3]
P-0322	Stock Water	In Channel	4.18	22.24	2564928.00	1814011.24	[3]
P-0323	Stock Water	In Channel	0.61	2.66	2568316.05	1821790.51	[3]
P-0324	Stock Water	In Channel	1.06	4.36	2568490.10	1822202.62	[3]
P-0325	Stock Water	In Channel	4.74	46.69	2563906.16	1832083.28	[3]
P-0328	Stock Water	In Channel	7.44	19.04	2482342.74	1792599.08	[3]
P-0329	Stock Water	In Channel	0.73	2.43	2495291.16	1803860.46	[3]
P-0332	Stock Water	In Channel	11.01	26	2520324.34	1976544.53	[3]
P-0334	Stock Water	In Channel	0.25	0.4	2518650.89	1941887.11	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0335	Stock Water	In Channel	2.67	9.46	2519055.87	1941886.19	[3]
P-0336	Stock Water	In Channel	18.04	92.31	2524900.75	1944362.22	[3]
P-0337	Stock Water	In Channel	1.48	1.75	2522161.74	1949859.55	[3]
P-0338	Stock Water	In Channel	1.41	3.05	2533501.11	1949806.27	[3]
P-0339	Stock Water	In Channel	2.02	2.39	2525798.60	1954854.51	[3]
P-0341	Stock Water	In Channel	0.95	1.3	2538029.86	1956882.04	[3]
P-0342	Stock Water	In Channel	6.47	44.58	2535066.37	1970153.74	[3]
P-0343	Stock Water	In Channel	3.23	27.38	2561539.93	1973929.76	[3]
P-0344	Stock Water	In Channel	1.84	3.98	2562438.61	1974438.07	[3]
P-0345	Stock Water	In Channel	2.52	10.93	2560323.92	1982855.83	[3]
P-0346	Stock Water	In Channel	2.54	9.01	2563088.91	1985449.24	[3]
P-0348	Stock Water	In Channel	3.98	25.05	2560342.49	1987331.90	[3]
P-0349	Stock Water	In Channel	1.85	10.9	2559148.17	1987537.66	[3]
P-0350	Stock Water	In Channel	2.59	16.81	2557642.09	1988782.95	[3]
P-0352	Stock Water	In Channel	0.14	0.28	2486374.58	2038758.14	[3]
P-0353	Stock Water	In Channel	0.21	0.13	2489347.04	2023571.92	[3]
P-0354	Stock Water	In Channel	1.1	2.17	2553500.31	2040287.28	[3]
P-0355	Stock Water	In Channel	0.59	1.86	2562237.83	2027122.31	[3]
P-0356	Stock Water	In Channel	1.15	0.9	2560667.10	2025728.42	[3]
P-0359	Industrial	Industrial	2.27	3.57	2518450.56	2016893.92	[2]
P-0361	Stock Water	In Channel	2.57	3.55	2541663.85	2026142.87	[3]
P-0365	Stock Water	In Channel	1.41	4.72	2545675.65	2056940.18	[3]
P-0366	Stock Water	In Channel	5.44	11.79	2549077.74	2047587.32	[3]
P-0367	Stock Water	In Channel	1.14	4.04	2553729.32	2040516.28	[3]
P-0368	Stock Water	In Channel	1.25	2.45	2545210.98	2035095.19	[3]
P-0369	Stock Water	Improved Spring	0.19	0.62	2554684.56	2014868.14	[3]
P-0370	Stock Water	In Channel	1.32	2.33	2559233.66	2027221.98	[3]
P-0371	Stock Water	In Channel	0.66	2.6	2502929.24	2056838.80	[3]
P-0372	Stock Water	In Channel	0.13	0.22	2485509.26	2039696.61	[3]
P-0373	Stock Water	In Channel	0.71	0.97	2491442.16	2035412.39	[3]
P-0374	Stock Water	In Channel	1	3.36	2490766.61	2021184.05	[3]
P-0375	Stock Water	In Channel	0.44	0.7	2490231.33	2019693.01	[3]
P-0376	Stock Water	In Channel	1.21	5.7	2489788.97	2019424.82	[3]
P-0377	Stock Water	In Channel	0.6	1.65	2479184.18	2021777.48	[3]
P-0378	Stock Water	In Channel, Well	2.28	10.31	2475160.11	2024570.98	[3]
P-0379	Stock Water	In Channel	0.26	0.46	2494938.31	2002181.40	[3]
P-0381	Stock Water	In Channel	1.82	9.67	2497313.07	1993849.26	[3]
P-0382	Stock Water	In Channel	0.22	0.26	2560788.05	2025743.70	[3]
P-0384	Stock Water	In Channel	1.57	10.18	2512085.05	2005645.97	[3]
P-0404	Stock Water	In Channel	3.05	10.94	2664154.87	1681886.20	[3]
P-0405	Stock Water	In Channel	0.15	0.2	2658297.26	1677957.08	[3]
P-0406	Stock Water	In Channel	0.74	1.79	2658187.63	1679471.45	[3]
P-0407	Stock Water	Well	0.11	0.3	2667489.58	1678513.31	[3]
P-0408	Stock Water	Well	0.03	0.12	2667402.32	1678450.06	[3]
P-0410	Stock Water	In Channel	0.95	5.81	2559757.48	1942432.10	[3]
P-0411	Stock Water	Off Channel	0.83	5.53	2539955.11	1942174.91	[3]
P-0430	Industrial	Power Plant	9.1	37.61	2521956.86	2072274.62	[2]
P-0431	Industrial	Power Plant	3.83	31.67	2521967.04	2071284.04	[2]
P-0432	Industrial	Power Plant	15.34	36.25	2523389.48	2070371.40	[2]
P-0433	Industrial	Power Plant	14.37	33.96	2523433.60	2070182.56	[2]
P-0434	Industrial	Power Plant	11.3	22.24	2523464.63	2068953.34	[2]
P-0435	Industrial	Power Plant	11.06	30.47	2523471.10	2068886.51	[2]
P-0436	Industrial	Power Plant	46.18	118.19	2525310.01	2069480.78	[2]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0437	Industrial	Power Plant	59.04	499.71	2525601.75	2067941.50	[2]
P-0438	Industrial	Power Plant	15.92	34.48	2526208.92	2070130.01	[2]
P-0439	Industrial	Power Plant	3.62	22.08	2526297.83	2070634.98	[2]
P-0440	Industrial	Power Plant	130.51	1001.97	2526287.14	2070725.33	[2]
P-0441	Stock Water	Well	0.1	0.14	2509504.12	2074106.72	[3]
P-0442	Stock Water	Well	0.07	0.1	2498728.51	2078446.92	[3]
P-0443	Stock Water	In Channel	0.69	3.01	2490492.82	2077806.69	[3]
P-0446	Stock Water	In Channel	0.62	0.61	2477369.40	2063654.24	[3]
P-0447	Stock Water	Well	1.94	4.58	2579503.43	1777426.14	[3]
P-0448	Stock Water	In Channel	1.32	4.93	2593860.90	1777281.37	[3]
P-0449	Stock Water	In Channel	0.58	1.13	2610015.06	1778683.97	[3]
P-0450	Stock Water	In Channel	5.37	28.53	2612244.83	1779658.54	[3]
P-0451	Stock Water	In Channel	0.76	2.68	2623212.73	1779968.58	[3]
P-0452	Stock Water	In Channel	3.39	8	2646189.73	1779694.87	[3]
P-0453	Stock Water	In Channel	0.46	1.17	2639223.85	1775387.75	[3]
P-0454	Stock Water	In Channel	1.04	8.22	2651565.48	1775876.33	[3]
P-0455	Stock Water	In Channel	1.75	6.88	2595589.43	1775440.04	[3]
P-0456	Stock Water	In Channel	0.8	6.63	2634978.40	1768874.13	[3]
P-0457	Stock Water	In Channel	0.79	5.3	2652110.39	1770765.78	[3]
P-0458	Stock Water	Off Channel	0.08	0.1	2655646.36	1769737.84	[3]
P-0459	Stock Water	Well	0.09	0.11	2640990.06	1762267.14	[3]
P-0460	Stock Water	In Channel	0.89	2.98	2635834.90	1759800.63	[3]
P-0461	Stock Water	In Channel	3.46	17.03	2651802.03	1775827.62	[3]
P-0462	Stock Water	Well	0.15	0.2	2638671.88	1774917.86	[3]
P-0463	Stock Water	Well	0.08	0.1	2638655.42	1774960.24	[3]
P-0465	Stock Water	In Channel	17.1	57.22	2634433.14	1769331.28	[3]
P-0466	Stock Water	Well	0.28	0.62	2640920.44	1762326.96	[3]
P-0467	Stock Water	Well	0.61	0.48	2592827.54	1811722.92	[3]
P-0468	Stock Water	In Channel	37.68	103.85	2583469.87	1823327.46	[3]
P-0469	Stock Water	In Channel	1.06	3.56	2576060.81	1809111.44	[3]
P-0470	Stock Water	In Channel	23.89	98.78	2590129.20	1806898.60	[3]
P-0471	Stock Water	In Channel	2.83	8.37	2577769.85	1805693.13	[3]
P-0472	Stock Water	In Channel	32.71	115.89	2579642.21	1795141.57	[3]
P-0473	Stock Water	In Channel	2.47	8.75	2604614.20	1782454.27	[3]
P-0474	Stock Water	In Channel	0.79	2.35	2602560.04	1781470.95	[3]
P-0475	Stock Water	In Channel	0.86	6.09	2583797.63	1823010.68	[3]
P-0479	Stock Water	In Channel	2.83	2.79	2629188.68	1823525.36	[3]
P-0482	Stock Water	In Channel	1.2	5.2	2633658.54	1812410.66	[3]
P-0483	Stock Water	In Channel	1.16	2.52	2642055.87	1810771.13	[3]
P-0484	Stock Water	In Channel	0.81	2.87	2652573.87	1803820.10	[3]
P-0485	Stock Water	In Channel	3.81	16.48	2634076.87	1797241.99	[3]
P-0486	Stock Water	In Channel	2.43	11	2648323.75	1799679.44	[3]
P-0487	Stock Water	In Channel	2.48	10.25	2654457.47	1796909.60	[3]
P-0488	Stock Water	In Channel	6.94	35.5	2633799.86	1790234.67	[3]
P-0489	Stock Water	Well	0.65	2.8	2615365.06	1785899.54	[3]
P-0490	Stock Water	In Channel	0.96	5.68	2626733.05	1784621.15	[3]
P-0491	Stock Water	In Channel	16.56	68.44	2626560.32	1783698.77	[3]
P-0492	Stock Water	In Channel	2.1	10.76	2638131.09	1787864.44	[3]
P-0493	Stock Water	In Channel	3.03	8.36	2638082.81	1787492.14	[3]
P-0494	Stock Water	In Channel	6.97	21.95	2638429.67	1788189.19	[3]
P-0495	Stock Water	In Channel	46.91	221.62	2638662.00	1787860.26	[3]
P-0496	Stock Water	In Channel	24.44	52.92	2639564.13	1786096.60	[3]
P-0499	Stock Water	In Channel	1.81	4.98	2649819.06	1823106.25	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0500	Stock Water	In Channel	0.67	0.79	2638819.14	1822701.33	[3]
P-0501	Stock Water	In Channel	0.74	1.31	2638362.20	1825103.27	[3]
P-0502	Stock Water	Well	0.26	0.61	2637946.87	1825785.38	[3]
P-0503	Stock Water	In Channel	14.78	58.2	2665154.94	1825641.38	[3]
P-0504	Stock Water	In Channel	2.35	13.85	2592488.91	1912123.22	[3]
P-0505	Stock Water	In Channel	8.85	20.91	2644661.40	1904058.09	[3]
P-0506	Stock Water	In Channel	6.11	19.25	2640896.31	1910670.63	[3]
P-0507	Stock Water	In Channel	2.37	7.92	2649228.14	1908147.76	[3]
P-0508	Stock Water	In Channel	2.95	14.54	2587660.51	1915064.13	[3]
P-0509	Stock Water	In Channel	3.04	4.18	2575070.03	1919527.54	[3]
P-0510	Stock Water	In Channel	1.34	2.64	2663687.69	1918354.14	[3]
P-0511	Stock Water	In Channel	11.45	29.31	2573705.42	1918746.70	[3]
P-0512	Stock Water	In Channel	0.9	1.23	2649142.23	1908580.52	[3]
P-0513	Stock Water	In Channel	0.81	5.74	2608057.24	1753033.80	[3]
P-0514	Stock Water	In Channel	7.68	10.58	2607970.33	1752319.25	[3]
P-0515	Stock Water	In Channel	2.61	8.22	2631082.46	1747153.61	[3]
P-0516	Stock Water	In Channel	0.41	2.09	2595915.43	1721727.87	[3]
P-0517	Stock Water	In Channel	0.13	0.21	2584588.40	1713745.22	[3]
P-0518	Stock Water	In Channel	0.81	2.39	2639774.24	1715309.59	[3]
P-0519	Stock Water	In Channel	5.58	18.68	2579164.91	1726947.64	[3]
P-0520	Stock Water	In Channel	1.19	5.64	2643386.96	1749185.03	[3]
P-0521	Stock Water	In Channel	0.92	1.81	2638345.58	1751553.57	[3]
P-0522	Stock Water	In Channel	0.54	1.59	2579078.94	1751761.77	[3]
P-0523	Stock Water	In Channel	1.08	1.49	2612490.31	1747896.01	[3]
P-0524	Stock Water	In Channel	0.76	1.95	2631879.47	1746603.44	[3]
P-0525	Irrigation, Stock Water	In Channel	42.89	177.31	2646175.84	1747542.77	[1]
P-0526	Stock Water	In Channel	5.95	7.03	2644364.62	1739943.85	[3]
P-0527	Stock Water	In Channel	0.88	6.25	2644490.96	1740186.05	[3]
P-0528	Stock Water	Well	0.35	1.39	2631896.97	1739197.15	[3]
P-0529	Irrigation, Stock Water	In Channel	2.07	10.17	2627830.26	1741258.19	[1]
P-0530	Stock Water	In Channel	0.86	6.42	2622662.75	1737989.31	[3]
P-0531	Stock Water	In Channel	0.73	3.73	2617474.43	1742697.67	[3]
P-0532	Stock Water	In Channel	3.1	6.11	2615398.25	1741507.54	[3]
P-0533	Stock Water	In Channel	0.77	3.32	2609871.48	1736841.87	[3]
P-0534	Stock Water	In Channel	3.72	6.59	2584329.12	1732604.93	[3]
P-0535	Stock Water	In Channel	0.8	0.94	2597152.12	1732032.96	[3]
P-0536	Stock Water	In Channel	2.38	2.81	2609024.85	1731119.95	[3]
P-0537	Stock Water	In Channel	0.79	2.32	2600860.14	1729753.89	[3]
P-0538	Stock Water	In Channel	0.97	1.52	2625274.22	1733698.81	[3]
P-0539	Stock Water	In Channel	0.49	2.03	2623146.88	1729314.89	[3]
P-0540	Stock Water	In Channel	0.2	0.2	2640154.42	1733860.73	[3]
P-0541	Stock Water	In Channel	0.34	0.74	2639919.53	1733161.06	[3]
P-0542	Stock Water	In Channel	1.07	6.56	2650126.04	1735014.39	[3]
P-0543	Stock Water	Well	0.75	3.84	2656553.42	1724774.68	[3]
P-0544	Stock Water	In Channel	3.15	9.31	2595505.55	1723590.01	[3]
P-0545	Stock Water	In Channel	0.97	2.49	2587330.93	1725114.93	[3]
P-0546	Stock Water	In Channel	0.7	3.45	2576101.84	1721710.54	[3]
P-0547	Stock Water	In Channel	0.89	1.4	2652218.12	1712703.91	[3]
P-0548	Stock Water	In Channel	1.07	2.1	2626483.97	1711180.24	[3]
P-0549	Stock Water	In Channel	1.61	4.43	2628315.52	1713785.35	[3]
P-0550	Stock Water	In Channel	1.06	4.79	2617494.71	1714247.49	[3]
P-0551	Stock Water	In Channel	1.85	5.11	2616167.85	1712830.13	[3]
P-0552	Stock Water	In Channel	0.16	0.84	2611725.66	1714130.91	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0553	Irrigation, Stock Water	In Channel	0.86	2.36	2601239.8	1715057.82	[1]
P-0554	Stock Water	In Channel	1.06	4.18	2597727.52	1712550.84	[3]
P-0555	Stock Water	In Channel	1.84	14.46	2578256.02	1713270.73	[3]
P-0556	Stock Water	In Channel	1.12	3.32	2633327.46	1708531.19	[3]
P-0557	Stock Water	Well	3.88	21.37	2604852.18	1710146.77	[3]
P-0558	Stock Water	In Channel	1.53	14.48	2601199.51	1707683.11	[3]
P-0559	Irrigation, Stock Water	In Channel	2.13	8.4	2601531.14	1702770.52	[1]
P-0560	Stock Water	In Channel	1.24	4.89	2615138.36	1701828.87	[3]
P-0561	Stock Water	In Channel	5.44	20.34	2654762.78	1702386.77	[3]
P-0562	Stock Water	In Channel	4.47	10.56	2662174.88	1688708.87	[3]
P-0564	Stock Water	Well	0.16	1.07	2633510.03	1714833.98	[3]
P-0565	Stock Water	Well	0.22	0.42	2588176.97	1749112.20	[3]
P-0566	Stock Water	Well	0.15	0.27	2588013.51	1748746.52	[3]
P-0567	Stock Water	In Channel	8.51	31.82	2622717.53	1738245.28	[3]
P-0568	Stock Water	In Channel	2.13	4.19	2617152.48	1742180.08	[3]
P-0569	Stock Water	In Channel	7.98	6.12	2610491.24	1736616.93	[3]
P-0570	Stock Water	In Channel	4.76	15	2596980.81	1732287.75	[3]
P-0571	Stock Water	In Channel	1.02	2.8	2600897.67	1729508.58	[3]
P-0572	Stock Water	In Channel	0.41	0.05	2623054.49	1729303.97	[3]
P-0573	Stock Water	In Channel	1.09	8.15	2595408.62	1723938.14	[3]
P-0574	Stock Water	In Channel	3.53	10.43	2575449.23	1721572.46	[3]
P-0575	Stock Water	Well	0.28	0.38	2589929.92	1719628.67	[3]
P-0576	Stock Water	Well	0.62	0.73	2590092.77	1719493.80	[3]
P-0577	Stock Water	In Channel	0.17	0.23	2626790.83	1711800.27	[3]
P-0578	Stock Water	In Channel	3.53	9.03	2617654.58	1714136.48	[3]
P-0579	Stock Water	In Channel	0.13	0.43	2611688.61	1714120.23	[3]
P-0580	Irrigation, Stock Water	In Channel	0.17	0.16	2601247.4	1715028.08	[1]
P-0581	Stock Water	In Channel	0.6	2.73	2654635.11	1702388.52	[3]
P-0582	Stock Water	In Channel	0.9	2.3	2661771.70	1689068.34	[3]
P-0584	Stock Water	In Channel	1.61	3.81	2584845.05	1930617.21	[3]
P-0585	Stock Water	In Channel	0.83	2.29	2575690.94	1937401.68	[3]
P-0586	Stock Water	In Channel	0.57	1.69	2577403.93	1934552.59	[3]
P-0587	Stock Water	In Channel	3.45	8.82	2588243.32	1934333.89	[3]
P-0588	Stock Water	In Channel	2.33	7.79	2599373.90	1934259.51	[3]
P-0591	Stock Water	In Channel	1.8	4.95	2583494.67	1957776.72	[3]
P-0593	Stock Water	In Channel	0.8	1.73	2587783.53	1964581.74	[3]
P-0594	Stock Water	In Channel	5.97	11.75	2596410.12	1960788.41	[3]
P-0595	Stock Water	In Channel	0.98	3.85	2572908.74	1932224.29	[3]
P-0596	Stock Water	Well	0.07	0.06	2577565.64	1931929.00	[3]
P-0597	Stock Water	Well	0.02	0.03	2577355.79	1931973.84	[3]
P-0598	Stock Water	Well	0.07	0.07	2587179.69	1943803.11	[3]
P-0599	Stock Water	In Channel	0.37	2.16	2625372.47	1766046.70	[3]
P-0600	Stock Water	In Channel	1.91	4.52	2625457.70	1765738.38	[3]
P-0601	Stock Water	In Channel	0.86	3.04	2581499.90	1760384.00	[3]
P-0602	Stock Water	In Channel	2.21	2.61	2581393.32	1760306.00	[3]
P-0603	Stock Water	In Channel	1.38	10.03	2595381.36	1758458.30	[3]
P-0604	Stock Water	In Channel	23.8	93.69	2594870.14	1758376.21	[3]
P-0605	Stock Water	In Channel	0.66	3.12	2603722.02	1756673.62	[3]
P-0606	Stock Water	Well	0.1	0.21	2625220.52	1763432.02	[3]
P-0607	Stock Water	In Channel	3.89	14.56	2620657.92	1767196.27	[3]
P-0608	Stock Water	In Channel	1.22	4.79	2596559.21	1950614.54	[3]
P-0609	Stock Water	In Channel	0.59	1.96	2598285.69	1958831.26	[3]
P-0610	Stock Water	In Channel	0.97	3.06	2597947.46	1963203.30	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0611	Stock Water	In Channel	0.75	1.62	2597451.50	1961607.91	[3]
P-0612	Stock Water	In Channel	6.37	20.05	2601293.00	1963092.99	[3]
P-0613	Stock Water	In Channel	0.56	1.33	2610324.78	1965625.81	[3]
P-0614	Stock Water	In Channel	0.27	0.32	2608093.31	1964276.02	[3]
P-0615	Stock Water	In Channel	0.44	1.82	2603768.68	1958254.62	[3]
P-0616	Stock Water	In Channel	1.05	3.73	2612152.25	1958258.65	[3]
P-0617	Stock Water	In Channel	4.8	14.16	2607020.60	1951591.82	[3]
P-0618	Stock Water	In Channel	0.22	0.96	2609068.35	1939164.66	[3]
P-0619	Stock Water	In Channel	0.85	4.37	2609927.14	1934696.42	[3]
P-0620	Stock Water	In Channel	1.27	2.75	2618462.68	1950974.42	[3]
P-0621	Stock Water	In Channel	7.18	28.26	2630324.32	1944852.20	[3]
P-0628	Stock Water	In Channel	17.58	48.46	2647387.00	1954918.33	[3]
P-0638	Sewer Settling	Sewer	0.47	2.4	2591121.64	1853045.75	[4]
P-0639	Sewer Settling	Sewer	0.96	3.2	2590995.75	1853272.27	[4]
P-0640	Stock Water	Well	0.11	0.15	2593129.30	1852731.96	[3]
P-0644	Stock Water	In Channel	0.31	0.24	2649833.67	1849080.95	[3]
P-0645	Sewer Settling	Sewer	0.3	0.59	2627360.78	1854007.15	[4]
P-0646	Stock Water	In Channel	6.89	14.92	2627607.73	1841200.86	[3]
P-0647	Irrigation, Stock Water	In Channel	0.84	1.32	2622150.33	1834922.89	[1]
P-0648	Sewer Settling	Sewer	1.89	2.24	2631573.61	1836983.70	[4]
P-0649	Sewer Settling	Sewer	0.55	2.06	2631418.85	1836787.29	[4]
P-0650	Sewer Settling	Sewer	0.43	1.19	2631233.83	1836657.32	[4]
P-0651	Stock Water	In Channel	0.8	0.63	2633687.81	1833425.90	[3]
P-0652	Stock Water	In Channel	1.16	2.73	2614845.19	1862127.45	[3]
P-0655	Stock Water	In Channel	1.33	6.55	2664411.26	1870162.22	[3]
P-0656	Stock Water	In Channel	0.43	0.26	2662613.61	1873056.46	[3]
P-0657	Stock Water	In Channel	2.39	5.18	2593581.87	1874105.76	[3]
P-0658	Stock Water	In Channel	2.32	6.86	2572741.26	1862641.90	[3]
P-0660	Stock Water	Off Channel	0.8	6.34	2571783.16	1855513.54	[3]
P-0661	Stock Water	In Channel	3.91	3	2577200.47	1850954.75	[3]
P-0662	Stock Water	In Channel	0.89	2.45	2618666.56	1847542.22	[3]
P-0663	Sewer Settling	Sewer	0.34	0.67	2627467.39	1854121.09	[4]
P-0664	Sewer Settling	Sewer	0.38	1.12	2627669.35	1853930.10	[4]
P-0665	Stock Water	In Channel	0.85	3.49	2627035.91	1841631.36	[3]
P-0668	Stock Water	In Channel	0.71	1.25	2586049.23	1841832.99	[3]
P-0669	Stock Water	In Channel	1.89	5.57	2572779.13	1843359.26	[3]
P-0670	Stock Water	In Channel	1.07	1.05	2587424.27	1837925.02	[3]
P-0671	Stock Water	In Channel	1.85	25.5	2583811.70	1830160.85	[3]
P-0672	Stock Water	In Channel	0.53	0.52	2618894.40	1831270.57	[3]
P-0673	Stock Water	In Channel	0.59	0.58	2632793.00	1833747.58	[3]
P-0674	Stock Water	In Channel	4.8	15.1	2571208.74	1828267.52	[3]
P-0675	Stock Water	Well	0.19	0.72	2584829.87	1874422.37	[3]
P-0676	Stock Water	Well	0.25	0.44	2577954.40	1854365.00	[3]
P-0677	Stock Water	Well	0.19	0.26	2650613.62	1849678.99	[3]
P-0678	Stock Water	Well	0.13	0.27	2630340.43	1835236.97	[3]
P-0679	Stock Water	Well	0.15	0.12	2577469.00	1834261.71	[3]
P-0680	Stock Water	In Channel	1.45	3.41	2648518.46	1831912.68	[3]
P-0681	Stock Water	In Channel	0.17	0.44	2648723.24	1832157.77	[3]
P-0683	Sewer Settling	Sewer	0.42	1.49	2631191.57	1836671.73	[4]
P-0684	Stock Water	In Channel	3.52	7.61	2591309.66	1974545.02	[3]
P-0685	Stock Water	In Channel	1.44	7.36	2583379.72	1989337.31	[3]
P-0687	Stock Water	In Channel	4.24	10.84	2595131.45	1991949.86	[3]
P-0688	Stock Water	In Channel	2.89	11.96	2595153.66	1995117.93	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0689	Stock Water	In Channel	3.54	28.54	2589425.68	1980544.98	[3]
P-0690	Stock Water	In Channel	1.39	10.09	2577329.98	2002741.10	[3]
P-0691	Stock Water	In Channel	3.91	16.15	2577834.98	2002126.45	[3]
P-0692	Stock Water	In Channel	0.15	0.55	2594559.09	2001942.88	[3]
P-0695	Stock Water	In Channel	3.14	30.25	2572198.25	2008483.56	[3]
P-0700	Stock Water	In Channel	3.12	16.56	2590443.84	2000837.14	[3]
P-0736	Stock Water	In Channel	1.5	6.78	2601556.44	1976067.27	[3]
P-0737	Stock Water	In Channel	4.29	19.44	2600758.30	1985185.47	[3]
P-0750	Stock Water	In Channel	1.02	7.04	2600476.82	1972629.63	[3]
P-0751	Stock Water	In Channel	1.31	6.18	2601760.07	1979876.26	[3]
P-0752	Stock Water	In Channel	0.67	2.38	2601846.04	1980163.53	[3]
P-0809	Stock Water	In Channel, Well	1.13	1.99	2474468.97	2024666.50	[3]
P-0810	Stock Water	In Channel	12.03	28.43	2526194.44	1852861.34	[3]
P-0811	Stock Water	In Channel	3.42	7.41	2576817.49	1966092.71	[3]
P-0812	Stock Water	In Channel	2.12	4.59	2572991.31	1969181.64	[3]
P-0813	Stock Water	In Channel	4.28	34.51	2573979.04	1968888.43	[3]
P-0827	Stock Water	In Channel	2.13	7.56	2524833.59	1780380.96	[3]
P-0828	Stock Water	In Channel	0.95	4.5	2647244.36	1684581.02	[3]
P-0872	Stock Water	In Channel	0.73	9.26	2706607.59	1903875.45	[3]
P-0873	Stock Water	In Channel	8.98	38.88	2706944.52	1903618.77	[3]
P-0874	Stock Water	In Channel	1.16	2.5	2745294.76	1904339.27	[3]
P-0875	Stock Water	In Channel	1.8	4.97	2728498.95	1900396.35	[3]
P-0876	Stock Water	In Channel	13.22	140.57	2715088.03	1895589.62	[3]
P-0877	Stock Water	In Channel	8.52	75.5	2718398.72	1898365.10	[3]
P-0878	Stock Water	In Channel	1.05	2.07	2725910.32	1888399.27	[3]
P-0879	Stock Water	In Channel	4.51	12.44	2707278.34	1912799.21	[3]
P-0880	Stock Water	In Channel	2.6	7.16	2709889.18	1917180.56	[3]
P-0881	Stock Water	Off Channel	1.55	13.09	2689257.97	1934775.98	[3]
P-0882	Stock Water	In Channel	1.51	4.47	2697120.16	1940506.69	[3]
P-0883	Stock Water	In Channel	0.15	0.32	2698876.40	1936224.31	[3]
P-0884	Stock Water	In Channel	0.24	0.52	2746776.53	1904260.53	[3]
P-0885	Stock Water	In Channel	0.45	1.33	2729008.42	1901732.86	[3]
P-0886	Stock Water	In Channel	1.54	12.74	2668938.63	1915111.77	[3]
P-0887	Stock Water	In Channel	18.77	59.13	2690534.26	1921233.05	[3]
P-0888	Stock Water	In Channel	3.36	8.61	2684626.07	1929743.74	[3]
P-0890	Stock Water	In Channel	1.07	2.74	2747596.65	1911568.69	[3]
P-0891	Stock Water	In Channel	1.18	8.4	2741514.77	1905276.33	[3]
P-0892	Stock Water	In Channel	0.94	3.69	2712721.04	1886501.71	[3]
P-0893	Stock Water	In Channel	6.94	23.22	2712582.29	1886686.99	[3]
P-0894	Stock Water	In Channel	2.42	6.2	2711844.10	1886824.63	[3]
P-0895	Stock Water	In Channel	2.43	10.99	2730887.98	1912697.55	[3]
P-0896	Stock Water	In Channel	3.08	20.6	2737528.50	1916060.19	[3]
P-0907	Stock Water	In Channel	1.22	2.63	2740026.43	1771344.96	[3]
P-0908	Stock Water	In Channel	5.79	17.09	2739795.78	1767430.07	[3]
P-0909	Stock Water	In Channel	1.25	3.7	2745516.50	1761958.96	[3]
P-0910	Stock Water	In Channel	7.71	21.26	2754487.87	1747117.37	[3]
P-0911	Stock Water	Well	0.07	0.08	2727820.68	1809585.13	[3]
P-0912	Stock Water	Well	0.06	0.11	2745811.45	1777356.49	[3]
P-0913	Stock Water	Well	0.08	0.08	2745893.85	1777411.74	[3]
P-0914	Stock Water	In Channel	0.66	1.95	2753794.89	1762382.31	[3]
P-0915	Stock Water	In Channel	14.13	33.38	2753017.65	1763291.15	[3]
P-0916	Stock Water	Well	0.09	0.36	2746930.38	1749986.78	[3]
P-0917	Stock Water	In Channel	0.68	1.6	2709850.07	1876309.40	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0918	Stock Water	In Channel	0.88	1.91	2679296.42	1831586.74	[3]
P-0921	Stock Water	In Channel	10.6	37.55	2665992.90	1879754.76	[3]
P-0922	Stock Water	In Channel	3.09	5.47	2667731.64	1875259.54	[3]
P-0923	Stock Water	In Channel	1.07	8.04	2667593.40	1875004.94	[3]
P-0924	Stock Water	In Channel	7.13	18.25	2699524.87	1866339.98	[3]
P-0925	Stock Water	In Channel	0.46	0.31	2694988.67	1864390.55	[3]
P-0926	Stock Water	In Channel	0.71	3.07	2695032.42	1864341.55	[3]
P-0927	Stock Water	In Channel	0.53	2.19	2689157.03	1856161.12	[3]
P-0928	Stock Water	In Channel	0.4	0.31	2729594.53	1851131.40	[3]
P-0929	Stock Water	In Channel	3.51	6.21	2721752.99	1847672.48	[3]
P-0930	Stock Water	In Channel	0.21	0.51	2712812.52	1851834.43	[3]
P-0931	Stock Water	In Channel	0.47	2.97	2715776.18	1848162.95	[3]
P-0932	Stock Water	In Channel	0.2	0.44	2715722.70	1848445.95	[3]
P-0933	Stock Water	In Channel	1.95	6.53	2741603.92	1844895.15	[3]
P-0934	Stock Water	In Channel	0.4	0.63	2748667.87	1835519.95	[3]
P-0935	Stock Water	In Channel	2.94	10.43	2738018.32	1836475.42	[3]
P-0938	Stock Water	In Channel	0.38	0.29	2713467.67	1837350.63	[3]
P-0939	Stock Water	In Channel	0.65	1.91	2713543.98	1837619.71	[3]
P-0940	Stock Water	In Channel	1.04	0.82	2677461.12	1828462.63	[3]
P-0941	Stock Water	In Channel	0.58	1.02	2735591.92	1828552.03	[3]
P-0942	Stock Water	In Channel	0.75	2.2	2733348.22	1827927.82	[3]
P-0943	Stock Water	In Channel	17.73	101.22	2745760.86	1832374.59	[3]
P-0944	Stock Water	In Channel	1.54	6.06	2745767.57	1822345.93	[3]
P-0945	Stock Water	In Channel	0.64	0.75	2725994.00	1822617.11	[3]
P-0946	Stock Water	In Channel	0.38	1.56	2681590.67	1822688.65	[3]
P-0947	Stock Water	In Channel	0.38	0.59	2681413.73	1822418.19	[3]
P-0950	Stock Water	Well	0.03	0.06	2721590.32	1841159.69	[3]
P-0952	Stock Water	Well	0.12	0.31	2734301.96	1828761.55	[3]
P-0953	Stock Water	Well	0.07	0.29	2734289.24	1829202.13	[3]
P-0954	Stock Water	Well	0.07	0.16	2725112.66	1821385.32	[3]
P-0955	Stock Water	In Channel	1.1	4.1	2669491.51	1824321.80	[3]
P-0958	Stock Water	In Channel	0.16	0.88	2687638.60	1681289.73	[3]
P-0959	Stock Water	In Channel	1.76	1.21	2742230.47	1733961.40	[3]
P-0960	Stock Water	In Channel	1.06	2.92	2676190.07	1683228.66	[3]
P-0961	Stock Water	In Channel	1.45	1.71	2676334.09	1676595.29	[3]
P-0962	Stock Water	In Channel	2.07	4.07	2686489.41	1676795.46	[3]
P-0963	Stock Water	In Channel	1.49	1.17	2688423.48	1682196.75	[3]
P-0964	Stock Water	In Channel	0.72	0.71	2678226.11	1677593.04	[3]
P-0965	Stock Water	Well	0.11	0.42	2695997.38	1684571.83	[3]
P-0966	Stock Water	Well	0.14	0.59	2695850.35	1684597.87	[3]
P-0967	Stock Water	In Channel	6.44	20.29	2672698.51	1700599.58	[3]
P-0968	Stock Water	In Channel	1.08	2.35	2688501.79	1682441.16	[3]
P-0969	Stock Water	In Channel	0.58	0.46	2688703.96	1682317.46	[3]
P-0980	Stock Water	In Channel	7.64	27.09	2770087.88	1838067.02	[3]
P-0982	Stock Water	In Channel	0.85	1	2761575.73	1825320.14	[3]
P-0983	Stock Water	In Channel	0.5	0.39	2762453.10	1824506.40	[3]
P-0984	Stock Water	In Channel	1.43	6.49	2758743.40	1819645.25	[3]
P-0985	Stock Water	In Channel	7.06	15.29	2776727.89	1815126.88	[3]
P-0986	Stock Water	In Channel	87.96	294.35	2772643.68	1813151.83	[3]
P-0987	Stock Water	In Channel	1.43	4.5	2754779.84	1819607.29	[3]
P-0988	Stock Water	In Channel, Well	74.69	529.26	2791554.48	1803881.33	[3]
P-0989	Stock Water	Off Channel	0.23	0.54	2794847.68	1795258.93	[3]
P-0990	Stock Water	In Channel	4.79	15.08	2796791.11	1792158.27	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-0991	Stock Water	In Channel	5.8	11.42	2826988.43	1857001.99	[3]
P-0992	Stock Water	In Channel	35.07	117.35	2825806.99	1849493.74	[3]
P-0993	Stock Water	In Channel	12.03	33.16	2821765.87	1846446.38	[3]
P-0994	Stock Water	In Channel	4.21	4.23	2823946.71	1850665.58	[3]
P-0995	Stock Water	In Channel	0.66	0.78	2823438.31	1851270.16	[3]
P-0996	Stock Water	In Channel	1.04	2.04	2810061.01	1841873.02	[3]
P-0997	Stock Water	In Channel	2.44	9.12	2833217.51	1796305.45	[3]
P-1000	Stock Water	In Channel	0.2	0.32	2829260.56	1863670.75	[3]
P-1001	Stock Water	In Channel	0.23	0.72	2761160.64	1883678.80	[3]
P-1002	Stock Water	In Channel	0.44	0.27	2760577.62	1884154.73	[3]
P-1003	Stock Water	In Channel	1.09	2.78	2770020.60	1892074.47	[3]
P-1004	Stock Water	In Channel	0.93	2.93	2760690.75	1906278.74	[3]
P-1005	Stock Water	In Channel	0.99	4.46	2758903.66	1904907.04	[3]
P-1006	Stock Water	In Channel	1.1	4.97	2751417.93	1899067.98	[3]
P-1007	Stock Water	Well	0.2	0.4	2769478.36	1893181.38	[3]
P-1008	Stock Water	Off Channel	1.09	6.01	2760587.62	1892810.60	[3]
P-1009	Stock Water	In Channel	0.42	1.25	2774924.92	1891499.56	[3]
P-1010	Stock Water	In Channel	2.38	3.27	2810005.54	1881163.31	[3]
P-1011	Stock Water	In Channel	4.45	7	2814015.66	1882149.49	[3]
P-1012	Stock Water	In Channel	13.68	88.84	2761842.76	1874844.11	[3]
P-1013	Stock Water	In Channel	1.22	3.36	2804765.02	1870551.85	[3]
P-1018	Stock Water	In Channel	0.26	0.57	2750205.09	1899661.54	[3]
P-1019	Stock Water	In Channel	0.23	0.32	2796295.28	1873512.64	[3]
P-1021	Stock Water	In Channel	0.14	0.52	2804592.08	1870395.90	[3]
P-1022	Stock Water	In Channel	0.44	2.35	2757177.27	1772022.19	[3]
P-1023	Stock Water	Well	0.15	0.15	2770513.97	1760863.68	[3]
P-1024	Stock Water	In Channel	0.77	1.81	2765303.31	1761316.07	[3]
P-1025	Stock Water	In Channel	0.99	2.33	2803176.07	1785498.61	[3]
P-1026	Stock Water	In Channel	0.31	0.67	2826328.66	1785349.24	[3]
P-1027	Stock Water	In Channel	2.79	3.85	2812797.52	1780085.89	[3]
P-1028	Stock Water	In Channel	0.15	0.3	2804493.80	1778685.54	[3]
P-1029	Stock Water	Well	0.28	0.55	2760014.57	1774479.73	[3]
P-1030	Stock Water	In Channel	1.22	4.07	2757352.08	1772133.83	[3]
P-1031	Stock Water	In Channel	23.45	87.72	2759711.19	1759260.65	[3]
P-1032	Stock Water	In Channel	4.93	18.45	2781808.46	1753307.01	[3]
P-1033	Stock Water	In Channel	1.8	1.77	2777358.50	1752568.13	[3]
P-1034	Stock Water	In Channel	0.51	3.03	2777325.99	1752586.36	[3]
P-1035	Stock Water	In Channel	0.94	1.11	2826066.11	1833956.47	[3]
P-1036	Stock Water	In Channel	1.23	2.65	2840670.34	1856629.02	[3]
P-1037	Stock Water	In Channel	1.43	5.33	2823922.78	1837608.49	[3]
P-1038	Stock Water	In Channel	0.47	1.66	2854600.52	1842782.34	[3]
P-1040	Stock Water	In Channel	1.88	5.56	2858072.45	1845954.17	[3]
P-1042	Stock Water	In Channel	1.71	8.43	2849725.37	1838583.13	[3]
P-1043	Stock Water	In Channel	0.93	4.42	2853517.34	1836730.00	[3]
P-1044	Stock Water	In Channel	1.85	2.92	2854686.52	1833472.90	[3]
P-1045	Stock Water	In Channel	2.77	9.8	2846055.22	1836712.86	[3]
P-1046	Stock Water	In Channel	0.8	0.79	2845582.25	1826892.74	[3]
P-1047	Stock Water	In Channel	2.04	3.62	2714335.43	1883932.93	[3]
P-1048	Stock Water	In Channel	2.59	19.85	2831794.72	1859076.60	[3]
P-1049	Stock Water	In Channel	1.87	4.42	2804252.79	1858557.46	[3]
P-1050	Stock Water	In Channel	0.98	1.16	2845309.15	1808038.87	[3]
P-1055	Stock Water	In Channel	1.21	1.91	2794134.54	1787458.18	[3]
P-1056	Stock Water	In Channel	0.34	0.47	2794297.68	1787407.30	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1058	Stock Water	In Channel	1.17	1.38	2821550.78	1787343.58	[3]
P-1060	Stock Water	In Channel	25.97	158.45	2543390.35	1924161.23	[3]
P-1061	Stock Water	In Channel	2.18	8.99	2560487.84	1925290.34	[3]
P-1063	Stock Water	In Channel	2.38	9.37	2574303.08	1824173.67	[3]
P-1087	Irrigation, Stock Water	In Channel	14.78	135.30	2379666.76	1940420.73	[1]
P-1127	Stock Water	In Channel	0.29	0.41	2442305.46	1819669.01	[3]
P-1128	Irrigation, Stock Water	In Channel, Spring	0.48	1.15	2450885.85	1808716.10	[1]
P-1129	Stock Water	In Channel, Spring	2.71	14.69	2452612.37	1808399.75	[3]
P-1130	Irrigation, Stock Water	In Channel	0.19	1.25	2462008.84	1844898.67	[1]
P-1131	Stock Water	In Channel	0.73	1.14	2465011.72	1835095.01	[3]
P-1132	Stock Water	In Channel	0.83	1.66	2413895.93	1780617.50	[3]
P-1133	Stock Water	In Channel	8.72	24.88	2413040.47	1780375.94	[3]
P-1134	Stock Water	In Channel	2.53	14.58	2412434.59	1780193.71	[3]
P-1135	Stock Water	In Channel	4.9	12.63	2410183.63	1777576.68	[3]
P-1136	Stock Water	In Channel	0.45	0.53	2457495.30	1796608.48	[3]
P-1137	Stock Water	In Channel	1.66	5.31	2457813.84	1797008.23	[3]
P-1138	Stock Water	In Channel	1.4	7.39	2471276.60	1791783.28	[3]
P-1139	Stock Water	In Channel	1.21	2.27	2477870.78	1820974.78	[3]
P-1140	Stock Water	In Channel	1.04	3.24	2478447.13	1819671.64	[3]
P-1141	Stock Water	In Channel	1.18	6.65	2457946.00	1823054.78	[3]
P-1142	Stock Water	In Channel	0.45	1.49	2476964.53	1816660.16	[3]
P-1143	Stock Water	Well	0.06	0.08	2483161.15	1824025.45	[3]
P-1144	Stock Water	In Channel	1.62	5.91	2456198.05	1827382.27	[3]
P-1146	Stock Water	In Channel	0.23	0.3	2469186.32	1827470.32	[3]
P-1149	Sewer Settling	Sewer	3.57	26.44	2473639.41	1846241.51	[4]
P-1150	Sewer Settling	Sewer	3.48	25.75	2474071.99	1846347.05	[4]
P-1151	Stock Water	In Channel	0.88	3.5	2469655.83	1844438.74	[3]
P-1152	Irrigation, Stock Water	In Channel	1.01	3.06	2469508.1	1845747.69	[1]
P-1153	Stock Water	In Channel	1.68	10.34	2456571.39	1848889.12	[3]
P-1154	Stock Water	In Channel	0.96	1.97	2449865.19	1849901.13	[3]
P-1155	Stock Water	In Channel	2.01	5.45	2452459.01	1853157.20	[3]
P-1156	Stock Water	In Channel	2.35	4.07	2464625.30	1854363.00	[3]
P-1157	Stock Water	In Channel	1.4	5.97	2465709.73	1797072.50	[3]
P-1158	Irrigation, Stock Water	In Channel	1.71	5.81	2433896.84	1707286.09	[1]
P-1159	Irrigation, Stock Water	In Channel	20.88	81.38	2438218.14	1709176.70	[1]
P-1160	Stock Water	Well	0.1	0.14	2477674.58	1795936.39	[3]
P-1161	Stock Water	In Channel	9.5	16.65	2470770.11	1776058.93	[3]
P-1162	Irrigation, Stock Water, Recretation	In Channel	101.16	1200.00*	2456614.71	1764524.14	[1]
P-1163	Sewer Settling	Sewer	1.25	7.27	2454310.23	1763817.20	[4]
P-1164	Sewer Settling	Sewer	1.83	5.21	2453787.08	1763961.72	[4]
P-1165	Sewer Settling	Sewer	2.28	4.44	2453999.91	1763641.02	[4]
P-1166	Sewer Settling	Sewer	4.92	17.44	2451172.51	1763338.84	[4]
P-1167	Sewer Settling	Sewer	6.59	28.28	2451089.59	1762984.37	[4]
P-1168	Sewer Settling	Sewer	4.22	15.37	2450187.37	1763209.31	[4]
P-1169	Stock Water	In Channel	0.38	1.21	2450528.49	1760326.73	[3]
P-1170	Stock Water	Well	0.13	0.32	2442452.97	1756462.11	[3]
P-1171	Stock Water	Off Channel	0.87	1.5	2477305.50	1767715.77	[3]
P-1172	Stock Water	Well	0.34	1	2475557.90	1764163.90	[3]
P-1173	Stock Water	Well	0.11	0.17	2475572.73	1764243.44	[3]
P-1174	Stock Water	In Channel	33.37	36.13	2478349.45	1754071.12	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1175	Stock Water	In Channel	0.63	2.76	2478431.75	1753871.44	[3]
P-1176	Stock Water	Well	0.07	0.12	2456988.84	1751921.58	[3]
P-1177	Irrigation, Stock Water	Well Chuska	1.93	11.68	2468040.53	1737751.94	[1]
P-1178	Stock Water	In Channel	5.22	22.62	2460464.06	1742696.48	[3]
P-1179	Stock Water	In Channel	0.53	2.01	2460459.23	1742214.69	[3]
P-1180	Stock Water	In Channel	1.34	2.72	2462453.04	1740650.92	[3]
P-1181	Stock Water	In Channel	1.9	6.74	2460609.18	1732337.92	[3]
P-1182	Stock Water	Well	2.18	1.89	2459109.38	1734298.55	[3]
P-1183	Stock Water	In Channel	2.48	4.25	2463747.36	1733718.08	[3]
P-1184	Stock Water	Off Channel	0.39	0.54	2475021.79	1733736.44	[3]
P-1185	Stock Water	In Channel	0.5	2.97	2480794.83	1738636.67	[3]
P-1186	Stock Water	In Channel	2.77	5.84	2481035.17	1738355.80	[3]
P-1187	Stock Water	In Channel	0.28	0.94	2445532.46	1723411.20	[3]
P-1188	Stock Water	In Channel	4.18	15.04	2445476.81	1723875.05	[3]
P-1190	Stock Water	In Channel	1.24	4.39	2459314.10	1722014.19	[3]
P-1191	Stock Water	In Channel	0.64	4.13	2464833.52	1723734.16	[3]
P-1192	Stock Water	In Channel	3.81	13.19	2464145.07	1722784.61	[3]
P-1193	Stock Water	Well	0.12	0.09	2453240.97	1718358.25	[3]
P-1194	Sewer Settling	Sewer	4.01	9.8	2447373.71	1717352.19	[4]
P-1195	Sewer Settling	Sewer	3.8	10.48	2448054.96	1716746.79	[4]
P-1196	Stock Water	Well	0.83	3.16	2434751.31	1715040.24	[3]
P-1197	Stock Water	In Channel	2.03	14.52	2438826.35	1714552.82	[3]
P-1198	Stock Water	In Channel	2.81	9.85	2440763.88	1716708.92	[3]
P-1199	Stock Water	In Channel	2.95	11.23	2436528.53	1722097.82	[3]
P-1200	Irrigation, Stock Water	In Channel, Well	5.16	27.62	2452656.34	1707423.78	[1]
P-1201	Stock Water	In Channel	1.88	3.73	2397355.69	1738070.64	[3]
P-1202	Stock Water	In Channel	2.22	8.34	2420448.09	1741148.25	[3]
P-1203	Stock Water	In Channel	2.99	18.98	2414587.35	1748719.03	[3]
P-1204	Stock Water	In Channel	0.21	0.49	2421463.01	1747362.84	[3]
P-1207	Stock Water	In Channel	0.14	0.32	2423323.58	1746424.85	[3]
P-1208	Stock Water	Well	0.93	3.01	2427318.23	1743420.87	[3]
P-1209	Stock Water	In Channel	0.62	2.98	2429705.73	1743213.05	[3]
P-1210	Sewer Settling	Sewer	1.93	8.3	2429847.92	1742596.53	[4]
P-1211	Sewer Settling	Sewer	1.35	4.38	2429751.21	1742857.83	[4]
P-1212	Irrigation, Stock Water	In Channel	1.08	2.72	2417531.29	1751894.43	[1]
P-1213	Stock Water	In Channel	2.04	6.72	2426847.63	1751968.26	[3]
P-1214	Stock Water	In Channel	2	9.16	2420317.18	1755124.02	[3]
P-1215	Stock Water	In Channel	1.59	6.12	2431039.27	1763665.97	[3]
P-1217	Stock Water	In Channel	11.9	67.24	2439289.69	1753736.63	[3]
P-1218	Stock Water	In Channel	1.62	6.8	2412731.80	1731414.93	[3]
P-1219	Stock Water	In Channel	4.81	21.98	2422710.56	1728857.02	[3]
P-1220	Stock Water	In Channel	1.67	4.38	2414581.20	1726355.50	[3]
P-1221	Stock Water	In Channel	1.2	3	2397849.37	1748069.65	[3]
P-1222	Stock Water	In Channel	2.01	6.44	2427895.58	1750200.09	[3]
P-1223	Sewer Settling	Sewer	0.18	0.52	2434521.62	1731566.15	[4]
P-1224	Sewer Settling	Sewer	0.21	0.62	2434541.76	1731361.94	[4]
P-1225	Stock Water	In Channel	0.58	1.13	2436162.70	1731328.27	[3]
P-1226	Stock Water	In Channel	0.22	0.19	2436827.26	1731530.24	[3]
P-1227	Stock Water	In Channel	0.25	0.38	2436341.92	1729887.28	[3]
P-1228	Stock Water	In Channel	0.37	0.45	2436643.73	1729902.36	[3]
P-1229	Stock Water	In Channel	0.25	0.48	2436978.05	1730481.77	[3]
P-1230	Stock Water	In Channel	0.35	0.62	2437434.23	1730227.08	[3]
P-1231	Stock Water	In Channel	0.49	0.91	2437991.49	1730488.76	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1232	Irrigation, Stock Water	In Channel	6.75	18.46	2434950.8	1746451.45	[1]
P-1233	Stock Water	In Channel	0.05	0.22	2439395.76	1743908.55	[3]
P-1234	Stock Water	In Channel	1.1	2.27	2440460.45	1744730.60	[3]
P-1235	Stock Water	In Channel	1.36	4.53	2408692.00	1773581.66	[3]
P-1236	Stock Water	In Channel	1.24	4.07	2409918.96	1776359.34	[3]
P-1237	Stock Water	In Channel	0.5	0.67	2410087.89	1785029.75	[3]
P-1247	Stock Water	In Channel	1.04	3.26	2417477.39	1865445.66	[3]
P-1249	Stock Water	In Channel	7.83	48.57	2403940.53	1865260.35	[3]
P-1250	Irrigation, Stock Water	In Channel	1.19	6.41	2421467.72	1895432.34	[1]
P-1251	Stock Water	In Channel	7.33	35.34	2396196.45	1900667.09	[3]
P-1252	Stock Water	In Channel	2.18	16.23	2418414.69	1902034.75	[3]
P-1255	Irrigation, Stock Water	Off Channel	0.41	0.71	2414794.41	1907449.05	[1]
P-1256	Irrigation, Stock Water	Off Channel	0.38	1.03	2416202.3	1907530.40	[1]
P-1257	Irrigation, Stock Water	Off Channel	0.93	1.39	2416898.19	1907523.53	[1]
P-1258	Irrigation, Stock Water	In Channel	0.89	1.96	2418662.11	1908728.39	[1]
P-1259	Sewer Settling	Sewer	1.71	4.5	2412009.37	1909470.35	[4]
P-1262	Stock Water	In Channel	0.6	1.52	2433898.28	1858290.60	[3]
P-1263	Irrigation, Stock Water	In Channel	1.19	4.44	2442672.49	1855607.95	[1]
P-1264	Stock Water	In Channel	2.41	18.24	2443848.28	1857315.69	[3]
P-1265	Stock Water	In Channel	0.89	4.49	2444222.24	1854689.79	[3]
P-1266	Stock Water	In Channel	0.74	2.01	2453676.55	1858593.08	[3]
P-1267	Stock Water	In Channel	5.05	15	2444393.80	1864972.69	[3]
P-1268	Stock Water	In Channel	0.85	3.22	2453052.39	1867802.18	[3]
P-1269	Sewer Settling	Sewer	1.51	5.32	2467727.75	1875201.90	[4]
P-1270	Sewer Settling	Sewer	1.44	5.07	2467545.73	1875768.95	[4]
P-1271	Sewer Settling	Sewer	3.94	13.88	2468038.25	1875928.82	[4]
P-1273	Stock Water	In Channel	0.54	1.31	2450941.92	1886494.45	[3]
P-1275	Stock Water	In Channel	2.38	5.3	2469942.70	1889069.68	[3]
P-1277	Stock Water	In Channel	3.31	16.99	2463178.79	1897197.49	[3]
P-1278	Stock Water	In Channel	1.32	0.81	2468916.40	1899812.97	[3]
P-1280	Stock Water	Off Channel	0.39	1.29	2453971.59	1907270.35	[3]
P-1281	Stock Water	In Channel	24.94	66.27	2468513.82	1908360.77	[3]
P-1282	Irrigation, Stock Water	In Channel	1.85	7.66	2426121.45	1916160.76	[1]
P-1283	Irrigation, Stock Water	In Channel	5.51	22.55	2426860.28	1916696.24	[1]
P-1284	Irrigation, Stock Water	Off Channel	1.14	4.01	2415601.33	1910005.60	[1]
P-1285	Irrigation, Stock Water	Off Channel	0.61	1.55	2416149.36	1909417.45	[1]
P-1286	Sewer Settling	Sewer	0.25	0.83	2411417.57	1909157.00	[4]
P-1287	Sewer Settling	Sewer	0.1	0.3	2411550.46	1909234.82	[4]
P-1288	Sewer Settling	Sewer	0.45	1.11	2411371.57	1909047.87	[4]
P-1289	Stock Water	In Channel	2.24	6.97	2415777.43	1916089.57	[3]
P-1292	Stock Water	In Channel	1.61	5.52	2419750.83	1922163.14	[3]
P-1293	Stock Water	In Channel	2.02	7.57	2416255.26	1924670.12	[3]
P-1294	Stock Water	In Channel	3.61	8.68	2417737.14	1924001.03	[3]
P-1296	Irrigation, Stock Water	In Channel	1.06	4.08	2420522.43	1926293.18	[1]
P-1297	Stock Water	In Channel	1.1	5.86	2423143.88	1930617.92	[3]
P-1300	Sewer Settling	Sewer	1.86	2.85	2423117.73	1977403.74	[4]
P-1301	Sewer Settling	Sewer	0.8	1.23	2422856.66	1977904.93	[4]
P-1302	Sewer Settling	Sewer	2.43	1.77	2423266.54	1978130.67	[4]
P-1303	Sewer Settling	Sewer	2.91	4.24	2420229.98	1975486.91	[4]
P-1304	Sewer Settling	Sewer	2.98	10.19	2419696.88	1974884.72	[4]
P-1305	Sewer Settling	Sewer	1.86	6.36	2419352.47	1975282.52	[4]
P-1307	Irrigation, Stock Water	Diversion	1.11	3.04	2413425.66	1977282.35	[1]
P-1308	Irrigation, Stock Water	Diversion	1	2.68	2413372.26	1977305.51	[1]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1309	Stock Water	In Channel	2.68	1.69	2417078.52	1978988.60	[3]
P-1310	Stock Water	In Channel	0.71	2.89	2402099.00	1977307.94	[3]
P-1311	Irrigation, Stock Water	In Channel	0.88	3.96	2392497.12	1975318.94	[1]
P-1312	Irrigation, Stock Water	Well	0.85	4.4	2393645.67	1976909.22	[1]
P-1313	Stock Water	In Channel	2.21	6.79	2408221.96	2001810.59	[3]
P-1314	Stock Water	In Channel	3.61	14.55	2407781.10	2014367.63	[3]
P-1315	Stock Water	Well	0.16	0.36	2416664.47	2017157.46	[3]
P-1316	Stock Water	In Channel	0.28	0.73	2420662.88	2018467.54	[3]
P-1325	Stock Water	In Channel	8.93	11.96	2441753.13	2046889.29	[3]
P-1328	Stock Water	In Channel	5.25	4.13	2450387.57	2045527.51	[3]
P-1329	Stock Water	In Channel	1.14	0.99	2456908.09	2048321.98	[3]
P-1330	Industrial	Off Channel	5.57	8.89	2469513.70	2039133.67	[2]
P-1331	Stock Water	In Channel	0.16	0.23	2467788.94	2037836.48	[3]
P-1332	Stock Water	In Channel	1.41	2.71	2453034.56	2035586.93	[3]
P-1333	Stock Water	In Channel	57.57	452.18	2448988.71	2033878.51	[3]
P-1334	Stock Water	In Channel	0.84	2.31	2468623.60	2014546.08	[3]
P-1335	Stock Water	In Channel	2.24	6.84	2472926.73	2012093.02	[3]
P-1336	Stock Water	In Channel	1.41	2.14	2473176.64	2010941.61	[3]
P-1337	Stock Water	In Channel	0.31	0.68	2465674.08	2006001.78	[3]
P-1338	Stock Water	In Channel	1.74	1.91	2472865.25	2005216.14	[3]
P-1339	Stock Water	Well	0.16	0.17	2414827.26	2007198.28	[3]
P-1340	Stock Water	In Channel	0.33	1.02	2420384.01	2007291.37	[3]
P-1341	Stock Water	In Channel	1.08	4.37	2431037.64	2013403.55	[3]
P-1342	Stock Water	In Channel	5.96	23.72	2436862.37	2009424.49	[3]
P-1343	Stock Water	Well	0.23	0.16	2432426.73	2012062.50	[3]
P-1344	Stock Water	In Channel	0.21	0.26	2437338.04	2025991.84	[3]
P-1345	Stock Water	In Channel	5.93	7.35	2470941.79	2003733.10	[3]
P-1346	Stock Water	In Channel	1.43	2.06	2466207.48	1998633.15	[3]
P-1347	Irrigation, Stock Water	Well Sanostee	0.91	1.79	2442790.55	1999778.67	[1]
P-1348	Stock Water	Well	0.29	0.46	2436155.62	1984546.18	[3]
P-1349	Irrigation, Stock Water	Well Sanostee	0.22	0.45	2436139.71	1984623.20	[1]
P-1350	Irrigation, Stock Water	Well Sanostee	0.14	0.32	2436248.74	1984621.18	[1]
P-1351	Irrigation, Stock Water	Diversion Sanostee	1.38	3.18	2432249.56	1982523.15	[1]
P-1352	Irrigation, Stock Water	Diversion Sanostee	1.12	5.31	2426796.3	1981537.04	[1]
P-1353	Irrigation, Stock Water	Diversion Sanostee	1.21	1.83	2426295.52	1981455.91	[1]
P-1354	Irrigation, Stock Water	Improved Spring	1.23	3.67	2444429.1	1965355.34	[1]
P-1355	Stock Water	Well	0.32	0.31	2444524.24	1963695.54	[3]
P-1356	Stock Water	In Channel	0.6	1.02	2463182.57	1965407.73	[3]
P-1357	Irrigation, Stock Water	In Channel, Well	4.86	19.04	2451096.96	1955470.87	[1]
P-1362	Stock Water	In Channel	0.58	1.13	2451854.45	2041856.92	[3]
P-1363	Stock Water	In Channel	2.43	1.91	2452711.20	2043354.62	[3]
P-1364	Stock Water	In Channel	1.23	2.42	2453963.10	2043686.37	[3]
P-1365	Stock Water	In Channel	1.3	1.05	2454888.42	2044928.59	[3]
P-1366	Stock Water	In Channel	2.34	1.43	2458576.10	2048530.01	[3]
P-1367	Stock Water	In Channel	7.07	18.1	2461102.96	2049769.36	[3]
P-1368	Stock Water	In Channel	2.27	5.37	2461947.19	2049888.05	[3]
P-1369	Stock Water	In Channel	0.77	1.52	2464308.68	2051149.66	[3]
P-1370	Stock Water	In Channel	1.56	1.85	2464854.85	2051645.93	[3]
P-1371	Stock Water	In Channel	1.44	3.97	2465919.87	2051515.92	[3]
P-1372	Stock Water	In Channel	7.79	16.87	2430968.92	2013168.61	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1373	Stock Water	In Channel	1.83	5.41	2450686.29	2040451.13	[3]
P-1374	Stock Water	In Channel	0.63	0.48	2450542.27	2038840.15	[3]
P-1375	Stock Water	In Channel	2.78	2.13	2465390.21	2051447.01	[3]
P-1376	Stock Water	In Channel	2.01	4.75	2466454.61	2052189.04	[3]
P-1377	Stock Water	In Channel	0.93	4.01	2448636.74	1835607.17	[3]
P-1378	Stock Water	In Channel	0.27	0.43	2459565.02	1835653.51	[3]
P-1379	Stock Water	In Channel	2.46	3.39	2477433.11	1837812.61	[3]
P-1388	Stock Water	In Channel	3.03	9.56	2426651.01	1880725.90	[3]
P-1389	Stock Water	Well	0.07	0.09	2435971.37	1942606.53	[3]
P-1393	Stock Water	In Channel	1.87	10.67	2472574.95	1977490.74	[3]
P-1394	Stock Water	In Channel	4	5.28	2622924.79	1728980.69	[3]
P-1395	Stock Water	In Channel	0.34	0.4	2642567.74	1810223.49	[3]
P-1396	Stock Water	In Channel	45.99	40.74	2686389.27	1700267.09	[3]
P-1398	Stock Water	In Channel	0.17	0.26	2738103.69	1875324.44	[3]
P-1399	Stock Water	In Channel	0.94	1.68	2683290.14	1870509.34	[3]
P-1400	Stock Water	In Channel	0.93	3.89	2495573.59	1794051.84	[3]
P-1407	Stock Water	In Channel	1.27	2.49	2462811.78	2050196.89	[3]
P-1408	Stock Water	In Channel	6.19	25.6	2464607.42	2049853.08	[3]
P-1409	Irrigation, Stock Water	In Channel	0.99	2.53	2424674.78	1922570.07	[1]
P-1410	Irrigation, Stock Water	In Channel	1.17	4.36	2424856.31	1922409.08	[1]
P-1411	Stock Water	In Channel	0.89	1.23	2466632.62	1867329.68	[3]
P-1412	Irrigation, Stock Water	In Channel	0.93	5.11	2444272.89	2003847.73	[1]
P-1414	Stock Water	In Channel, Well	1.54	1.03	2473886.01	2024792.14	[3]
P-1415	Stock Water	In Channel	13.77	45.27	2572375.46	1854192.72	[3]
P-1416	Stock Water	In Channel	2.9	6.11	2461174.69	1705259.83	[3]
P-1417	Stock Water	In Channel	0.78	3.53	2466135.83	1788473.35	[3]
P-1418	Stock Water	In Channel	5.61	7.4	2496095.85	1793581.70	[3]
P-1419	Stock Water	In Channel	0.64	0.98	2473864.67	1732981.02	[3]
P-1420	Stock Water	In Channel	0.26	1.09	2486230.31	1867117.26	[3]
P-1421	Stock Water	In Channel	1.65	1.2	2514038.82	1846874.66	[3]
P-1422	Stock Water	Well	0.45	0.52	2586646.75	1728364.03	[3]
P-1423	Stock Water	In Channel	0.86	4.45	2584835.10	1717016.71	[3]
P-1425	Stock Water	In Channel	8.88	14.69	2530226.98	1777735.26	[3]
P-1426	Stock Water	In Channel	1.21	2.9	2529760.36	1779461.48	[3]
P-1430	Fish Hatchery	NIIP, Off Channel	2.64	13.19	2540340.20	2032523.57	[2]
P-1431	Fish Hatchery	NIIP, Off Channel	2.64	13.2	2540794.51	2032975.11	[2]
P-1432	Fish Hatchery	NIIP, Off Channel	2.62	13.12	2541244.91	2033419.11	[2]
P-1433	Fish Hatchery	NIIP, Off Channel	2.84	14.2	2541545.69	2033107.49	[2]
P-1434	Fish Hatchery	NIIP, Off Channel	2.56	12.81	2541095.63	2032679.73	[2]
P-1435	Fish Hatchery	NIIP, Off Channel	2.75	13.74	2540648.13	2032225.11	[2]
P-1436	Stock Water	In Channel	0.93	2.8	2659852.83	1772404.51	[3]
P-1437	Stock Water	In Channel	3.87	7.3	2658195.82	1769643.63	[3]
P-1438	Stock Water	In Channel	1.33	2.83	2665707.15	1765251.16	[3]
P-1439	Stock Water	In Channel	1.56	2.7	2666473.33	1765609.09	[3]
P-1440	Stock Water	In Channel	0.37	0.74	2669312.92	1759956.37	[3]
P-1441	Stock Water	In Channel	47.31	228.15	2667523.63	1758258.21	[3]
P-1442	Stock Water	In Channel	0.97	2.67	2598914.13	1817552.23	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1443	Stock Water	In Channel	10.75	42.34	2597070.25	1811243.71	[3]
P-1444	Stock Water	In Channel	3.46	8.17	2602188.05	1814604.26	[3]
P-1445	Stock Water	In Channel	0.82	0.96	2603804.46	1799087.64	[3]
P-1446	Stock Water	In Channel	2.6	6.64	2623838.43	1794000.76	[3]
P-1447	Stock Water	Well	0.15	0.72	2620216.75	1816346.03	[3]
P-1448	Stock Water	Well	0.22	0.69	2620185.51	1816475.28	[3]
P-1449	Stock Water	Well	0.16	0.65	2629993.67	1806532.93	[3]
P-1450	Stock Water	Well	0.15	0.58	2630219.58	1806109.08	[3]
P-1451	Stock Water	Well	1.9	4.87	2630365.33	1806323.41	[3]
P-1452	Stock Water	Well	0.26	0.73	2630218.59	1806808.10	[3]
P-1453	Stock Water	Well	0.48	0.42	2630440.04	1806522.21	[3]
P-1454	Stock Water	In Channel	2.5	3.45	2618110.25	1801505.71	[3]
P-1455	Stock Water	Well	0.15	0.49	2615047.91	1800733.64	[3]
P-1456	Stock Water	In Channel	53.8	169.44	2628628.85	1903215.30	[3]
P-1457	Stock Water	Well	0.39	1.83	2627812.33	1902510.81	[3]
P-1458	Stock Water	In Channel	0.98	4.23	2597231.16	1847926.00	[3]
P-1459	Stock Water	In Channel	10.25	30.26	2665997.49	1818946.45	[3]
P-1460	Stock Water	In Channel	1.52	6.29	2667036.60	1813890.00	[3]
P-1461	Stock Water	In Channel	2.37	6.06	2604262.00	1791400.02	[3]
P-1462	Stock Water	In Channel	3.03	5.96	2605759.69	1788611.87	[3]
P-1463	Stock Water	In Channel	2.77	7.09	2604973.16	1785571.06	[3]
P-1464	Stock Water	Well	0.12	0.21	2658017.07	1814949.71	[3]
P-1465	Stock Water	Well	0.72	3.13	2658244.16	1815098.07	[3]
P-1466	Stock Water	In Channel	5.14	17.2	2660966.68	1816672.38	[3]
P-1467	Stock Water	In Channel	1.11	2.63	2661802.94	1818008.07	[3]
P-1468	Stock Water	Well	0.35	0.82	2606142.26	1796505.14	[3]
P-1469	Stock Water	Well	0.11	0.21	2606287.73	1796742.36	[3]
P-1470	Stock Water	Well	0.11	0.26	2606521.53	1796678.95	[3]
P-1471	Stock Water	In Channel	1.49	4.41	2660662.56	1810478.71	[3]
P-1472	Stock Water	In Channel	1.33	5.74	2664348.30	1808737.07	[3]
P-1473	Stock Water	In Channel	3.99	10.99	2667986.89	1807274.77	[3]
P-1474	Stock Water	In Channel	0.8	2.04	2658193.54	1789127.44	[3]
P-1475	Stock Water	In Channel	11.26	95.35	2657601.44	1794283.05	[3]
P-1476	Stock Water	In Channel	4.2	9.1	2665237.62	1784418.10	[3]
P-1477	Stock Water	In Channel	1.15	4.53	2664188.26	1801295.29	[3]
P-1478	Stock Water	In Channel	1.58	6.22	2658673.97	1799209.44	[3]
P-1479	Stock Water	In Channel	0.71	2.53	2657730.12	1776617.58	[3]
P-1480	Stock Water	In Channel	0.48	0.94	2816130.09	1776211.40	[3]
P-1481	Stock Water	In Channel	1.88	13.72	2825196.65	1775975.14	[3]
P-1485	Stock Water	In Channel	2.51	5.92	2658750.27	1736126.89	[3]
P-1486	Stock Water	In Channel	12.07	21.38	2658931.85	1736048.41	[3]
P-1488	Stock Water	In Channel	1.18	2.79	2667666.22	1739170.20	[3]
P-1490	Stock Water	In Channel	3.05	12.02	2658475.20	1757451.34	[3]
P-1491	Stock Water	In Channel	5.41	14.92	2661241.94	1748943.77	[3]
P-1492	Stock Water	In Channel	2.07	4.88	2668431.38	1747838.22	[3]
P-1493	Sewer Settling	Sewer	0.23	1.29	2658073.95	1759727.73	[4]
P-1494	Stock Water	In Channel	0.28	1.22	2657424.94	1758835.43	[3]
P-1495	Stock Water	In Channel	0.55	1.19	2657388.42	1758824.62	[3]
P-1496	Stock Water	In Channel	16.31	89.89	2656558.27	1759041.87	[3]
P-1497	Stock Water	In Channel	9.42	14.83	2656225.34	1758352.13	[3]
P-1498	Stock Water	In Channel	2.81	3.88	2658345.89	1757157.96	[3]
P-1499	Stock Water	In Channel	3.87	6.1	2658697.16	1758078.49	[3]
P-1500	Stock Water	In Channel	2.24	5.72	2659069.86	1757672.06	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1501	Stock Water	In Channel	1.52	5.7	2657450.40	1746729.70	[3]
P-1502	Stock Water	Well	0.19	0.19	2730282.98	1776283.44	[3]
P-1503	Stock Water	In Channel	0.72	0.57	2733036.56	1771538.47	[3]
P-1504	Stock Water	In Channel	2.68	4.75	2732746.95	1771977.53	[3]
P-1505	Stock Water	Well	0.72	0.99	2711875.65	1809481.62	[3]
P-1506	Stock Water	In Channel	6.16	42.47	2683600.78	1771249.35	[3]
P-1507	Stock Water	In Channel	3.18	19.4	2677561.18	1765093.02	[3]
P-1508	Stock Water	In Channel	2.62	6.71	2670260.93	1756393.71	[3]
P-1509	Stock Water	In Channel	3.55	19.54	2678935.60	1758310.09	[3]
P-1510	Stock Water	Well	0.08	0.19	2681525.72	1773819.67	[3]
P-1511	Stock Water	In Channel	1.19	2.12	2678247.90	1765951.36	[3]
P-1512	Stock Water	Well	0.11	0.15	2675765.93	1755054.19	[3]
P-1513	Stock Water	In Channel	0.74	0.73	2699379.20	1813982.91	[3]
P-1514	Stock Water	Well	0.12	0.11	2699126.64	1815268.55	[3]
P-1515	Stock Water	In Channel	0.53	1.36	2699195.62	1817399.67	[3]
P-1516	Stock Water	In Channel	0.68	2	2699068.15	1817414.82	[3]
P-1517	Stock Water	In Channel	0.84	3.29	2689982.72	1821704.16	[3]
P-1518	Stock Water	In Channel	1.05	6.01	2688508.44	1818645.48	[3]
P-1519	Stock Water	In Channel	0.26	0.66	2690658.57	1818933.63	[3]
P-1520	Stock Water	In Channel	0.34	0.6	2674211.39	1817808.38	[3]
P-1521	Stock Water	In Channel	0.77	4.67	2677710.89	1810984.43	[3]
P-1522	Stock Water	In Channel	2.43	1.58	2677786.96	1810906.18	[3]
P-1523	Stock Water	In Channel	0.66	1.69	2687303.48	1810693.52	[3]
P-1524	Stock Water	In Channel	0.76	1.5	2686907.49	1810585.99	[3]
P-1526	Stock Water	In Channel	0.11	0.07	2702743.85	1853787.43	[3]
P-1527	Stock Water	In Channel	0.74	0.46	2703562.05	1854249.99	[3]
P-1528	Stock Water	In Channel	0.38	0.32	2704033.02	1854436.70	[3]
P-1529	Stock Water	In Channel	0.09	0.32	2702470.15	1850809.68	[3]
P-1530	Stock Water	In Channel	1.66	2.52	2726940.78	1847615.03	[3]
P-1531	Stock Water	In Channel	3.43	9.92	2729781.52	1839505.39	[3]
P-1532	Stock Water	In Channel	2.55	9.27	2741112.23	1841875.61	[3]
P-1533	Stock Water	In Channel	0.2	0.2	2747105.97	1848087.44	[3]
P-1534	Stock Water	In Channel	1.36	3.44	2751568.88	1850432.69	[3]
P-1535	Stock Water	In Channel	0.24	0.38	2733521.70	1830382.58	[3]
P-1536	Stock Water	In Channel	0.47	0.62	2737371.92	1814658.28	[3]
P-1537	Stock Water	In Channel	0.6	1.36	2741467.96	1815932.30	[3]
P-1538	Stock Water	In Channel	0.55	1.08	2747234.70	1814217.89	[3]
P-1539	Stock Water	In Channel	2.79	4.89	2748445.80	1815562.02	[3]
P-1540	Stock Water	In Channel	0.52	0.91	2762577.98	1815123.49	[3]
P-1541	Stock Water	In Channel	1.88	1.48	2813069.73	1799743.78	[3]
P-1542	Stock Water	In Channel	1.22	2.4	2813708.93	1799521.53	[3]
P-1543	Stock Water	In Channel	0.24	0.7	2813305.12	1799896.85	[3]
P-1544	Stock Water	In Channel	1.14	2.25	2810252.45	1797899.96	[3]
P-1545	Stock Water	In Channel	0.47	0.93	2817806.40	1769661.73	[3]
P-1546	Stock Water	In Channel	1.59	11.56	2818264.11	1764013.70	[3]
P-1547	Stock Water	In Channel	0.17	0.34	2763521.72	1814635.90	[3]
P-1548	Stock Water	Well	0.1	0.31	2758549.94	1816935.33	[3]
P-1549	Stock Water	Well	0.1	0.14	2814458.83	1803694.03	[3]
P-1550	Stock Water	Well	0.06	0.29	2820415.49	1761392.41	[3]
P-1551	Stock Water	Well	0.24	0.74	2733784.34	1739564.72	[3]
P-1552	Stock Water	Well	0.12	0.18	2733757.68	1739732.26	[3]
P-1553	Stock Water	In Channel	1.18	2.09	2677205.98	1729437.31	[3]
P-1554	Stock Water	In Channel	3.06	10.25	2737581.94	1732917.83	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1555	Stock Water	In Channel	1.56	4	2732640.94	1728286.49	[3]
P-1556	Stock Water	In Channel	2.47	3.88	2669089.53	1727633.71	[3]
P-1557	Stock Water	In Channel	0.75	1.33	2734783.81	1728225.26	[3]
P-1558	Stock Water	In Channel	0.35	0.56	2735970.20	1727824.11	[3]
P-1559	Stock Water	In Channel	0.26	0.51	2738594.78	1807401.11	[3]
P-1560	Stock Water	Well	0.04	0.09	2744337.59	1802069.59	[3]
P-1561	Stock Water	Well	0.07	0.16	2744405.07	1802262.94	[3]
P-1562	Stock Water	In Channel	0.17	0.24	2747395.42	1804245.52	[3]
P-1563	Stock Water	In Channel	0.06	0.12	2731214.99	1798577.52	[3]
P-1564	Stock Water	In Channel	1.32	6.52	2722953.09	1803750.86	[3]
P-1565	Stock Water	In Channel	1.08	3.4	2724412.40	1802749.12	[3]
P-1566	Stock Water	In Channel	1.48	4.95	2725295.34	1803171.44	[3]
P-1567	Stock Water	In Channel	0.17	0.9	2752564.51	1792659.58	[3]
P-1568	Stock Water	In Channel	0.21	0.21	2740954.78	1789169.47	[3]
P-1569	Stock Water	In Channel	0.52	1.63	2729753.81	1786268.28	[3]
P-1570	Stock Water	In Channel	0.72	0.99	2756032.50	1779025.43	[3]
P-1571	Stock Water	In Channel	0.16	0.32	2687194.98	1810704.73	[3]
P-1572	Stock Water	In Channel	0.54	0.95	2693782.48	1807814.46	[3]
P-1573	Stock Water	In Channel	0.64	2.02	2688524.07	1804987.19	[3]
P-1574	Stock Water	In Channel	0.28	0.17	2688066.17	1804818.83	[3]
P-1575	Stock Water	In Channel	0.24	0.34	2674096.10	1804439.36	[3]
P-1576	Stock Water	Well	0.09	0.07	2675313.12	1802603.02	[3]
P-1577	Stock Water	Well	0.37	0.37	2675403.31	1802907.00	[3]
P-1578	Stock Water	In Channel	0.09	0.06	2676295.70	1801631.11	[3]
P-1579	Stock Water	Well	0.22	0.53	2721219.68	1794537.90	[3]
P-1580	Stock Water	Well	0.1	0.22	2721375.05	1777820.49	[3]
P-1581	Stock Water	Well	0.13	0.32	2721546.57	1777823.64	[3]
P-1582	Stock Water	In Channel	1.83	3.96	2719549.46	1775185.08	[3]
P-1583	Stock Water	In Channel	4.95	30.18	2712562.41	1772652.42	[3]
P-1584	Stock Water	In Channel	0.27	0.53	2704422.93	1777222.97	[3]
P-1585	Stock Water	Well	0.17	0.13	2706730.69	1779214.37	[3]
P-1586	Stock Water	Well	0.09	0.16	2706739.20	1779340.63	[3]
P-1587	Stock Water	In Channel	0.47	0.64	2706422.11	1767657.19	[3]
P-1588	Stock Water	In Channel	0.82	3.72	2705143.32	1764379.89	[3]
P-1589	Stock Water	In Channel	0.93	1.47	2709513.25	1765267.89	[3]
P-1590	Stock Water	In Channel	0.14	0.09	2709162.33	1763431.25	[3]
P-1591	Stock Water	Well	0.08	0.07	2710566.04	1763286.28	[3]
P-1592	Stock Water	In Channel	2.22	8.3	2725808.30	1770751.68	[3]
P-1593	Stock Water	In Channel	0.79	1.25	2720747.17	1765203.53	[3]
P-1594	Stock Water	Well	0.18	0.46	2721002.83	1763961.16	[3]
P-1595	Stock Water	Well	0.09	0.19	2721022.77	1764036.22	[3]
P-1596	Stock Water	In Channel	0.19	0.19	2720445.41	1767083.14	[3]
P-1597	Stock Water	In Channel	0.63	0.74	2723499.02	1763213.77	[3]
P-1598	Stock Water	In Channel	0.5	0.39	2723943.51	1763071.84	[3]
P-1599	Stock Water	In Channel	0.39	0.54	2723769.17	1762660.48	[3]
P-1600	Stock Water	In Channel	1.14	2.24	2723979.62	1762267.53	[3]
P-1601	Stock Water	In Channel	0.56	0.88	2724148.61	1761744.24	[3]
P-1602	Stock Water	In Channel	0.09	0.23	2727076.61	1763061.02	[3]
P-1603	Stock Water	In Channel	0.09	0.31	2731260.81	1764609.93	[3]
P-1604	Stock Water	In Channel	0.08	0.07	2734169.31	1762678.86	[3]
P-1605	Stock Water	Well	0.73	0.46	2735089.49	1760526.68	[3]
P-1606	Stock Water	Well	0.13	0.13	2734118.33	1759593.67	[3]
P-1607	Stock Water	In Channel	0.96	3.96	2741139.39	1755428.31	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1608	Sewer Settling	Sewer	0.19	0.18	2743885.29	1751846.94	[4]
P-1609	Sewer Settling	Sewer	0.4	0.47	2743981.26	1752008.02	[4]
P-1610	Stock Water	In Channel	1.21	1.43	2728744.77	1752941.95	[3]
P-1611	Stock Water	In Channel	0.27	0.32	2728814.22	1753923.83	[3]
P-1612	Stock Water	In Channel	0.36	0.35	2729135.38	1752200.50	[3]
P-1645	Stock Water	In Channel	14.18	25.13	2819037.85	1791500.97	[3]
P-1651	Stock Water	In Channel	0.15	0.15	2820038.94	1787806.47	[3]
P-1660	Stock Water	In Channel	0.38	1.42	2724809.47	1753862.37	[3]
P-1661	Stock Water	In Channel	0.26	0.31	2723514.23	1755437.32	[3]
P-1662	Stock Water	In Channel	0.2	0.24	2722148.37	1751138.05	[3]
P-1663	Stock Water	In Channel	0.28	0.22	2722137.66	1750815.85	[3]
P-1664	Stock Water	In Channel	0.12	0.08	2721779.39	1750121.79	[3]
P-1665	Stock Water	In Channel	0.24	0.51	2708655.74	1749329.23	[3]
P-1666	Stock Water	In Channel	0.43	1.17	2708181.58	1748910.74	[3]
P-1667	Stock Water	In Channel	1.06	4.18	2705474.73	1747666.61	[3]
P-1668	Stock Water	In Channel	0.85	3.68	2714389.22	1756260.56	[3]
P-1669	Stock Water	In Channel	1.1	4.1	2707038.10	1757196.84	[3]
P-1670	Stock Water	In Channel	0.59	1.05	2724443.67	1760172.14	[3]
P-1671	Stock Water	In Channel	0.28	0.22	2723993.31	1759583.99	[3]
P-1672	Stock Water	In Channel	0.65	1.53	2728564.44	1818196.36	[3]
P-1679	Stock Water	In Channel	1.06	0.84	2694555.17	1740028.60	[3]
P-1680	Stock Water	In Channel	0.45	2.31	2749338.03	1736225.32	[3]
P-1681	Stock Water	In Channel	0.21	1.14	2749263.78	1736168.78	[3]
P-1682	Stock Water	In Channel	1.48	4.36	2756087.26	1750870.07	[3]
P-1683	Sewer Settling	Sewer	1.34	5.27	2775514.67	1808163.32	[4]
P-1684	Sewer Settling	Sewer	1.04	1.22	2775751.12	1807944.75	[4]
P-1685	Stock Water	In Channel	0.53	0.93	2783036.69	1814238.08	[3]
P-1686	Stock Water	In Channel	0.52	1.43	2798892.51	1816656.37	[3]
P-1687	Stock Water	Well	0.13	0.13	2713661.06	1793343.64	[3]
P-1688	Stock Water	Well	0.11	0.1	2713632.28	1793450.27	[3]
P-1689	Stock Water	Well	0.11	0.29	2701153.13	1796712.31	[3]
P-1690	Stock Water	Well	0.05	0.28	2701269.59	1796720.21	[3]
P-1691	Stock Water	In Channel	0.94	2.42	2705045.45	1790281.36	[3]
P-1692	Stock Water	Well	0.17	0.34	2691461.48	1794206.62	[3]
P-1693	Stock Water	In Channel	1.41	1.14	2693247.88	1793576.17	[3]
P-1694	Stock Water	In Channel	0.42	2	2698809.87	1785012.32	[3]
P-1695	Stock Water	In Channel	0.55	1.19	2698734.70	1784813.79	[3]
P-1696	Stock Water	In Channel	0.66	2.07	2698818.43	1787369.62	[3]
P-1697	Stock Water	In Channel	2.8	16.56	2691078.28	1780168.67	[3]
P-1698	Stock Water	In Channel	0.39	1.23	2689999.87	1777741.42	[3]
P-1699	Stock Water	In Channel	2.72	5.89	2686302.87	1778442.12	[3]
P-1700	Stock Water	In Channel	0.96	2.08	2690053.56	1768702.01	[3]
P-1701	Stock Water	Well	0.09	0.19	2693494.29	1770740.90	[3]
P-1702	Stock Water	Well	0.15	0.44	2693377.27	1770633.36	[3]
P-1703	Stock Water	In Channel	0.9	3.9	2675920.99	1779891.78	[3]
P-1704	Stock Water	Well	0.23	0.22	2684368.26	1795798.47	[3]
P-1705	Stock Water	Well	0.13	0.31	2684029.37	1795880.02	[3]
P-1706	Stock Water	Well	0.25	0.2	2680292.76	1794199.55	[3]
P-1707	Stock Water	Well	0.23	0.23	2680250.04	1793949.61	[3]
P-1708	Stock Water	In Channel	0.91	0.72	2672407.32	1793927.71	[3]
P-1709	Stock Water	In Channel	0.44	1.8	2628302.00	1876896.41	[3]
P-1710	Stock Water	In Channel	0.67	0.54	2609654.56	1852453.09	[3]
P-1711	Stock Water	In Channel	4.91	6.76	2616243.77	1846268.15	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1712	Stock Water	In Channel	0.4	0.32	2628294.51	1828791.95	[3]
P-1714	Stock Water	In Channel	3.88	11.45	2634076.10	1828054.02	[3]
P-1715	Stock Water	In Channel	0.66	1.05	2651205.52	1830308.72	[3]
P-1716	Stock Water	In Channel	0.34	0.47	2610479.51	1835393.65	[3]
P-1717	Stock Water	In Channel	0.4	0.31	2687824.34	1690223.15	[3]
P-1718	Stock Water	In Channel	0.7	4.01	2673083.56	1707245.33	[3]
P-1719	Stock Water	In Channel	0.73	0.59	2673257.89	1707027.31	[3]
P-1720	Stock Water	In Channel	3.75	18.48	2690402.81	1672920.53	[3]
P-1721	Stock Water	In Channel	0.39	0.31	2765711.14	1766863.97	[3]
P-1722	Stock Water	Well	0.17	0.44	2763086.74	1750149.79	[3]
P-1723	Stock Water	In Channel	0.24	0.19	2765259.44	1746818.19	[3]
P-1724	Stock Water	In Channel	1.26	2.96	2765215.21	1747085.91	[3]
P-1725	Stock Water	In Channel	1.11	4.35	2770118.58	1751114.31	[3]
P-1726	Stock Water	In Channel	0.46	0.82	2816454.19	1782760.55	[3]
P-1728	Stock Water	In Channel	3.29	2.59	2610734.38	1834773.01	[3]
P-1729	Stock Water	Well	0.35	0.34	2607295.93	1835096.22	[3]
P-1730	Stock Water	In Channel	0.58	1.04	2604463.48	1834214.16	[3]
P-1731	Stock Water	In Channel	1.41	0.86	2583103.06	1829770.71	[3]
P-1732	Stock Water	In Channel	0.46	0.73	2607541.09	1815584.64	[3]
P-1733	Stock Water	In Channel	1.37	8.1	2622012.26	1801066.68	[3]
P-1734	Stock Water	In Channel	0.42	0.74	2621805.78	1783332.19	[3]
P-1735	Stock Water	In Channel	3.19	3.76	2621716.23	1782868.41	[3]
P-1736	Stock Water	Well	0.1	0.13	2625011.90	1772579.09	[3]
P-1737	Stock Water	Well	0.13	0.23	2624975.40	1772525.89	[3]
P-1738	Stock Water	Well	0.19	0.26	2624941.55	1772631.19	[3]
P-1739	Stock Water	In Channel	0.85	2.33	2595245.09	1796928.98	[3]
P-1740	Stock Water	In Channel	0.23	0.23	2592023.07	1788532.03	[3]
P-1741	Stock Water	In Channel	20.8	16.38	2603479.66	1778068.36	[3]
P-1742	Stock Water	In Channel	11.58	36.48	2543514.37	1880434.74	[3]
P-1743	Stock Water	In Channel	1.94	6.48	2550655.60	1864239.40	[3]
P-1744	Stock Water	In Channel	7.44	23.45	2566055.71	1767682.71	[3]
P-1745	Stock Water	In Channel	0.63	0.86	2565139.63	1875123.17	[3]
P-1746	Stock Water	In Channel	3.29	8.41	2565083.33	1875382.11	[3]
P-1747	Stock Water	In Channel	5.34	17.88	2560428.54	1917345.16	[3]
P-1748	Stock Water	In Channel	0.29	0.29	2564485.83	1928532.05	[3]
P-1749	Stock Water	In Channel	0.93	2.19	2559692.35	1932689.68	[3]
P-1750	Stock Water	In Channel	2.54	8.49	2558799.19	1934104.76	[3]
P-1751	Stock Water	In Channel	0.45	1.34	2558651.00	1933935.86	[3]
P-1752	Stock Water	Well	0.26	0.55	2485354.76	1724359.52	[3]
P-1753	Stock Water	In Channel	5.26	14.49	2546420.41	1772076.17	[3]
P-1754	Stock Water	In Channel	0.17	0.57	2524980.17	1713043.87	[3]
P-1755	Stock Water	In Channel	0.87	1.55	2662644.15	1678336.11	[3]
P-1756	Stock Water	Improved Spring	0.1	0.1	2463239.86	2057811.19	[3]
P-1758	Stock Water	In Channel	1.57	8.97	2645742.36	1753901.75	[3]
P-1759	Stock Water	Improved Spring	0.38	0.68	2463504.89	2058326.10	[3]
P-1761	Stock Water	Well	0.4	0.63	2438627.60	2034846.49	[3]
P-1762	Stock Water	Well	0.29	0.29	2458488.83	2014962.99	[3]
P-1765	Stock Water	In Channel	1.95	7.67	2573741.18	1942802.07	[3]
P-1766	Stock Water	In Channel	7.72	30.38	2582987.81	1914286.78	[3]
P-1767	Stock Water	In Channel	3.68	10.15	2580644.26	1933473.92	[3]
P-1768	Stock Water	In Channel	0.64	1.26	2599719.76	1969462.09	[3]
P-1769	Stock Water	In Channel	2.75	22.77	2546287.05	2041980.82	[3]
P-1770	Stock Water	In Channel	0.57	1.13	2502372.14	2066294.31	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-1771	Stock Water	In Channel	0.63	1.73	2499231.82	2036096.30	[3]
P-1772	Stock Water	In Channel	8.89	19.26	2439286.86	1743871.09	[3]
P-1773	Stock Water	In Channel	0.34	1.69	2439626.35	1743650.12	[3]
P-1774	Stock Water	In Channel	3.09	5.47	2464446.15	1901549.75	[3]
P-1775	Stock Water	In Channel	4.32	8.51	2463125.85	1901640.69	[3]
P-1776	Stock Water	In Channel	7.01	15.19	2463634.94	1894287.43	[3]
P-1777	Stock Water	In Channel	1.62	19.82	2458862.85	1866622.82	[3]
P-1778	Stock Water	In Channel	0.84	2.8	2438284.69	1700428.29	[3]
P-1779	Stock Water	In Channel	1.67	4.61	2437136.43	1847451.63	[3]
P-1780	Stock Water	In Channel	3.48	10.97	2437906.07	1849957.17	[3]
P-1781	Stock Water	In Channel	2.11	6.65	2461428.70	1871994.06	[3]
P-1782	Stock Water	In Channel	1.07	9.65	2430923.47	2013458.53	[3]
P-1783	Stock Water	In Channel	1.81	3.55	2645652.11	1753488.64	[3]
P-1784	Stock Water	In Channel	1.52	8.4	2627475.56	1748585.41	[3]
P-1785	Stock Water	In Channel	0.2	0.12	2630062.02	1736909.74	[3]
P-1786	Stock Water	In Channel	1.31	2.58	2643167.37	1734833.07	[3]
P-1787	Stock Water	In Channel	6.41	8.83	2647162.43	1741265.60	[3]
P-1788	Sewer Settling	Sewer	1.16	5.23	2627428.70	1729676.60	[4]
P-1789	Sewer Settling	Sewer	1.15	2.49	2627623.50	1729443.57	[4]
P-1790	Sewer Settling	Sewer	3.87	15.98	2628082.49	1729656.69	[4]
P-1791	Stock Water	In Channel	1.76	5.56	2630486.63	1728700.23	[3]
P-1792	Stock Water	In Channel	0.07	0.13	2629401.10	1730639.98	[3]
P-1793	Sewer Settling	Sewer	3.16	10.59	2590580.97	1720371.43	[4]
P-1794	Sewer Settling	Sewer	0.42	0.99	2590903.75	1720754.25	[4]
P-1795	Sewer Settling	Sewer	0.37	0.79	2590808.19	1720623.39	[4]
P-1796	Sewer Settling	Sewer	0.13	0.34	2590773.52	1720827.99	[4]
P-1797	Sewer Settling	Sewer	5.45	12.88	2634997.47	1709059.16	[4]
P-1798	Sewer Settling	Sewer	5.31	31.38	2635008.17	1709588.54	[4]
P-1799	Sewer Settling	Sewer	5.49	10.8	2635500.96	1709528.27	[4]
P-1800	Sewer Settling	Sewer	5.16	18.3	2635515.29	1710021.00	[4]
P-1801	Sewer Settling	Sewer	8.3	49.04	2635511.88	1710088.96	[4]
P-1803	Stock Water	In Channel	0.77	0.68	2587238.46	1716020.30	[3]
P-1804	Irrigation, Stock Water	Off Channel	0.35	0.84	2411291.22	1922692.34	[1]
P-1805	Stock Water	In Channel	0.51	2.7	2416129.69	1948306.59	[3]
P-1806	Irrigation, Stock Water	Well	1.09	3.66	2436627.54	1939598.49	[1]
P-1807	Irrigation, Stock Water	Well	0.39	0.38	2465333.69	1944675.37	[1]
P-1808	Irrigation, Stock Water	Off Channel	5.75	31.69	2452592.36	1928171.94	[1]
P-1811	Irrigation, Stock Water	Off Channel	2.45	6.74	2464147.2	1932623.95	[1]
P-1812	Irrigation, Stock Water	Off Channel	0.19	0.55	2411960.78	1976144.52	[1]
P-1813	Stock Water	In Channel	4.53	11.59	2660582.59	1817912.03	[3]
P-1814	Stock Water	In Channel	2.06	2.84	2604698.21	1783837.91	[3]
P-1815	Irrigation, Stock Water	In Channel	8.23	17.83	2480338.25	1861864.52	[1]
P-1816	Irrigation, Stock Water	In Channel	5.67	5.58	2633524.98	1832855.43	[1]
P-1817	Stock Water	Well	1.04	2.24	2565791.03	1747680.85	[3]
P-1818	Irrigation, Stock Water	In Channel	0.14	1.37	2416035.61	1948166.81	[1]
P-1819	Stock Water	Well	0.58	0.46	2444680.72	1966880.29	[3]
P-1820	Stock Water	Well	7.31	12.94	2469074.83	1718069.10	[3]
P-1821	Stock Water	In Channel	2.64	23.88	2426595.40	1743986.08	[3]
P-1822	Stock Water	In Channel	1.93	12.53	2426667.43	1743972.43	[3]
P-1823	Stock Water	Well	4.83	6.65	2468692.29	1718375.22	[3]
P-5001	Stock Water	In Channel	1.38	6.53	2436284.08	1702583.40	[3]
P-5002	Stock Water	Well	0.15	0.38	2600024.95	1723141.59	[3]
P-5003	Stock Water	In Channel	2.22	9.44	2458594.68	1721522.74	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-5004	Stock Water	Well	0.13	0.54	2578863.82	1730312.07	[3]
P-5005	Stock Water	Well	0.09	0.16	2530687.73	1738642.09	[3]
P-5006	Stock Water	Well	0.04	0.04	2443477.37	1736423.10	[3]
P-5008	Stock Water	In Channel	2.02	6.19	2422030.22	1745523.51	[3]
P-5009	Stock Water	In Channel	1.82	7.22	2420177.74	1746459.08	[3]
P-5010	Stock Water	In Channel	10.38	21.8	2548997.77	1760856.89	[3]
P-5011	Stock Water	In Channel	2.79	10.39	2433954.53	1758525.47	[3]
P-5012	Stock Water	In Channel	5.59	15.43	2546972.72	1762755.92	[3]
P-5013	Stock Water	In Channel	2.52	5.89	2546426.25	1764123.25	[3]
P-5014	Stock Water	Well	0.22	0.65	2558077.37	1769919.03	[3]
P-5015	Stock Water	Well	0.19	0.42	2639188.38	1774494.55	[3]
P-5016	Stock Water	In Channel	0.48	1.01	2528947.18	1777806.96	[3]
P-5017	Stock Water	In Channel	1.05	7.53	2541867.58	1778856.12	[3]
P-5018	Stock Water	In Channel	0.21	0.89	2630541.36	1786756.71	[3]
P-5019	Stock Water	In Channel	0.66	1.57	2588353.94	1787938.21	[3]
P-5020	Stock Water	In Channel	0.89	1.72	2600115.86	1800608.66	[3]
P-5021	Stock Water	In Channel	12.52	12.77	2562780.03	1804270.08	[3]
P-5022	Stock Water	Well	0.32	0.63	2600788.55	1805778.33	[3]
P-5023	Stock Water	Well	0.1	0.24	2600943.41	1806070.74	[3]
P-5024	Stock Water	In Channel	1.03	1.17	2573644.22	1805549.98	[3]
P-5025	Stock Water	Well	0.12	0.21	2563255.99	1806428.21	[3]
P-5026	Stock Water	In Channel	0.51	2.39	2617777.47	1808515.47	[3]
P-5028	Stock Water	Well	0.12	0.17	2641127.17	1809744.67	[3]
P-5029	Stock Water	Well	0.58	1.08	2504768.18	1809278.35	[3]
P-5030	Stock Water	In Channel	0.16	0.25	2527657.47	1811235.95	[3]
P-5031	Stock Water	In Channel	0.79	1.79	2630302.42	1815584.30	[3]
P-5032	Stock Water	In Channel	0.2	0.52	2599507.71	1817836.13	[3]
P-5033	Stock Water	In Channel	18.44	90.74	2628000.74	1821481.91	[3]
P-5034	Stock Water	Well	0.31	0.56	2548760.36	1819406.27	[3]
P-5035	Stock Water	In Channel	0.73	0.52	2627165.69	1823244.02	[3]
P-5036	Stock Water	In Channel	0.18	0.2	2669493.02	1825858.71	[3]
P-5037	Stock Water	In Channel	0.1	0.38	2669513.96	1827626.60	[3]
P-5038	Stock Water	In Channel	0.85	3.28	2627195.73	1826327.24	[3]
P-5039	Stock Water	In Channel	3.81	11.89	2733057.60	1829247.30	[3]
P-5040	Stock Water	In Channel	0.13	0.1	2668991.43	1828113.20	[3]
P-5041	Stock Water	In Channel	1.11	6.58	2631791.05	1827115.23	[3]
P-5042	Stock Water	In Channel	0.4	0.5	2634521.57	1827687.42	[3]
P-5043	Stock Water	In Channel	0.69	1.91	2669710.00	1828759.45	[3]
P-5044	Stock Water	In Channel	0.27	0.47	2633945.43	1827912.66	[3]
P-5045	Stock Water	Well	0.29	1.42	2470337.73	1826044.51	[3]
P-5046	Stock Water	In Channel	0.17	0.35	2728769.75	1833871.22	[3]
P-5047	Stock Water	In Channel	0.89	7.97	2469821.94	1826634.97	[3]
P-5048	Stock Water	In Channel	3.61	9.31	2469732.58	1827041.04	[3]
P-5049	Stock Water	In Channel	4.69	19.41	2456512.56	1826583.77	[3]
P-5050	Stock Water	In Channel	0.15	0.2	2443332.14	1828562.74	[3]
P-5051	Stock Water	In Channel	0.96	3.39	2745130.54	1838774.06	[3]
P-5052	Stock Water	In Channel	0.35	0.73	2555218.69	1833110.65	[3]
P-5053	Stock Water	In Channel	0.07	0.08	2727349.01	1839182.86	[3]
P-5054	Stock Water	In Channel	0.26	0.41	2724823.21	1839225.09	[3]
P-5055	Stock Water	In Channel	0.8	6.5	2492797.42	1832614.76	[3]
P-5056	Stock Water	In Channel	2.96	6.74	2718046.80	1840062.93	[3]
P-5057	Stock Water	In Channel	1.59	3.15	2772836.62	1843007.06	[3]
P-5058	Stock Water	In Channel	1.38	3.47	2570059.27	1837150.08	[3]

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Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-5059	Stock Water	In Channel	0.72	2.17	2586623.61	1837740.58	[3]
P-5060	Stock Water	In Channel	0.51	0.64	2732456.68	1842137.64	[3]
P-5061	Stock Water	In Channel	0.05	0.09	2737013.22	1843548.65	[3]
P-5062	Stock Water	In Channel	0.34	1.01	2705926.96	1842881.40	[3]
P-5063	Stock Water	In Channel	1.3	11.27	2457273.85	1838219.90	[3]
P-5064	Stock Water	In Channel	1.02	3.61	2586198.50	1842355.94	[3]
P-5065	Stock Water	In Channel	0.39	1.15	2726621.09	1847296.48	[3]
P-5066	Stock Water	In Channel	0.58	0.77	2600690.50	1843501.98	[3]
P-5067	Stock Water	In Channel	0.82	5.92	2600426.72	1843772.67	[3]
P-5068	Stock Water	In Channel	0.27	0.38	2600630.80	1843905.26	[3]
P-5069	Stock Water	Well	0.23	0.27	2564803.63	1846400.04	[3]
P-5070	Stock Water	In Channel	0.36	1.62	2843022.64	1856580.51	[3]
P-5071	Stock Water	Well	0.09	0.09	2512222.59	1849307.66	[3]
P-5072	Stock Water	Well	0.22	0.64	2593039.93	1853913.05	[3]
P-5073	Irrigation, Stock Water	In Channel	1.09	2.55	2831589.89	1861549.32	[1]
P-5074	Stock Water	Well	0.11	0.1	2499275.01	1851835.55	[3]
P-5075	Stock Water	In Channel	1.21	2.9	2592343.48	1854572.12	[3]
P-5076	Stock Water	Well	0.24	0.95	2578092.12	1854613.59	[3]
P-5077	Stock Water	In Channel	1.5	7.58	2464946.39	1854026.39	[3]
P-5080	Stock Water	In Channel	3.68	13.25	2483121.84	1857272.94	[3]
P-5086	Stock Water	In Channel	0.38	0.32	2435430.97	1859201.89	[3]
P-5087	Stock Water	In Channel	0.98	0.82	2435441.13	1860532.38	[3]
P-5088	Stock Water	In Channel	40.52	63.21	2397617.01	1861038.39	[3]
P-5089	Stock Water	In Channel	0.6	6.64	2475956.30	1864449.04	[3]
P-5090	Stock Water	In Channel	0.95	5.74	2476022.41	1864528.42	[3]
P-5091	Stock Water	In Channel	3.74	13.45	2475869.24	1864610.11	[3]
P-5092	Stock Water, Recreation	In Channel	9.22	60.99	2401769.10	1864891.81	[3]
P-5093	Stock Water	In Channel	0.6	0.97	2420016.81	1867257.21	[3]
P-5094	Stock Water	Well	0.05	0.05	2499680.72	1869602.38	[3]
P-5095	Stock Water	Well	0.12	0.19	2499671.27	1869694.04	[3]
P-5097	Stock Water	In Channel	0.97	6.86	2593586.81	1874432.26	[3]
P-5098	Stock Water	In Channel	0.13	0.19	2423310.42	1869848.63	[3]
P-5100	Stock Water	In Channel	0.28	0.33	2420617.59	1871189.36	[3]
P-5103	Stock Water	In Channel	0.53	0.93	2588307.15	1879374.24	[3]
P-5104	Stock Water	Diversion	1.07	4.3	2588092.70	1880113.71	[3]
P-5105	Stock Water	In Channel	1.57	11.9	2471945.52	1878108.73	[3]
P-5106	Stock Water	In Channel	0.51	0.55	2473523.72	1878966.47	[3]
P-5109	Stock Water	In Channel	1.38	7.12	2499685.91	1880233.66	[3]
P-5110	Stock Water	In Channel	6.21	49.94	2426423.11	1879478.96	[3]
P-5111	Stock Water	In Channel	0.61	0.85	2660178.68	1886342.99	[3]
P-5112	Stock Water	In Channel	0.8	3.01	2581098.13	1884030.05	[3]
P-5114	Stock Water	In Channel	0.16	0.1	2660255.87	1889998.28	[3]
P-5116	Stock Water	In Channel, Well	0.35	0.36	2466941.17	1889117.57	[3]
P-5117	Stock Water	Well	0.12	0.22	2449533.70	1889074.82	[3]
P-5118	Stock Water	In Channel	0.96	3.35	2620993.43	1895588.20	[3]
P-5119	Stock Water	In Channel	2.33	7.82	2662328.82	1897405.15	[3]
P-5120	Stock Water	In Channel	4.35	5.75	2470992.02	1892133.95	[3]
P-5121	Stock Water	In Channel	1.67	2.81	2634023.91	1898482.77	[3]
P-5122	Stock Water	Well	0.05	0.06	2609569.74	1899567.08	[3]
P-5123	Stock Water	Diversion	0.69	3.18	2424245.38	1895327.29	[3]
P-5124	Stock Water	Diversion	1.48	9.43	2424224.03	1896099.27	[3]
P-5125	Stock Water	In Channel	0.48	1.1	2500602.20	1898954.68	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-5126	Stock Water	Diversion	0.63	2.55	2429687.58	1897478.41	[3]
P-5127	Stock Water	Well	0.77	1.15	2441982.81	1898143.61	[3]
P-5128	Stock Water	In Channel	1.17	1.4	2621158.42	1903358.86	[3]
P-5129	Stock Water	In Channel	0.28	0.92	2423653.41	1897997.40	[3]
P-5130	Stock Water	In Channel	0.78	1.44	2425323.51	1898384.07	[3]
P-5131	Stock Water	In Channel	0.81	1.26	2609770.48	1904253.59	[3]
P-5133	Stock Water	Diversion	0.54	1.26	2444939.45	1900001.24	[3]
P-5134	Stock Water	In Channel	1.62	5.45	2477194.58	1901368.63	[3]
P-5135	Stock Water	In Channel	0.22	0.27	2707119.65	1908175.54	[3]
P-5136	Stock Water	In Channel	1.1	3.1	2427444.19	1900119.73	[3]
P-5137	Stock Water	In Channel	0.36	1.51	2424321.42	1899954.36	[3]
P-5139	Stock Water	In Channel	0.15	0.18	2569725.61	1905033.46	[3]
P-5140	Stock Water	In Channel	6.3	12.47	2462497.29	1902223.35	[3]
P-5141	Stock Water	In Channel	2.57	7.71	2433598.54	1901666.24	[3]
P-5142	Stock Water	In Channel	0.13	0.34	2428922.22	1901861.59	[3]
P-5143	Stock Water	In Channel	0.2	0.78	2428748.98	1902097.10	[3]
P-5144	Stock Water	In Channel	0.76	1.63	2635409.43	1908255.44	[3]
P-5146	Stock Water	In Channel	0.88	1.8	2570764.63	1908191.34	[3]
P-5147	Stock Water	In Channel	0.14	0.37	2551159.12	1908636.95	[3]
P-5148	Stock Water	Well	0.07	0.1	2704980.78	1915370.19	[3]
P-5149	Stock Water	Well	0.54	3.09	2410565.66	1907606.06	[3]
P-5150	Stock Water	Well	0.44	2.48	2410399.38	1907786.61	[3]
P-5152	Stock Water	In Channel	0.84	0.91	2466111.30	1914023.41	[3]
P-5153	Stock Water	In Channel	0.62	0.52	2456564.73	1915101.47	[3]
P-5154	Stock Water	In Channel	0.67	1.94	2459456.99	1918044.24	[3]
P-5155	Stock Water	Well	0.26	0.59	2432853.46	1919701.98	[3]
P-5157	Stock Water	In Channel	4	7.92	2549077.29	1926761.58	[3]
P-5158	Stock Water	In Channel	9.99	34.75	2577025.66	1926766.04	[3]
P-5160	Stock Water	In Channel	1.31	8.51	2420464.18	1925605.05	[3]
P-5162	Stock Water	In Channel	0.1	0.13	2549272.90	1929860.36	[3]
P-5163	Stock Water	In Channel	0.91	1.09	2557196.49	1930619.83	[3]
P-5165	Stock Water	In Channel	5.92	14.92	2533286.25	1933273.58	[3]
P-5166	Stock Water	Well	0.55	2.03	2434017.98	1931329.23	[3]
P-5167	Stock Water	In Channel	12.91	33.3	2525355.46	1934731.81	[3]
P-5168	Stock Water	In Channel	0.37	0.87	2548152.04	1936047.88	[3]
P-5169	Stock Water	In Channel	0.11	0.33	2550872.94	1937534.33	[3]
P-5170	Stock Water	In Channel	0.1	0.13	2550531.26	1937498.52	[3]
P-5171	Stock Water	In Channel	0.59	1	2551293.51	1937748.40	[3]
P-5172	Stock Water	Well	0.1	0.26	2604357.60	1939778.19	[3]
P-5173	Stock Water	In Channel	7.33	18.02	2579820.13	1938496.28	[3]
P-5174	Stock Water	Well	0.04	0.1	2604396.45	1939898.52	[3]
P-5176	Stock Water	In Channel	2.18	3.67	2588582.73	1941488.15	[3]
P-5177	Stock Water	In Channel	0.43	0.62	2516212.81	1939749.97	[3]
P-5178	Stock Water	In Channel	0.28	0.85	2531167.00	1942035.35	[3]
P-5179	Stock Water	In Channel	1.2	4.24	2530827.33	1942333.97	[3]
P-5180	Stock Water	In Channel	0.83	1.9	2584722.51	1945421.36	[3]
P-5182	Stock Water	Well	0.06	0.06	2606927.28	1957503.28	[3]
P-5183	Stock Water	In Channel	0.32	1.12	2593538.95	1957653.42	[3]
P-5184	Stock Water	In Channel	2.09	3.63	2533440.49	1955601.34	[3]
P-5185	Stock Water	In Channel	1.63	1.76	2599328.57	1958036.09	[3]
P-5187	Stock Water	In Channel	0.21	0.41	2556259.59	1959933.51	[3]
P-5188	Stock Water	In Channel	0.08	0.13	2599784.76	1961228.27	[3]
P-5189	Stock Water	In Channel	1.48	7.82	2582742.42	1960772.57	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-5190	Stock Water	In Channel	1.08	4.29	2556228.27	1960045.65	[3]
P-5192	Stock Water	In Channel	11.24	50.88	2528374.87	1960183.99	[3]
P-5195	Stock Water	In Channel	5.95	37.5	2575053.59	1964474.54	[3]
P-5197	Stock Water	Diversion	0.24	0.65	2416519.19	1963839.80	[3]
P-5200	Stock Water	In Channel	0.65	0.94	2487183.33	1967334.06	[3]
P-5201	Stock Water	In Channel	0.77	2.07	2466900.44	1969039.64	[3]
P-5204	Stock Water	In Channel	1.67	9.93	2419359.77	1968881.48	[3]
P-5205	Stock Water	Well	1.81	2.28	2521869.77	1972011.53	[3]
P-5206	Stock Water	Well	0.72	2.3	2521790.06	1972117.04	[3]
P-5208	Stock Water	In Channel	1.91	1.95	2470683.92	1971062.56	[3]
P-5209	Stock Water	In Channel	0.19	0.26	2561137.12	1973730.74	[3]
P-5210	Stock Water	Well	0.06	0.07	2485838.09	1973112.62	[3]
P-5213	Stock Water	In Channel	0.18	0.23	2566673.01	1976805.28	[3]
P-5217	Stock Water	Well	0.22	0.17	2417561.47	1975474.24	[3]
P-5219	Stock Water	Diversion	0.85	2.67	2412148.29	1976510.97	[3]
P-5220	Stock Water	Diversion	2.47	5.77	2417990.13	1977131.39	[3]
P-5221	Stock Water	Diversion	1.72	3	2416113.87	1976888.59	[3]
P-5222	Stock Water	Diversion	1.58	5.68	2418145.67	1977194.78	[3]
P-5224	Stock Water	Diversion	2.16	3.24	2410896.02	1977333.33	[3]
P-5226	Stock Water	In Channel	0.3	0.56	2407903.00	1978062.04	[3]
P-5228	Stock Water	In Channel	0.31	0.5	2462067.06	1979835.13	[3]
P-5232	Stock Water	In Channel	0.4	0.26	2545969.04	1983709.73	[3]
P-5233	Stock Water	In Channel	6.6	26.52	2546041.21	1983883.90	[3]
P-5234	Stock Water	In Channel	0.24	0.3	2474546.47	1981988.86	[3]
P-5236	Stock Water	Diversion	2.36	10.89	2410353.66	1980769.99	[3]
P-5238	Stock Water	In Channel	3.63	13.72	2419771.74	1981908.51	[3]
P-5240	Stock Water	Diversion	3.85	10.61	2421199.87	1982227.13	[3]
P-5241	Stock Water	In Channel	4.34	26.04	2561823.42	1985923.90	[3]
P-5243	Stock Water	Diversion	1.57	6.42	2415528.96	1982511.47	[3]
P-5247	Stock Water	Well	0.12	0.29	2458923.26	1984962.78	[3]
P-5248	Stock Water	Well	0.11	0.17	2458936.10	1985015.05	[3]
P-5250	Stock Water	In Channel	0.41	0.52	2596883.54	1989642.49	[3]
P-5251	Stock Water	In Channel	0.36	0.57	2478859.45	1986964.42	[3]
P-5253	Stock Water	Diversion	1.12	3.37	2418448.46	1985611.45	[3]
P-5261	Stock Water	In Channel	4.65	11.43	2525389.79	1992137.08	[3]
P-5262	Stock Water	In Channel	4.16	18.71	2568334.71	1993619.73	[3]
P-5274	Stock Water	In Channel	15.9	83.01	2524198.67	1995571.38	[3]
P-5277	Stock Water	In Channel	3.71	13.79	2412374.38	1993985.85	[3]
P-5278	Stock Water	Well	0.09	0.24	2490910.43	1996570.97	[3]
P-5279	Stock Water	Well	0.04	0.06	2490821.40	1996590.77	[3]
P-5280	Stock Water	In Channel	0.59	2.03	2574267.28	1999469.75	[3]
P-5293	Stock Water	In Channel	0.26	0.3	2472644.40	2004013.56	[3]
P-5294	Stock Water	In Channel	0.27	0.28	2513929.19	2006176.80	[3]
P-5297	Stock Water	In Channel	0.21	0.25	2464810.21	2005901.29	[3]
P-5298	Stock Water	In Channel	0.16	0.51	2404516.00	2004772.73	[3]
P-5299	Stock Water	In Channel	0.31	0.53	2462689.41	2006524.76	[3]
P-5305	Stock Water	In Channel	0.48	1.37	2513951.76	2014263.31	[3]
P-5306	Stock Water	In Channel	0.91	2.41	2532727.96	2014949.77	[3]
P-5309	Stock Water	In Channel	0.63	3.94	2527678.07	2015454.10	[3]
P-5311	Stock Water	In Channel	0.63	1.84	2566637.04	2018982.52	[3]
P-5316	Stock Water	In Channel	2.17	5.21	2528069.42	2020899.73	[3]
P-5318	Stock Water	In Channel	0.58	1.4	2534950.07	2021699.97	[3]
P-5319	Stock Water	In Channel	0.37	1.02	2477838.96	2020395.51	[3]

Appendix B

Table B-2: Surface Water Uses

Site Number	Primary Use	Impoundment Source	Impoundment Area (Ac)	Acre Feet	X coordinate	Y Coordinate	Data Source
P-5320	Stock Water	In Channel	1.38	3.24	2529227.25	2022085.45	[3]
P-5323	Stock Water	In Channel	1	1.38	2528211.12	2024349.68	[3]
P-5324	Stock Water	In Channel	1.19	2	2528060.58	2024735.80	[3]
P-5325	Stock Water	In Channel	0.3	0.29	2527210.69	2024699.06	[3]
P-5330	Stock Water	In Channel	2.74	6.57	2546977.52	2026939.87	[3]
P-5333	Stock Water	Well	4.08	26.41	2456954.19	2025291.16	[3]
P-5334	Stock Water	Well	0.37	0.62	2472671.56	2026472.39	[3]
P-5342	Stock Water	Well	0.19	0.29	2472040.38	2029327.09	[3]
P-5344	Stock Water	In Channel	0.75	5.11	2530465.26	2031334.61	[3]
P-5352	Stock Water	In Channel	9.34	15.69	2542299.33	2036005.68	[3]
P-5353	Stock Water	In Channel	0.78	1.72	2538891.44	2036209.45	[3]
P-5354	Stock Water	In Channel	3.94	6.85	2516330.81	2035657.25	[3]
P-5357	Stock Water	In Channel	0.25	1.21	2568150.55	2039198.81	[3]
P-5358	Stock Water	In Channel	1.16	1.67	2511628.74	2038458.87	[3]
P-5362	Stock Water	Well	0.1	0.1	2486912.44	2040307.77	[3]
P-5366	Stock Water	In Channel	0.24	0.43	2444734.82	2043026.26	[3]
P-5367	Stock Water	In Channel	6.55	18.07	2446787.00	2043338.88	[3]
P-5368	Stock Water	Well	0.09	0.21	2428055.50	2044986.60	[3]
P-5374	Stock Water	In Channel	0.07	0.1	2428782.46	2053422.63	[3]
P-5378	Stock Water	In Channel	1.27	4.04	2547781.49	2060487.02	[3]
P-5380	Stock Water	In Channel	0.78	2.94	2515124.68	2064448.83	[3]
P-5383	Stock Water	In Channel	1.15	2	2515093.78	2066593.34	[3]
P-5384	Stock Water	In Channel	1.04	3.18	2514786.85	2066597.67	[3]
P-5386	Stock Water	In Channel	1.18	7.39	2513978.39	2068060.67	[3]
P-5388	Stock Water	In Channel	7.53	50.43	2481683.31	2067433.02	[3]
P-5389	Stock Water	In Channel	0.14	0.22	2476182.07	2069650.39	[3]
P-5391	Stock Water	In Channel	0.12	0.23	2515536.36	2071392.89	[3]
P-5392	Stock Water	In Channel	4.23	5.07	2530023.87	2074139.48	[3]
P-5394	Stock Water	In Channel	2.03	3.29	2479164.59	2082712.11	[3]

Data Source:

[1] NMSEO: Navajo Hydrographic Survey (2010) - Table F-3

New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table F-3 (http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj_notice2010.html)

[2] NMSEO: Navajo Hydrographic Survey (2010) - Table K-1

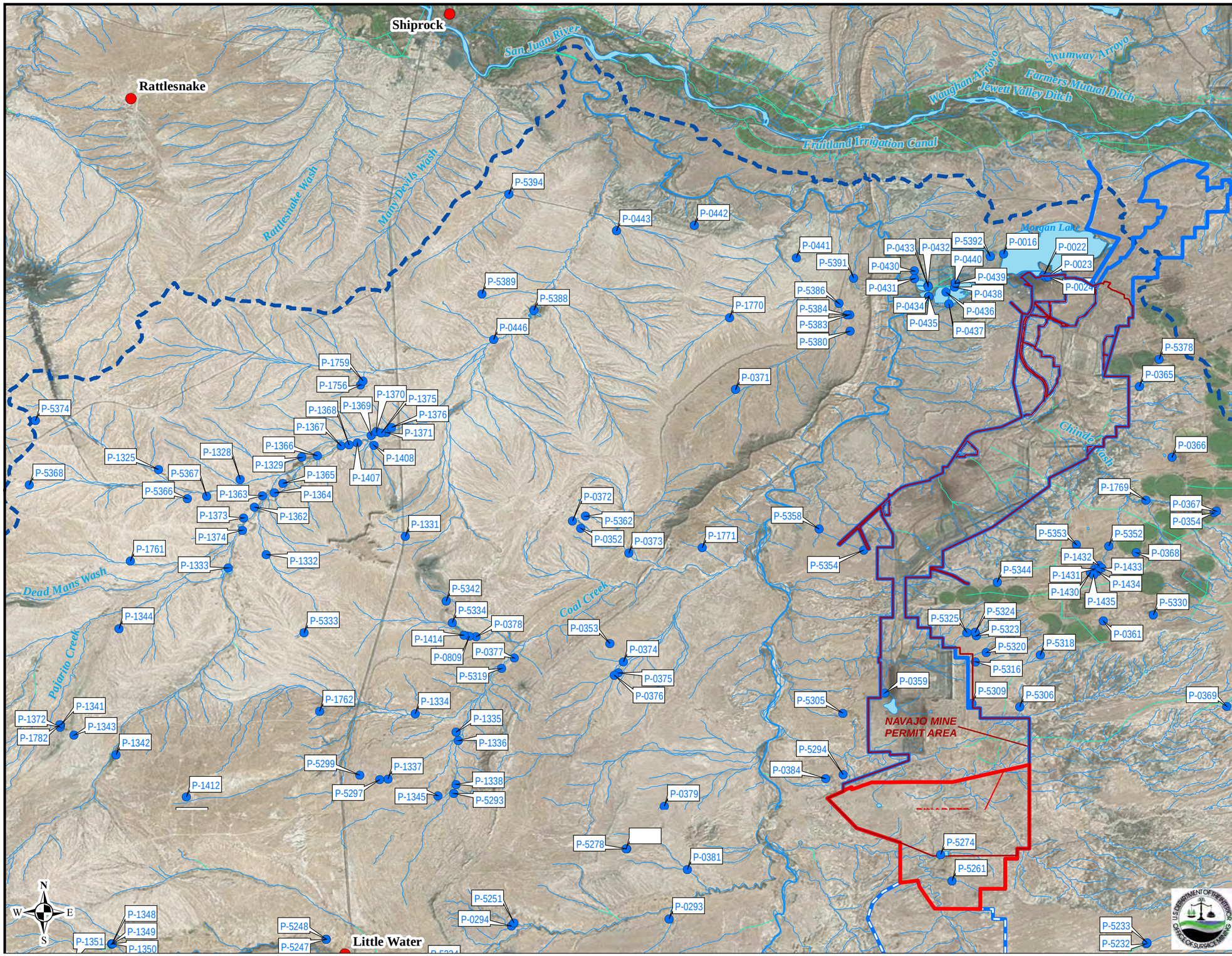
New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table K-1

[3] NMSEO: Navajo Hydrographic Survey (2010) - Table M-3

New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table M-3 (http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj_notice2010.html)

[4] NMSEO: Navajo Hydrographic Survey (2010) - Table D-3

New Mexico State Engineer's Office - Settlements "Notice of Navajo Nation Expedited Inter Se Proceeding" - Navajo Hydrographic Survey (2010) - Table D-3 (http://www.ose.state.nm.us/legal_ose_proposed_settlements_sj_notice2010.html)



Legend

- Impoundments [1]
- Water Body [2]
- Pinabete Permit Area
- Navajo Mine Permit Area
- Coal Lease Area
- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

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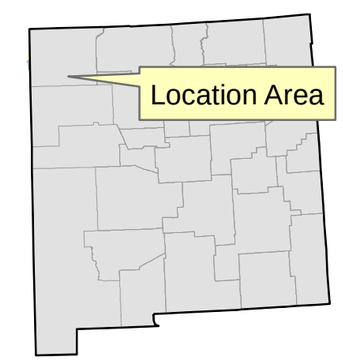
Miles

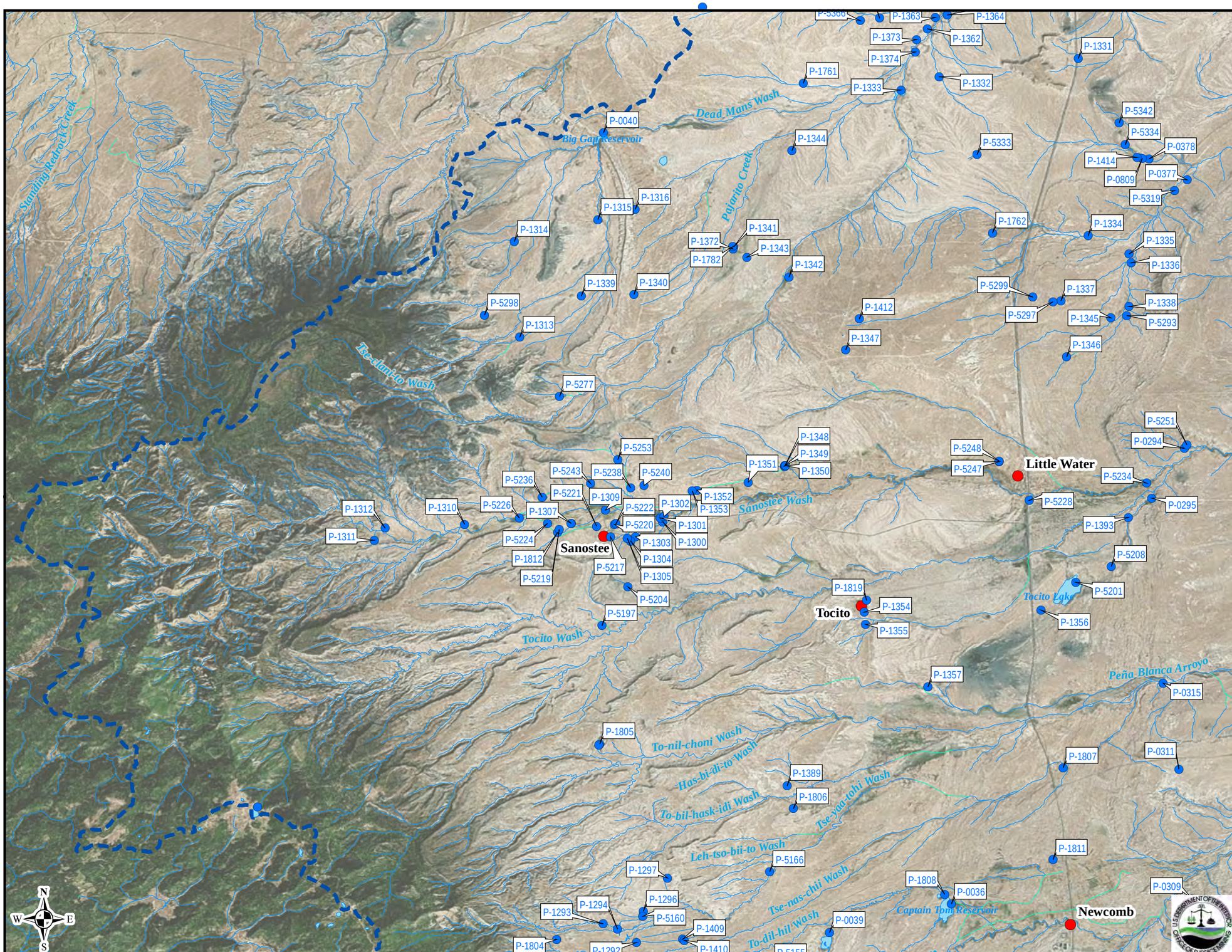


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 1 of 12)



Legend

- Impoundments [1]
- Water Body [2]
- Pinabete Permit Area
- Navajo Mine Permit Area
- Coal Lease Area
- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

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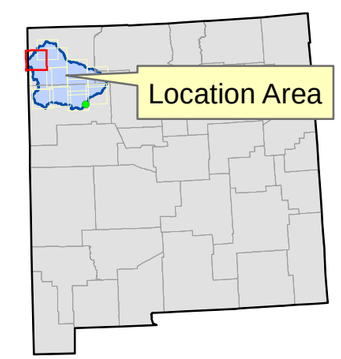
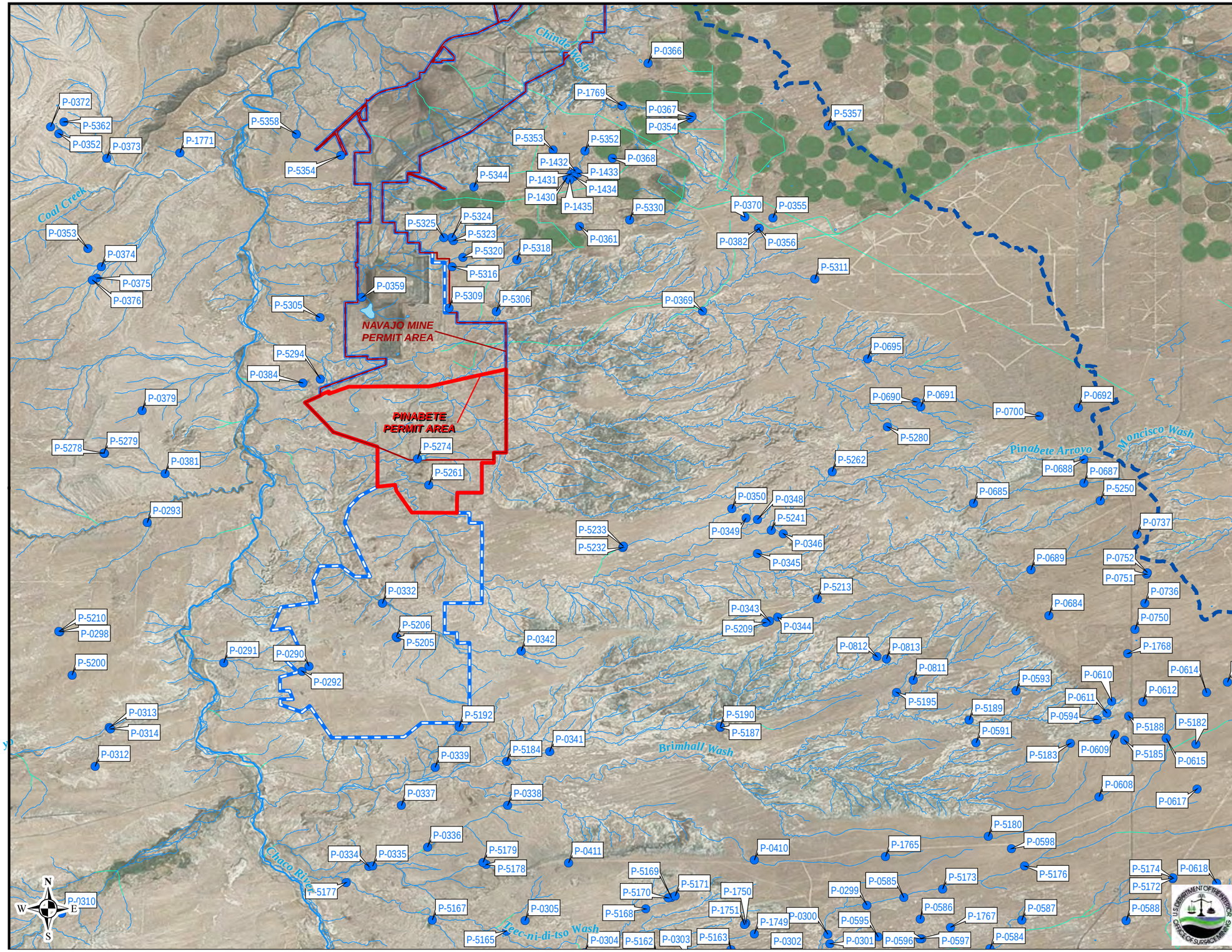


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 2 of 12)



Legend

- Impoundments [1]
- Water Body [2]
- Pinabete Permit Area
- Navajo Mine Permit Area
- Coal Lease Area
- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

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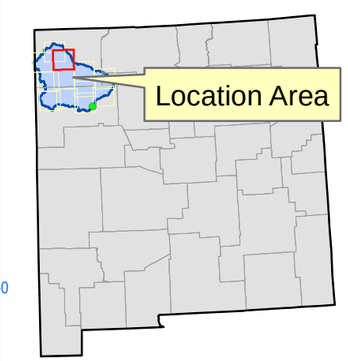

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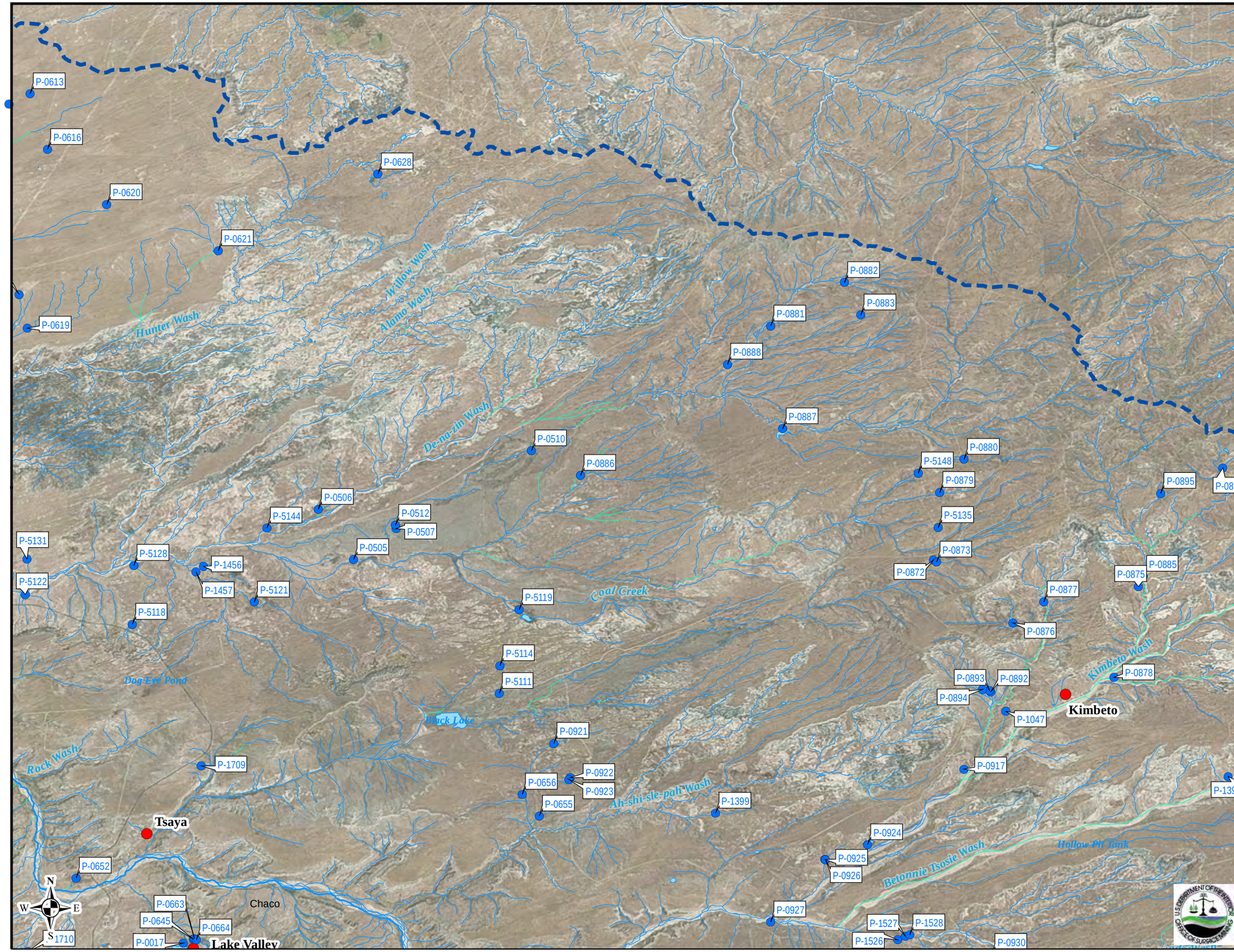
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 3 of 12)

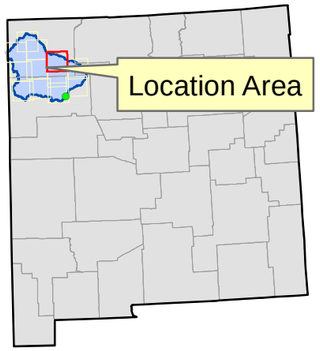


Legend

- Impoundments [1]
- Water Body [2]
- Pinabete Permit Area
- Navajo Mine Permit Area
- Coal Lease Area
- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles

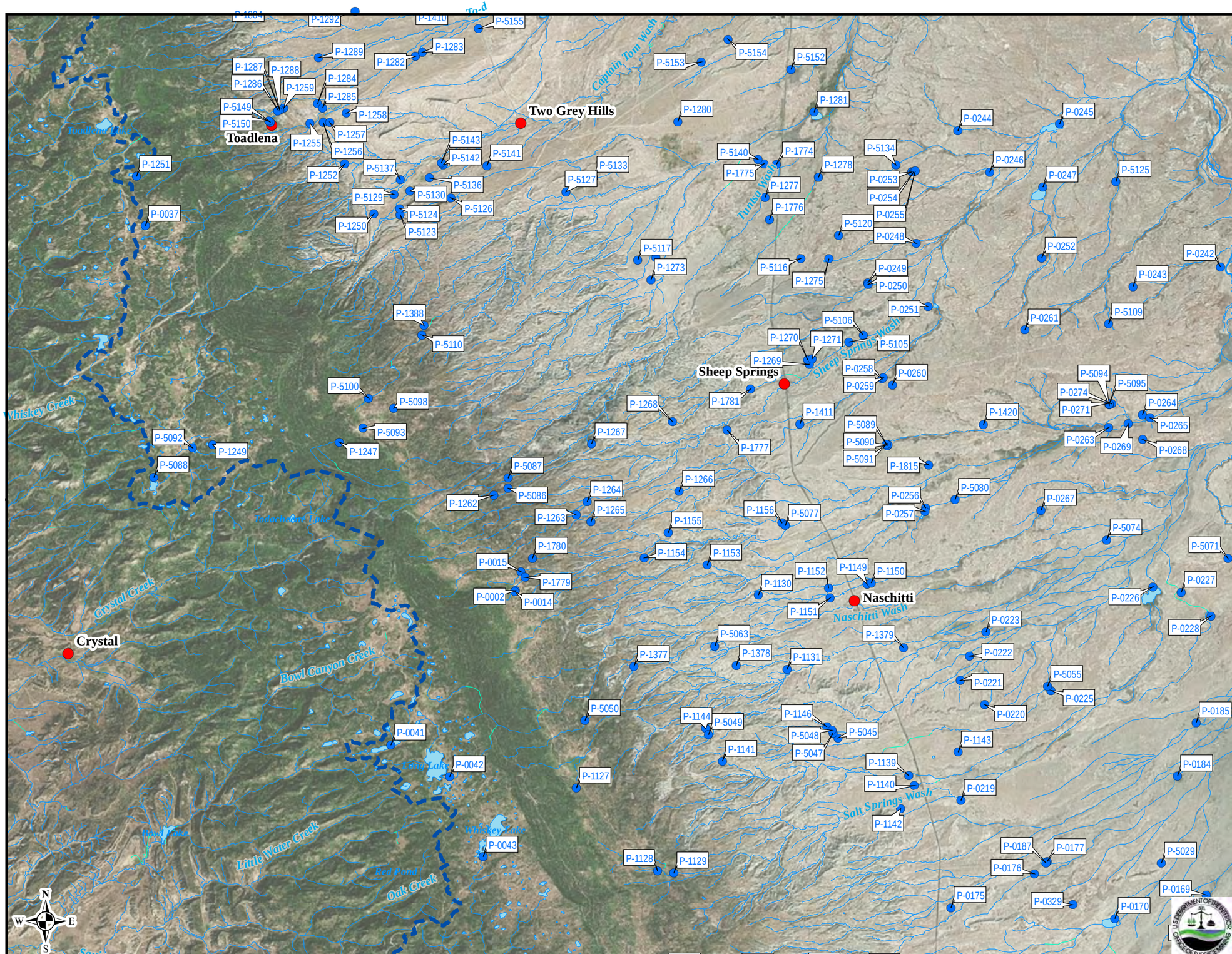


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 4 of 12)



Legend

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Data Sources:
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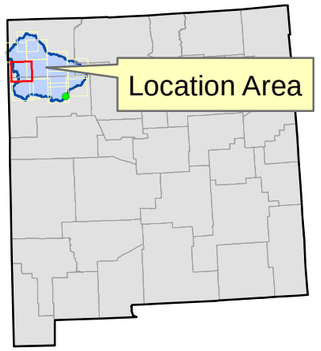
Miles

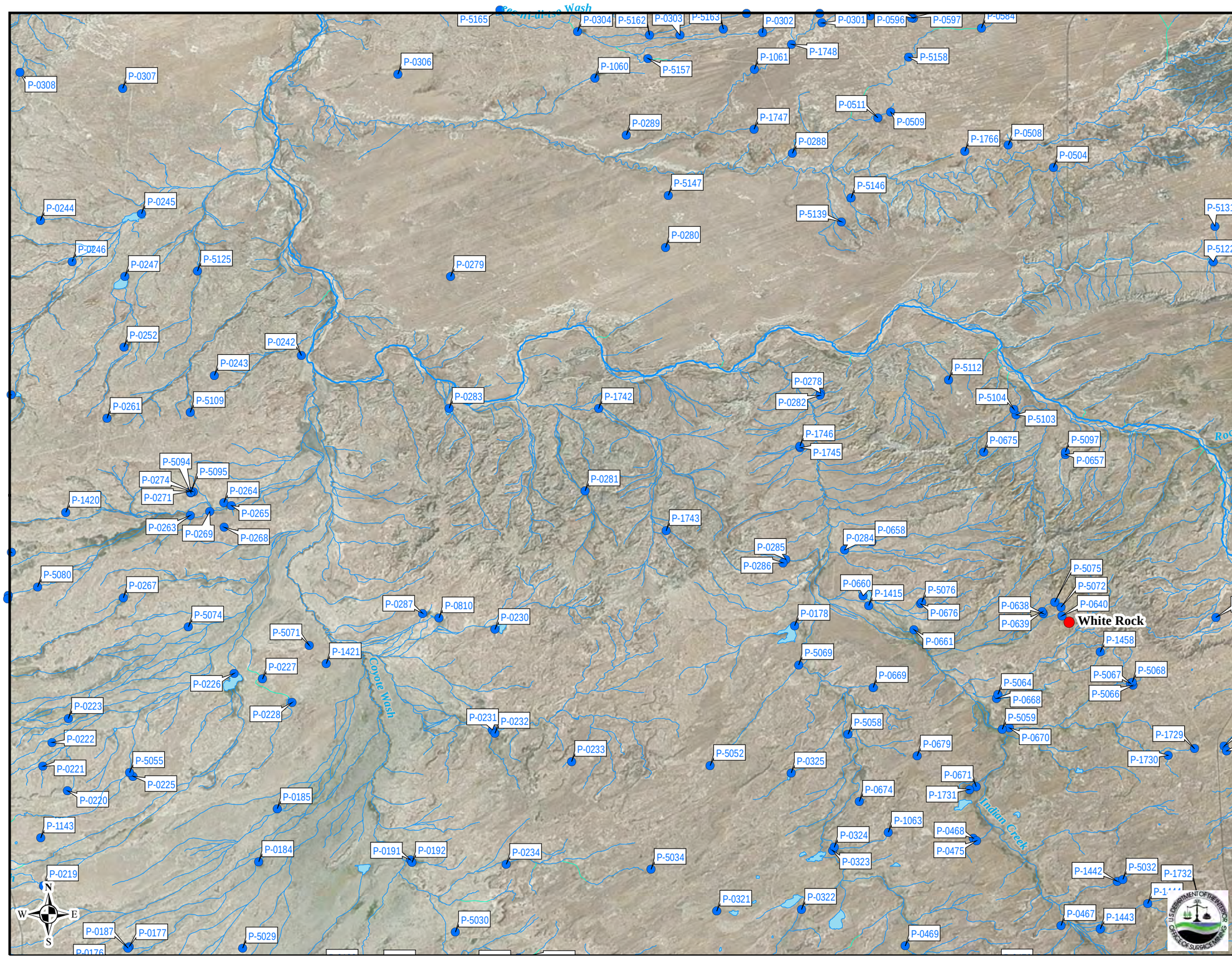


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 5 of 12)



Legend

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- Natural Stream [2]
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Data Sources:
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[1] Navajo Nation Hydrographic Survey (2010)
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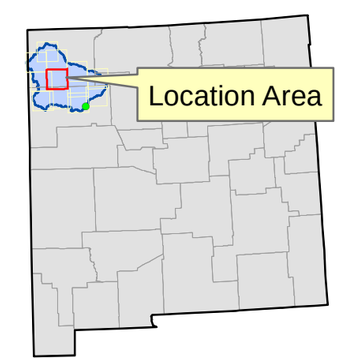
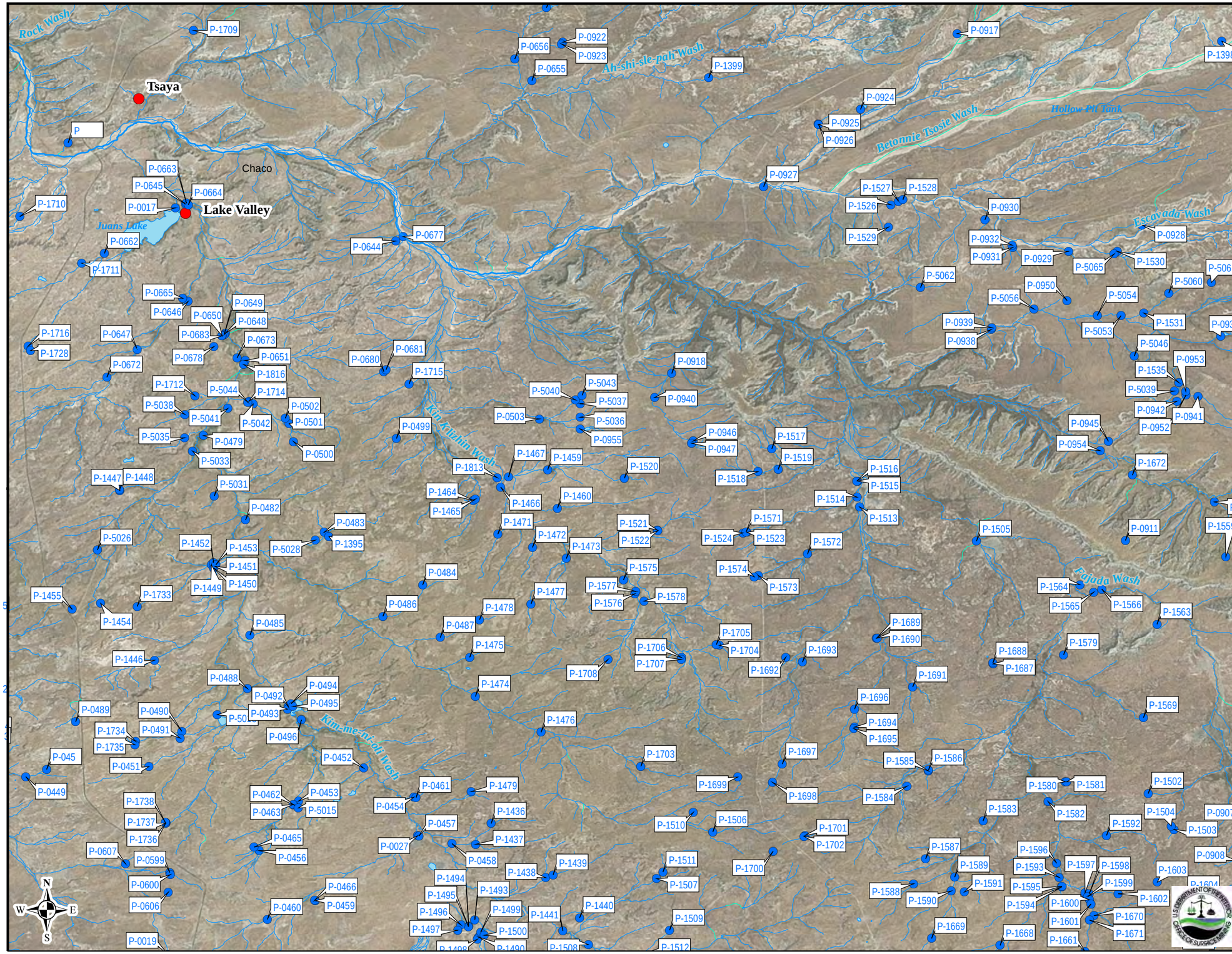
1 0 1 2 3 4
Miles



Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2
(Pg 6 of 12)



Legend

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- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
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- El Segundo Mine

Data Sources:
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[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
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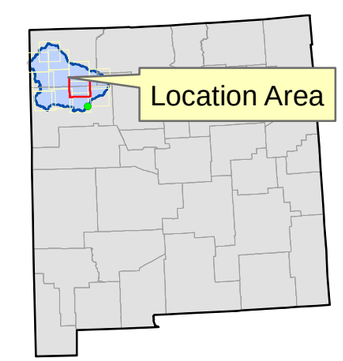
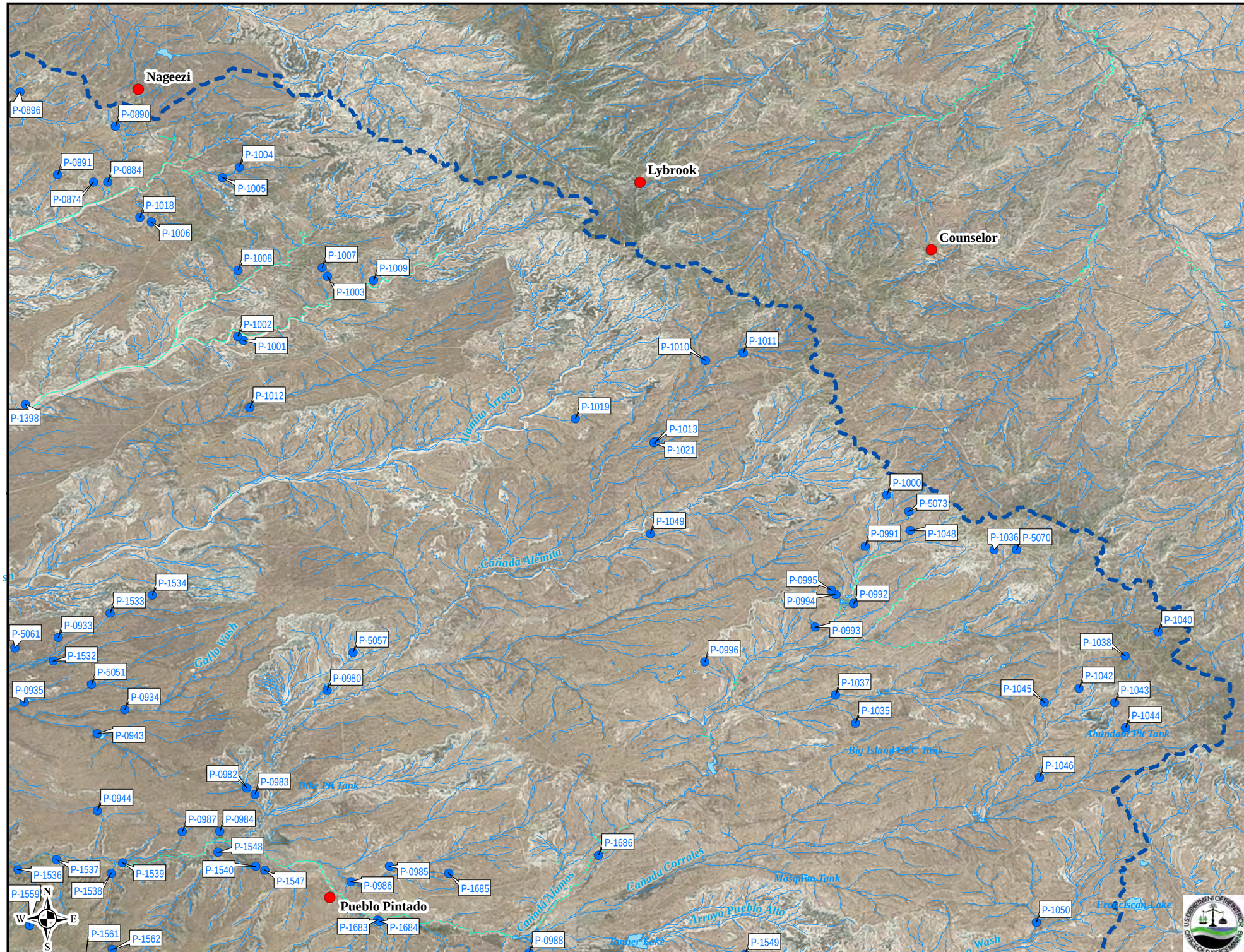


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 7 of 12)



Legend

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- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
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- El Segundo Mine

Data Sources:
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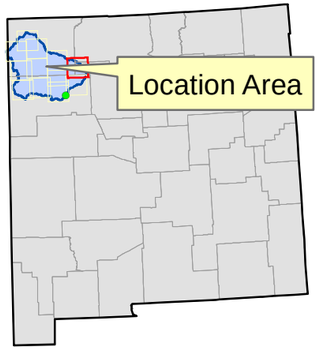
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles

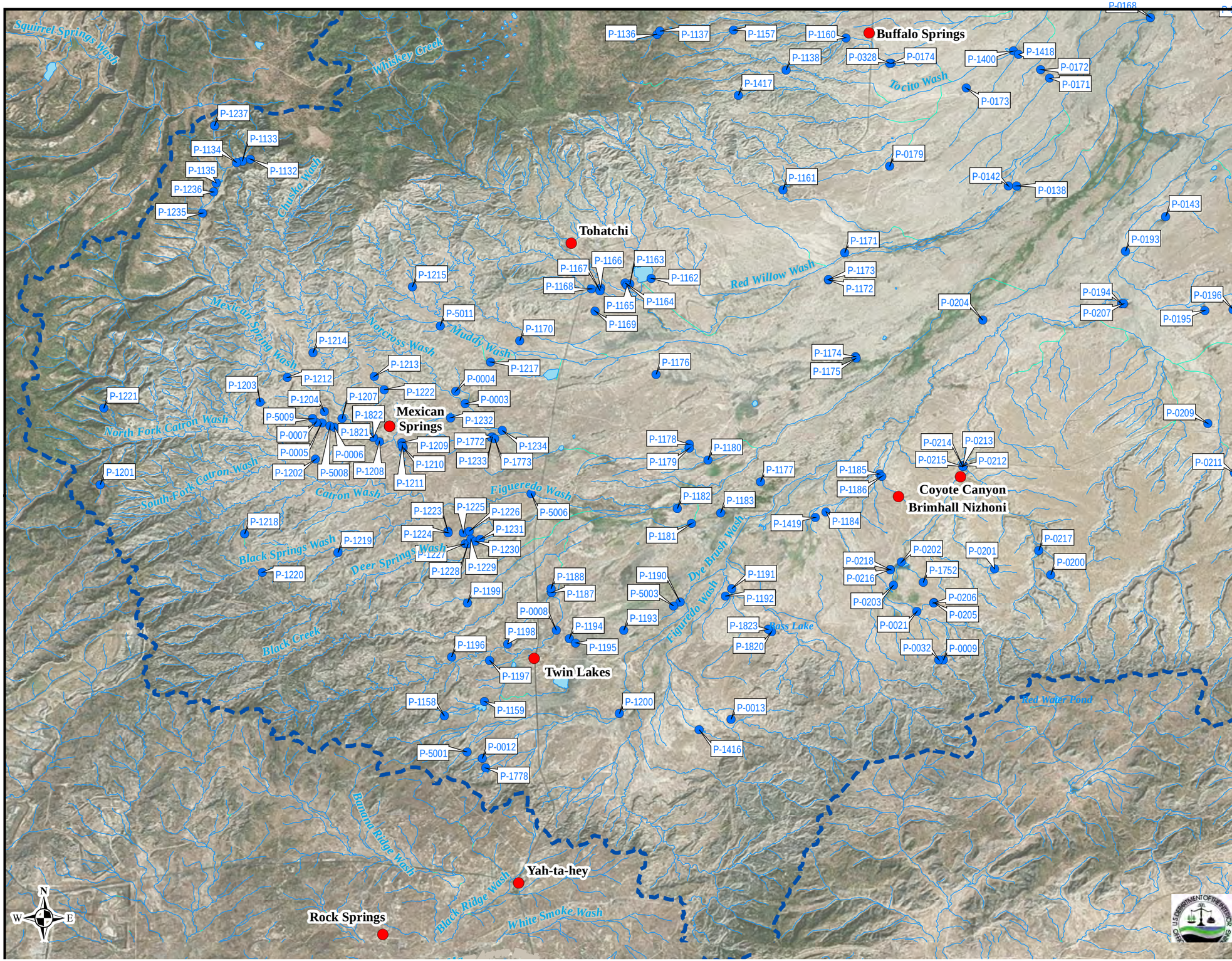


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 8 of 12)



Legend

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- Water Body [2]
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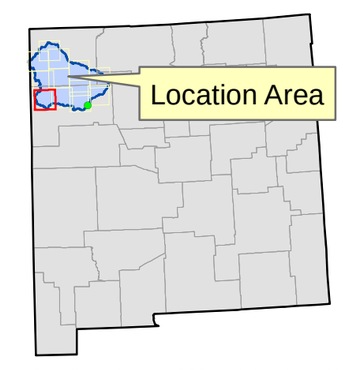
- Navajo Mine Permit Area
- Coal Lease Area
- Surface Water CIA
- Natural Stream [2]
- Artifical Path/Ditch [2]
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles

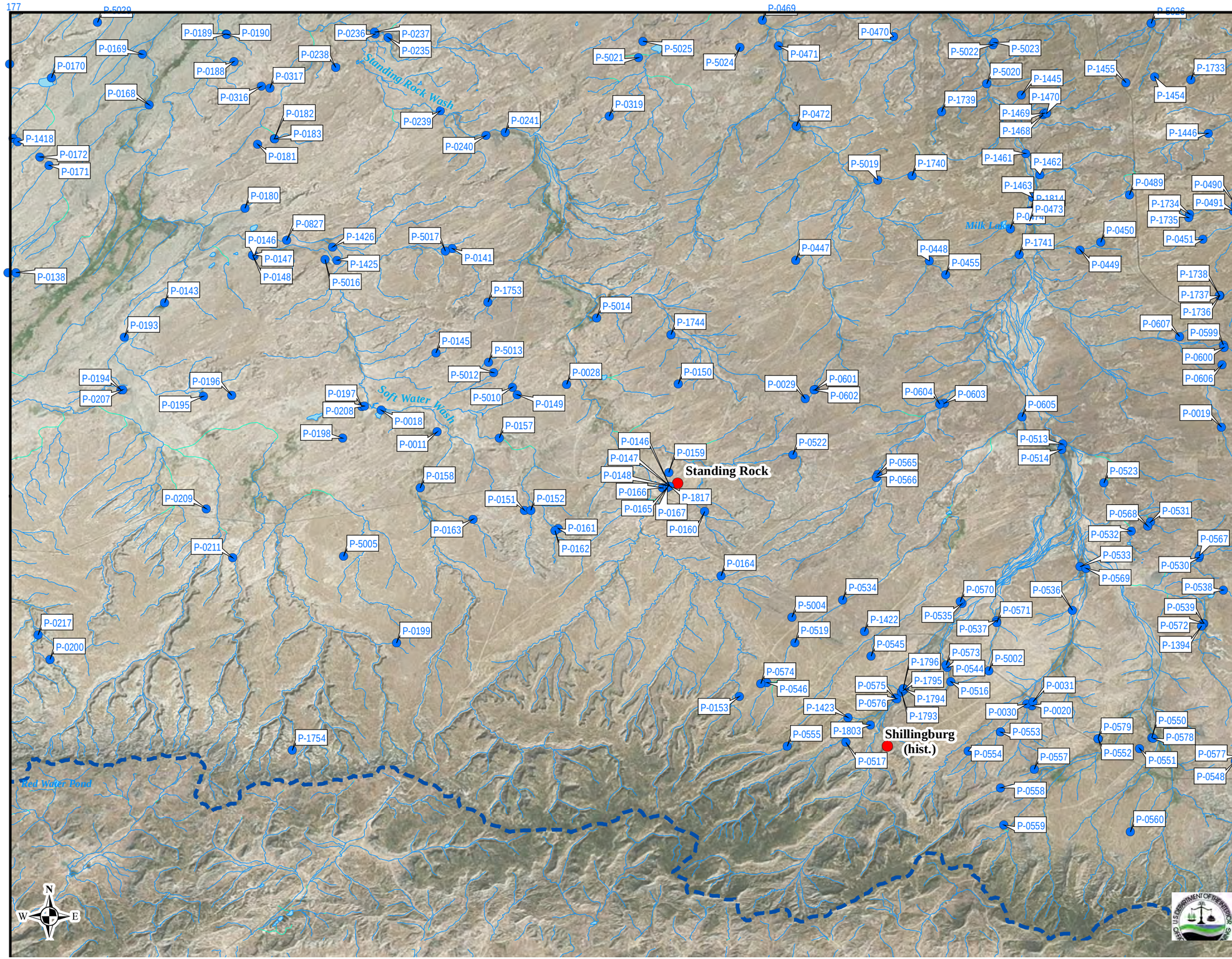


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 9 of 12)



Legend

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- Navajo Mine Permit Area
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- Natural Stream [2]
- Artifical Path/Ditch [2]
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Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
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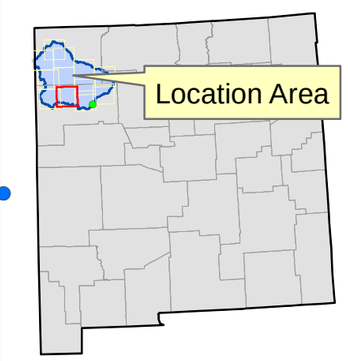
1 0 1 2 3 4
Miles

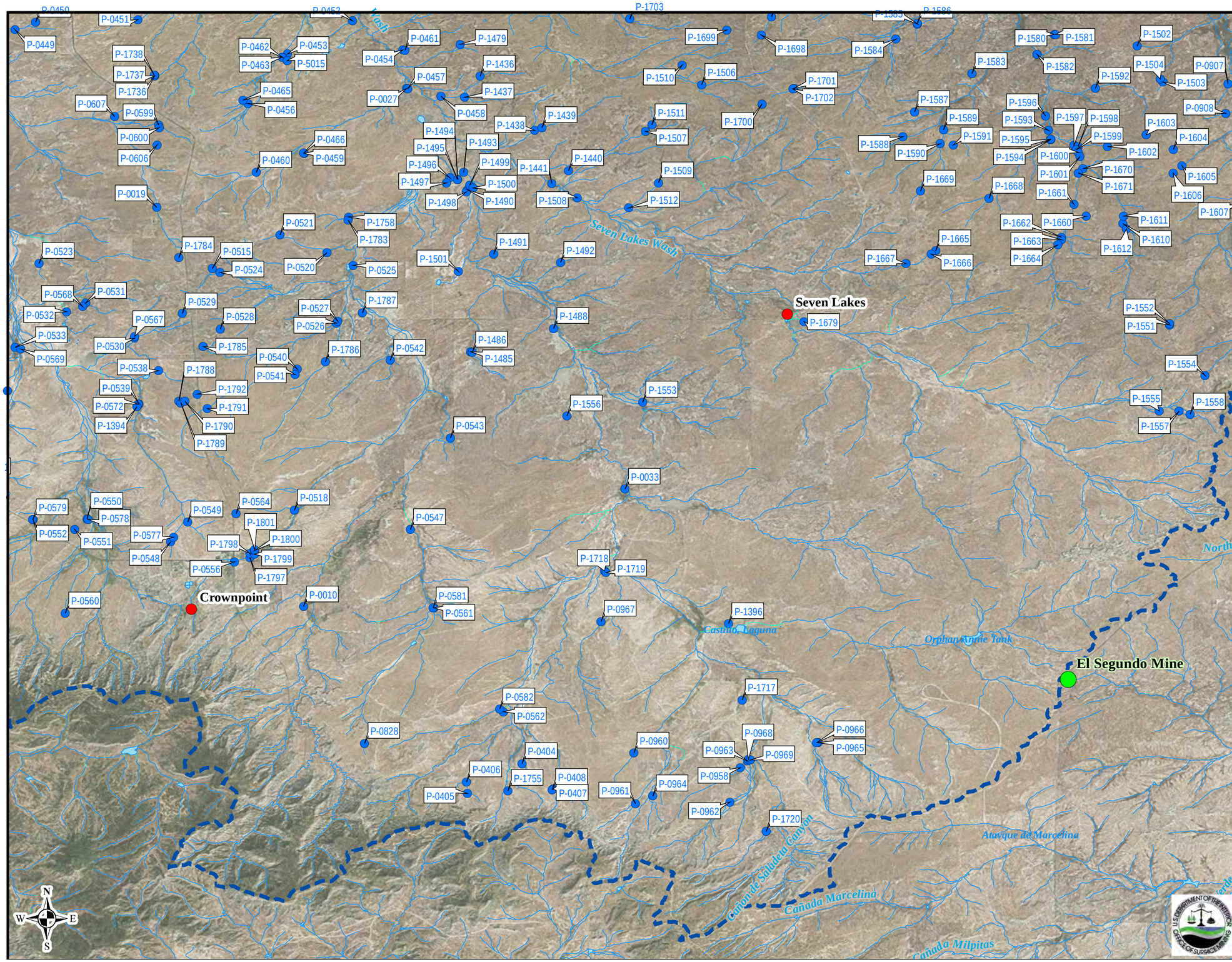


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 10 of 12)



Legend

- Impoundments [1]
- Water Body [2]
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- Navajo Mine Permit Area
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- Surface Water CIA
- Natural Stream [2]
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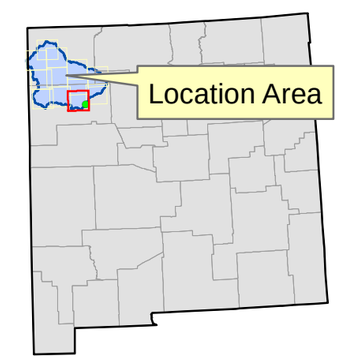
- Population Centers
- El Segundo Mine

Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles

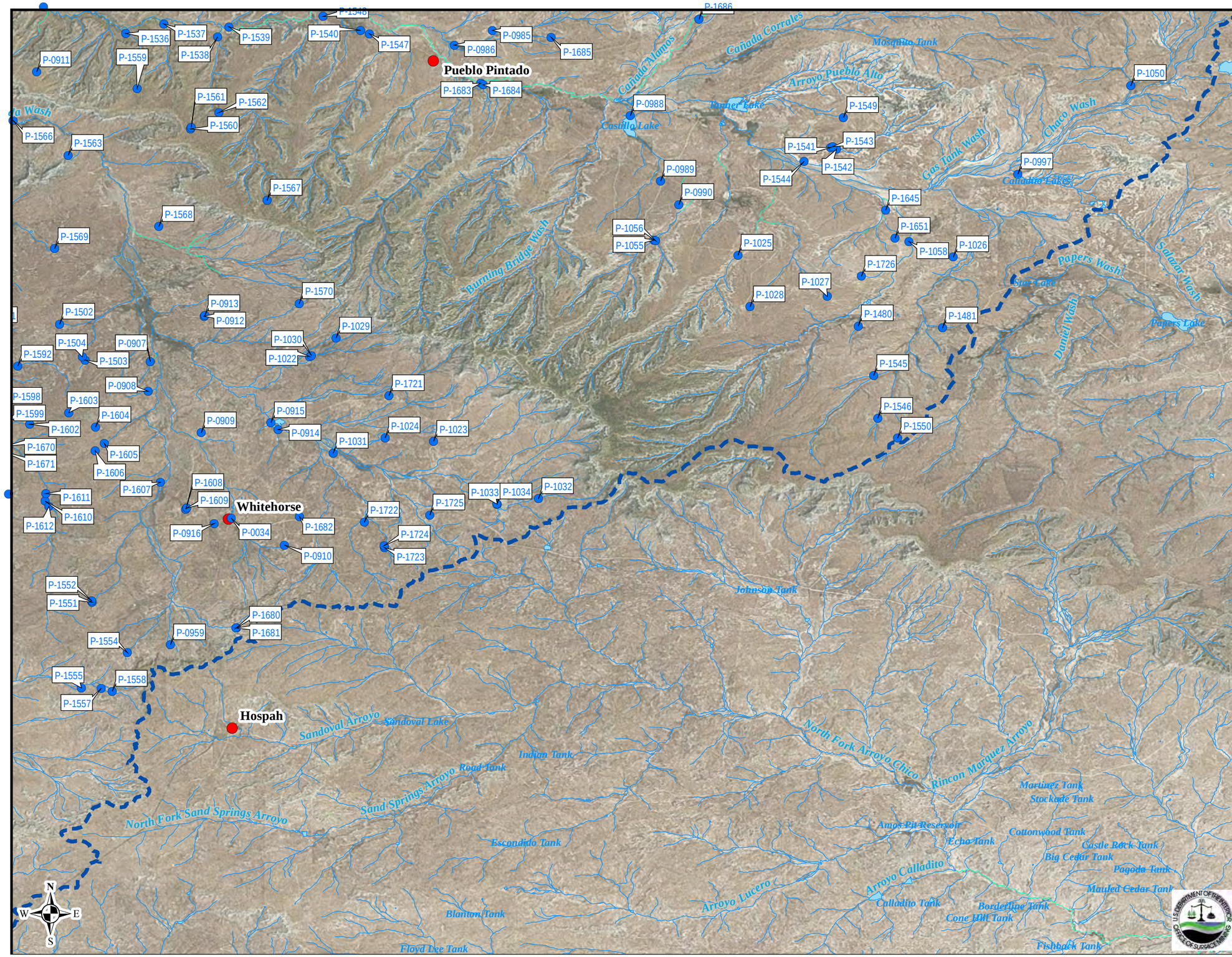


Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2

(Pg 11 of 12)



Legend

- Impoundments [1]
- Water Body [2]
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- Navajo Mine Permit Area
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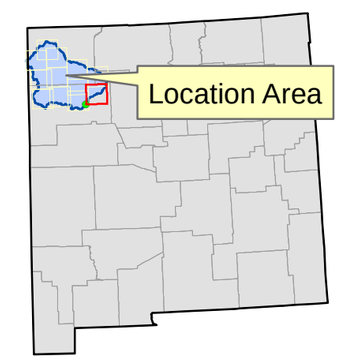
Data Sources:
Aerial Photography (ESRI Mapping Service)
[1] Navajo Nation Hydrographic Survey (2010)
[2] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles



Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Surface Water Cumulative Impacts Area Northwestern NM

Figure B-2
(Pg 12 of 12)

Appendix C

NTEC Water Management Structures

Subwatershed (HUC12 code)	*Total Watershed Acreage*	*Drainage*	*Navajo Mine Area*	*Impoundment Name*	*Type*	*Navajo Mine Pit*	*Intended Life Span*	*Watershed Area (acres)*	*Design Storm Event*	*Peak Discharge (cfs)*	*Runoff Volume (acre-feet)*	*Status*	*Percent Drainage Area Disturbed*
Morgan Lake-Chaco River 140801062008	**32,637**	Morgan Lake Tributary	I	**Emma's Pond**	Sediment	Pinto	Will be removed in 2025	91.50	100-yr, 6-hr	76.22	3.34	Active	0.28%
			I	**North Pond Cell A, B & C (combined)**	Sediment	Facilities	Will be removed in 2025	214.90	100-yr, 6-hr	138.4	11.39	Active	0.66%
			I	**North Pond 1 Cell A**	Sediment	Facilities	Will be removed in 2025	See Table 11-5U North Pond 1 Cells A, B & C	100-yr, 6-hr	See Table 11-5U North Pond 1 Cells A, B & C	See Table 11-5U North Pond 1 Cells A, B & C	Active	
			I	**North Pond 1 Cell A2**	Sediment	Facilities	Will be removed in 2025	51.90	100-yr, 6-hr	16.3	2.67	Active	
			I	**North Pond 1 Cell B**	Sediment	Facilities	Will be removed in 2025	See Table 11-5U North Pond 1 Cells A, B & C	100-yr, 6-hr	See Table 11-5U North Pond 1 Cells A, B & C	See Table 11-5U North Pond 1 Cells A, B & C	Active	
			I	**North Pond 1 Cell C**	Sediment	Facilities	Will be removed in 2025	See Table 11-5U North Pond 1 Cells A, B & C	100-yr, 6-hr	See Table 11-5U North Pond 1 Cells A, B & C	See Table 11-5U North Pond 1 Cells A, B & C	Active	
Total								**306.4**		**214.6**	**14.7**		**0.94%**
Chinde Wash-Chaco River 140801062007	**14,225**	Hosteen Wash	II	**North Pinto Pond**	Sediment	Pinto	Will be removed in 2025	76.90	100-yr, 6-hr	42.2	3.6	Active	0.54%
			II	**North Sewer Pond**	Sediment	Facilities	Will be removed in 2025	2.20	100-yr, 6-hr	6.43	0.38	Active	0.02%
			II	**Pond 5**	Sediment		Will be removed in 2025	41.90	100-yr, 6-hr	36.53	1.92	Active	0.29%
		Barber Arroyo	II	**Vinnel Pond**	Sediment	Bighan	Will be removed in 2006	276.50	10-yr, 24-hr	11.06	4.78	Active	1.94%
			II	**Hosteen Stockpile Pond 1**	Sediment	Hosteen	Will be removed in 2025	155.54	10-yr, 24-hr	22.17	4.01	Active	1.09%
			II	**Hosteen Stockpile Pond 2**	Sediment	Hosteen	Will be removed in 2025	122.80	10-yr, 24-hr	26.55	4.36	Active	0.86%
			II	**Hosteen Stockpile Pond 3**	Sediment	Hosteen	Will be removed in 2025	135.20	100-yr, 6-hr	68.03	6.76	Active	0.95%
			II	**Barber Loadout**	Sediment	Barber	Will be removed in 2025	3.60	100-yr, 6-hr	8.01	0.33	Active	0.03%
			II	**Barber Stockpile Pond 2**	Sediment (I)	Barber	Will be removed in 2025	106.60	100-yr, 6-hr	82.12	5.72	Active	0.75%
			II	**Barber Stockpile Pond 3**	Detention	Barber	Will be removed in 2025	59.80	10-yr, 24-hr	4.28	1.13	Active	0.42%
		South Barber Arroyo	III	**Block-C Pond 1**	Sediment	Block C	Will be removed in 2015	49.48	100-yr, 6-hr	38.54	2.49	Active	0.35%
			III	**Block-C Pond 2**	Sediment	Block C	Will be removed in 2015	66.64	100-yr, 6-hr	62.1	4.42	Active	0.47%
			III	**Block-C Pond 3**	Sediment	Block C	Will be removed in 2015	269.20	10-yr, 24-hr	74.52	10.48	Active	1.89%
			III	**Block-C Pond 4**	Sediment	Block C	Will be removed in 2015	262.64	100-yr, 6-hr	128.27	13.19	Active	1.85%
Total								**1,629.0**		**610.8**	**63.6**		**11.45%**
Coal Creek-Chaco River 140801062005	**28,235**	Neck Arroyo	II	**Area III Sewer Pond**	Sewage	Facilities	Will be removed in 2025	1.20	100-yr, 6-hr	2.67	0.11	Active	0.00%
		Lowe Arroyo	III	**Area III Sewage Pond-2**	Sediment	Facilities	Will be removed in 2025	N/A	N/A	N/A	N/A		
			III	**Mason Pond**	Sediment	Barber	Will be removed in 2015	133.20	100-yr, 6-hr	96.4	7.2	Active	0.47%
			III	**South Barber Pond**	Sediment	Barber	2016	157.40	100-yr, 6-hr	70	5.43	Active	0.56%
			III	**Employee Coal Dump**	Sediment	Barber	2015	6.20	100-yr, 6-hr	12.12	0.53	Active	0.02%
			III	**Lowe Highwall Pond 304**	Highwall Impoundment	Lowe		416.70					1.48%
			III	**Lowe Highwall Pond 305**	Highwall Impoundment	Lowe		933.00					3.30%
			III	**Lowe Hole 3 Pond 2**	Highwall Impoundment	Lowe	Will be removed in 2025	628.37	2-yr, 6-hr	23.8	7.7	Active	2.23%
			III	**Lowe Hole 3 Pond 3**	Highwall Impoundment	Lowe	Will be removed in 2009	39.61	100-yr, 6-hr	32.45	2.01	Active	0.14%
			III	**Lowe Impoundment 1**	Highwall Impoundment	Lowe	Permanent	1642	25-yr, 6-hr	241.9	50.04	Active	5.82%
			III	**Lowe Loadout**	Sediment	Lowe	Will be removed in 2025	3.40	100-yr, 6-hr	7.57	0.31	Active	0.01%
			III	**Lowe Railroad Impoundment #1**	Sediment	Lowe	This pond will be reclaimed in 2015	105.73	100-yr, 6-hr	39.73	6.84	Active	0.37%
			III	**Lowe Railroad Impoundment #2**	Sediment	Lowe	Will be removed in 2025	133.27	10-yr, 24-hr	103.67	6.65	Active	0.47%
			III	**Lowe Stockpile Pond**	Sediment	Lowe	Will be removed in 2025	51.80	10-yr, 24-hr	13.35	2.99	Active	0.18%
Total								**4,251.9**		**643.7**	**89.8**		**15.06%**

Appendix C

NTEC Water Management Structures

Subwatershed (HUC12 code)	Total Watershed Acreage	Drainage	Navajo Mine Area	Impoundment Name	Type	Navajo Mine Pit	Intended Life Span	Watershed Area (acres)	Design Storm Event	Peak Discharge (cfs)	Runoff Volume (acre-feet)	Status	Percent Drainage Area Disturbed
Cottonwood Arroyo 140801062002	29,845	North Fork Cottonwood Arroyo	III	**Lowe-Dixon Diversion North Pond**	Sediment	Lowe	Will be mined out in Lowe Strip 66	7.40	100-yr, 6-hr	10.06	0.81	Removed	0.02%
			III	**Lowe-Dixon Diversion South Pond**	Sediment	Lowe	Will be mined out in Dixon Strip 68	33.30	100-yr, 6-hr	40.46	3.64	Active	0.11%
			III	**Northwest Dixon**	Sediment	Dixon	Will be removed in 2025	62.20	100-yr, 6-hr	47.84	4.42	Active	0.21%
			III	**North Fork Pond**	Impoundment	Dixon		198.70				Active	0.67%
			III	**Pond 302**	Sediment	Dixon	2016	41.70	100-yr, 6-hr	Refer to Appendix 11-AA	3.8	Active	0.14%
		Cottonwood Arroyo	III	**Collyer Road Pond #4**	Sediment	Dixon	Will be removed in 2009	142.1 – AOC topo (72.3– Current topo)	100-yr, 6-hr	81.9/(40.1)	10.0/(2.4)	Active	0.00%
			III	**Pond 301**	Sediment	Dixon	2016	32.90	100-yr, 6-hr	Refer to Appendix 11-AA	2.4	Active	0.11%
			III	**South Dixon Pond 1**	Sediment	Dixon	Will be removed in 2009	296.46	10-yr, 24-hr	73.11	6.63	Active	0.99%
			III	**South Dixon Pond 2**	Sediment	Dixon	Will be removed in 2009	28.40	100-yr, 6-hr	23.15	1.33	Active	0.10%
			III	**South Dixon Pond 3**	Sediment	Dixon	Will be removed in 2009	28.18	100-yr, 6-hr	22.6	1.05	Active	0.09%
			III	**South Dixon Pond 7**	Sediment	Dixon	Will be removed in 2009	82.00	10-yr, 24-hr	54.34	5.62	Active	0.27%
			III	**Southwest Dixon Pond**	Sediment	Dixon	Will be removed in 2009	37.80	100-yr, 6-hr	33.33	2.01	Active	0.13%
			IVN	**Area 4 North Pond 1**	Sediment		2016	40.40	100-yr, 6-hr	44	3.92		0.14%
			IVN	**Area 4 North Pond 2**	Sediment		2016	35.50	100-yr, 6-hr	49.6	3.44		0.12%
			IVN	**Area 4 North Pond 3**	Sediment		Until completion of final reclamation	8.60	100-yr, 6-hr	Refer to Appendix 11-AA	0.8	Active	0.03%
			IVN	**Area 4 North Pond 4**	Sediment		Until completion of final reclamation	46.30	100-yr, 6-hr	Refer to Appendix 11-AA	4.5	Active	0.16%
			IVN	**Area 4 North Pond 5**	Sediment		2016	254.03	10-yr, 24-hr	103.9	13.75		0.85%
			IVN	**Area 4 North Pond 6**	Sediment		2016	356.60	100-yr, 6-hr	50.8	14.73		1.19%
			IVN	**Area 4 North Pond 7**	Sediment		2016	84.10	100-yr, 6-hr	90	5.68		0.28%
			IVN	**Area 4 North Pond 401**	Sediment		Until completion of final reclamation	20.80	100-yr, 6-hr	Refer to Appendix 11-AA	1.4	Active	0.07%
			IVN	**Area 4 North Pond 402**	Sediment		Until completion of final reclamation	96.80	100-yr, 6-hr	Refer to Appendix 11-AA	6.8	Active	0.32%
			IVN	**Area 4 North Pond 404**	Sediment		2016	11.70	100-yr, 6-hr	Refer to Appendix 11-AA	1	Active	0.04%
			IVN	**Area 4 North Pond 405**	Sediment		2016	90.60	100-yr, 6-hr	Refer to Appendix 11-AA	6.3	Active	0.30%
			IVN	**Area 4 North Pond 406**	Highwall Impoundment			238.10				Active	0.80%
			IVN	**Area 4 North Pond 407**	Highwall Impoundment			124.80				Active	0.42%
			IVN	**Area 4 North Pond 408**	Sediment		Until completion of final reclamation	6.18	100-yr, 6-hr	Refer to Appendix 11-AA	0.4	Active	0.02%
			IVN	**Area 4 North Pond 409**	Sediment		Until completion of final reclamation	2.83	100-yr, 6-hr	Refer to Appendix 11-AA	0.2	Active	0.01%
			IVN	**Area 4 North Pond 410**	Sediment		Until completion of final reclamation	2.37	100-yr, 6-hr	Refer to Appendix 11-AA	0.17	Active	0.01%
			IVN	**Area 4 North Pond 411**	Sediment		Until completion of final reclamation	12.50	100-yr, 6-hr	Refer to Appendix 11-AA	1.2	Active	0.04%
			IVN	**Area 4 North Pond 412**	Sediment		Until completion of final reclamation	30.60	100-yr, 6-hr	Refer to Appendix 11-AA	3	Active	0.10%
			IVN	**Area 4 North Pond 413**	Sediment		Until completion of final reclamation	6.80	100-yr, 6-hr	Refer to Appendix 11-AA	0.6	Active	0.02%
Total								**2,460.8**		**725.1**	**109.6**		**8.25%**

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Chaco Downstream (USGS 09367950)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria											
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption		Baseline Median + 2MAD	
											n	%	n	%	n	%	n	%	n	%	n	%
Aluminum	(04/28/1977-04/28/1977)	**1**	(0.05-0.05)	**0.05**	0	**0.050**			0.05	**0.05**												
Arsenic	(12/11/1975-08/10/1989)	**44**	(0.0005-0.02)	**0.0020**	0.0010	**0.0033**	0.0046	**142**	0.003	**0.0154**											4	**9**
Barium	(12/11/1975-05/19/1981)	**34**	(0.05-0.5)	**0.085**	0.035	**0.14**	0.13	**91**	0.2	**0.37**											12	35
Boron	(11/13/1975-08/10/1989)	**94**	(0.08-25.)	**2.5**	1.9	**3.551**	4.214	**119**	4.6	**9.3**	22	**23.4**									90	96
Cadmium	(04/28/1977-08/10/1989)	**13**	(0.0005-2.)	**0.0005**	0	**0.1544**	0.5545	**359**	0.001	**0.8006**	1	**8**	1	**8**	1	8	13	**100**	1	**8**	4	31
Chloride	(10/08/1969-08/10/1989)	**72**	(12.-720.)	**78**	42	**106**	102	**96**	130	174.5	1	**1**									68	**94**
Chromium	(04/28/1977-08/10/1989)	**13**	(0.001-0.01)	**0.01**	0	**0.009**	0.003	**39**	0.01	**0.01**			13	**100**								
Copper	(12/20/1978-08/10/1989)	**4**	(0.005-0.031)	**0.009**	0.0025	**0.0135**	0.011846	**88**	0.015	**0.02785**			1	**25**			1	**25**				
Fluoride	(04/27/1970-08/10/1989)	72	(0.1-13.)	**1.55**	0.85	**2.7**	2.5	**91**	3.825	**7.29**	33	46									39	**54**
Lead	(12/20/1978-08/10/1989)	**5**	(0.0005-0.0025)	**0.001**	0.0005	**0.0014**	0.0010	**73**	0.003	**0.0025**							1	**8**				
Mercury	(12/11/1975-08/10/1989)	**54**	(0.00005-	**0.0003**	0.0003	**0.00104**	0.001116	**108**	0.002	**0.0031**			9	**17**	54	**100**			46	**85**		
Nitrate	(04/27/1970-04/27/1970)	**1**	(15.-15.)	**15.0**	0	**15.0**			15.0	**15.0**												
pH	(10/08/1969-08/10/1989)	**174**	(6.8-11.3)	**7.85**	0.4	**7.8**	0.6	**7**	8.2	**8.5**											1	1
Radium (pCi/l)	(11/29/1977-08/10/1989)	**24**	(0.01-0.27)	**0.115**	0.03	**0.1196**	0.0536	**45**	0.15	**0.1800**											9	38
Selenium	(12/11/1975-08/10/1989)	**26**	(0.001-0.047)	**0.0065**	0.004	**0.0110**	0.0123	**112**	0.012	**0.039**			2	8	22	**85**					15	58
Silver																						
Sulfate	(10/08/1969-08/10/1989)	**72**	(240.-7600.)	**700**	250	**965**	1095	**113**	1000	**1946**	17	**24**									72	100
TDS - 180°C	(10/08/1969-08/10/1989)	**73**	(517.5-12750.)	**1305**	444	**1701**	1727	**102**	1790	**3196**	4	**5**									70	96
Zinc	(12/11/1975-08/10/1989)	**24**	(0.0015-0.072)	**0.01**	0.0025	**0.016**	0.015	**96**	0.02	**0.039**			2	**8**	2	**8**					2	8
TSS																						
Conductivity (umho/cm)	(10/08/1969-08/10/1989)	**177**	(310.-12600.)	**1700**	500	**1926**	1320	**69**	2200	**3500**											157	89
Iron (total)	(12/11/1975-07/13/1984)	**83**	(0.23-800.)	**19**	16	**117.17**	176.03	**150**	190	**445**											5	**6**
Manganese	(12/11/1975-08/24/1982)	**41**	(0.0005-0.15)	**0.005**	0.0045	**0.018**	0.030	**163**	0.02	**0.08**											6	15

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Composite Chinde Baseline (CD-1 & CD-1A)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(09/05/2000-09/25/2008)	**45**	(0.036-0.5)	**0.05**	0	**0.112**	0.125	**112**	0.1	**0.45**					12	**27**				
Arsenic	(07/21/1986-07/02/1997)	**289**	(0.0005-0.092)	**0.0005**	0	**0.0017**	0.0055	**325**	0.003	**0.0025**									1	**0**
Barium	(07/21/1986-07/02/1997)	**287**	(0.02-1.1)	**0.5**	0	**0.37**	0.20	**53**	0.5	**0.5**										
Boron	(07/21/1986-09/21/2010)	**376**	(0.005-1.89)	**0.16**	0.08	**0.228**	0.225	**98**	0.28	**0.6**									11	**21**
Cadmium	(07/21/1986-07/02/1997)	**289**	(0.0005-0.005)	**0.0025**	0	**0.002**	0.001	**54**	0.003	**0.003**			12	**4**	289	**100**				
Chloride	(07/21/1986-09/21/2010)	**381**	(0.84-373.)	**31**	19.2	**46.48**	43.65	**94**	63	**129**										
Chromium	(07/21/1986-07/02/1997)	**289**	(0.001-0.1)	**0.01**	0	**0.009**	0.006	**71**	0.01	**0.01**			289	**100**	7	**2**				
Copper																				
Fluoride	(08/24/1988-09/21/2010)	**153**	(0.005-3.5)	**1**	0.37	**1.25**	0.80	**64**	1.6	**3**	25	**16**								
Lead	(07/21/1986-07/02/1997)	**289**	(0.0005-0.16)	**0.01**	0	**0.009**	0.012	**131**	0.01	**0.013**	1	**0.3**	1	**0**	188	**65**	13	**4**		
Mercury																				
Nitrate	(08/12/1988-07/02/1997)	**117**	(0.5-239.)	**6.9**	2.6	**11.5**	24.4	**212**	10.3	**21**										
pH	(07/21/1986-09/21/2010)	**257**	(6.7-8.86)	**7.9**	0.23	**7.90**	0.36	**5**	8.15	**8.4**										
Radium (pCi/l)	(07/21/1986-06/28/1989)	**11**	(0.3-1.2)	**0.4**	0.1	**0.5**	0.3	**56**	0.6	**0.9**										
Selenium	(07/21/1986-09/21/2010)	**346**	(0.0005-0.1)	**0.0028**	0.0013	**0.0051**	0.0074	**146**	0.006	**0.013**	1	**0.3**	3	**1**	263	**76**				
Silver	(07/21/1986-07/02/1997)	**288**	(0.0005-0.09)	**0.005**	0	**0.0056**	0.0055	**98**	0.005	**0.01**			5	**2**						
Sulfate	(07/21/1986-09/21/2010)	**378**	(40.-4050.)	**560**	240	**674**	506	**75**	820	**1653**	61	**16**								
TDS - 180°C	(07/21/1986-09/21/2010)	**371**	(150.-7000.)	**1020**	424	**1257**	837	**67**	1585	**2880**	16	**4**								
Zinc	(07/21/1986-07/02/1997)	**289**	(0.005-1.01)	**0.07**	0.055	**0.081**	0.082	**102**	0.125	**0.125**			184	**64**	184	**64**				
TSS	(07/21/1986-09/21/2010)	**375**	(1.-108000.)	**884**	865	**4541**	11211	**247**	3280	**22380**										
Conductivity (umho/cm)	(07/21/1986-09/21/2010)	**380**	(105.-7600.)	**1425**	542	**1674**	977	**58**	2200	**3502.5**										
Iron (total)	(12/29/1992-09/21/2010)	**243**	(0.05-412.)	**1.44**	1.33	**19.78**	53.72	**272**	10.45	**116.9**										
Manganese	(07/21/1986-09/21/2010)	**377**	(0.0025-2.85)	**0.1**	0.028	**0.099**	0.215	**218**	0.1	**0.152**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Baseline (CD-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum																				
Arsenic	(07/21/1986-05/23/1997)	**287**	(0.0005-0.092)	**0.0005**	0	**0.0017**	0.0055	**327**	0.003	**0.0025**									1	**0**
Barium	(07/21/1986-05/23/1997)	**285**	(0.025-1.1)	**0.5**	0	**0.37**	0.19	**53**	0.5	**0.5**										
Boron	(07/21/1986-05/23/1997)	**285**	(0.005-1.89)	**0.15**	0.06	**0.193**	0.202	**104**	0.22	**0.5**										
Cadmium	(07/21/1986-05/23/1997)	**287**	(0.0005-0.005)	**0.0025**	0	**0.002**	0.001	**53**	0.003	**0.003**			12	**4**	287	**100**				
Chloride	(07/21/1986-05/23/1997)	**289**	(0.84-373.)	**29**	16	**44.48**	44.81	**101**	54.9	**135.8**										
Chromium	(07/21/1986-05/23/1997)	**287**	(0.001-0.1)	**0.01**	0	**0.009**	0.006	**71**	0.01	**0.01**			287	**100**	7	**2**				
Copper																				
Fluoride	(08/24/1988-06/21/1996)	**113**	(0.005-3.3)	**0.97**	0.24	**1.05**	0.52	**49**	1.25	**1.994**	6	**5**								
Lead	(07/21/1986-05/23/1997)	**287**	(0.0005-0.16)	**0.01**	0	**0.009**	0.012	**131**	0.01	**0.0135**	1	**0.3**	1	**0**	188	**66**	13	**5**		
Mercury																				
Nitrate	(08/12/1988-07/02/1997)	**115**	(0.5-239.)	**6.9**	2.6	**11.7**	24.6	**211**	10.35	**21.5**										
pH	(07/21/1986-09/21/2010)	**203**	(6.7-8.8)	**7.84**	0.2	**7.83**	0.34	**4**	8.015	**8.3**										
Radium (pCi/l)	(07/21/1986-06/28/1989)	**11**	(0.3-1.2)	**0.4**	0.1	**0.5**	0.3	**56**	0.6	**0.9**										
Selenium	(07/21/1986-05/23/1997)	**287**	(0.0005-0.046)	**0.003**	0.001	**0.0044**	0.0046	**103**	0.005	**0.012**			1	**0**	209	**73**				
Silver	(07/21/1986-05/23/1997)	**286**	(0.0005-0.03)	**0.005**	0	**0.0053**	0.0023	**43**	0.005	**0.01**			4	**1**						
Sulfate	(07/21/1986-05/23/1997)	**286**	(40.-4050.)	**558**	262	**729**	554	**76**	880	**1715**	59	**21**								
TDS - 180°C	(07/21/1986-05/23/1997)	**288**	(260.-7000.)	**1005**	400	**1301**	894	**69**	1573	**3053**	16									
Zinc	(07/21/1986-05/23/1997)	**287**	(0.005-1.01)	**0.08**	0.045	**0.081**	0.082	**102**	0.125	**0.125**			184	**64**	184	**64**				
TSS	(07/21/1986-05/23/1997)	**284**	(2.5-108000.)	**1610**	1410	**5945**	12565	**211**	4950	**26195**										
Conductivity (umho/cm)	(07/21/1986-05/23/1997)	**288**	(105.-7600.)	**1400**	500	**1696**	1031	**61**	2100	**3636.5**										
Iron (total)	(12/29/1992-05/23/1997)	**152**	(0.1-412.)	**3.75**	3.575	**29.83**	65.58	**220**	29.08	**142.35**										
Manganese	(07/21/1986-05/23/1997)	**286**	(0.0025-2.85)	**0.1**	0	**0.119**	0.242	**203**	0.1	**0.29**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Baseline (CD-1A)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(09/05/2000-09/25/2008)	**45**	(0.036-0.5)	**0.05**	0	**0.112**	0.125	**112**	0.1	**0.45**					12	**27**				
Arsenic	(09/14/1996-07/02/1997)	**2**	(0.0025-0.0025)	**0.0025**	0	**0.0025**	0	**0**	0.003	**0.0025**										
Barium	(09/14/1996-07/02/1997)	**2**	(0.02-0.03)	**0.025**	0.005	**0.03**	0.01	**28**	0.028	**0.0295**										
Boron	(09/14/1996-09/21/2010)	**91**	(0.025-1.1)	**0.25**	0.2	**0.338**	0.256	**76**	0.595	**0.71**										
Cadmium	(09/14/1996-07/02/1997)	**2**	(0.0005-0.0005)	**0.0005**	0	**0.001**	0	**0**	0.001	**0.001**					2	**100**				
Chloride	(09/14/1996-09/21/2010)	**92**	(3.-159.)	**40.5**	32.5	**52.78**	39.38	**75**	82.25	**117.7**										
Chromium	(09/14/1996-07/02/1997)	**2**	(0.005-0.005)	**0.005**	0	**0.005**	0	**0**	0.005	**0.005**			2	**100**						
Copper																				
Fluoride	(05/06/2002-09/21/2010)	**40**	(0.1-3.5)	**2**	1	**1.81**	1.12	**62**	2.9	**3.5**	19	**48**								
Lead	(09/14/1996-07/02/1997)	**2**	(0.0025-0.0025)	**0.0025**	0	**0.003**	0	**0**	0.003	**0.0025**										
Mercury																				
Nitrate	(09/14/1996-07/02/1997)	**2**	(0.5-7.9)	**4.2**	3.7	**4.2**	5.2	**125**	6.05	**7.53**										
pH	(07/02/1997-09/21/2010)	**54**	(6.9-8.7)	**8.21**	0.155	**8.16**	0.33	**4**	8.368	**8.4635**										
Radium (pCi/l)																				
Selenium	(09/14/1996-09/21/2010)	**59**	(0.0005-0.1)	**0.0025**	0.002	**0.0084**	0.0146	**174**	0.009	**0.025**	1	**1.7**	2	**3**	54	**92**				
Silver	(09/14/1996-07/02/1997)	**2**	(0.005-0.09)	**0.0475**	0.0425	**0.0475**	0.0601	**127**	0.069	**0.08575**			1	**50**						
Sulfate	(09/14/1996-09/21/2010)	**92**	(46.-1060.)	**563**	179.5	**502**	246	**49**	700.5	**818.35**	2	**2**								
TDS - 180°C	(09/14/1996-09/21/2010)	**83**	(150.-2240.)	**1130**	520	**1103**	577	**52**	1635	**1900**										
Zinc	(09/14/1996-07/02/1997)	**2**	(0.025-0.03)	**0.0275**	0.0025	**0.028**	0.004	**13**	0.029	**0.02975**										
TSS	(09/14/1996-09/21/2010)	**91**	(1.-3490.)	**20.3**	17.8	**160**	452	**282**	92.5	**1040**										
Conductivity (umho/cm)	(09/14/1996-09/21/2010)	**92**	(260.-3060.)	**1620**	690	**1607**	787	**49**	2333	**2693.5**										
Iron (total)	(09/14/1996-09/21/2010)	**91**	(0.05-69.)	**0.38**	0.29	**2.98**	9.25	**311**	1.32	**14.75**										
Manganese	(09/14/1996-09/21/2010)	**91**	(0.0025-0.461)	**0.02**	0.015	**0.036**	0.061	**171**	0.037	**0.103**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Composite Chinde Downstream (CD-2 & CD-2A)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria											
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption		Baseline Median + 2MAD	
											n	%	n	%	n	%	n	%	n	%	n	%
Aluminum	(09/05/2000-03/26/2008)	**24**	(0.05-0.5)	**0.065**	0.015	**0.148**	0.151	**102**	0.175	**0.5**					11	**46**					12	**50**
Arsenic	(05/13/1986-05/23/1997)	**168**	(0.0005-0.012)	**0.0008**	0.0003	**0.0015**	0.0014	**89**	0.003	**0.0025**											84	**50**
Barium	(05/13/1986-05/23/1997)	**168**	(0.04-1.)	**0.5**	0.25	**0.36**	0.20	**57**	0.5	**0.5**											6	4
Boron	(05/13/1986-03/24/2010)	**219**	(0.005-5.4)	**0.15**	0.07	**0.222**	0.399	**180**	0.245	**0.513**	1	**0.5**									32	15
Cadmium	(05/13/1986-05/23/1997)	**168**	(0.0005-0.005)	**0.0025**	0.0015	**0.0018**	0.0011	**61**	0.003	**0.0025**											7	4
Chloride	(05/13/1986-03/24/2010)	**221**	(5.-6150.)	**56**	33	**184**	670	**364**	120	550	10	**5**									86	**39**
Chromium	(05/13/1986-05/23/1997)	**168**	(0.001-0.025)	**0.01**	0	**0.009**	0.004	**44**	0.01	**0.01**			168	**100**	5	**3**					5	3
Copper																						
Fluoride	(05/06/2002-03/24/2010)	**16**	(0.3-1.7)	**1.2**	0.2	**1.2**	0.4	**29**	1.5	**1.7**												
Lead	(05/13/1986-05/23/1997)	**168**	(0.0005-0.09)	**0.01**	0.0015	**0.0084**	0.0100	**120**	0.01	**0.0107**							7	**4**			9	5
Mercury																						
Nitrate	(08/12/1988-05/23/1997)	**166**	(0.5-340.)	**9.5**	3.8	**15.2**	31.3	**205**	14.2	**31.4**											58	**35**
pH	(04/05/1996-05/23/1997)	**44**	(7.2-8.4)	**8.2**	0.1	**8.1**	0.3	**4**	8.3	**8.4**											4	9
Radium (pCi/l)	(05/13/1986-08/27/1992)	**14**	(0.2-9.9999)	**0.4**	0.1	**1.0786**	2.5700	**238**	0.5	**3.8900**											1	7
Selenium	(05/13/1986-03/24/2010)	**220**	(0.0005-0.1)	**0.0025**	0.0015	**0.0048**	0.0087	**179**	0.005	**0.0125**	1	**0.5**	3	**1**	153	**70**					52	24
Silver	(05/13/1986-05/23/1997)	**168**	(0.0005-0.05)	**0.005**	0	**0.0053**	0.0040	**75**	0.005	**0.01**											10	6
Sulfate	(05/13/1986-03/24/2010)	**219**	(49.-5580.)	**580**	280	**743**	678	**91**	900	**1761**	51	**23**									47	21
TDS - 180°C	(05/13/1986-03/24/2010)	**213**	(250.-18300.)	**1080**	470	**1561**	2022	**130**	1660	**3612**	13	**6**									46	22
Zinc	(05/13/1986-05/23/1997)	**168**	(0.005-0.64)	**0.05**	0.045	**0.080**	0.079	**99**	0.125	**0.128**											4	2
TSS	(05/13/1986-03/24/2010)	**206**	(2.5-335000.)	**726**	717.5	**8306.7**	30325.8	**365**	4418	**35125**											66	**32**
Conductivity (umho/cm)	(05/13/1986-03/24/2010)	**221**	(17.-25300.)	**1550**	650	**2212**	2858	**129**	2310	**4950**											48	22
Iron (total)	(12/29/1992-03/24/2010)	**157**	(0.05-325.)	**1.4**	1.25	**21.40**	54.07	**253**	9.54	**123.4**											51	**32**
Manganese	(05/13/1986-03/24/2010)	**220**	(0.002-3.75)	**0.1**	0.0685	**0.139**	0.356	**256**	0.1	**0.904**											21	10

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Downstream (CD-2)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria											
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption		Baseline Median + 2MAD	
											n	%	n	%	n	%	n	%	n	%	n	%
Aluminum																						
Arsenic	(05/13/1986-05/23/1997)	**168**	(0.0005-0.012)	**0.0008**	0.0003	**0.0015**	0.0014	**89**	0.003	**0.0025**											84	**50**
Barium	(05/13/1986-05/23/1997)	**168**	(0.04-1.)	**0.5**	0.25	**0.36**	0.20	**57**	0.5	**0.5**											6	4
Boron	(05/13/1986-05/23/1997)	**167**	(0.005-5.4)	**0.12**	0.06	**0.213**	0.451	**212**	0.2	**0.561**	1	**0.6**									21	13
Cadmium	(05/13/1986-05/23/1997)	**168**	(0.0005-0.005)	**0.0025**	0.0015	**0.0018**	0.0011	**61**	0.003	**0.0025**											7	4
Chloride	(05/13/1986-05/23/1997)	**168**	(5.-6150.)	**50**	27.5	**217**	765	**353**	122.3	651.55	10	**6**									59	**35**
Chromium	(05/13/1986-05/23/1997)	**168**	(0.001-0.025)	**0.01**	0	**0.009**	0.004	**44**	0.01	**0.01**			168	**100**	5	**3**					5	3
Copper																						
Fluoride																						
Lead	(05/13/1986-05/23/1997)	**168**	(0.0005-0.09)	**0.01**	0.0015	**0.0084**	0.0100	**120**	0.01	**0.0107**								**4**			9	5
Mercury																						
Nitrate	(05/13/1986-05/23/1997)	**166**	(0.5-340.)	**9.5**	3.8	**15.2**	31.3	**205**	14.2	**31.4**											58	**35**
pH	(04/05/1996-05/23/1997)	**23**	(7.2-8.4)	**7.9**	0.2	**7.9**	0.3	**4**	8.25	**8.4**											2	9
Radium (pCi/l)	(05/13/1986-08/27/1992)	**14**	(0.2-9.9999)	**0.4**	0.1	**1.0786**	2.5700	**238**	0.5	**3.8900**											1	7
Selenium	(05/13/1986-05/23/1997)	**168**	(0.0005-0.019)	**0.0025**	0.0005	**0.0034**	0.0030	**87**	0.004	**0.009**						**108**	64				32	19
Silver	(05/13/1986-05/23/1997)	**168**	(0.0005-0.05)	**0.005**	0	**0.0053**	0.0040	**75**	0.005	**0.01**											10	6
Sulfate	(05/13/1986-05/23/1997)	**166**	(49.-5580.)	**495**	226.5	**697**	732	**105**	837.5	**1794**	30	**18**									27	16
TDS - 180°C	(05/13/1986-05/23/1997)	**168**	(367.-18300.)	**1005**	395	**1536**	2235	**146**	1593	**3884.8**	12	**7**									28	17
Zinc	(05/13/1986-05/23/1997)	**168**	(0.005-0.64)	**0.05**	0.045	**0.080**	0.079	**99**	0.125	**0.128**											4	2
TSS	(05/13/1986-05/23/1997)	**166**	(5.-335000.)	**1705**	1605	**10290.2**	33499.3	**326**	6570	**37400**											66	**40**
Conductivity (umho/cm)	(05/13/1986-05/23/1997)	**168**	(17.-25300.)	**1410**	540	**2207**	3232	**146**	2123	**5677**											28	17
Iron (total)	(12/29/1992-05/23/1997)	**105**	(0.1-325.)	**3**	2.85	**31.26**	63.93	**205**	30.1	**155**											45	**43**
Manganese	(05/13/1986-05/23/1997)	**168**	(0.002-3.75)	**0.1**	0	**0.174**	0.399	**230**	0.1	**1.086**											19	11

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Downstream (CD-2A)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria											
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption		Baseline Median + 2MAD	
											n	%	n	%	n	%	n	%	n	%	n	%
Aluminum	(09/05/2000-03/26/2008)	**24**	(0.05-0.5)	**0.065**	0.015	**0.148**	0.151	**102**	0.175	**0.5**					11	**46**					12	**50**
Arsenic																						
Barium																						
Boron	(08/06/1997-03/24/2010)	**52**	(0.05-0.76)	**0.215**	0.085	**0.253**	0.136	**54**	0.3	**0.468**											11	**21**
Cadmium																						
Chloride	(08/06/1997-03/24/2010)	**53**	(5.-174.)	**75**	46	**80**	50	**63**	120	162.2											27	**51**
Chromium																						
Copper																						
Fluoride	(05/06/2002-03/24/2010)	16	(0.3-1.7)	**1.2**	0.2	**1.2**	0.4	**29**	1.5	**1.7**												
Lead																						
Mercury																						
Nitrate																						
pH	(08/06/1997-03/24/2010)	**21**	(7.8-8.39)	**8.27**	0.1	**8.2**	0.1	**2**	8.32	**8.4**											2	10
Radium (pCi/l)																						
Selenium	(08/06/1997-03/24/2010)	**52**	(0.0005-0.1)	**0.005**	0.0025	**0.0095**	0.0163	**172**	0.009	**0.03625**	1	**1.9**	3	**6**	45	**87**					20	**38**
Silver																						
Sulfate	(08/06/1997-03/24/2010)	**53**	(87.-1970.)	**820**	390	**887**	450	**51**	1260	**1550**	21	**40**									20	**38**
TDS - 180°C	(08/06/1997-03/24/2010)	**45**	(250.-3870.)	**1520**	810	**1656**	858	**52**	2360	**2816**	1	**2**									18	**40**
Zinc																						
TSS	(08/06/1997-03/24/2010)	**40**	(2.5-840.)	**21**	14.15	**74.9**	150.5	**201**	59.5	**286.9**												
Conductivity (umho/cm)	(08/06/1997-03/24/2010)	**53**	(390.-5010.)	**2230**	880	**2228**	1007	**45**	3100	**3648**											20	**38**
Iron (total)	(08/06/1997-03/24/2010)	**52**	(0.05-10.4)	**0.425**	0.315	**1.49**	2.21	**148**	1.715	**6.0105**											6	**12**
Manganese	(08/06/1997-03/24/2010)	**52**	(0.0025-0.503)	**0.005**	0.0025	**0.028**	0.073	**261**	0.025	**0.089**											2	4

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Composite Cottonwood Baseline (CN-1, CNS-1, CS-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum																				
Arsenic	(07/18/1990-09/01/1997)	**222**	(0.0005-0.347)	**0.002**	0.001	**0.0036**	0.023	**639**	0.003	**0.005**	1	**0**	1	**0**	1	**0**	1	**0**	1	**0**
Barium	(07/18/1990-09/01/1997)	**227**	(0.005-4.9)	**0.5**	0.2	**0.52**	0.54	**105**	0.5	**1.221**										
Boron	(07/18/1990-09/02/1999)	**282**	(0.005-1.1)	**0.11**	0.06	**0.162**	0.175	**108**	0.19	**0.5**										
Cadmium	(07/18/1990-09/01/1997)	**226**	(0.0005-0.009)	**0.0025**	0	**0.002**	0.0011	**57**	0.003	**0.003**			4	**2**	226	**100**			1	**0**
Chloride	(07/18/1990-09/02/1999)	**284**	(0.52-197.)	**13**	5	**16.89**	16.50	**98**	19	**41**										
Chromium	(07/18/1990-09/01/1997)	**226**	(0.005-0.17)	**0.01**	0	**0.010**	0.0126	**132**	0.01	**0.0175**			226	**100**	12	**5**			1	**0**
Copper																				
Fluoride																				
Lead	(07/18/1990-09/01/1997)	**226**	(0.0025-1.13)	**0.01**	0	**0.024**	0.091	**384**	0.01	**0.06075**	6	**2.7**	3	**1**	177	**78**	45	**20**		
Mercury																				
Nitrate	(07/18/1990-09/01/1997)	**219**	(0.5-180.)	**7.5**	3.4	**15.6**	25.7	**165**	14.45	**47.53**										
pH	(06/22/1996-11/12/1997)	**41**	(5.3-9.)	**8.4**	0.2	**8.13**	0.72	**9**	8.5	**8.8**	2	**5**								
Radium (pCi/l)																				
Selenium	(07/18/1990-09/02/1999)	**282**	(0.0005-0.032)	**0.0025**	0.0005	**0.0029**	0.0030	**105**	0.003	**0.006**					180	**64**				
Silver	(07/18/1990-09/01/1997)	**226**	(0.005-0.03)	**0.005**	0	**0.0052**	0.0018	**35**	0.005	**0.005**			2	**1**						
Sulfate	(07/18/1990-09/02/1999)	**283**	(50.-1760.)	**285**	105	**353**	249	**70**	430	**840**	8	**3**								
TDS - 180°C	(07/18/1990-09/02/1999)	**287**	(290.-15600.)	**692**	203	**1041**	1488	**143**	952.5	**2167**	12	**4**								
Zinc	(07/18/1990-09/01/1997)	**226**	(0.005-1.82)	**0.125**	0.025	**0.173**	0.275	**159**	0.125	**0.735**			173	**77**	173	**77**				
TSS	(07/18/1990-09/02/1999)	**279**	(920.-1120000.)	**73600**	32500	**113627**	142466	**125**	1E+05	**372030**										
Conductivity (umho/cm)	(07/18/1990-09/02/1999)	**292**	(250.-11809.)	**853**	247	**1013**	831	**82**	1190	**1918**										
Iron (total)	(12/29/1992-09/02/1999)	**203**	(0.01-4350.)	**203**	196.9	**494.07**	737.66	**149**	638.5	**2030**										
Manganese	(07/18/1990-09/02/1999)	**281**	(0.0025-4.23)	**0.1**	0.08	**0.373**	0.724	**194**	0.265	**1.83**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Baseline (CN-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum																				
Arsenic	(07/18/1990-09/01/1997)	**64**	(0.0005-0.347)	**0.0015**	0.001	**0.0072**	0.043	**597**	0.003	**0.0057**	1	**2**	1	**2**	1	**2**	1	**2**	1	**2**
Barium	(07/18/1990-09/01/1997)	**67**	(0.005-2.4)	**0.5**	0	**0.44**	0.38	**87**	0.5	**1.05**										
Boron	(07/18/1990-09/02/1999)	**92**	(0.005-0.78)	**0.08**	0.03	**0.128**	0.139	**108**	0.16	**0.4115**										
Cadmium	(07/18/1990-09/01/1997)	**66**	(0.0005-0.008)	**0.0025**	0	**0.002**	0.0011	**59**	0.003	**0.003**			1	**2**	66	**100**				
Chloride	(07/18/1990-09/02/1999)	**94**	(3.-77.)	**16**	6	**19.62**	14.94	**76**	22.75	**48.7**										
Chromium	(07/18/1990-09/01/1997)	**66**	(0.005-0.09)	**0.01**	0.0025	**0.009**	0.0107	**113**	0.01	**0.0175**			66	**100**	4	**6**				
Copper																				
Fluoride																				
Lead	(07/18/1990-09/01/1997)	**66**	(0.0025-1.13)	**0.01**	0	**0.028**	0.138	**492**	0.01	**0.0335**	1	**1.5**	1	**2**	51	**77**	10	**15**		
Mercury																				
Nitrate	(07/18/1990-09/01/1997)	**63**	(0.5-116.)	**7**	3.5	**11.5**	15.9	**138**	13.15	**29.36**										
pH	(06/27/1996-11/12/1997)	**10**	(5.3-8.6)	**7.95**	0.45	**7.77**	0.96	**12**	8.4	**8.51**	1	**10**								
Radium (pCi/l)																				
Selenium	(07/18/1990-09/02/1999)	**92**	(0.0005-0.032)	**0.0025**	0.0005	**0.0035**	0.0048	**135**	0.003	**0.007**					57	**62**				
Silver	(07/18/1990-09/01/1997)	**66**	(0.005-0.005)	**0.005**	0	**0.0050**	0.0000	**0**	0.005	**0.005**										
Sulfate	(07/18/1990-09/02/1999)	**94**	(50.-1760.)	**385.5**	168	**451**	303	**67**	567.5	**1009**	5	**5**								
TDS - 180°C	(07/18/1990-09/02/1999)	**94**	(290.-6220.)	**780**	250	**972**	712	**73**	1195	**1895**	1	**1**								
Zinc	(07/18/1990-09/01/1997)	**66**	(0.005-1.7)	**0.125**	0.0025	**0.154**	0.318	**206**	0.125	**0.2075**			46	**70**	46	**70**				
TSS	(07/18/1990-09/02/1999)	**92**	(14400.-	**87500**	37600	**131005**	127328	**97**	1E+05	**378690**										
Conductivity (umho/cm)	(07/18/1990-09/02/1999)	**96**	(390.-3350.)	**1035**	320	**1151**	567	**49**	1413	**2177.5**										
Iron (total)	(08/14/1993-09/02/1999)	**62**	(0.01-4350.)	**174**	172.1	**631.36**	876.58	**139**	1087	**2082.5**										
Manganese	(07/18/1990-09/02/1999)	**90**	(0.0025-2.9)	**0.1**	0.064	**0.258**	0.546	**211**	0.1	**1.629**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Baseline (CNS-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum																				
Arsenic	(07/18/1990-05/22/1997)	**81**	(0.0005-0.024)	**0.002**	0.0005	**0.0023**	0.003	**146**	0.003	**0.005**										
Barium	(07/18/1990-05/22/1997)	**82**	(0.04-2.)	**0.5**	0.055	**0.50**	0.35	**70**	0.5	**1.195**										
Boron	(07/18/1990-08/03/1999)	**100**	(0.005-1.02)	**0.13**	0.08	**0.168**	0.172	**103**	0.223	**0.5315**										
Cadmium	(07/18/1990-05/22/1997)	**82**	(0.0005-0.005)	**0.0025**	0	**0.002**	0.0010	**53**	0.003	**0.003**			2	**2**	82	**100**				
Chloride	(07/18/1990-08/03/1999)	**99**	(0.52-47.)	**13**	3.48	**14.07**	8.85	**63**	15	**30.6**										
Chromium	(07/18/1990-05/22/1997)	**82**	(0.005-0.03)	**0.01**	0	**0.009**	0.0039	**46**	0.01	**0.01**			82	**100**	3	**4**				
Copper																				
Fluoride																				
Lead	(07/18/1990-05/22/1997)	**82**	(0.0025-0.12)	**0.01**	0	**0.015**	0.020	**134**	0.01	**0.05865**	1	**1.2**			60	**73**	17	**21**		
Mercury																				
Nitrate	(07/18/1990-05/22/1997)	**80**	(0.5-155.)	**8**	3.25	**15.6**	25.6	**164**	15.55	**34.72**										
pH	(06/22/1996-11/12/1997)	**16**	(5.9-8.9)	**8.3**	0.3	**8.16**	0.68	**8**	8.525	**8.75**	1	**6**								
Radium (pCi/l)																				
Selenium	(07/18/1990-08/03/1999)	**100**	(0.0005-0.011)	**0.0025**	0.0005	**0.0025**	0.0014	**57**	0.003	**0.00505**					66	**66**				
Silver	(07/18/1990-05/22/1997)	**82**	(0.005-0.03)	**0.005**	0	**0.0054**	0.0028	**52**	0.005	**0.005**			1	**1**						
Sulfate	(07/18/1990-08/03/1999)	**98**	(50.-1050.)	**257.5**	82	**292**	179	**61**	338	**718.3**	2	**2**								
TDS - 180°C	(07/18/1990-08/03/1999)	**103**	(315.-15600.)	**610**	160	**1099**	2049	**187**	880	**2062**	4	**4**								
Zinc	(07/18/1990-05/22/1997)	**82**	(0.005-1.1)	**0.125**	0.045	**0.158**	0.221	**140**	0.125	**0.7355**			60	**73**	60	**73**				
TSS	(07/18/1990-08/02/1999)	**98**	(920.-1120000.)	**65300**	28300	**95335**	134569	**141**	96100	**209900**										
Conductivity (umho/cm)	(07/18/1990-08/03/1999)	**104**	(370.-2300.)	**760**	178.5	**861**	374	**43**	973.5	**1649.5**										
Iron (total)	(12/29/1992-08/03/1999)	**79**	(0.07-3720.)	**203**	189.7	**444.66**	731.51	**165**	526.5	**2073**										
Manganese	(07/18/1990-08/03/1999)	**101**	(0.005-4.02)	**0.1**	0.09	**0.340**	0.600	**176**	0.332	**1.47**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Baseline (CS-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum																				
Arsenic	(07/18/1990-08/05/1997)	**77**	(0.0005-0.014)	**0.002**	0.001	**0.0021**	0.002	**93**	0.003	**0.0052**										
Barium	(07/18/1990-08/05/1997)	**78**	(0.025-4.9)	**0.5**	0.245	**0.61**	0.77	**126**	0.5	**1.5**										
Boron	(07/18/1990-08/05/1999)	**90**	(0.005-1.1)	**0.12**	0.07	**0.189**	0.206	**109**	0.22	**0.5275**										
Cadmium	(07/18/1990-08/05/1997)	**78**	(0.0005-0.009)	**0.0025**	0	**0.002**	0.0012	**59**	0.003	**0.003**			1	**1**	78	**100**			1	**1**
Chloride	(07/18/1990-08/05/1999)	**91**	(4.-197.)	**12.8**	5.2	**17.14**	22.88	**133**	17	**39**										
Chromium	(07/18/1990-08/05/1997)	**78**	(0.005-0.17)	**0.01**	0	**0.011**	0.0186	**176**	0.01	**0.02**			78	**100**	5	**6**			1	**1**
Copper																				
Fluoride																				
Lead	(07/18/1990-08/05/1997)	**78**	(0.0025-0.753)	**0.01**	0	**0.030**	0.088	**298**	0.01	**0.08615**	4	**5.1**	2	**3**	66	**85**	18	**23**		
Mercury																				
Nitrate	(07/18/1990-08/05/1997)	**76**	(0.5-180.)	**7.65**	3.95	**18.9**	31.7	**168**	14.88	**102**										
pH	(06/27/1996-11/12/1997)	**15**	(6.9-9.)	**8.4**	0.2	**8.35**	0.48	**6**	8.6	**8.86**										
Radium (pCi/l)																				
Selenium	(07/18/1990-08/05/1999)	**90**	(0.0005-0.011)	**0.0025**	0.0005	**0.0026**	0.0015	**59**	0.003	**0.005**					57	**63**				
Silver	(07/18/1990-08/05/1997)	**78**	(0.005-0.015)	**0.005**	0	**0.0051**	0.0011	**22**	0.005	**0.005**			1	**1**						
Sulfate	(07/18/1990-08/05/1999)	**91**	(85.-1500.)	**275**	86	**317**	222	**70**	355.5	**828.5**	1	**1**								
TDS - 180°C	(07/18/1990-08/05/1999)	**90**	(305.-9060.)	**675**	207	**1048**	1329	**127**	910	**3558.5**	7	**8**								
Zinc	(07/18/1990-08/05/1997)	**78**	(0.005-1.82)	**0.125**	0.02	**0.204**	0.288	**141**	0.129	**0.7185**			67	**86**	67	**86**				
TSS	(07/18/1990-08/05/1999)	**89**	(2110.-	**59400**	28300	**115804**	163401	**141**	1E+05	**366900**										
Conductivity (umho/cm)	(07/18/1990-08/05/1999)	**92**	(250.-11809.)	**817**	213	**1041**	1292	**124**	1030	**1800**										
Iron (total)	(12/29/1992-08/05/1999)	**62**	(1.5-2350.)	**225.5**	211.15	**419.74**	566.88	**135**	557.3	**1813.5**										
Manganese	(07/18/1990-08/05/1999)	**90**	(0.005-4.23)	**0.1**	0.08	**0.524**	0.953	**182**	0.425	**3.139**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Composite Baseline (Pinabete & No Name)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(08/28/2007-08/12/2008)	**29**	(0.005-2.3)	**0.05**	0.045	**0.261**	0.506	**194**	0.25	**1.214**			2	**7**	12	**41**				
Arsenic	(08/28/2007-08/12/2008)	**29**	(0.0009-0.0204)	**0.0027**	0.0016	**0.0052**	0.0048	**92**	0.006	**0.01432**										
Barium	(08/28/2007-08/12/2008)	**29**	(0.0247-0.2193)	**0.0528**	0.0157	**0.07**	0.04	**63**	0.071	**0.13716**										
Boron	(07/29/1998-08/12/2008)	**44**	(0.025-0.9)	**0.095**	0.045	**0.169**	0.201	**119**	0.2	**0.5**										
Cadmium	(08/28/2007-08/12/2008)	**26**	(0.000025-	**3E-05**	0	**0.003**	0.013	**407**	0.000	**0.008**	1	**4**	2	**8**	6	**23**			2	**8**
Chloride	(07/29/1998-08/12/2008)	**44**	(5.-34.)	**8**	3	**10.05**	7.20	**72**	11	**26.55**										
Chromium	(08/28/2007-08/12/2008)	**28**	(0.0005-0.005)	**0.0005**	0	**0.002**	0.002	**99**	0.003	**0.005**			13	**46**						
Copper	(08/28/2007-08/12/2008)	**29**	(0.0042-0.0261)	**0.0076**	0.0019	**0.00882**	0.004344	**49**	0.01	**0.01522**					2	**7**				
Fluoride	(07/29/1998-08/12/2008)	**41**	(0.1-1.19)	**0.2**	0.1	**0.35**	0.31	**90**	0.6	**0.9**										
Lead	(08/28/2007-08/12/2008)	**29**	(0.00005-	**0.0002**	0.0002	**0.001**	0.002	**241**	5E-04	**0.0036**					1	**3**				
Mercury	(08/28/2007-12/03/2007)	**7**	(0.0001-0.0001)	**0.0001**	0	**0.0001**	1.46E-20	**0**	1E-04	**0.0001**					7	**100**				
Nitrate	(08/28/2007-08/12/2008)	**28**	(0.01-3.4)	**0.405**	0.355	**0.9**	1.0	**116**	1.67	**2.94**										
pH	(07/29/1998-08/12/2008)	**46**	(7.-8.56)	**8.005**	0.2	**7.90**	0.35	**4**	8.16	**8.3875**										
Radium (pCi/l)																				
Selenium	(07/29/1998-08/12/2008)	**43**	(0.0005-0.007)	**0.0025**	0.0005	**0.0023**	0.0016	**71**	0.003	**0.005**					24	**56**				
Silver	(08/28/2007-08/12/2008)	**26**	(0.000025-	**3E-05**	0	**0.0001**	0.0003	**193**	2E-04	**0.00025**										
Sulfate	(07/29/1998-08/12/2008)	**44**	(5.-840.)	**175**	152	**252**	229	**91**	365	**731.6**										
TDS - 180°C	(07/29/1998-08/12/2008)	**46**	(100.-28400.)	**550**	272.5	**1599**	4531	**283**	1006	**4327.5**	3	**7**								
Zinc	(08/28/2007-08/12/2008)	**29**	(0.001-14.2)	**0.004**	0.002	**0.501**	2.635	**526**	0.01	**0.108**			2	**7**	2	**7**			1	**3**
TSS	(07/29/1998-08/12/2008)	**44**	(367.-521000.)	**49750**	40000	**93912**	119354	**127**	1E+05	**380650**										
Conductivity (umho/cm)	(07/29/1998-08/12/2008)	**47**	(150.-1940.)	**666**	329	**777**	460	**59**	1020	**1607**										
Iron (total)	(07/29/1998-08/12/2008)	**42**	(1.26-6020.)	**272**	265.49	**592.99**	1004.03	**169**	826.8	**1547**										
Manganese	(07/29/1998-08/12/2008)	**42**	(0.0025-3.76)	**0.0145**	0.012	**0.277**	0.669	**241**	0.227	**0.89335**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Baseline (Upper Pinabete)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(10/08/2007-08/12/2008)	**5**	(0.05-0.42)	**0.25**	0.17	**0.210**	0.160	**76**	0.28	**0.392**					3	**60**				
Arsenic	(10/08/2007-08/12/2008)	**5**	(0.0009-0.0204)	**0.0084**	0.0066	**0.0094**	0.0083	**89**	0.015	**0.01932**										
Barium	(10/08/2007-08/12/2008)	**5**	(0.0313-0.112)	**0.0433**	0.012	**0.06**	0.03	**56**	0.069	**0.1033**										
Boron	(07/29/1998-08/12/2008)	**9**	(0.05-0.9)	**0.09**	0.02	**0.196**	0.275	**140**	0.1	**0.66**										
Cadmium	(12/03/2007-08/12/2008)	**4**	(0.000025-	**3E-05**	0	**0.000**	0.000	**107**	0.000	**0.000**										
Chloride	(07/29/1998-08/12/2008)	**9**	(5.-32.)	**10**	1	**13.44**	8.66	**64**	11	**28.8**										
Chromium	(12/03/2007-08/12/2008)	**4**	(0.0005-0.002)	**0.0005**	0	**0.001**	0.001	**86**	9E-04	**0.001775**			1	**25**						
Copper	(10/08/2007-08/12/2008)	**5**	(0.008-0.0261)	**0.0096**	0.0016	**0.01284**	0.007522	**59**	0.012	**0.02318**					1	**20**				
Fluoride	(07/29/1998-08/12/2008)	**8**	(0.1-1.19)	**0.44**	0.34	**0.55**	0.49	**90**	0.948	**1.155**										
Lead	(10/08/2007-08/12/2008)	**5**	(0.00005-	**0.0001**	5E-05	**0.000**	0.000	**105**	2E-04	**0.00044**										
Mercury	(12/03/2007-12/03/2007)	**1**	(0.0001-0.0001)	**0.0001**	0	**0.0001**			1E-04	**0.0001**					1	**100**				
Nitrate	(10/08/2007-08/12/2008)	**4**	(0.06-2.48)	**1.195**	0.795	**1.2**	1.1	**86**	1.858	**2.3555**										
pH	(07/29/1998-08/12/2008)	**9**	(7.48-8.24)	**7.99**	0.21	**7.89**	0.30	**4**	8.11	**8.224**										
Radium (pCi/l)																				
Selenium	(07/29/1998-08/12/2008)	**9**	(0.001-0.005)	**0.0025**	0.0005	**0.0026**	0.0011	**42**	0.003	**0.0042**					6	**67**				
Silver	(12/03/2007-08/12/2008)	**4**	(0.000025-	**3E-05**	0	**0.0000**	0.0000	**86**	4E-05	**8.875E-05**										
Sulfate	(07/29/1998-08/12/2008)	**9**	(180.-840.)	**390**	191	**500**	240	**48**	740	**816**										
TDS - 180°C	(07/29/1998-08/12/2008)	**9**	(610.-5300.)	**1060**	225	**1425**	1479	**104**	1270	**3688**	1	**11**								
Zinc	(10/08/2007-08/12/2008)	**5**	(0.001-0.004)	**0.002**	0.001	**0.002**	0.001	**61**	0.002	**0.0036**										
TSS	(07/29/1998-08/12/2008)	**8**	(26600.-	**124500**	56900	**179213**	161955	**90**	2E+05	**445400**										
Conductivity (umho/cm)	(07/29/1998-08/12/2008)	**9**	(584.-1810.)	**1460**	350	**1250**	417	**33**	1520	**1742**										
Iron (total)	(07/29/1998-08/12/2008)	**8**	(5.96-1220.)	**428.5**	396.02	**568.75**	527.53	**93**	1143	**1195.5**										
Manganese	(07/29/1998-08/12/2008)	**8**	(0.0025-0.453)	**0.005**	0.0025	**0.104**	0.187	**180**	0.095	**0.4194**										

Appendix D: Surface Water Quality Data Summary Tables

(all Values are dissolved (mg/L) unless otherwise indicated)

Baseline (Lower Pinabete)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(09/18/2007-07/21/2008)	**11**	(0.005-2.3)	**0.05**	0.045	**0.305**	0.667	**219**	0.21	**1.28**			1	**9**	5	**45**				
Arsenic	(09/18/2007-07/21/2008)	**11**	(0.0013-0.0133)	**0.0025**	0.0012	**0.0056**	0.0043	**77**	0.01	**0.0117**										
Barium	(09/18/2007-07/21/2008)	**11**	(0.0247-0.2193)	**0.0528**	0.0182	**0.07**	0.06	**78**	0.074	**0.1776**										
Boron	(07/29/1998-07/21/2008)	**17**	(0.025-0.9)	**0.1**	0.05	**0.189**	0.221	**117**	0.2	**0.58**										
Cadmium	(09/18/2007-07/21/2008)	**9**	(0.000025-	**3E-05**	0	**0.008**	0.023	**281**	0.000	**0.042**	1	**11**	1	**11**					1	**11**
Chloride	(07/29/1998-07/21/2008)	**17**	(5.-34.)	**8**	3	**11.18**	8.11	**73**	13	**28.4**										
Chromium	(09/18/2007-07/21/2008)	**11**	(0.0005-0.005)	**0.001**	0.0005	**0.002**	0.002	**90**	0.004	**0.005**			7	**64**						
Copper	(09/18/2007-07/21/2008)	**11**	(0.006-0.0171)	**0.009**	0.0019	**0.0094**	0.003149	**33**	0.011	**0.0144**					1	**9**				
Fluoride	(07/29/1998-07/21/2008)	**15**	(0.1-0.75)	**0.1**	0	**0.31**	0.27	**87**	0.525	**0.75**										
Lead	(09/18/2007-07/21/2008)	**11**	(0.00005-0.004)	**0.0005**	0.0004	**0.001**	0.001	**143**	8E-04	**0.0035**										
Mercury	(09/18/2007-12/03/2007)	**4**	(0.0001-0.0001)	**0.0001**	0	**0.0001**	0		1E-04	**0.0001**					4	**100**				
Nitrate	(09/18/2007-07/21/2008)	**11**	(0.04-3.4)	**0.85**	0.54	**1.1**	1.0	**89**	1.76	**2.665**										
pH	(07/29/1998-07/21/2008)	**19**	(7.-8.56)	**8.07**	0.28	**7.95**	0.41	**5**	8.205	**8.416**										
Radium (pCi/l)																				
Selenium	(07/29/1998-07/21/2008)	**17**	(0.0005-0.007)	**0.0025**	0.0005	**0.0026**	0.0019	**73**	0.003	**0.007**					11	**65**				
Silver	(09/18/2007-07/21/2008)	**9**	(0.000025-	**6E-05**	4E-05	**0.0001**	0.0001	**91**	3E-04	**0.00025**										
Sulfate	(07/29/1998-07/21/2008)	**17**	(100.-684.)	**170**	40	**248**	168	**68**	295	**609.6**										
TDS - 180°C	(07/29/1998-07/21/2008)	**19**	(295.-28400.)	**570**	200	**2808**	6878	**245**	1175	**15080**	2	**11**								
Zinc	(09/18/2007-07/21/2008)	**11**	(0.002-0.16)	**0.006**	0.004	**0.021**	0.046	**223**	0.013	**0.088**			1	**9**	1	**9**				
TSS	(07/29/1998-07/21/2008)	**18**	(10200.-	**59900**	30600	**77678**	63856	**82**	95600	**174450**										
Conductivity (umho/cm)	(07/29/1998-08/12/2008)	**20**	(396.-1940.)	**660.5**	103	**773**	376	**49**	798.5	**1550.5**										
Iron (total)	(07/29/1998-07/21/2008)	**16**	(125.-1940.)	**674.5**	435.5	**805.19**	552.74	**69**	1155	**1647.5**										
Manganese	(07/29/1998-07/21/2008)	**16**	(0.0025-3.76)	**0.0635**	0.061	**0.526**	1.023	**194**	0.541	**2.5225**										

Appendix D: Surface Water Quality Data Summary Tables

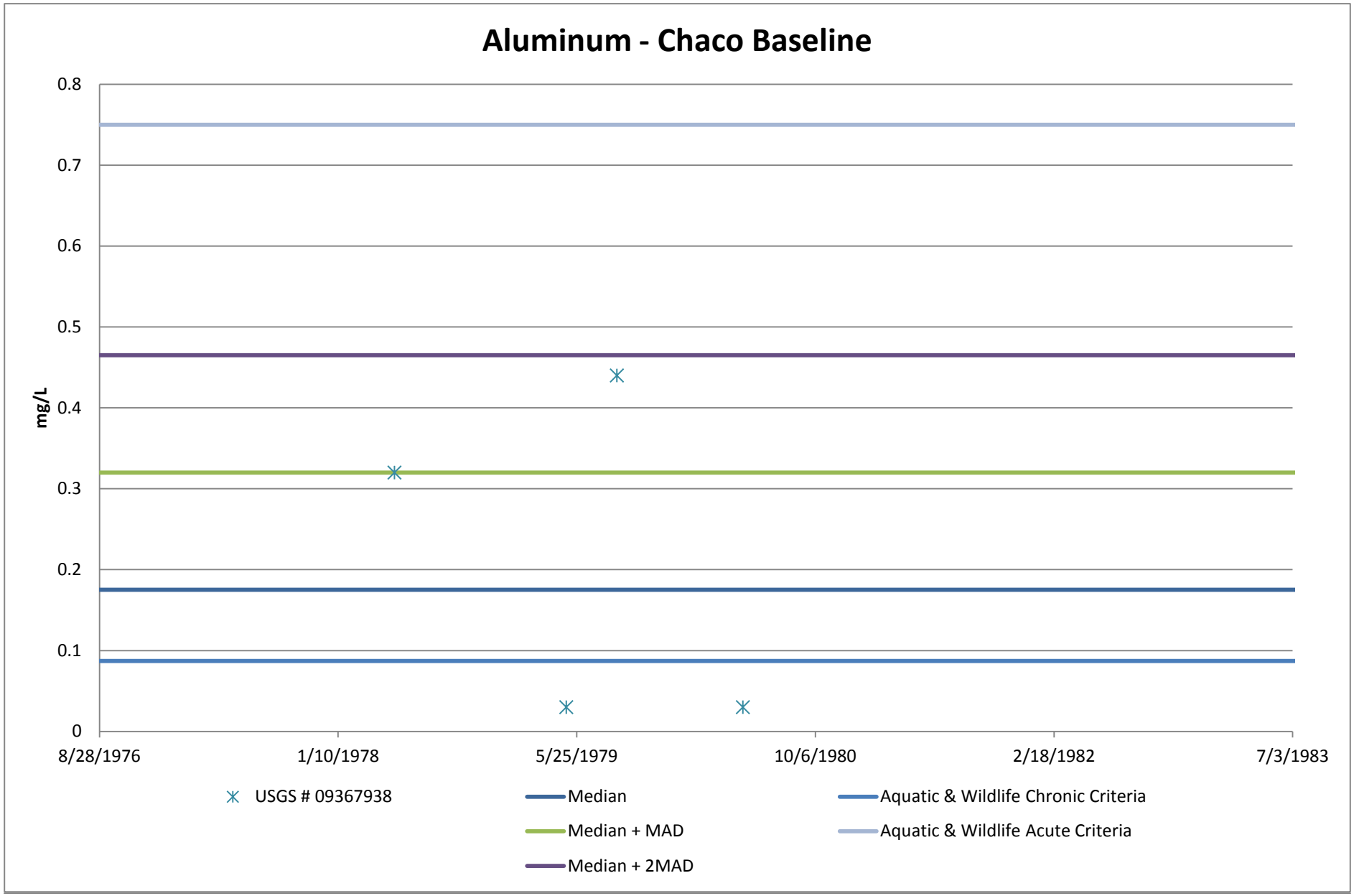
(all Values are dissolved (mg/L) unless otherwise indicated)

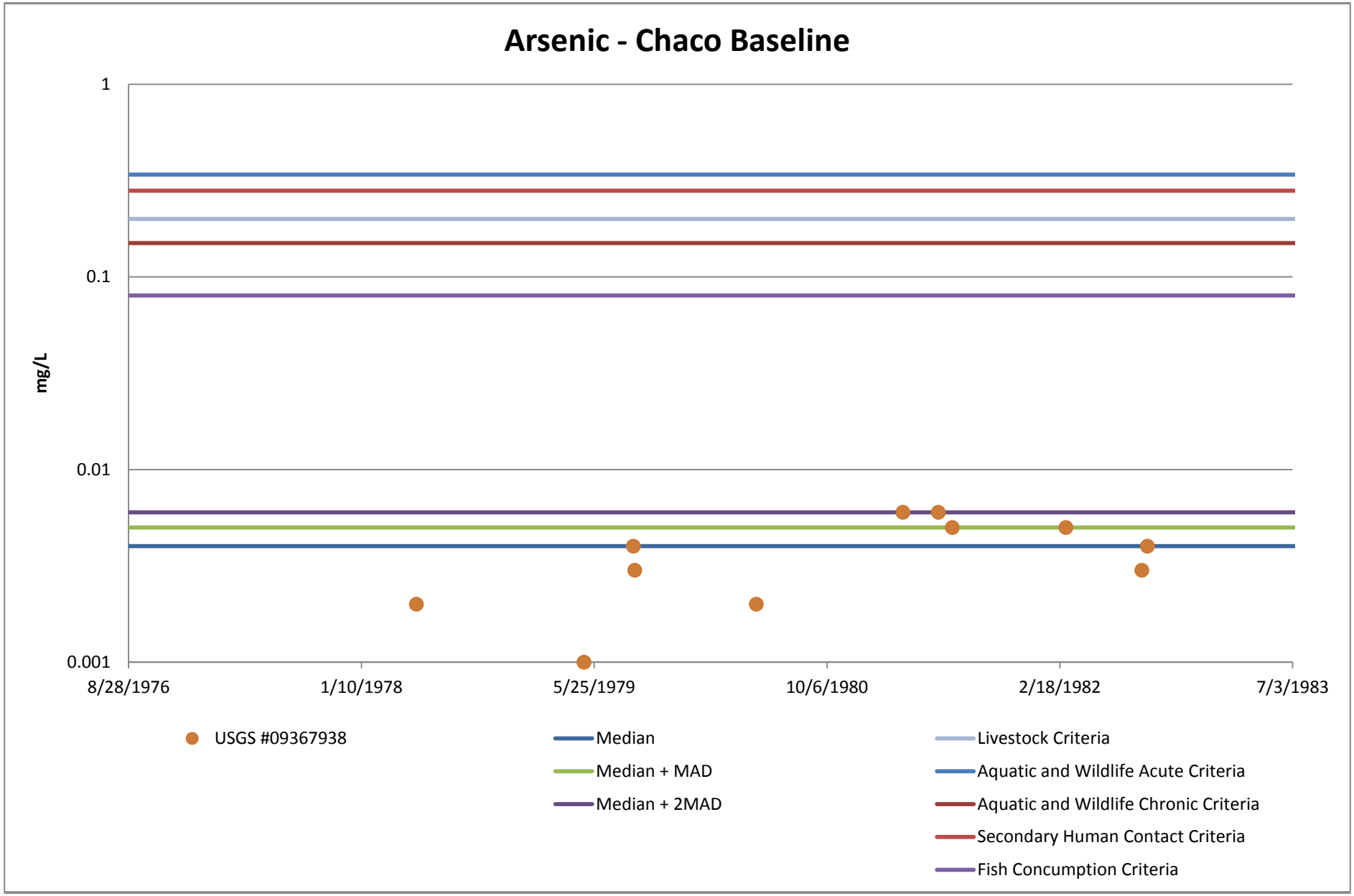
Baseline (Upper No Name)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(02/13/2008-08/12/2008)	**8**	(0.005-1.65)	**0.1**	0.095	**0.374**	0.563	**151**	0.53	**1.2685**			1	**13**	4	**50**				
Arsenic	(02/13/2008-08/12/2008)	**8**	(0.0019-0.0046)	**0.0026**	0.0005	**0.0029**	0.0009	**30**	0.003	**0.00432**										
Barium	(02/13/2008-08/12/2008)	**8**	(0.0287-0.0658)	**0.0515**	0.008	**0.05**	0.01	**25**	0.059	**0.06398**										
Boron	(07/29/1998-08/12/2008)	**10**	(0.025-0.5)	**0.05**	0.0125	**0.150**	0.179	**119**	0.238	**0.455**										
Cadmium	(02/13/2008-08/12/2008)	**8**	(0.000025-	**0.0001**	0.0001	**0.001**	0.003	**228**	0.001	**0.007**			1	**13**	3	**38**			1	**13**
Chloride	(07/29/1998-08/12/2008)	**10**	(5.-19.)	**5**	0	**6.90**	4.38	**64**	6.5	**14.05**										
Chromium	(02/13/2008-08/12/2008)	**8**	(0.0005-0.005)	**0.0025**	0.002	**0.002**	0.002	**78**	0.004	**0.005**			5	**63**						
Copper	(02/13/2008-08/12/2008)	**8**	(0.0042-0.0124)	**0.0069**	0.0025	**0.00713**	0.002925	**41**	0.008	**0.011525**										
Fluoride	(07/29/1998-08/12/2008)	**10**	(0.1-0.3)	**0.23**	0.07	**0.22**	0.09	**41**	0.3	**0.3**										
Lead	(02/13/2008-08/12/2008)	**8**	(0.00005-	**8E-05**	3E-05	**0.000**	0.000	**111**	2E-04	**0.000495**										
Mercury																				
Nitrate	(02/13/2008-08/12/2008)	**8**	(0.01-0.4)	**0.06**	0.04	**0.1**	0.2	**105**	0.278	**0.3755**										
pH	(07/29/1998-08/12/2008)	**10**	(7.83-8.4)	**8.085**	0.075	**8.07**	0.17	**2**	8.15	**8.292**										
Radium (pCi/l)																				
Selenium	(07/29/1998-08/12/2008)	**9**	(0.0005-0.005)	**0.0005**	0	**0.0019**	0.0019	**99**	0.003	**0.005**					4	**44**				
Silver	(02/13/2008-08/12/2008)	**8**	(0.000025-	**5E-05**	2E-05	**0.0001**	0.0001	**98**	2E-04	**0.00025**										
Sulfate	(07/29/1998-08/12/2008)	**10**	(5.-30.)	**5**	0	**10**	8	**85**	13.75	**23.7**										
TDS - 180°C	(07/29/1998-08/12/2008)	**10**	(100.-490.)	**185**	30	**215**	113	**52**	213.8	**413.5**										
Zinc	(02/13/2008-08/12/2008)	**8**	(0.001-0.03)	**0.0045**	0.003	**0.010**	0.013	**125**	0.013	**0.03**										
TSS	(07/29/1998-08/12/2008)	**10**	(367.-19400.)	**7090**	3055	**7571**	6042	**80**	8153	**17825**										
Conductivity (umho/cm)	(07/29/1998-08/12/2008)	**10**	(150.-337.)	**229**	36.5	**241**	55	**23**	282	**315.85**										
Iron (total)	(07/29/1998-08/12/2008)	**10**	(3.24-6020.)	**50.3**	46.215	**645.82**	1888.85	**292**	103	**3366.35**										
Manganese	(07/29/1998-08/12/2008)	**10**	(0.0025-0.24)	**0.024**	0.0203	**0.055**	0.076	**138**	0.078	**0.18375**										

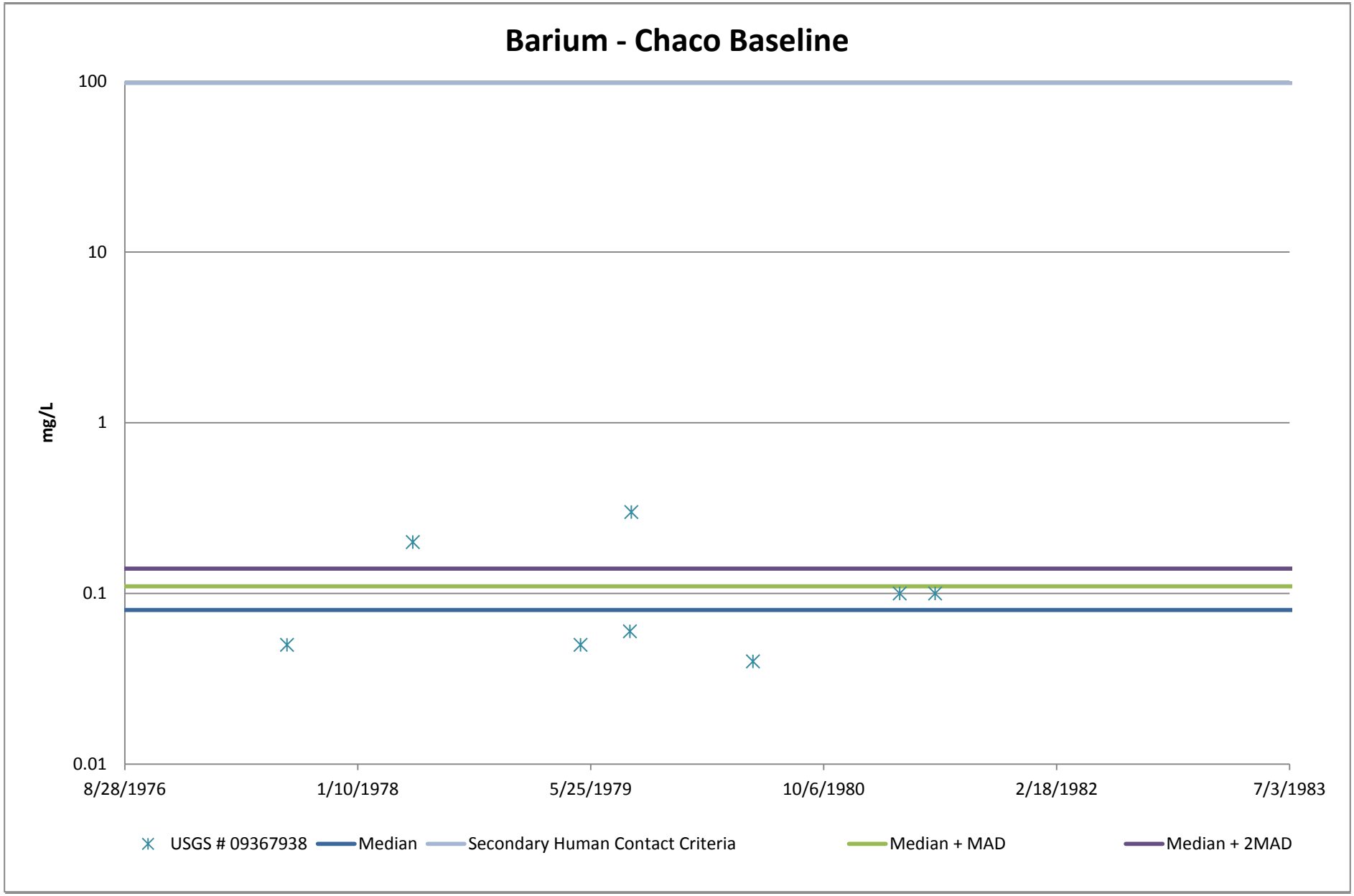
Appendix D: Surface Water Quality Data Summary Tables

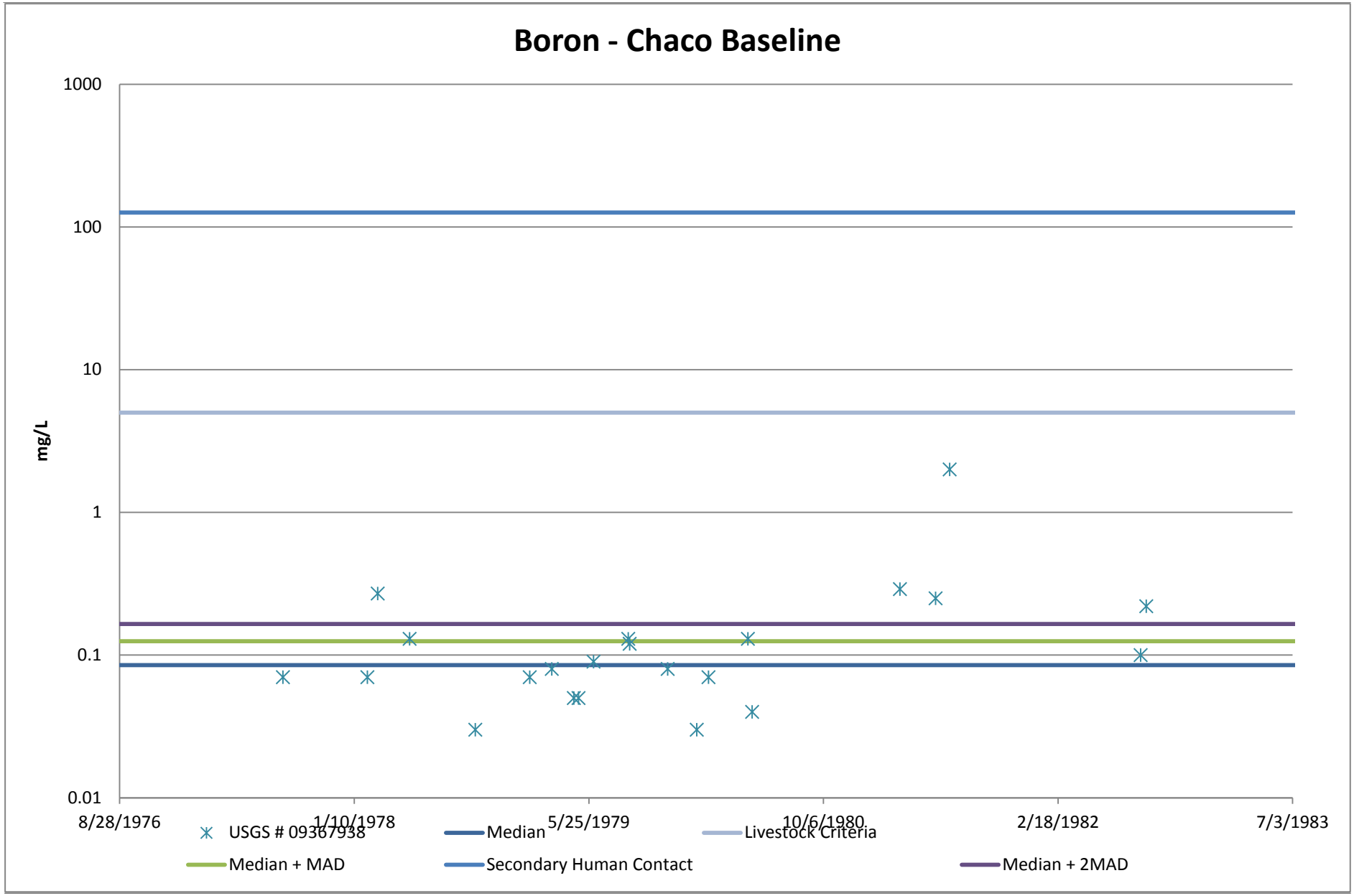
(all Values are dissolved (mg/L) unless otherwise indicated)

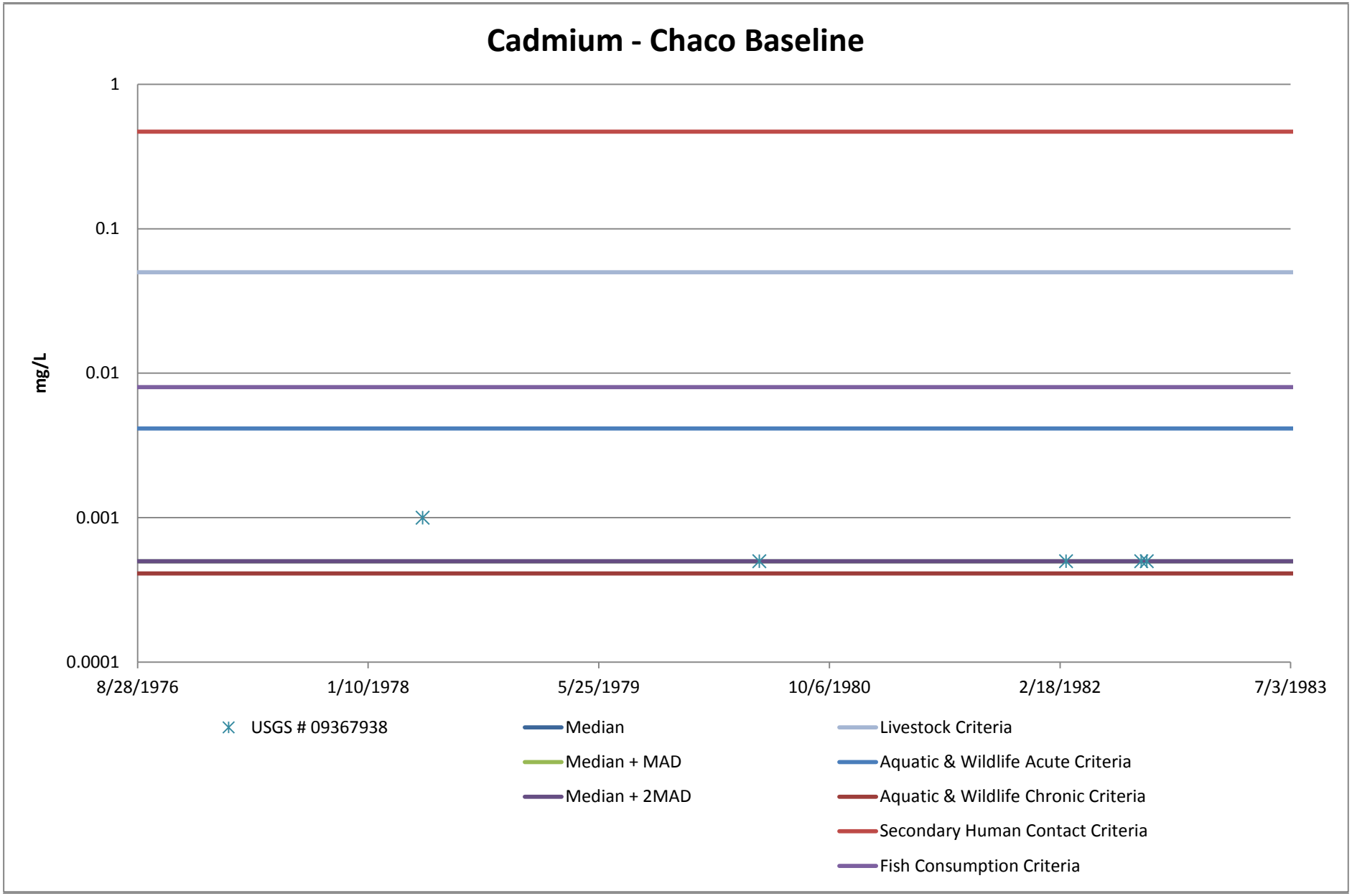
Baseline (Lower No Name)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria									
											Livestock		Aquatic & Wildlife Acute		Aquatic & Wildlife Chronic		Secondary Human Contact		Fish Consumption	
											n	%	n	%	n	%	n	%	n	%
Aluminum	(08/28/2007-08/12/2008)	**5**	(0.005-0.05)	**0.05**	0	**0.032**	0.025	**77**	0.05	**0.05**										
Arsenic	(08/28/2007-08/12/2008)	**5**	(0.0011-0.0058)	**0.0045**	0.0013	**0.0035**	0.0023	**64**	0.005	**0.00566**										
Barium	(08/28/2007-08/12/2008)	**5**	(0.0474-0.138)	**0.111**	0.027	**0.09**	0.04	**45**	0.122	**0.1348**										
Boron	(08/13/1998-08/12/2008)	**8**	(0.05-0.2)	**0.14**	0.06	**0.124**	0.066	**53**	0.17	**0.2**										
Cadmium	(08/28/2007-08/12/2008)	**5**	(0.000025-	**3E-05**	0	**0.000**	0.000	**197**	0.000	**0.001**										
Chloride	(08/13/1998-08/12/2008)	**8**	(5.-17.)	**5**	0	**7.75**	4.40	**57**	9.5	**14.9**										
Chromium	(08/28/2007-08/12/2008)	**5**	(0.0005-0.0005)	**0.0005**	0	**0.001**	0.000		5E-04	**0.0005**										
Copper	(08/28/2007-08/12/2008)	**5**	(0.0056-0.0072)	**0.0063**	0.0006	**0.00622**	0.000638	**10**	0.006	**0.00702**										
Fluoride	(08/13/1998-08/12/2008)	**8**	(0.1-0.89)	**0.35**	0.25	**0.40**	0.31	**76**	0.65	**0.8165**										
Lead	(08/28/2007-08/12/2008)	**5**	(0.00005-	**0.0002**	0.0002	**0.002**	0.004	**209**	2E-04	**0.0074**										
Mercury	(08/28/2007-08/28/2007)	**2**	(0.0001-0.0001)	**0.0001**	0	**0.0001**	0		1E-04	**0.0001**					2	**100**				
Nitrate	(08/28/2007-08/12/2008)	**5**	(0.06-2.94)	**0.41**	0.35	**1.3**	1.5	**118**	2.94	**2.94**										
pH	(08/13/1998-08/12/2008)	**8**	(7.17-8.)	**7.65**	0.29	**7.61**	0.32	**4**	7.903	**7.9685**										
Radium (pCi/l)																				
Selenium	(08/13/1998-08/12/2008)	**8**	(0.001-0.0025)	**0.001**	0	**0.0016**	0.0008	**50**	0.003	**0.0025**					3	**38**				
Silver	(08/28/2007-08/12/2008)	**5**	(0.000025-	**3E-05**	0	**0.0003**	0.0006	**204**	3E-05	**0.001085**										
Sulfate	(08/13/1998-08/12/2008)	**8**	(131.-600.)	**242.5**	106	**284**	162	**57**	380.8	**524.05**										
TDS - 180°C	(08/13/1998-08/12/2008)	**8**	(385.-1030.)	**600**	182.5	**654**	224	**34**	817.5	**963.5**										
Zinc	(08/28/2007-08/12/2008)	**5**	(0.001-14.2)	**0.004**	0.003	**2.844**	6.348	**223**	0.01	**11.362**			1	**20**	20	**1**			1	**20**
TSS	(08/13/1998-08/12/2008)	**8**	(16700.-	**57600**	36200	**153063**	166392	**109**	3E+05	**394650**										
Conductivity (umho/cm)	(08/13/1998-08/12/2008)	**8**	(498.-1330.)	**1010**	220	**926**	286	**31**	1080	**1274**										
Iron (total)	(08/13/1998-08/12/2008)	**8**	(1.26-419.)	**16.7**	13.82	**126.78**	168.31	**133**	266	**373.85**										
Manganese	(08/13/1998-08/12/2008)	**8**	(0.0025-0.786)	**0.12**	0.113	**0.231**	0.296	**128**	0.317	**0.7097**										

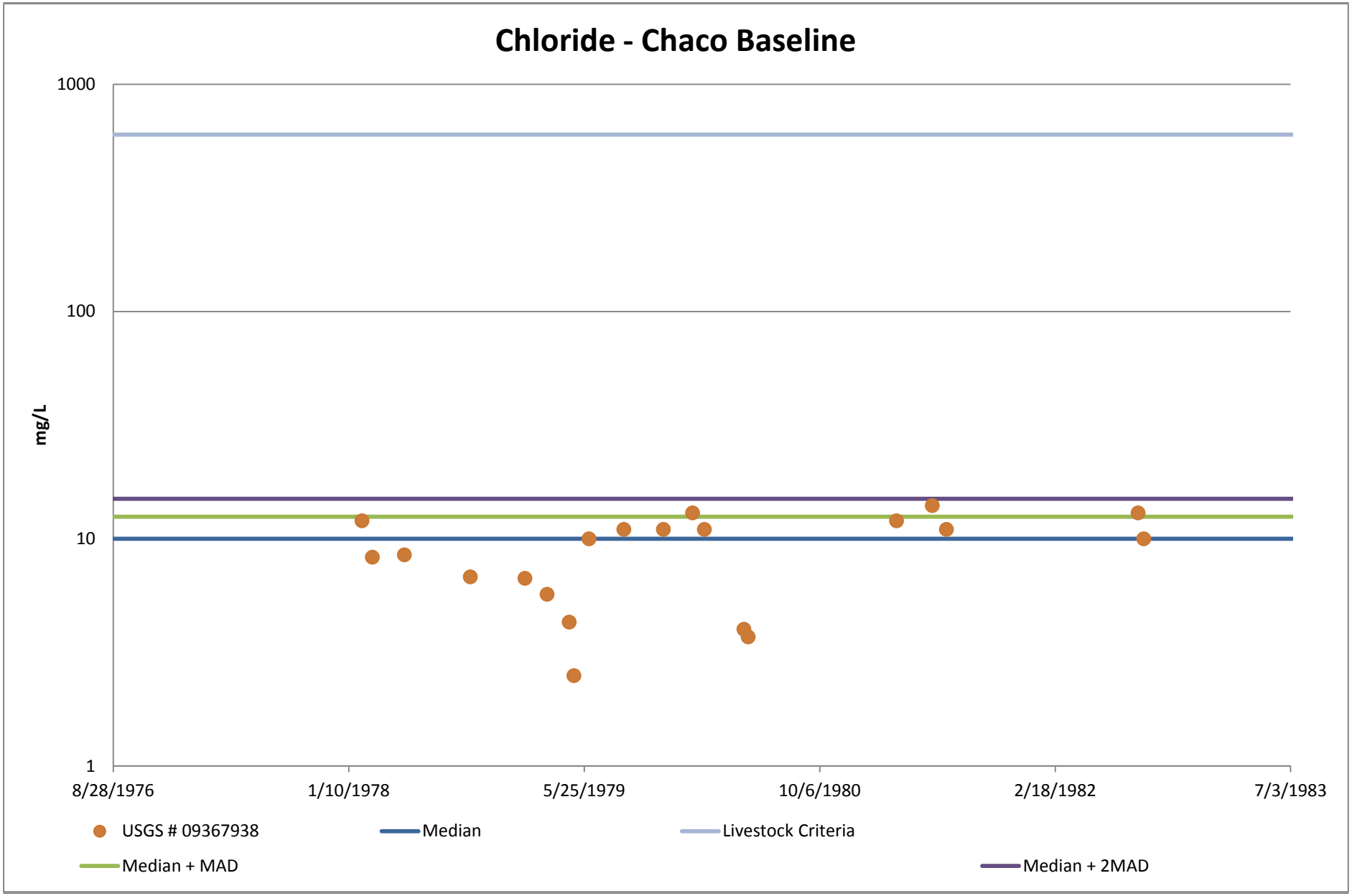

Aluminum - Chaco Baseline
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Aquatic & Wildlife Chronic Criteria
Median + MAD
Aquatic & Wildlife Acute Criteria
Median + 2MAD

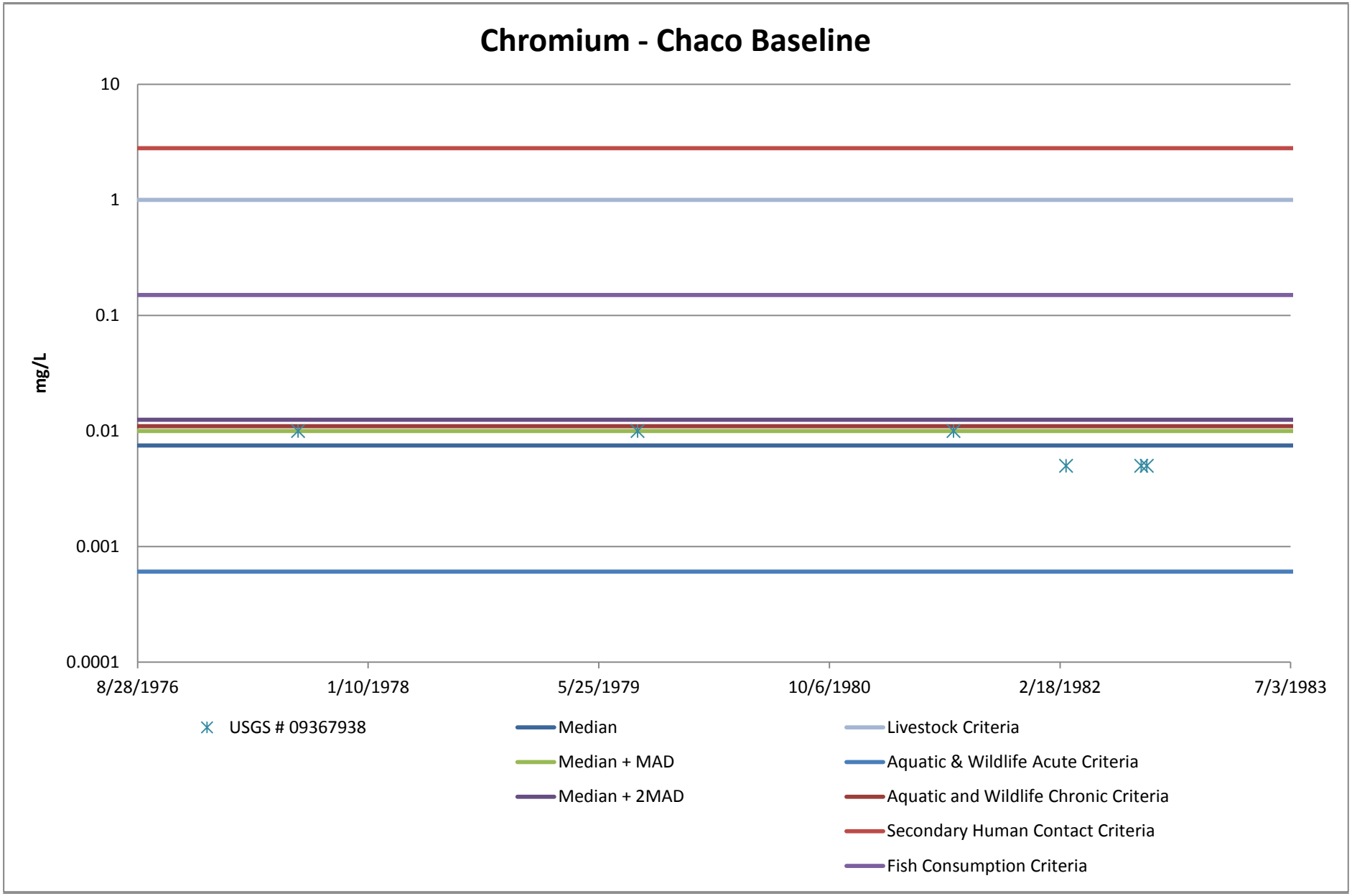

Arsenic - Chaco Baseline
1
0.1
0.01
0.001
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS #09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria

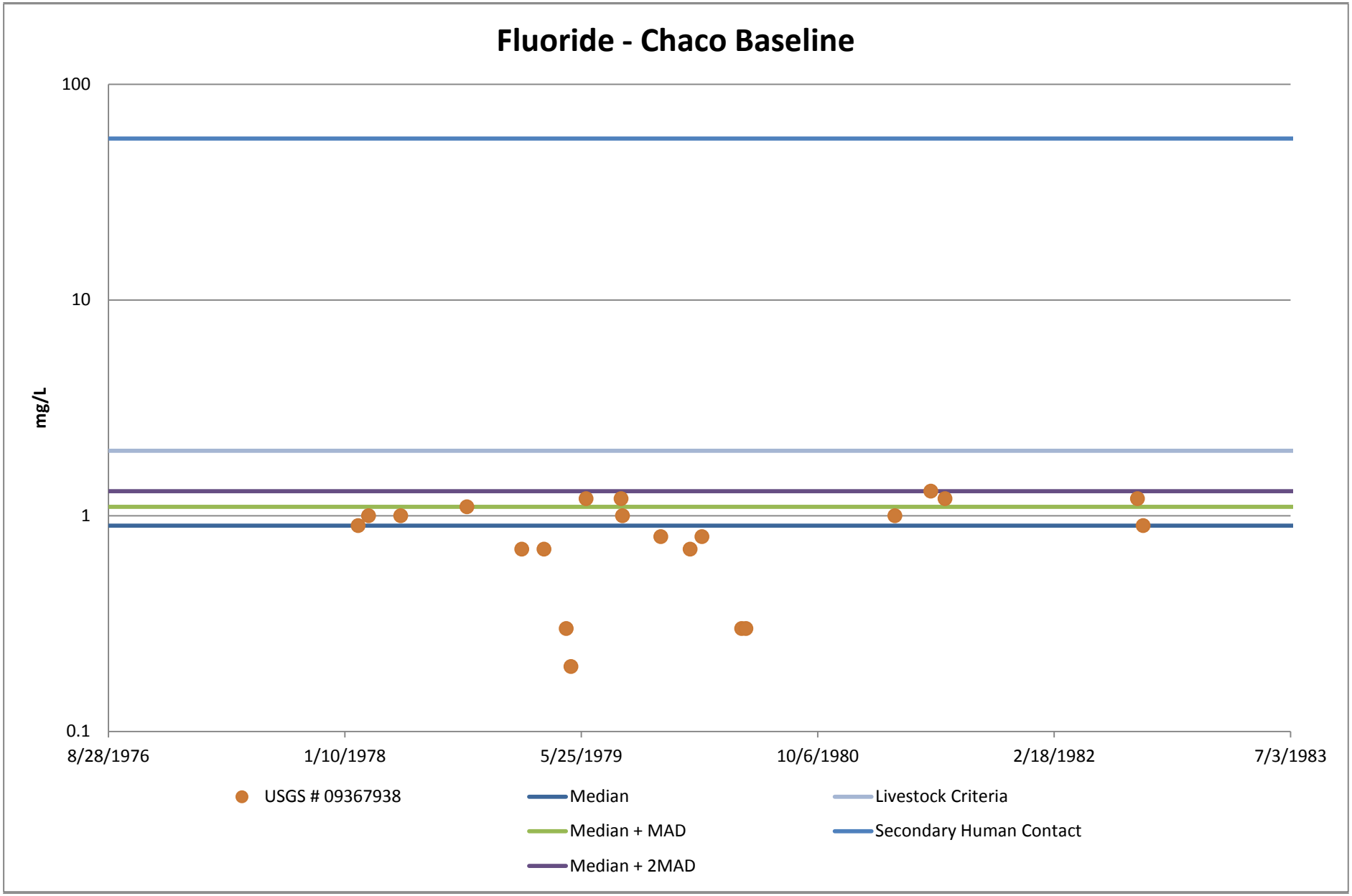

Barium - Chaco Baseline
100
10
1
0.1
0.01
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Secondary Human Contact Criteria
Median + MAD
Median + 2MAD

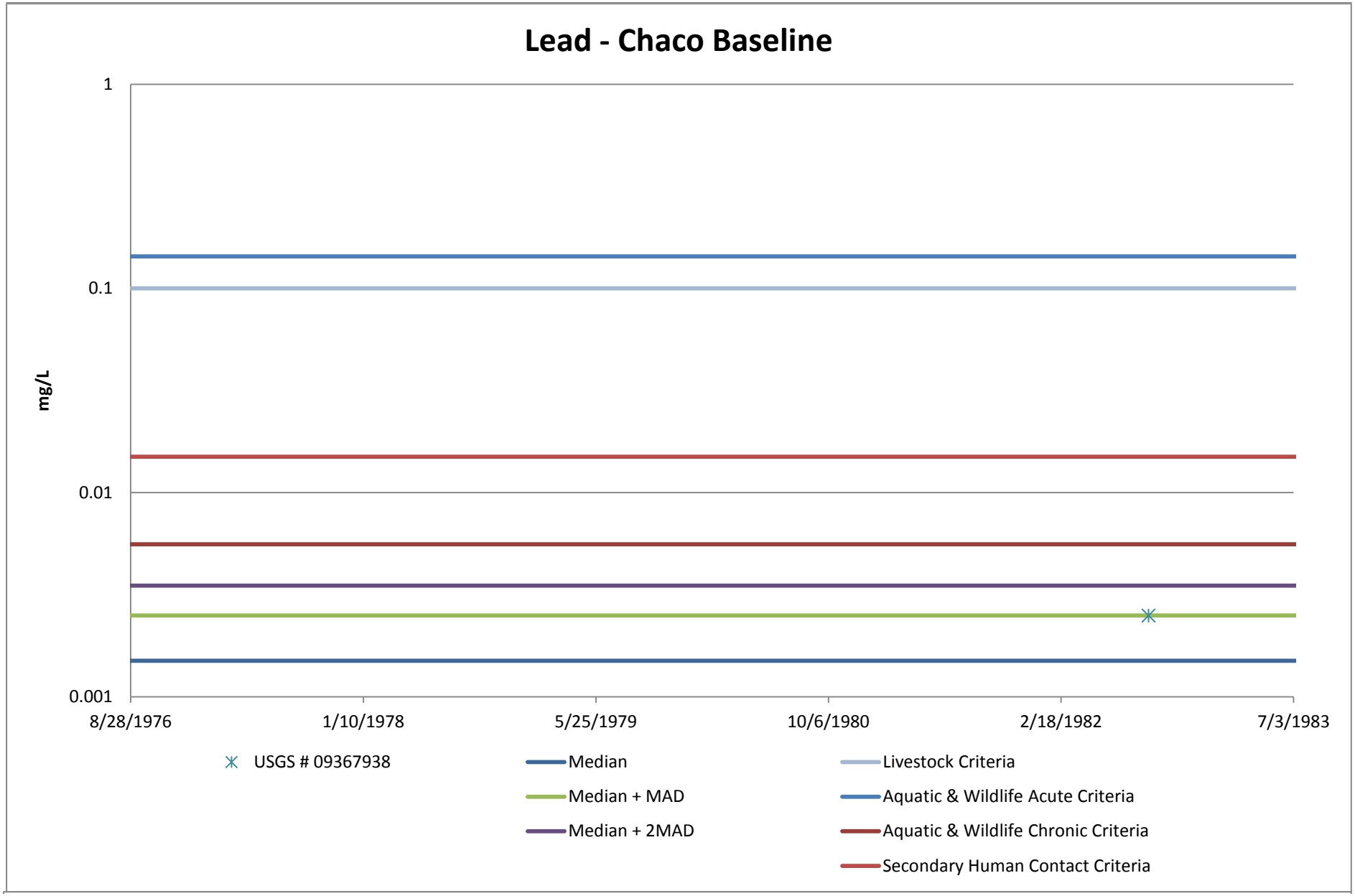

Boron - Chaco Baseline
1000
100
10
1
0.1
0.01
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Secondary Human Contact
Median + 2MAD

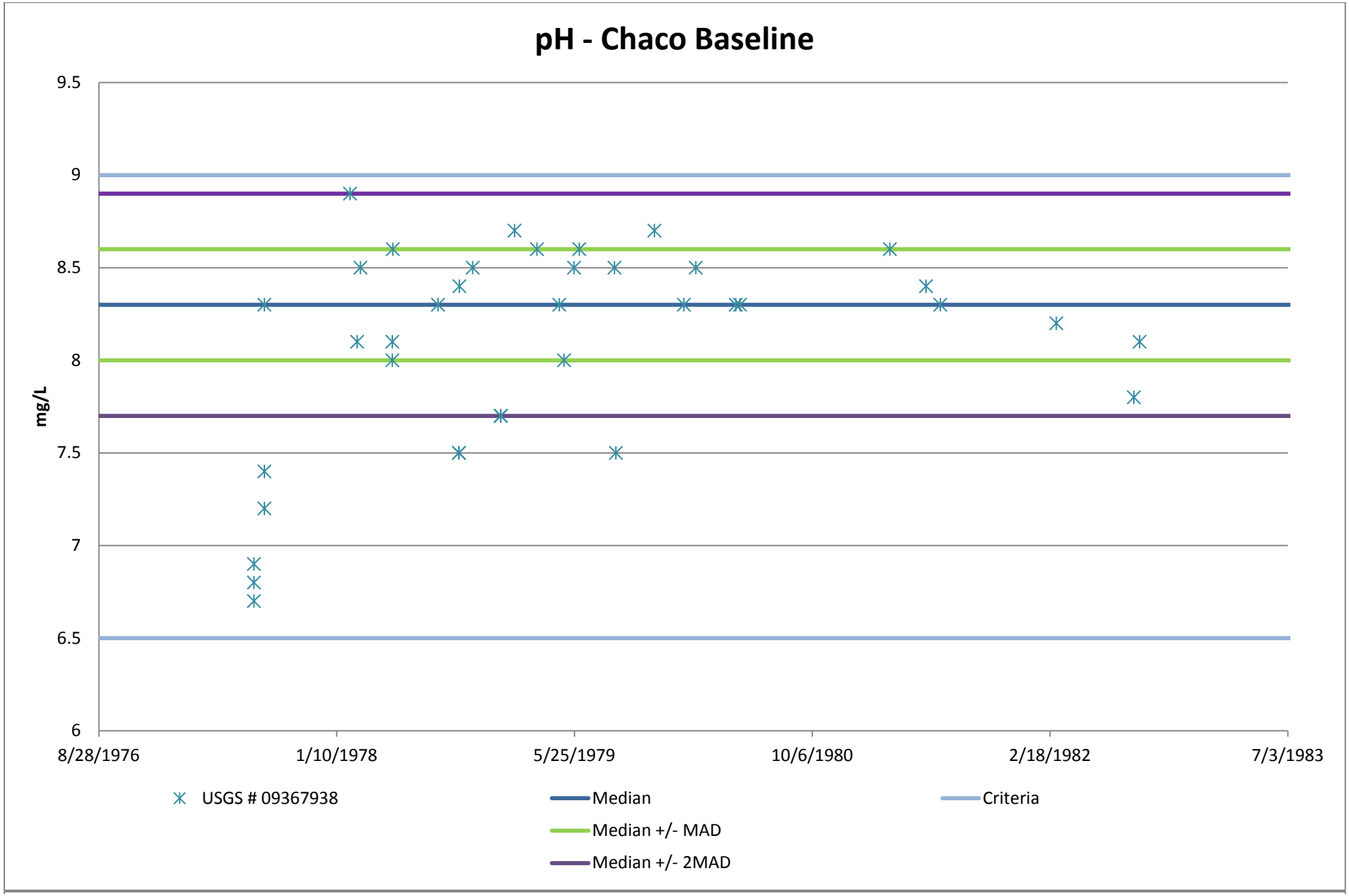

Cadmium - Chaco Baseline
mg/L
1
0.1
0.01
0.001
0.0001
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

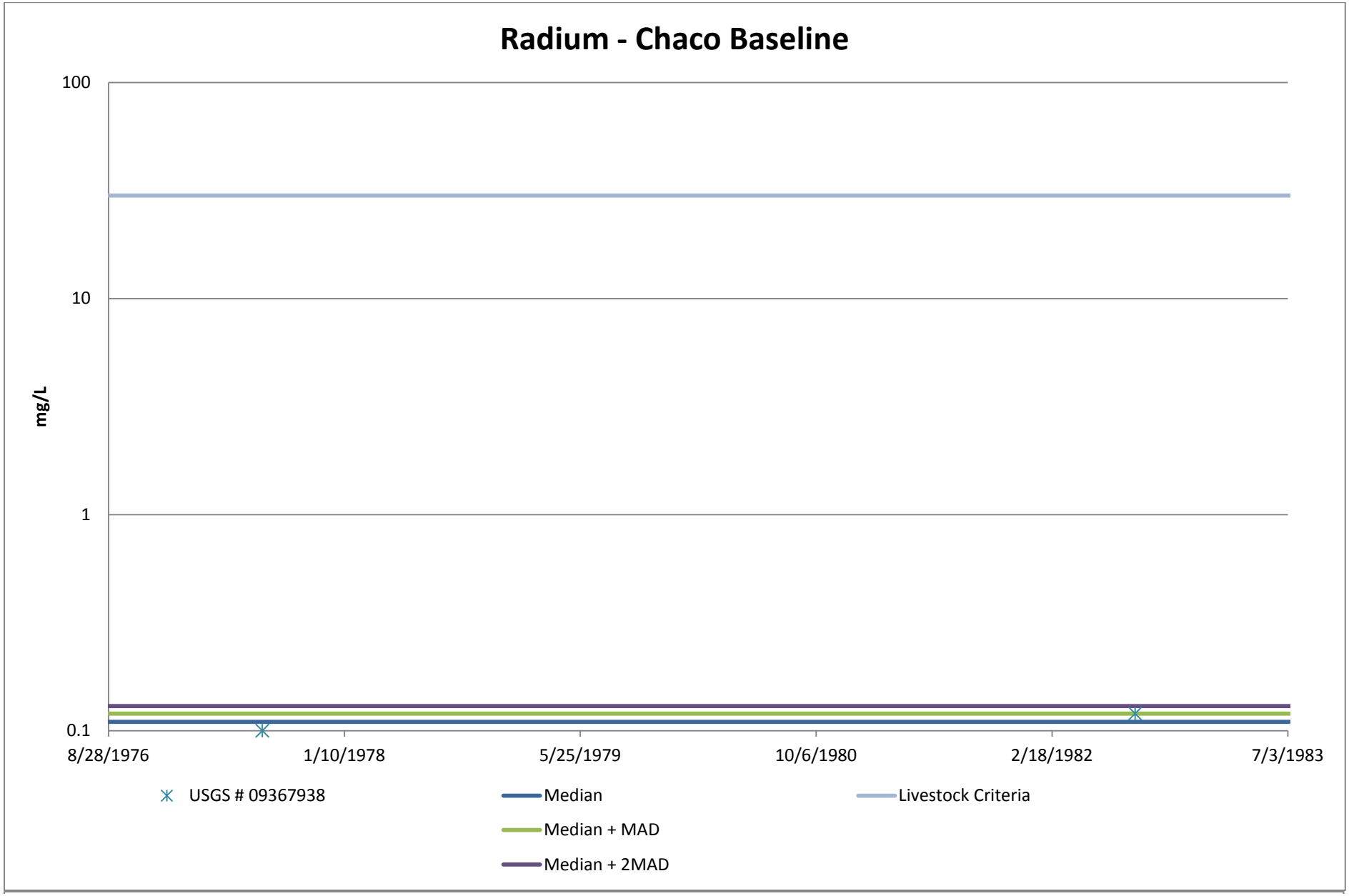

Chloride - Chaco Baseline
1000
100
10
1
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Median + 2MAD

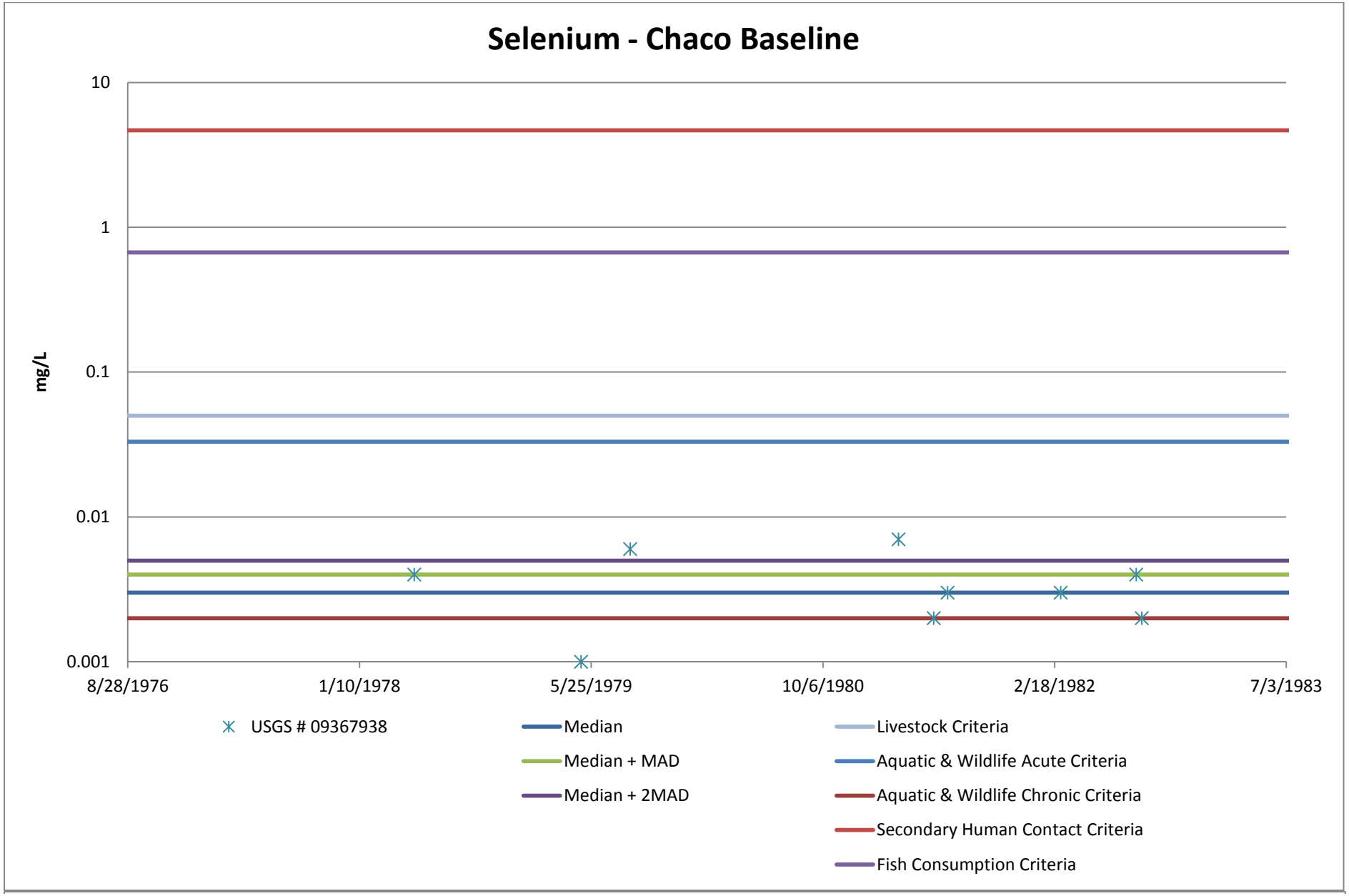

Chromium - Chaco Baseline
10
1
0.1
0.01
0.001
0.0001
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

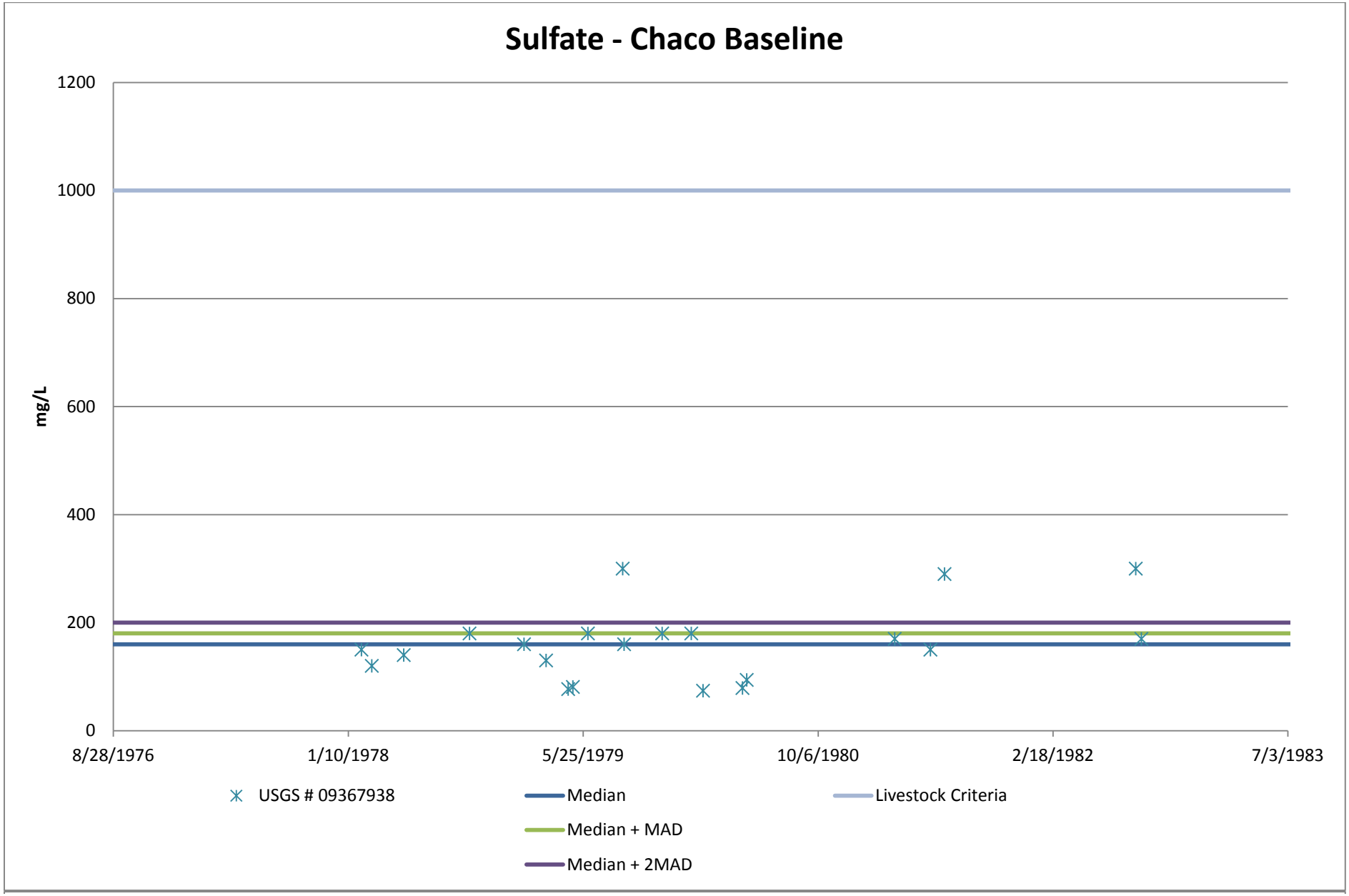

Fluoride - Chaco Baseline
100
10
1
0.1
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Secondary Human Contact
Median + 2MAD

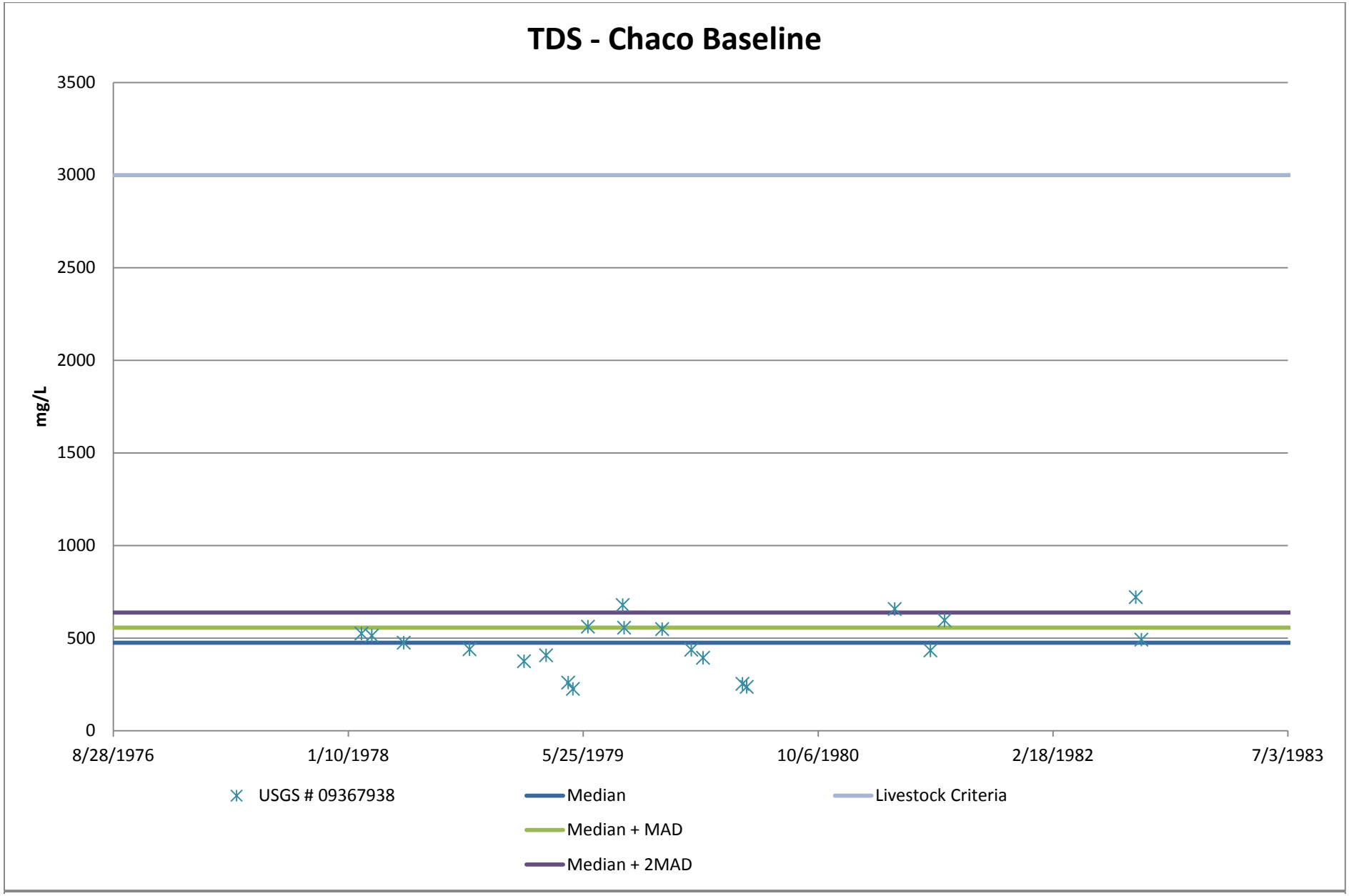

Lead - Chaco Baseline
1
0.1
0.01
0.001
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

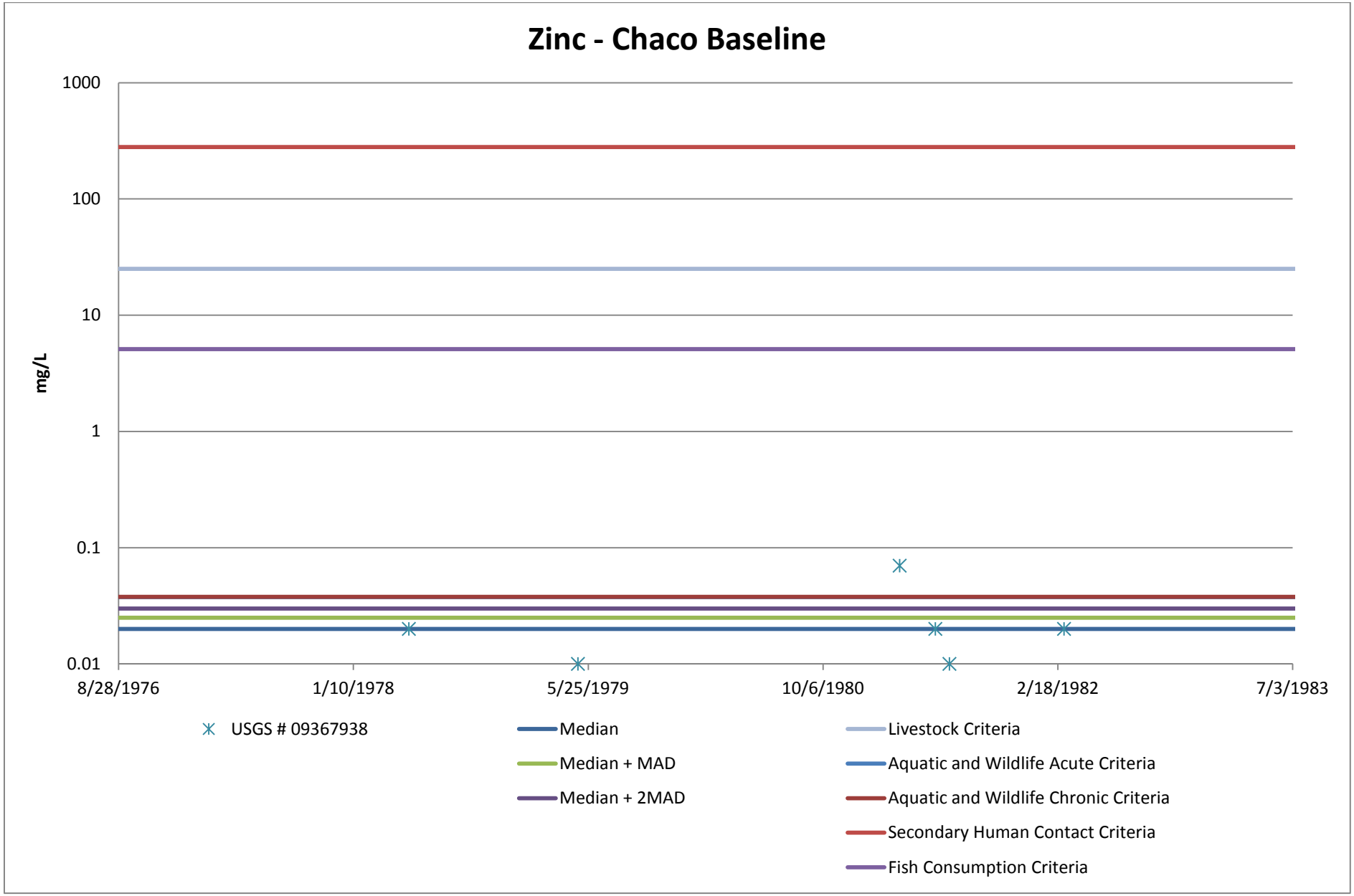

pH - Chaco Baseline
9.5
9
8.5
8
7.5
7
6.5
6
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Criteria
Median +/- MAD
Median +/- 2MAD

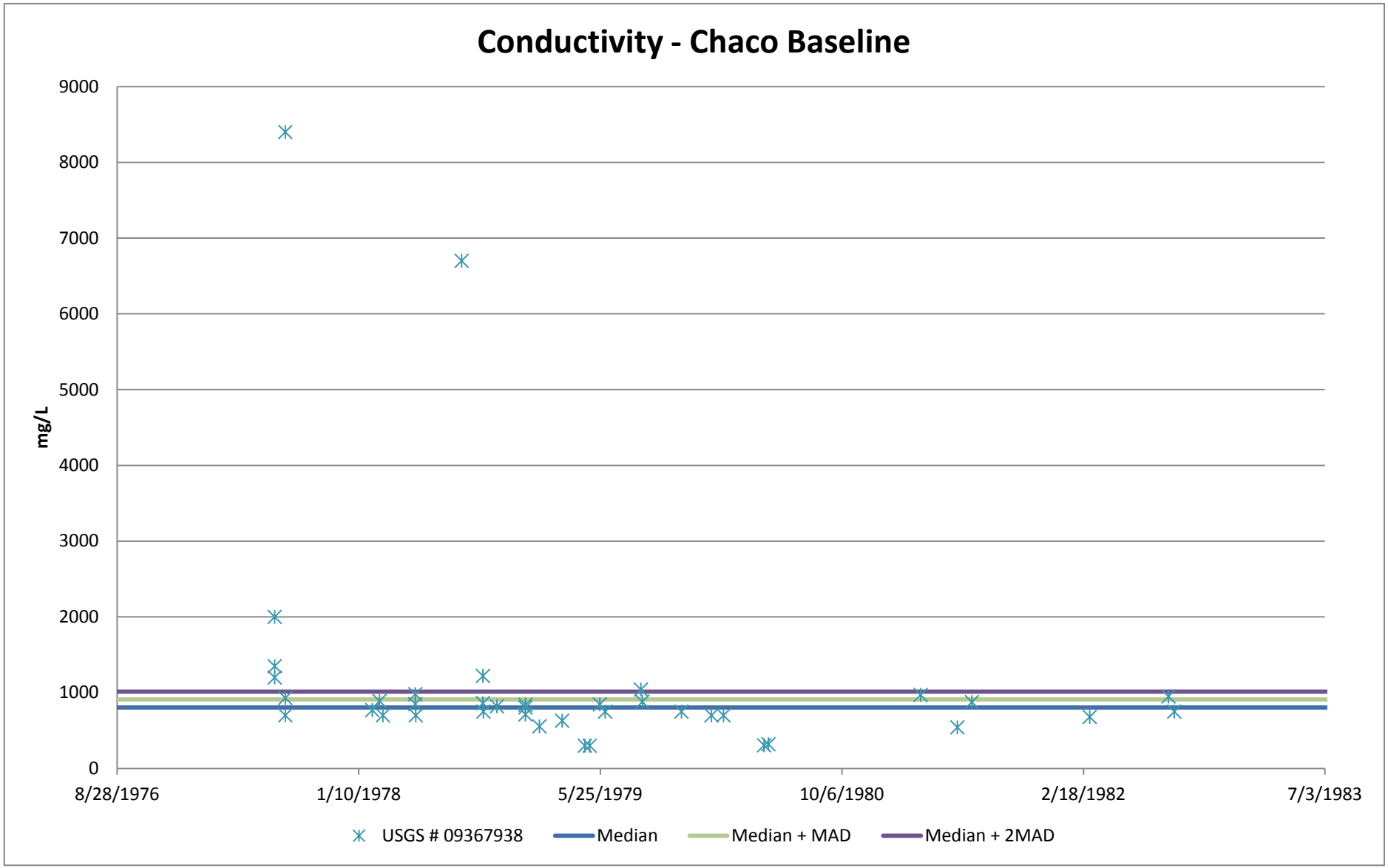

Radium - Chaco Baseline
100
10
1
0.1
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Median + 2MAD

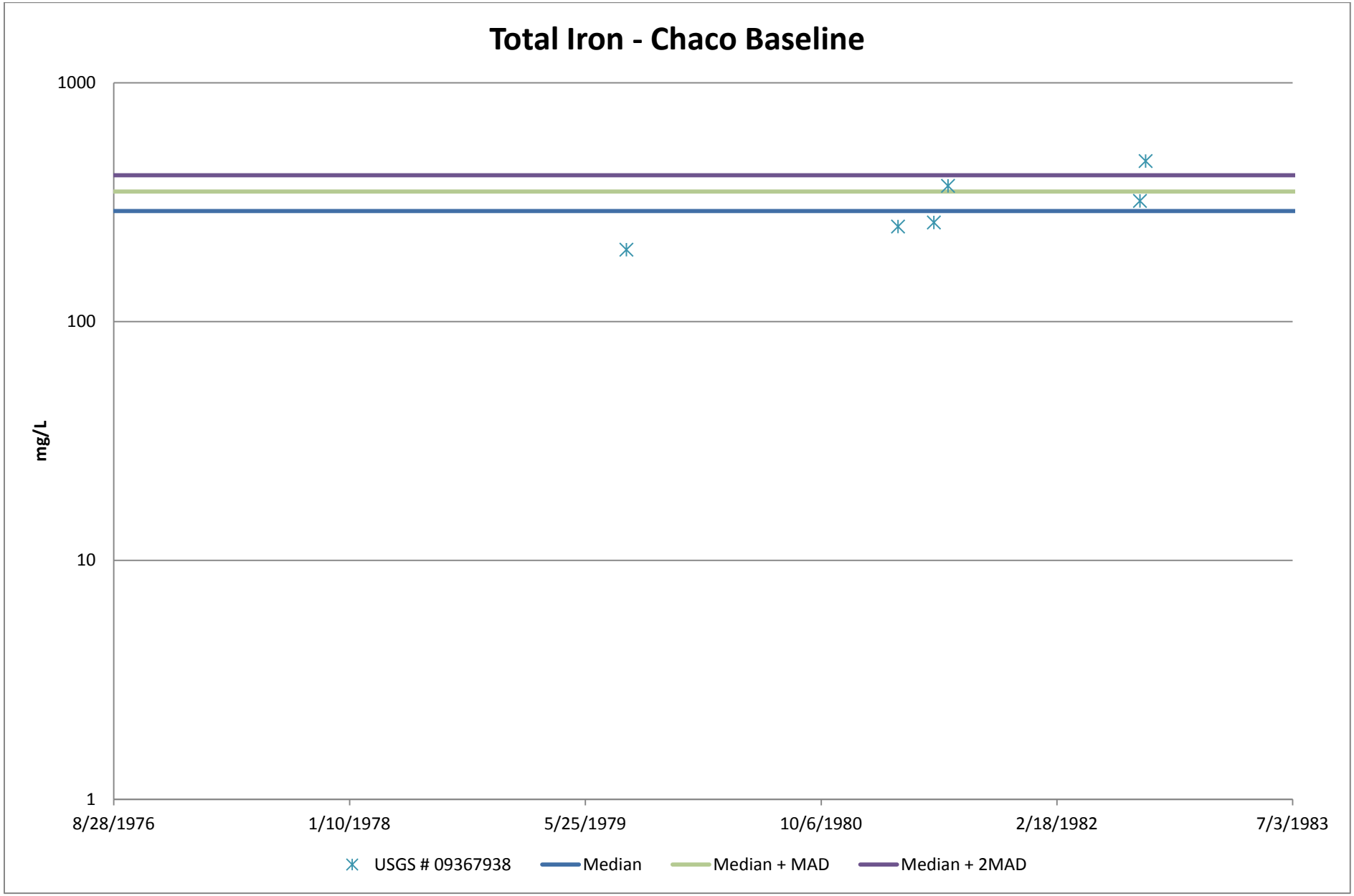

Selenium - Chaco Baseline
mg/L
10
1
0.1
0.01
0.001
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

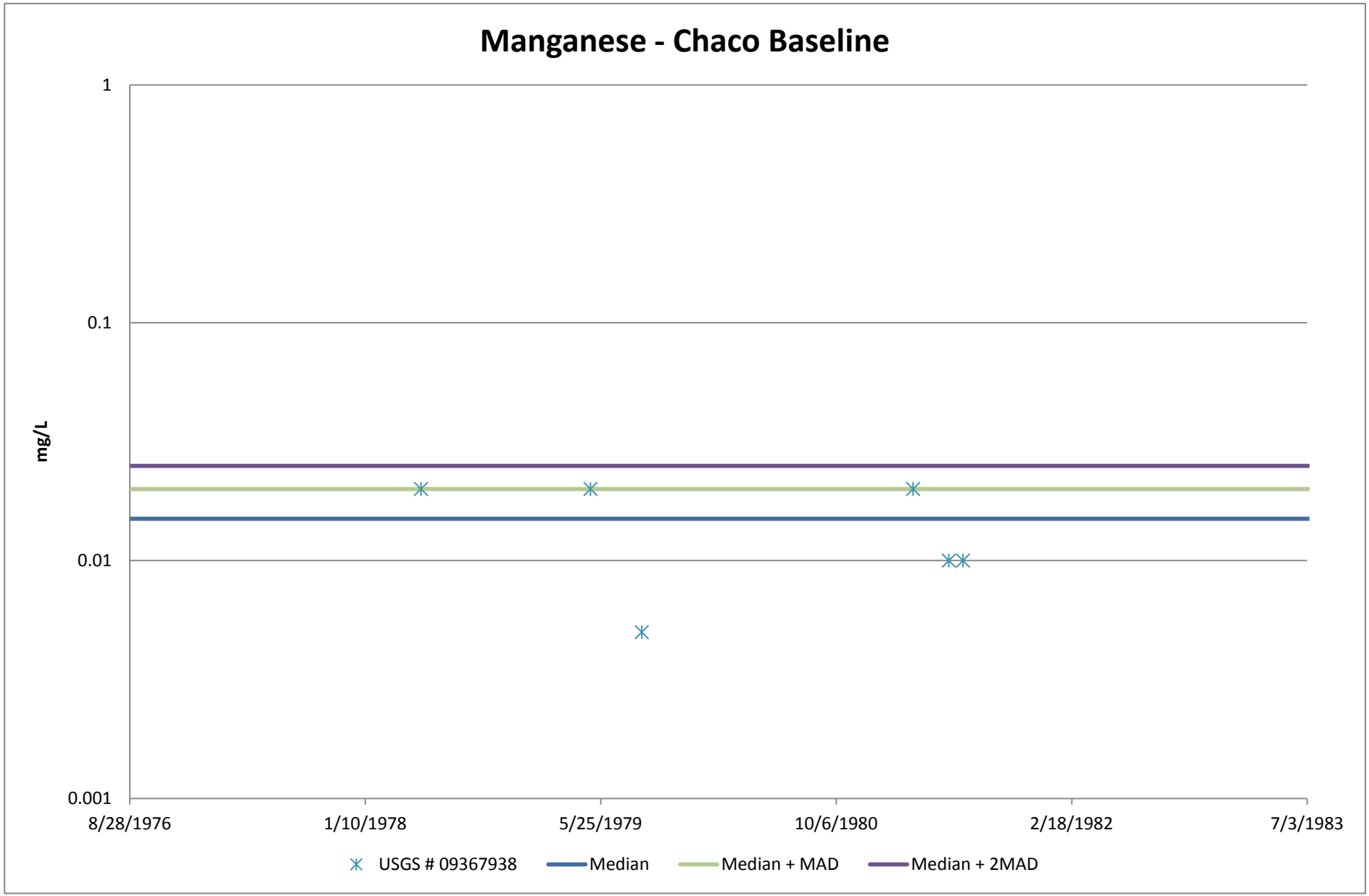

Sulfate - Chaco Baseline
1200
1000
800
600
400
200
0
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Median + 2MAD

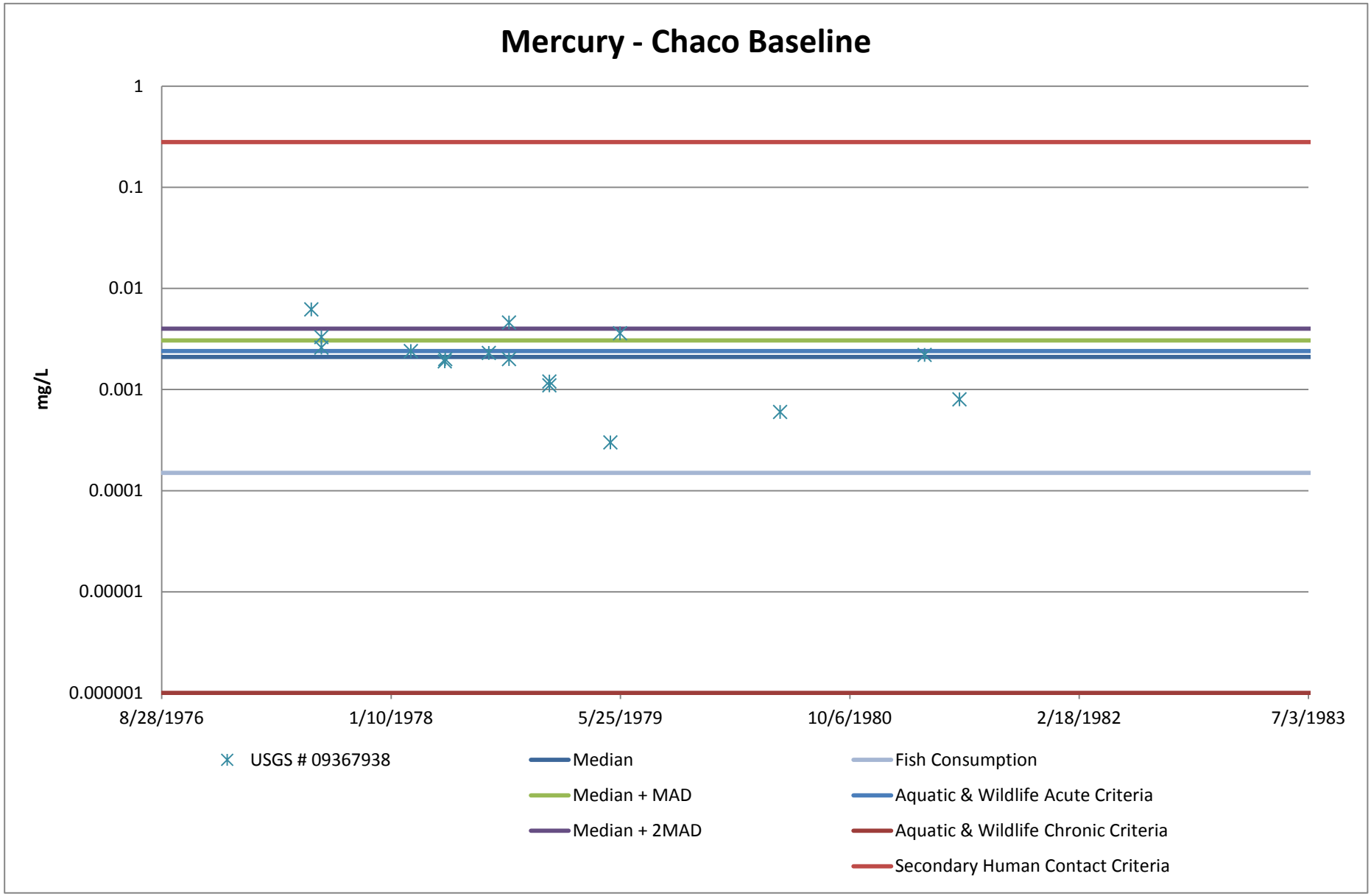

TDS - Chaco Baseline
mg/L
3500
3000
2500
2000
1500
1000
500
0
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Livestock Criteria
Median + MAD
Median + 2MAD

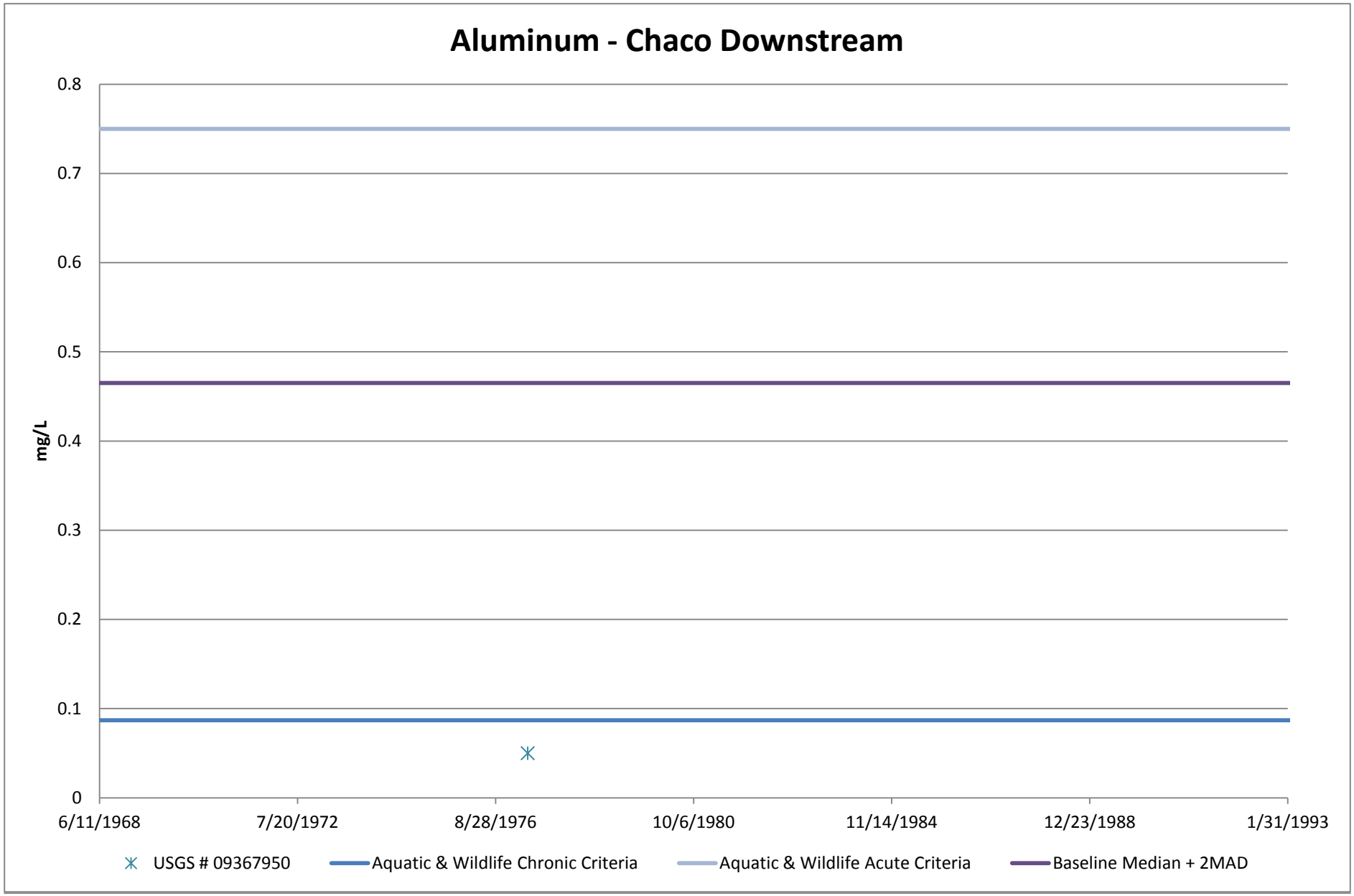

Zinc - Chaco Baseline
1000
100
10
1
0.1
0.01
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

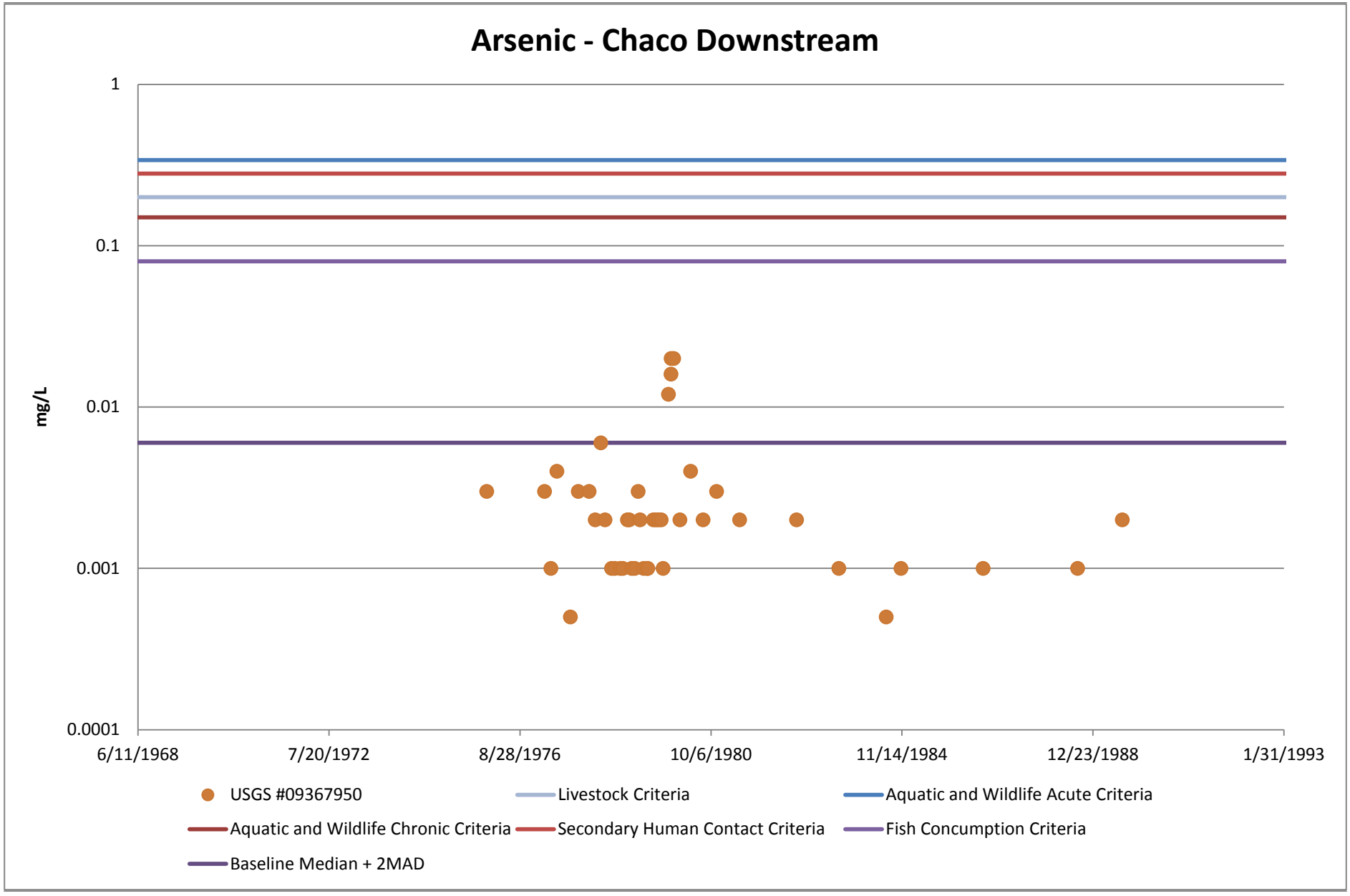

Conductivity - Chaco Baseline
mg/L
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD

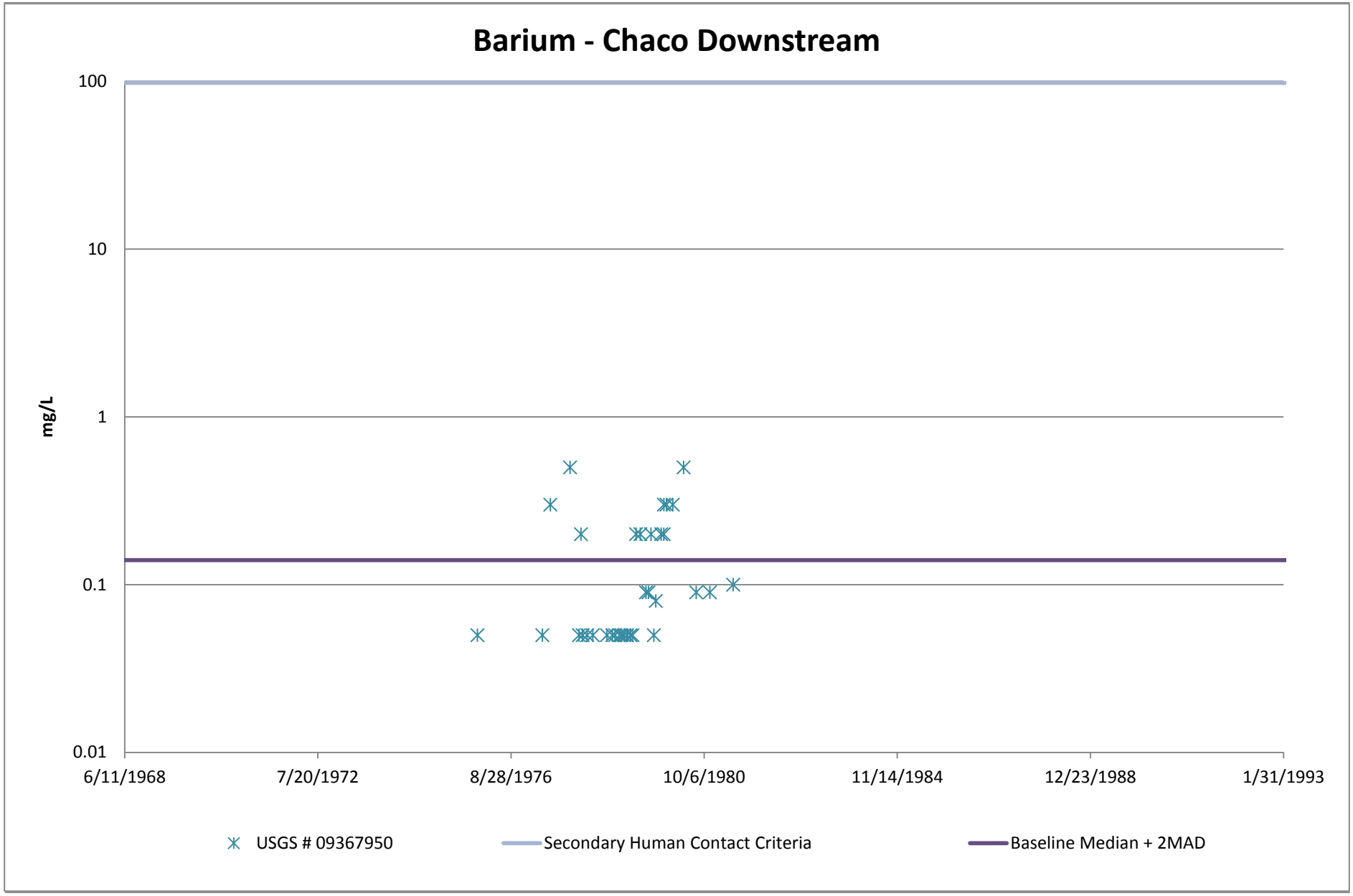

Total Iron - Chaco Baseline
1000
100
10
1
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD

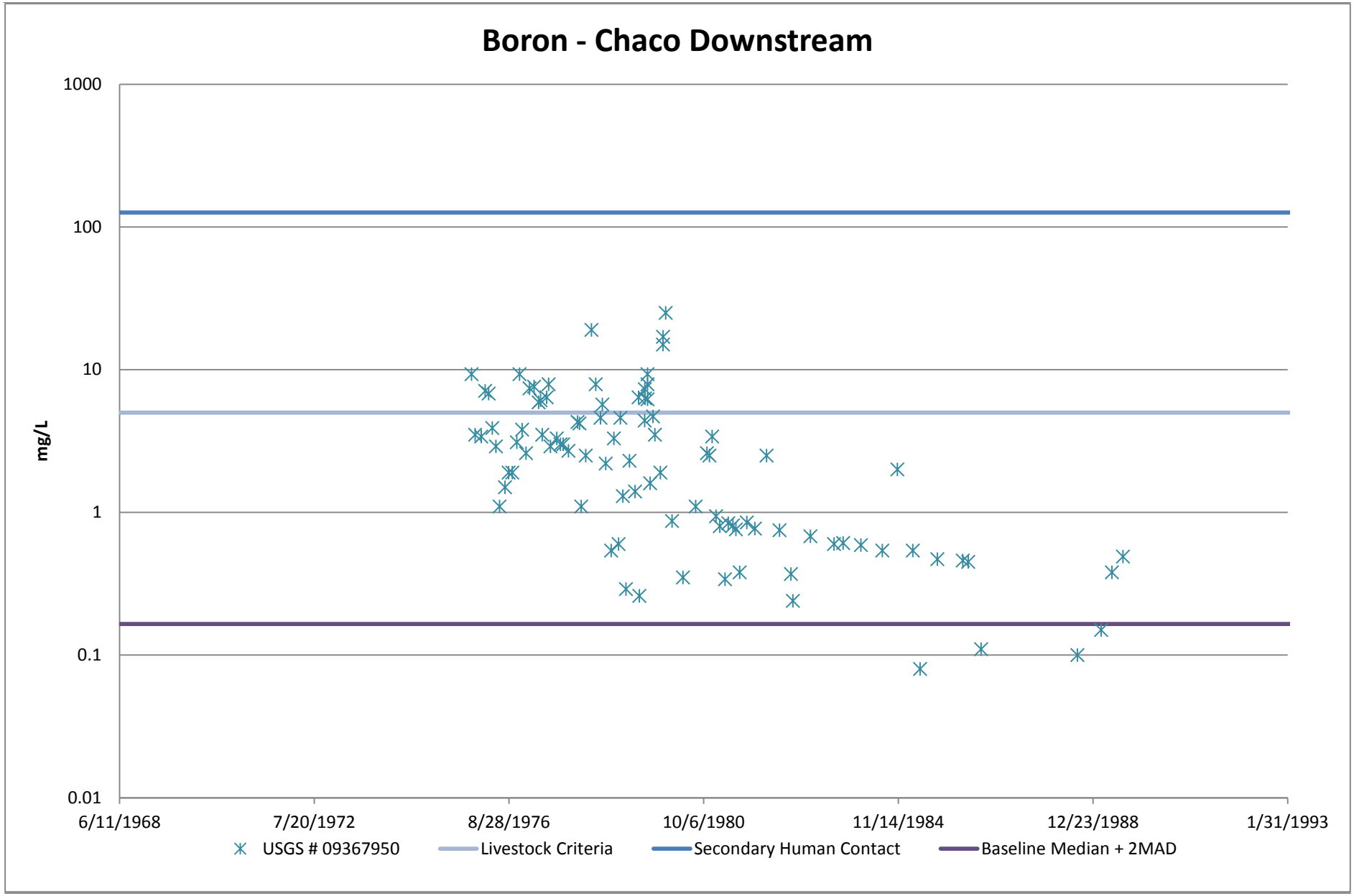

Manganese - Chaco Baseline
1
0.1
0.01
0.001
mg/L
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD

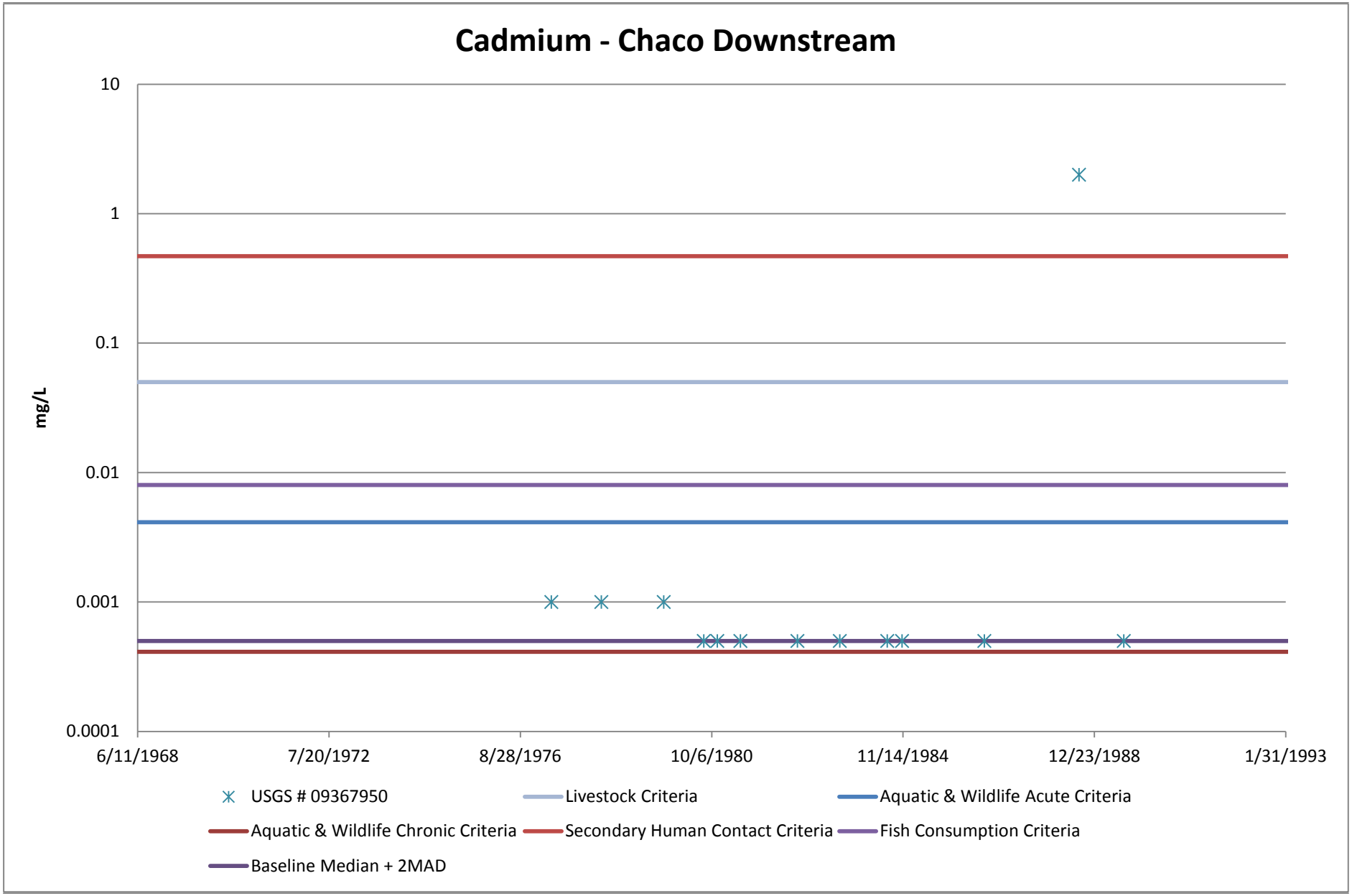

Mercury - Chaco Baseline
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
8/28/1976
1/10/1978
5/25/1979
10/6/1980
2/18/1982
7/3/1983
USGS # 09367938
Median
Median + MAD
Median + 2MAD
Fish Consumption
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

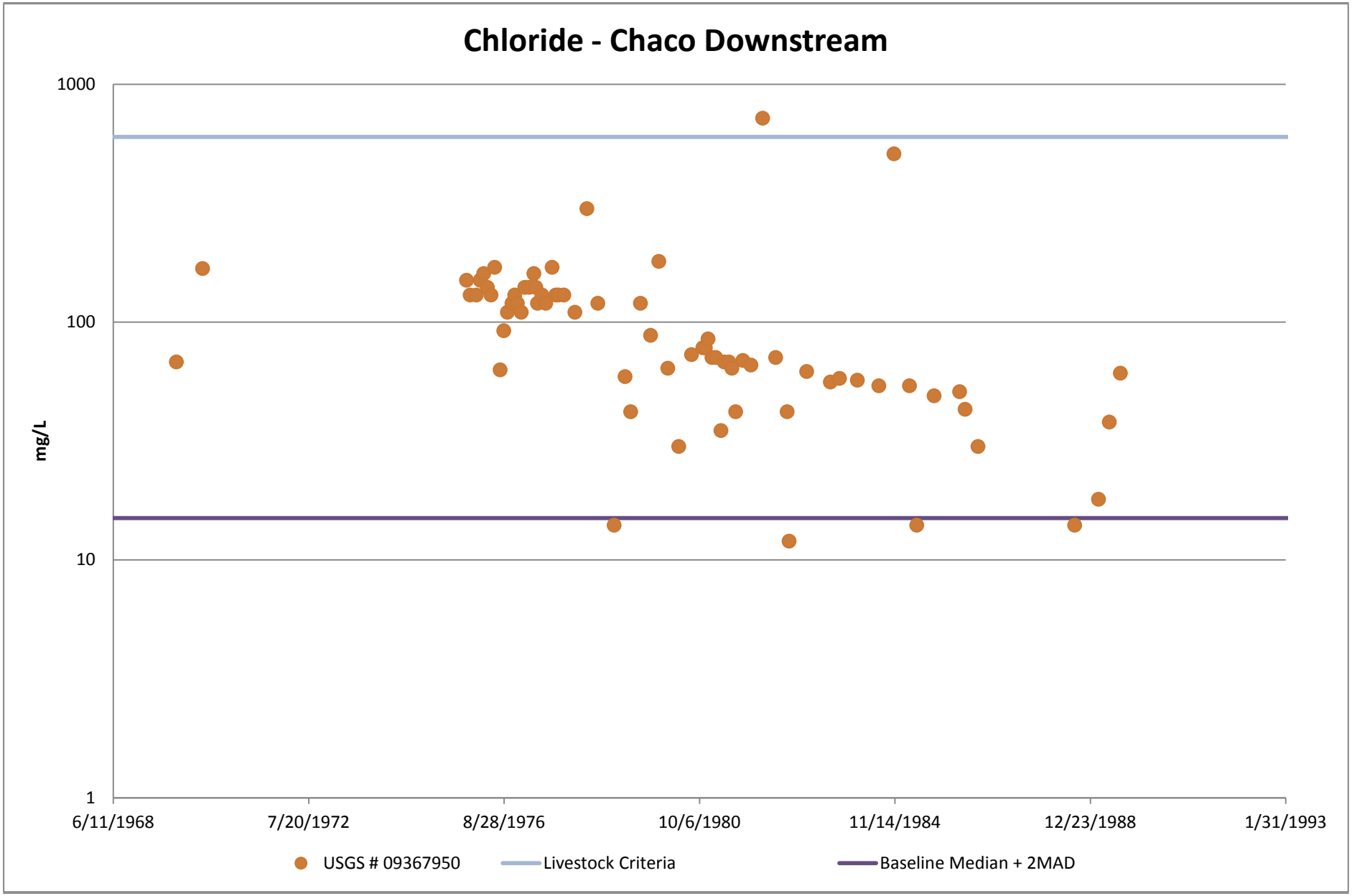

Aluminum - Chaco Downstream
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Aquatic & Wildlife Chronic Criteria
Aquatic & Wildlife Acute Criteria
Baseline Median + 2MAD

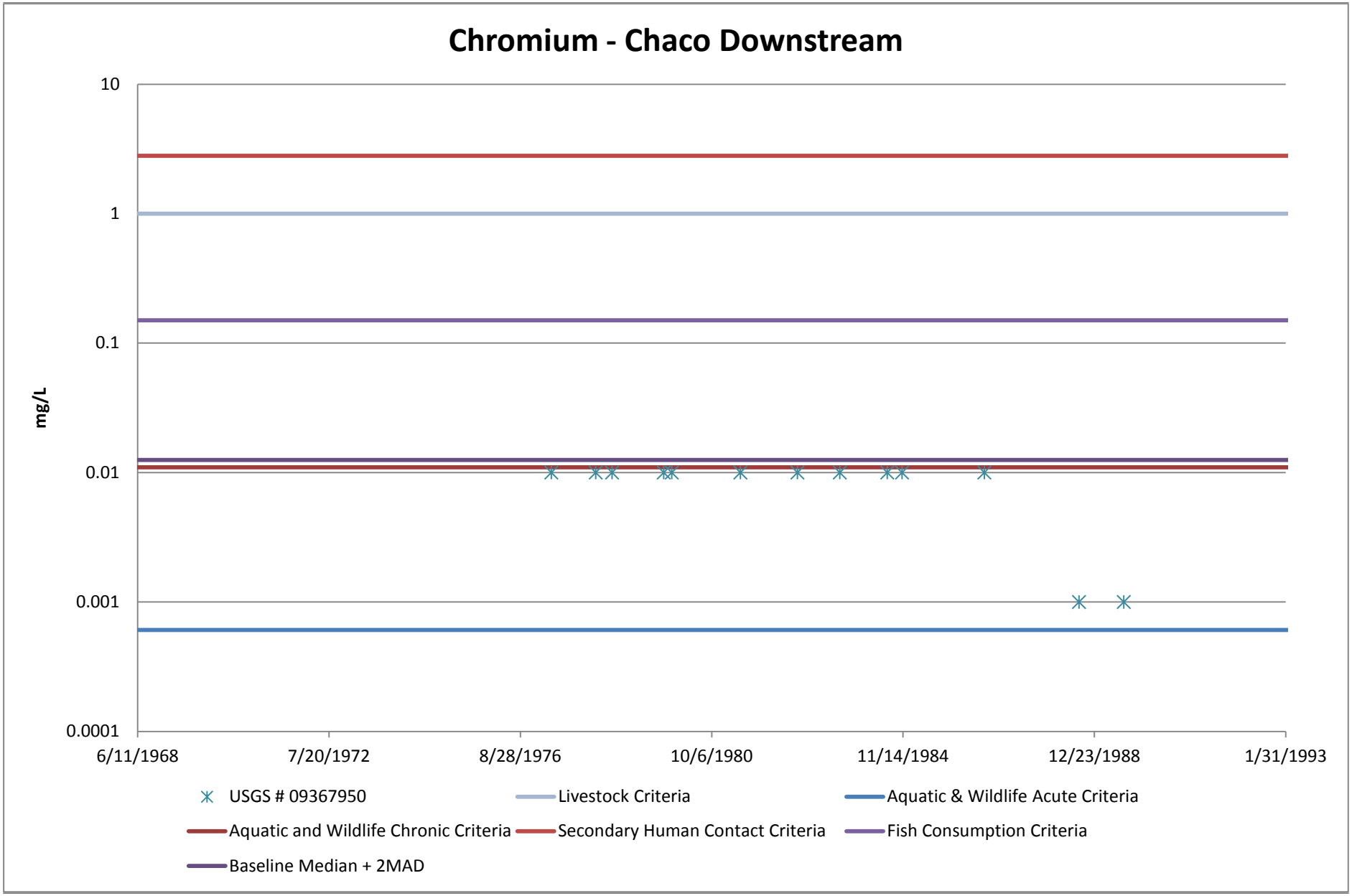

Arsenic - Chaco Downstream
mg/L
1
0.1
0.01
0.001
0.0001
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS #09367950
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria
Baseline Median + 2MAD

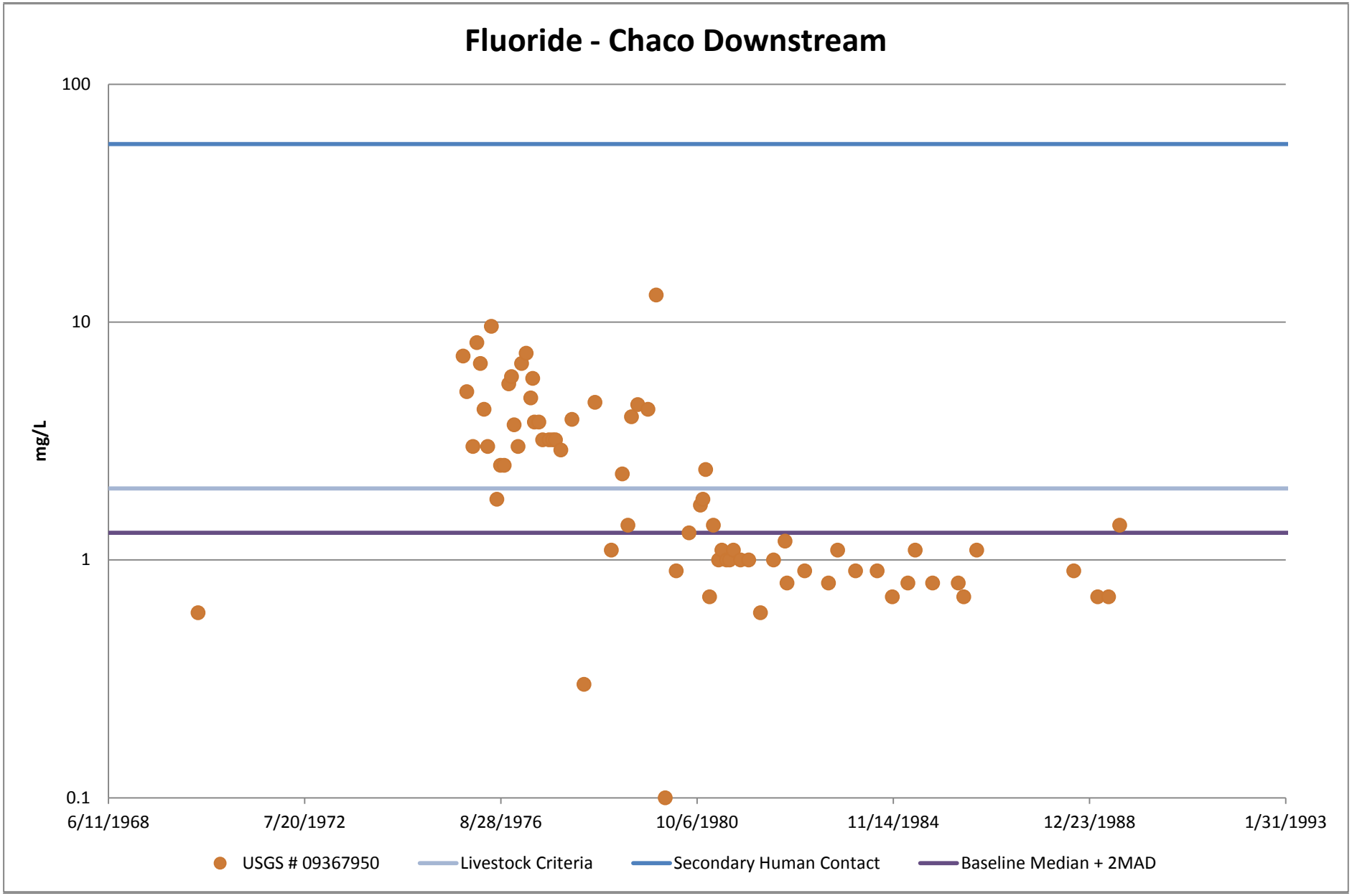

Barium - Chaco Downstream
mg/L
100
10
1
0.1
0.01
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Secondary Human Contact Criteria
Baseline Median + 2MAD

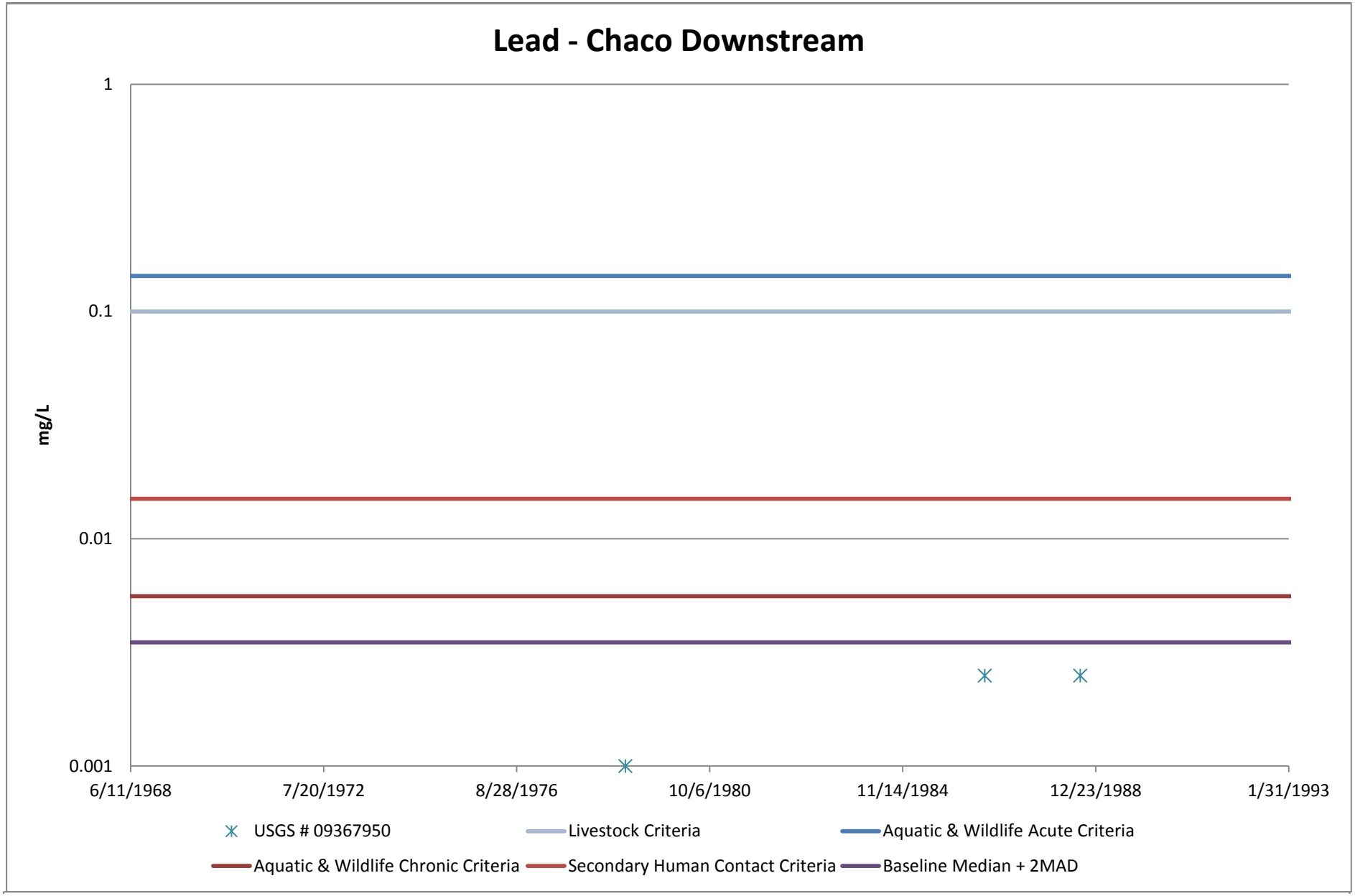

Boron - Chaco Downstream
1000
100
10
1
0.1
0.01
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Secondary Human Contact
Baseline Median + 2MAD

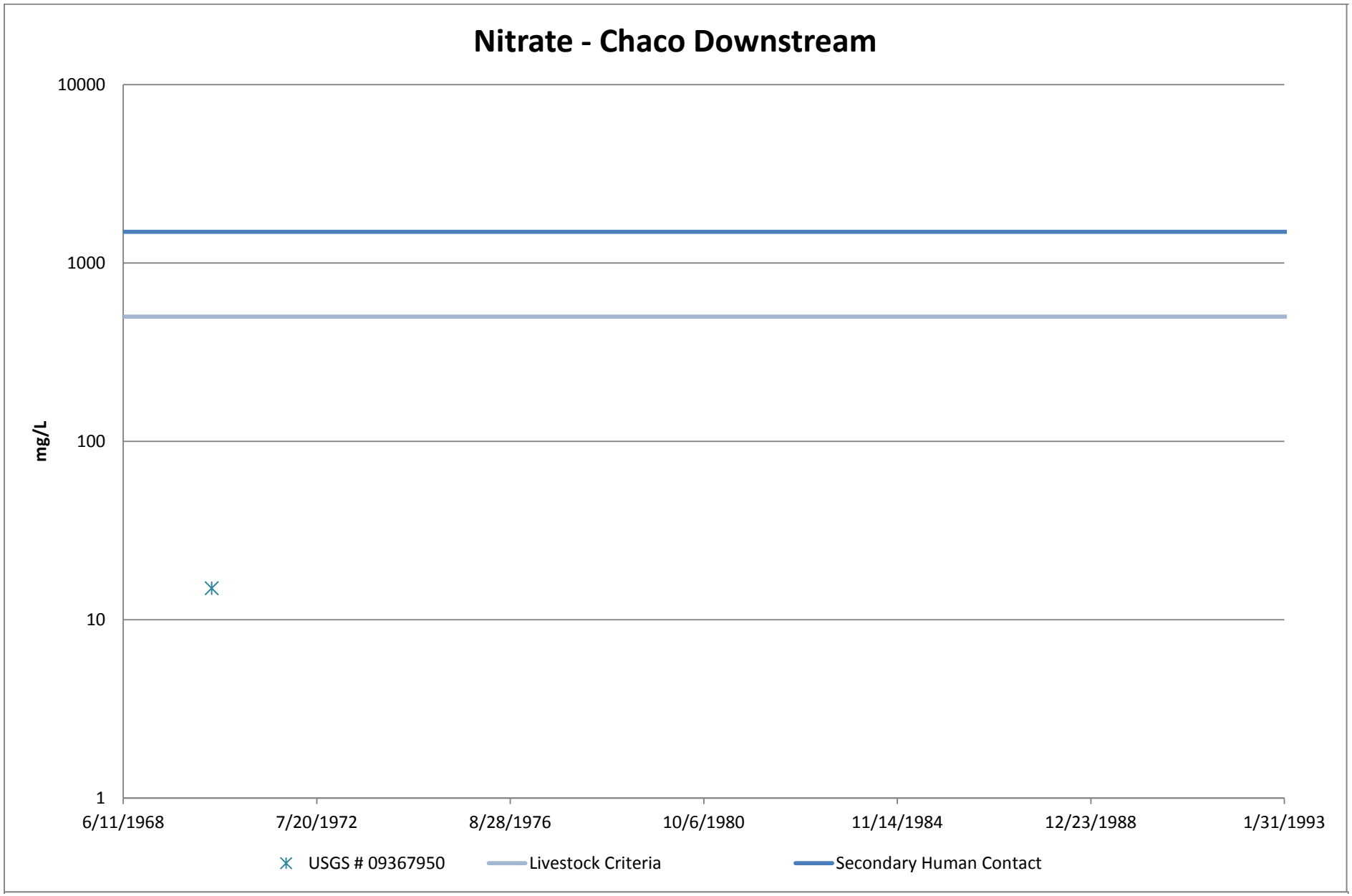

Cadmium - Chaco Downstream
mg/L
10
1
0.1
0.01
0.001
0.0001
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Baseline Median + 2MAD

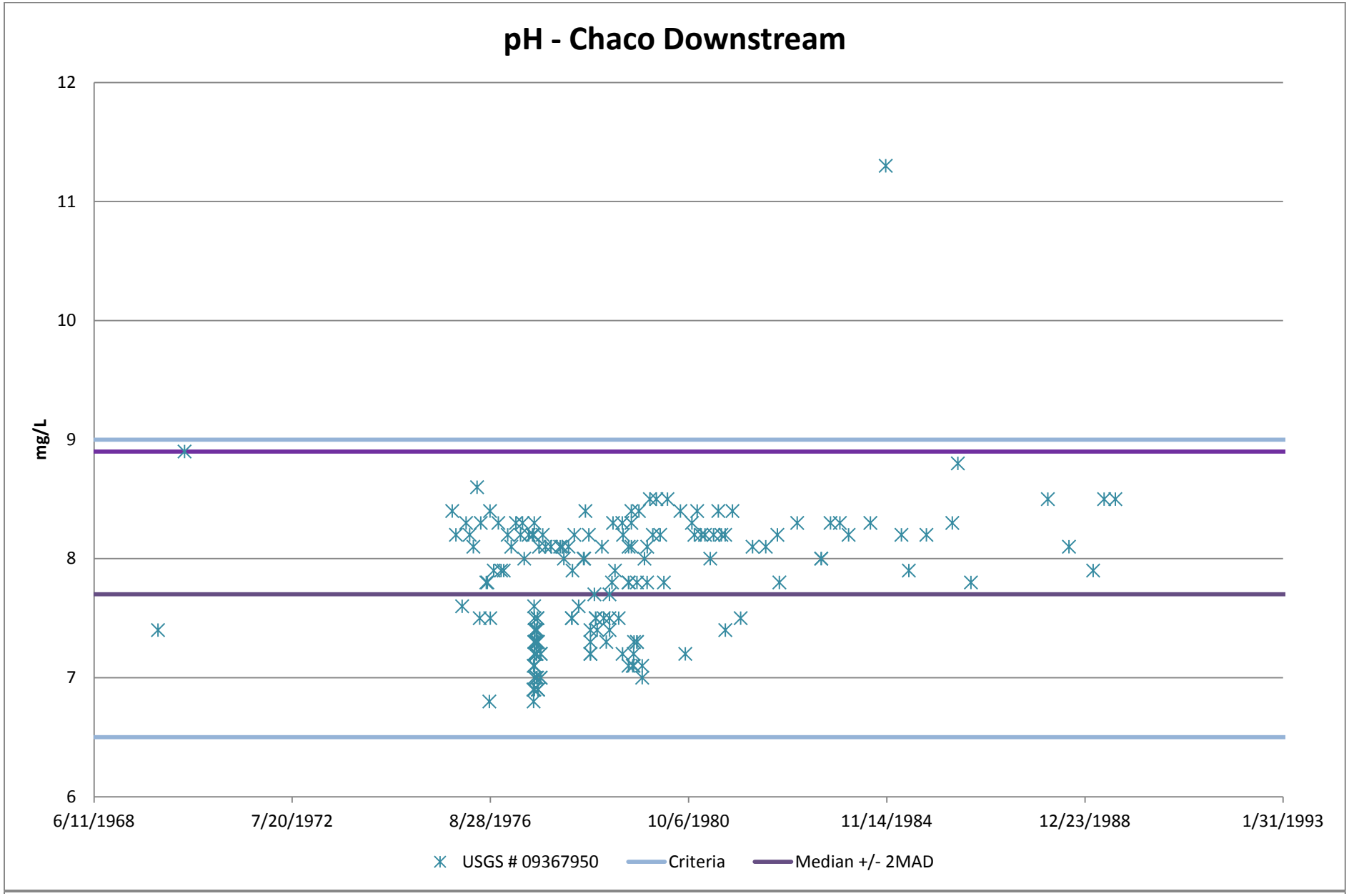

Chloride - Chaco Downstream
1000
100
10
1
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Baseline Median + 2MAD

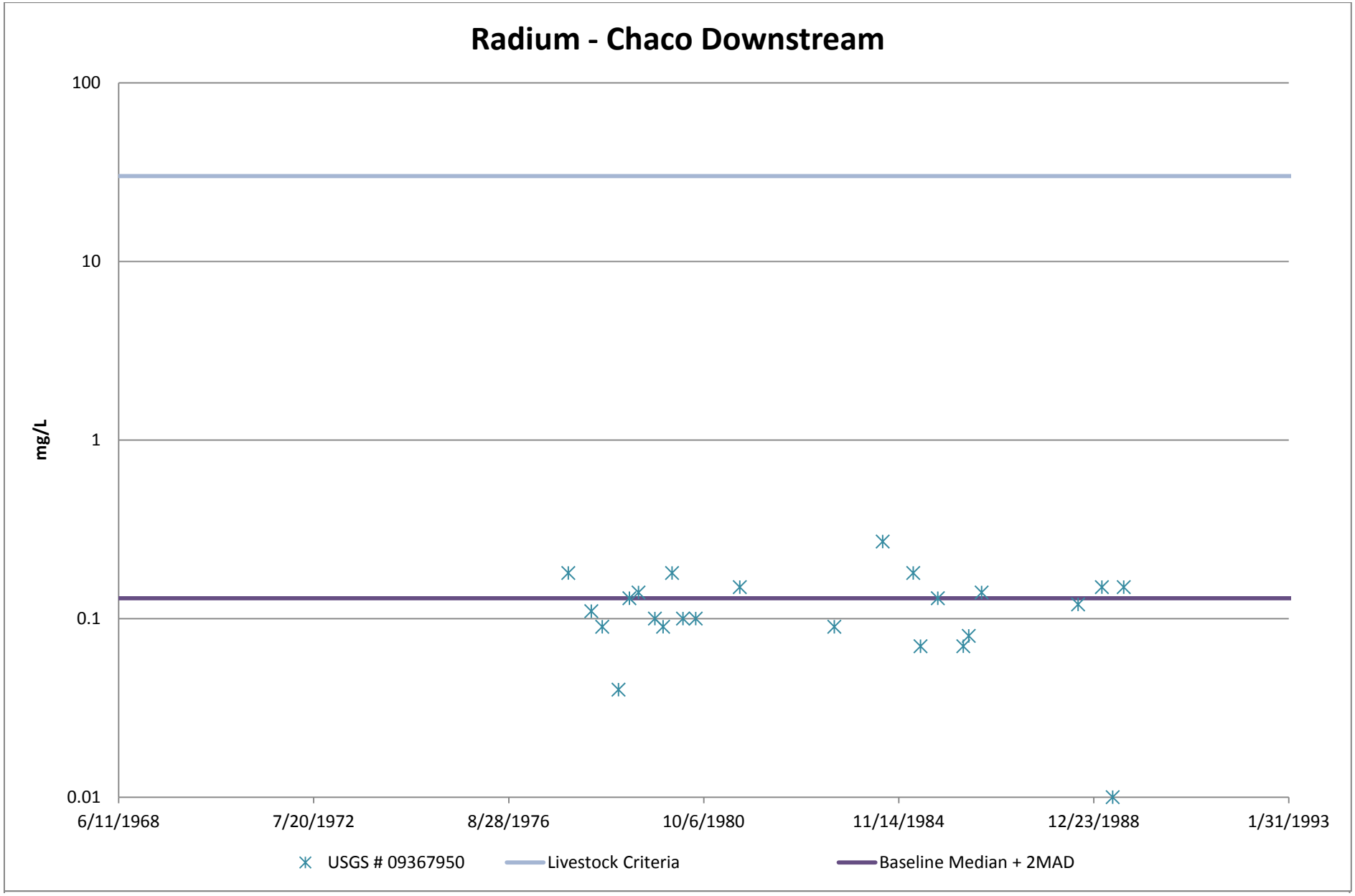

Chromium - Chaco Downstream
mg/L
10
1
0.1
0.01
0.001
0.0001
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Baseline Median + 2MAD

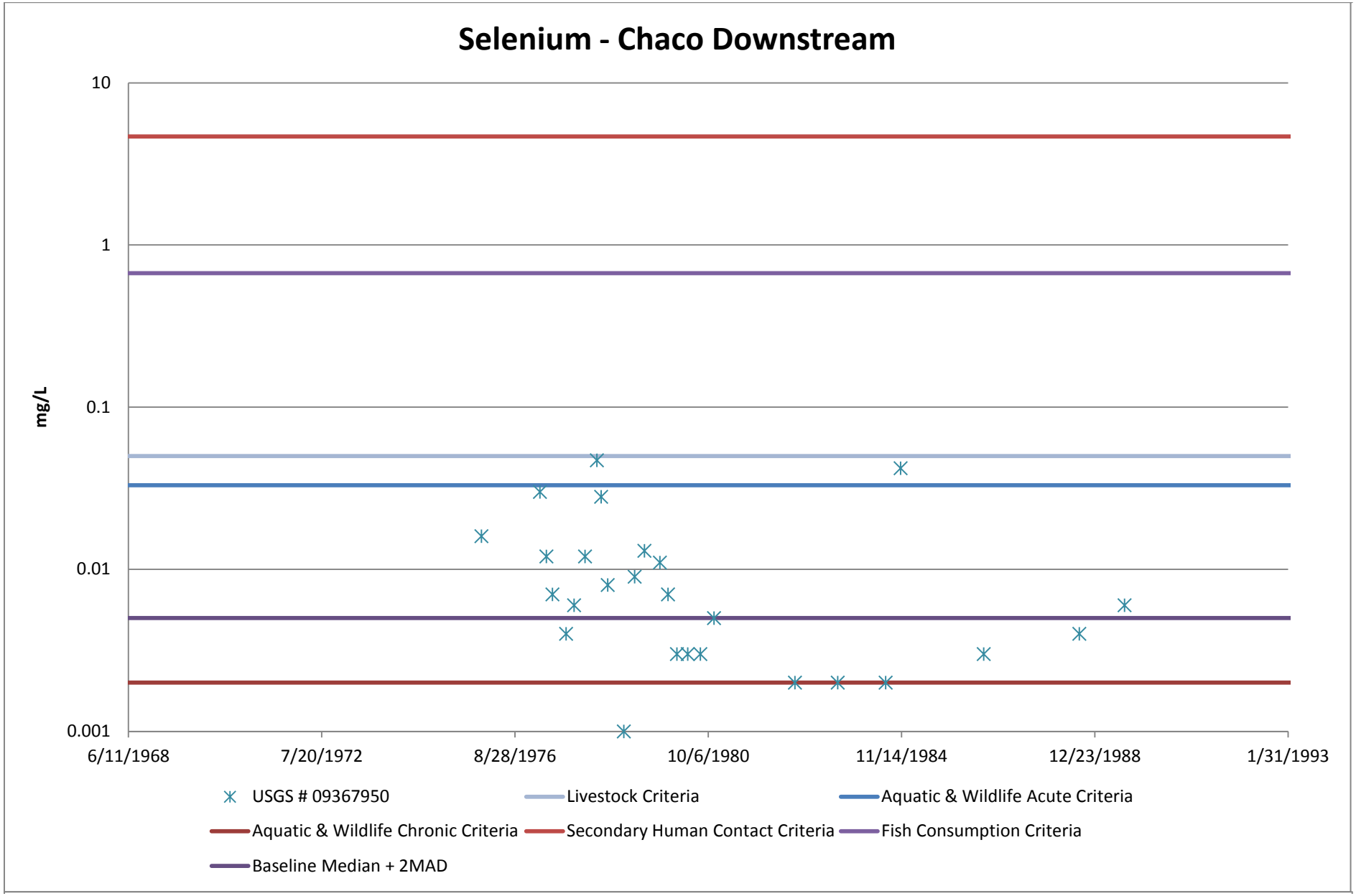

Fluoride - Chaco Downstream
100
10
1
0.1
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Secondary Human Contact
Baseline Median + 2MAD

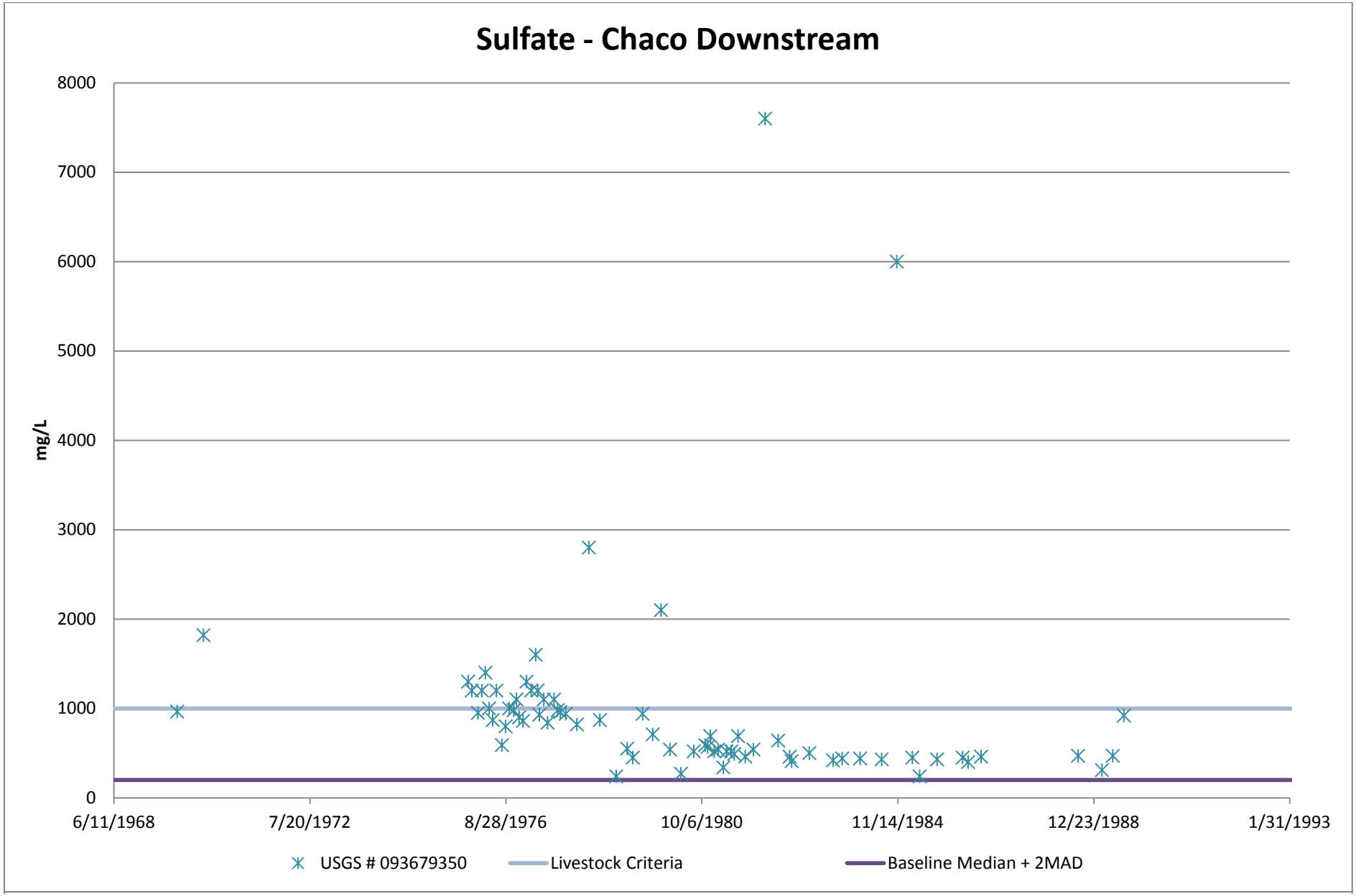

Lead - Chaco Downstream
1
0.1
0.01
0.001
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Baseline Median + 2MAD

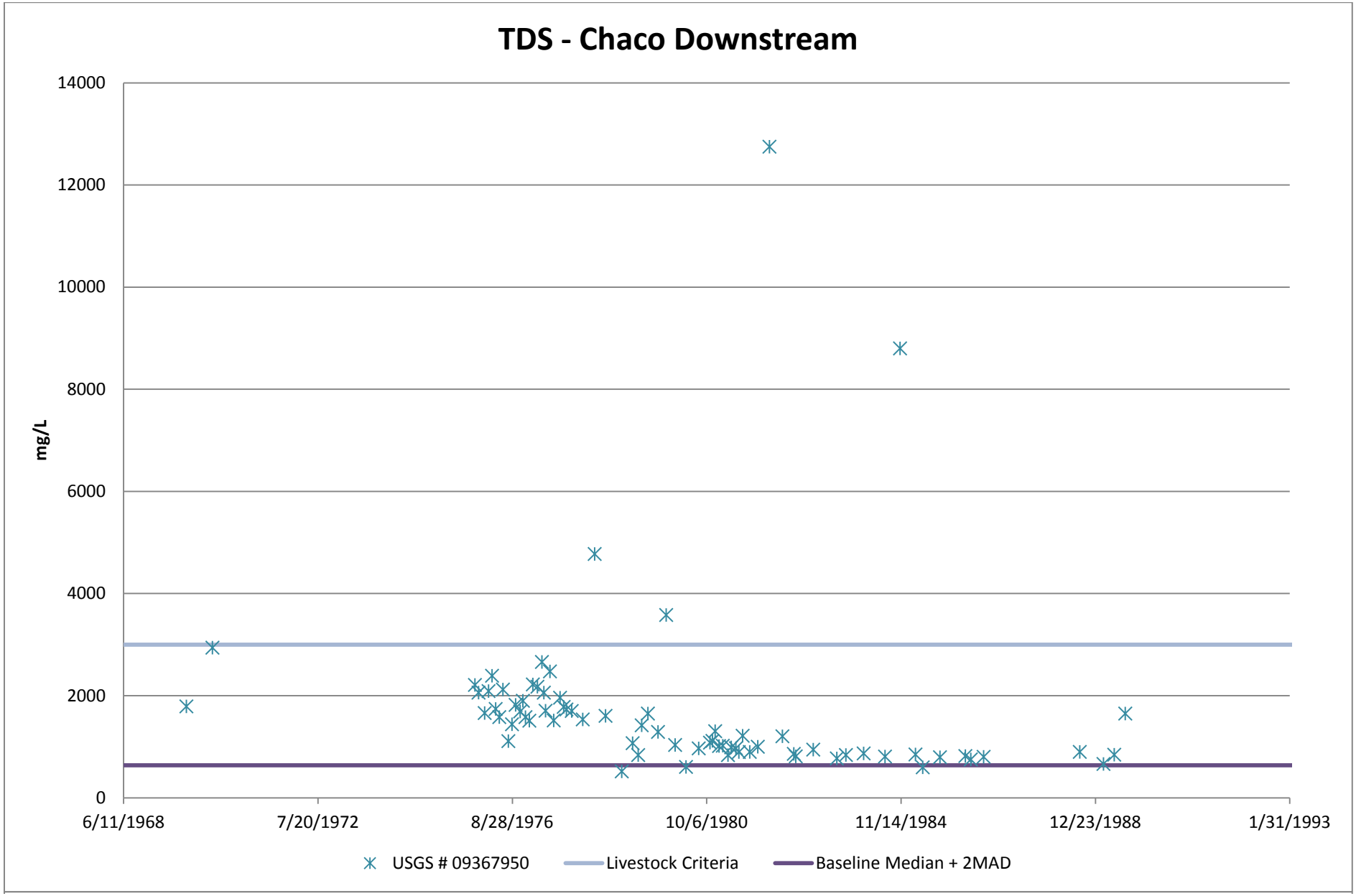

Nitrate - Chaco Downstream
10000
1000
100
10
1
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Secondary Human Contact

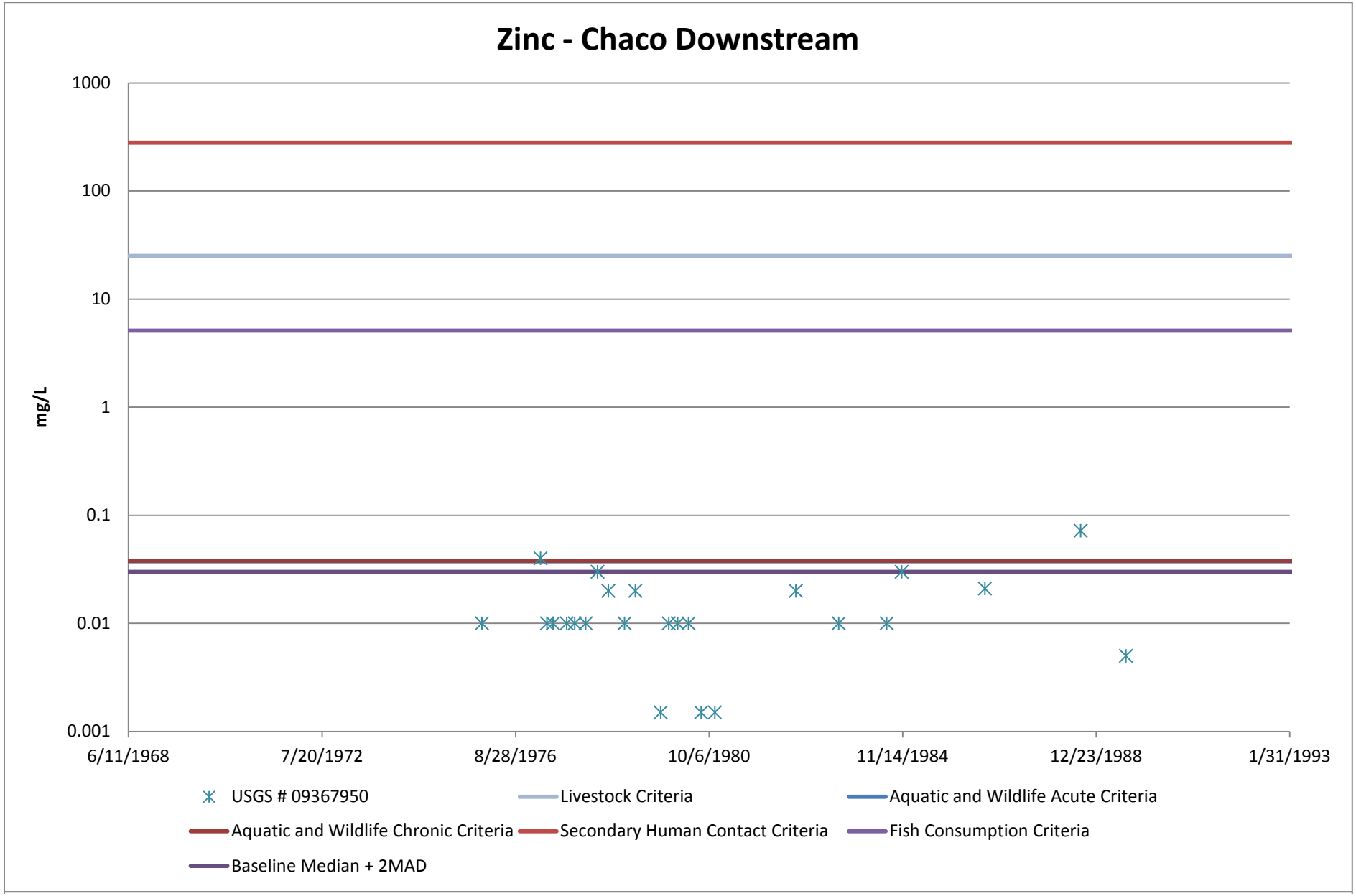

pH - Chaco Downstream
12
11
10
9
8
7
6
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Criteria
Median +/- 2MAD

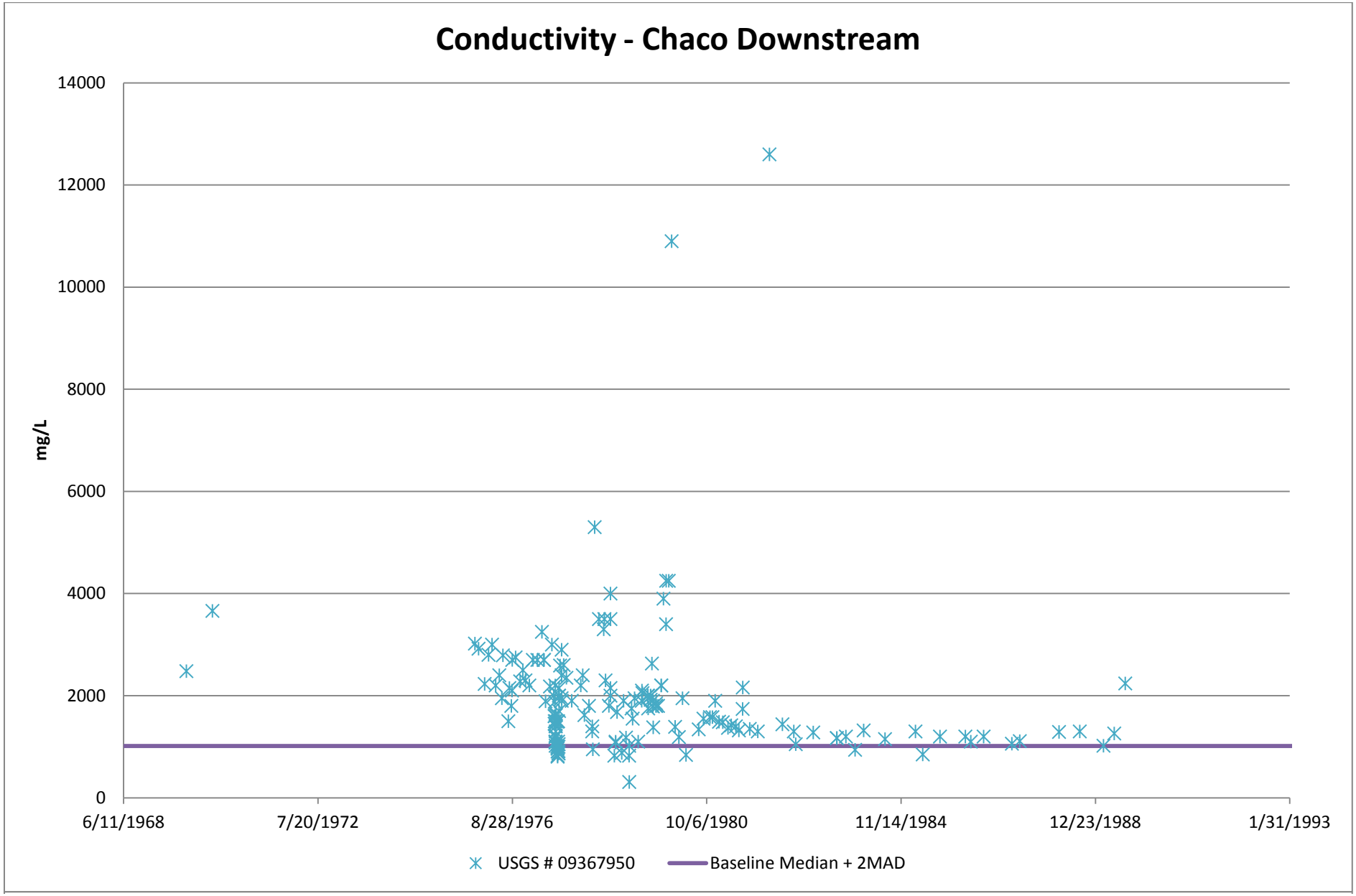

Radium - Chaco Downstream
100
10
1
0.1
0.01
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Baseline Median + 2MAD

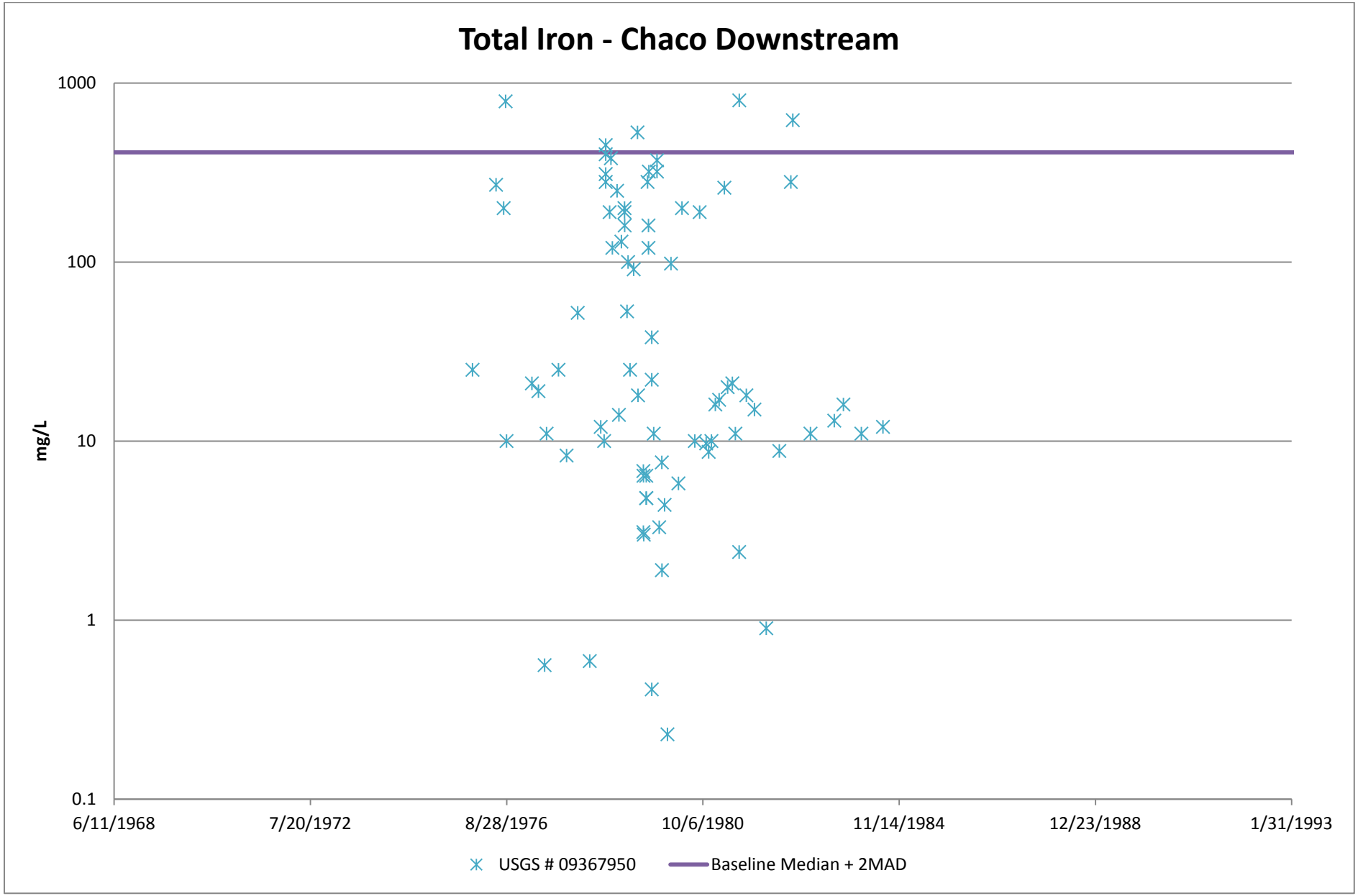

Selenium - Chaco Downstream
mg/L
10
1
0.1
0.01
0.001
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Baseline Median + 2MAD

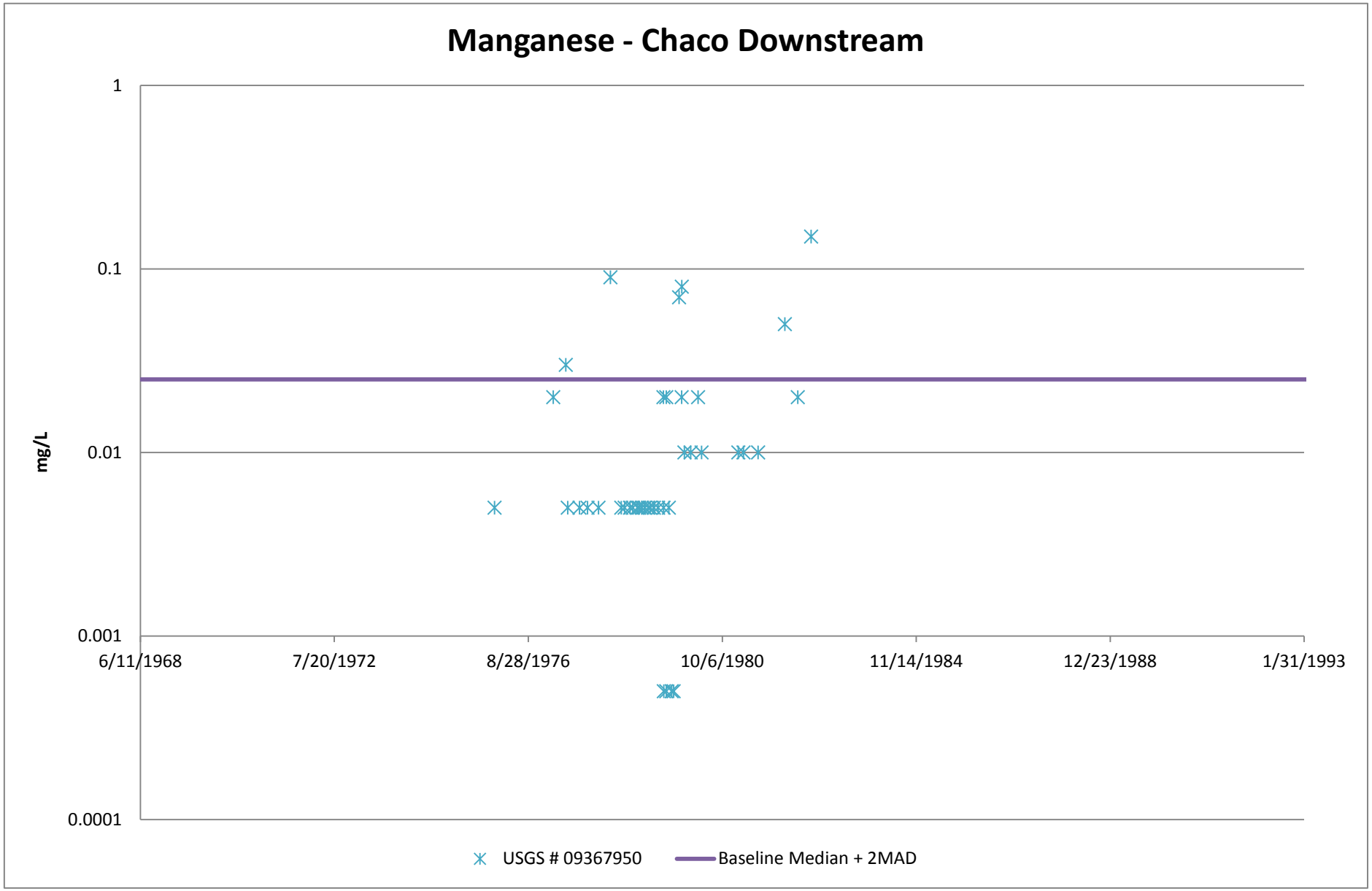

Sulfate - Chaco Downstream
mg/L
8000
7000
6000
5000
4000
3000
2000
1000
0
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 093679350
Livestock Criteria
Baseline Median + 2MAD

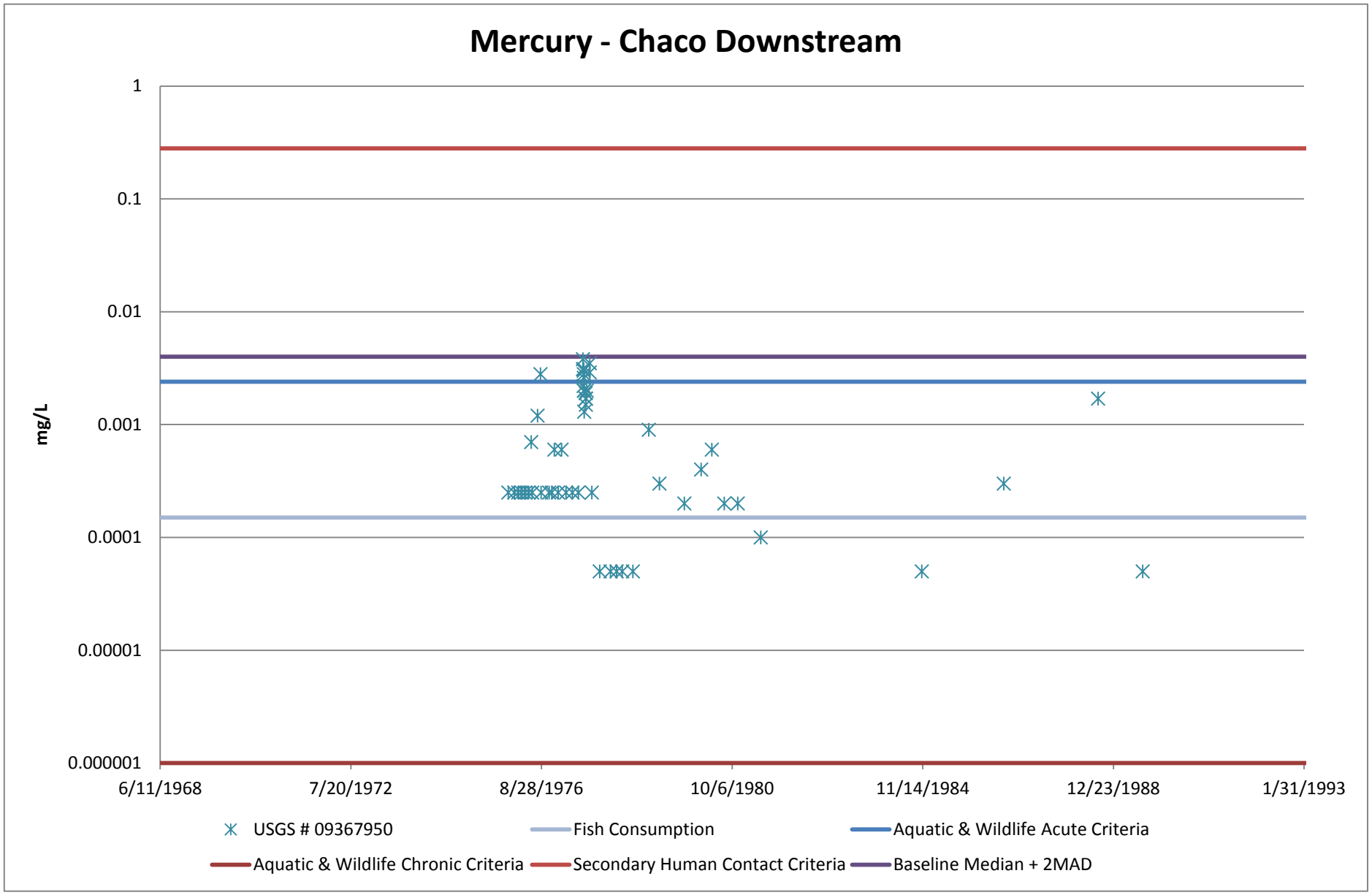

TDS - Chaco Downstream
14000
12000
10000
8000
6000
4000
2000
0
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Baseline Median + 2MAD

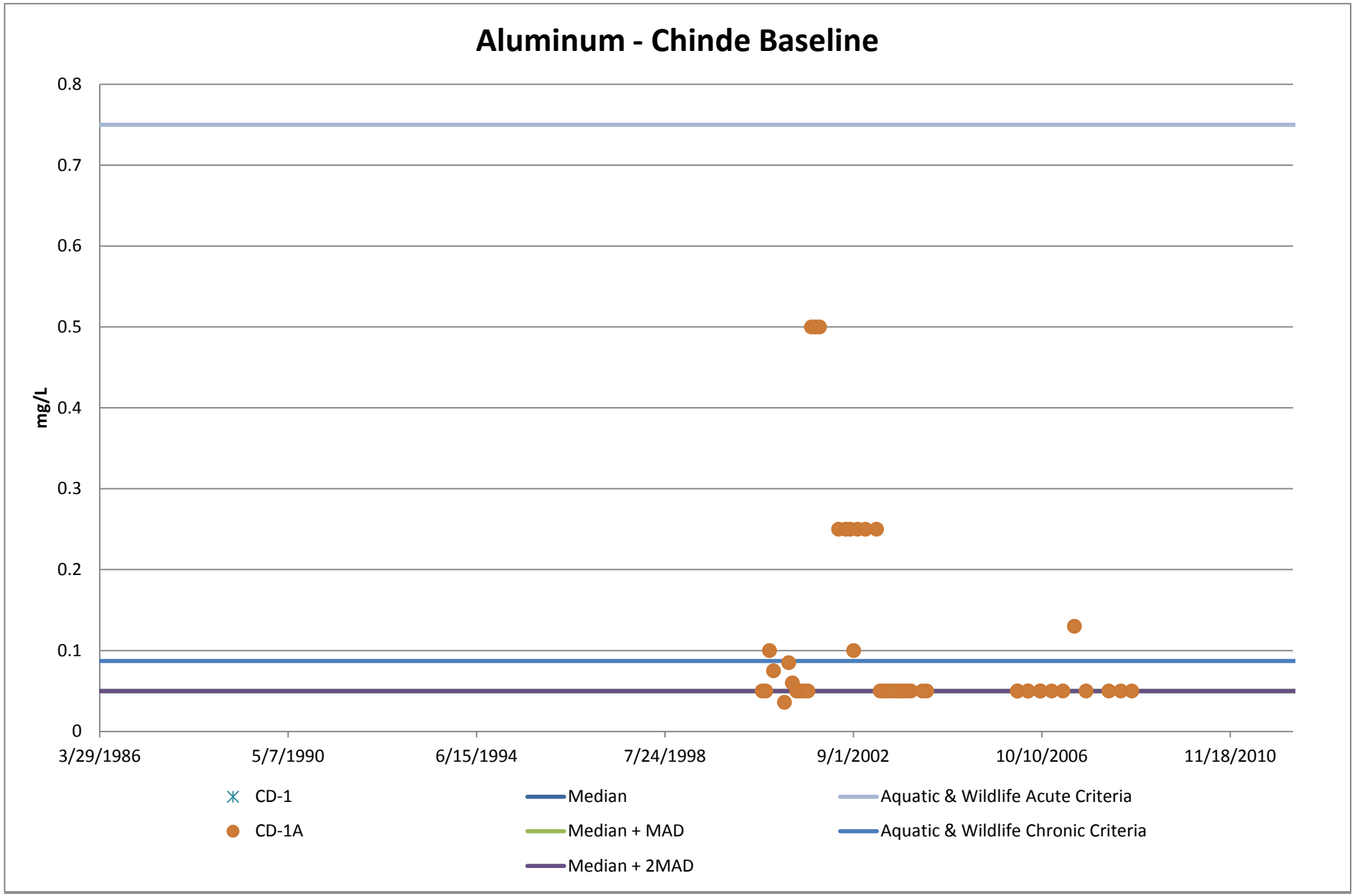

Zinc - Chaco Downstream
1000
100
10
1
0.1
0.01
0.001
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Baseline Median + 2MAD

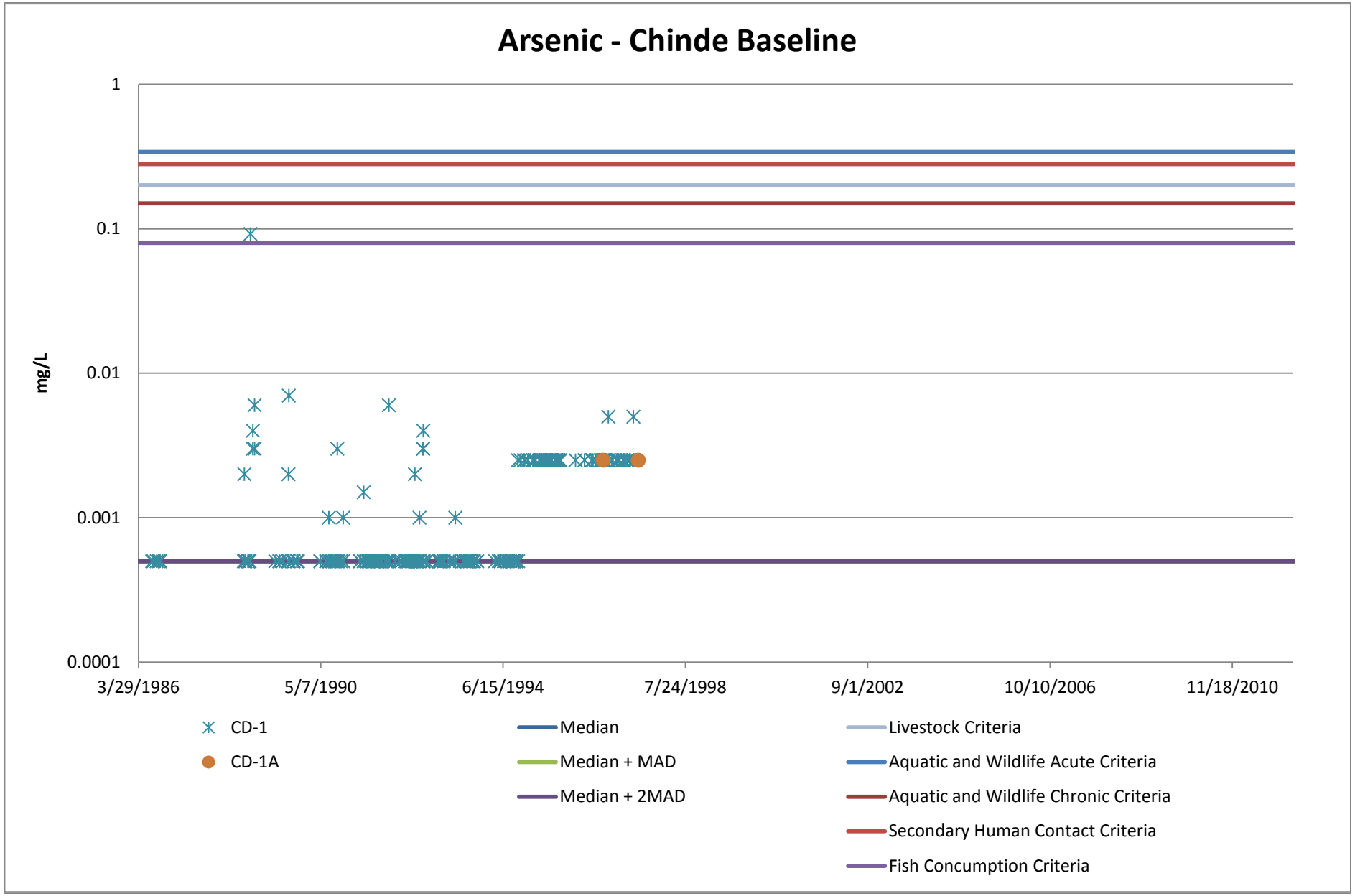

Conductivity - Chaco Downstream
14000
12000
10000
8000
6000
4000
2000
0
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Baseline Median + 2MAD

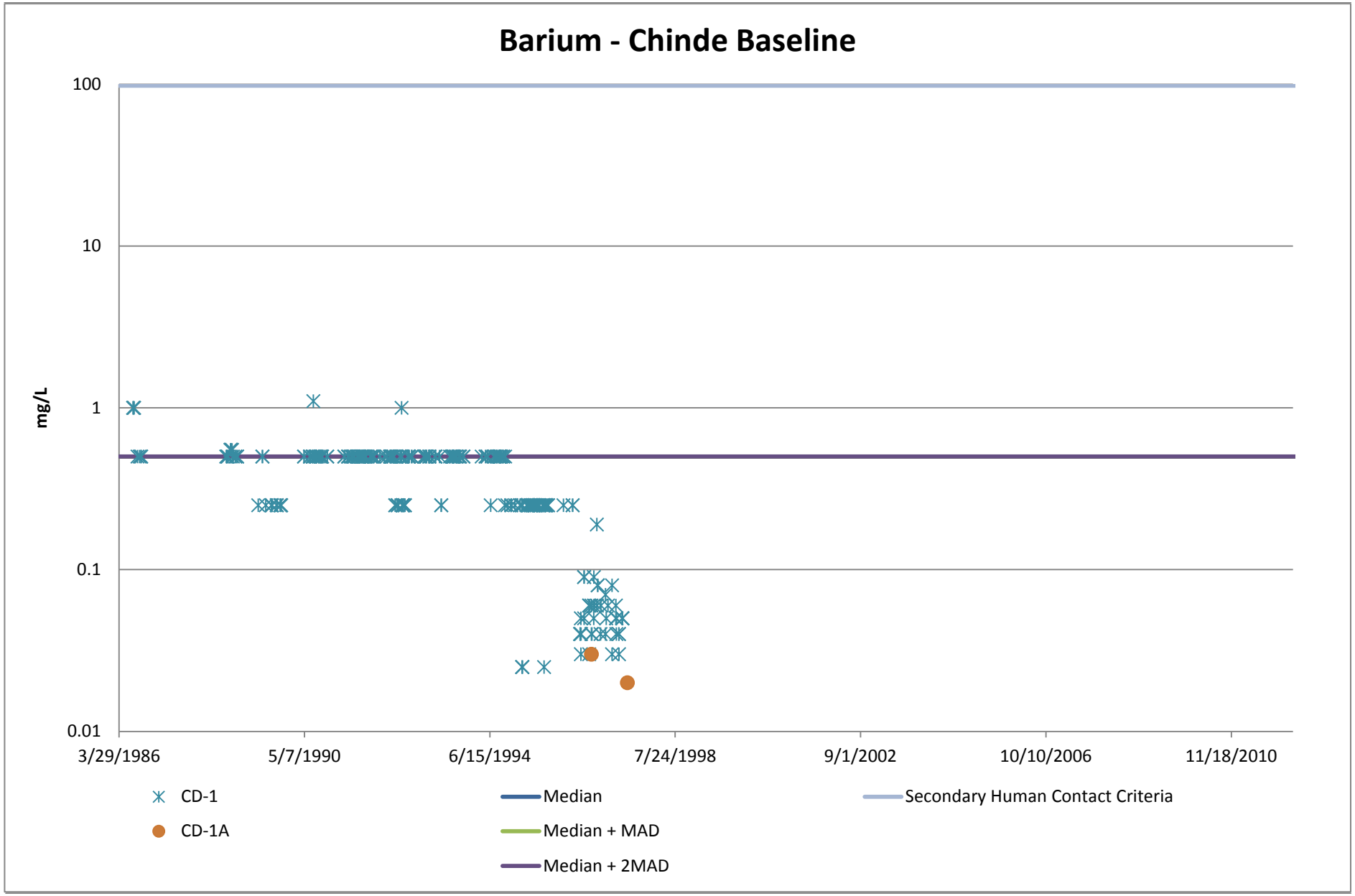

Total Iron - Chaco Downstream
1000
100
10
1
0.1
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Baseline Median + 2MAD

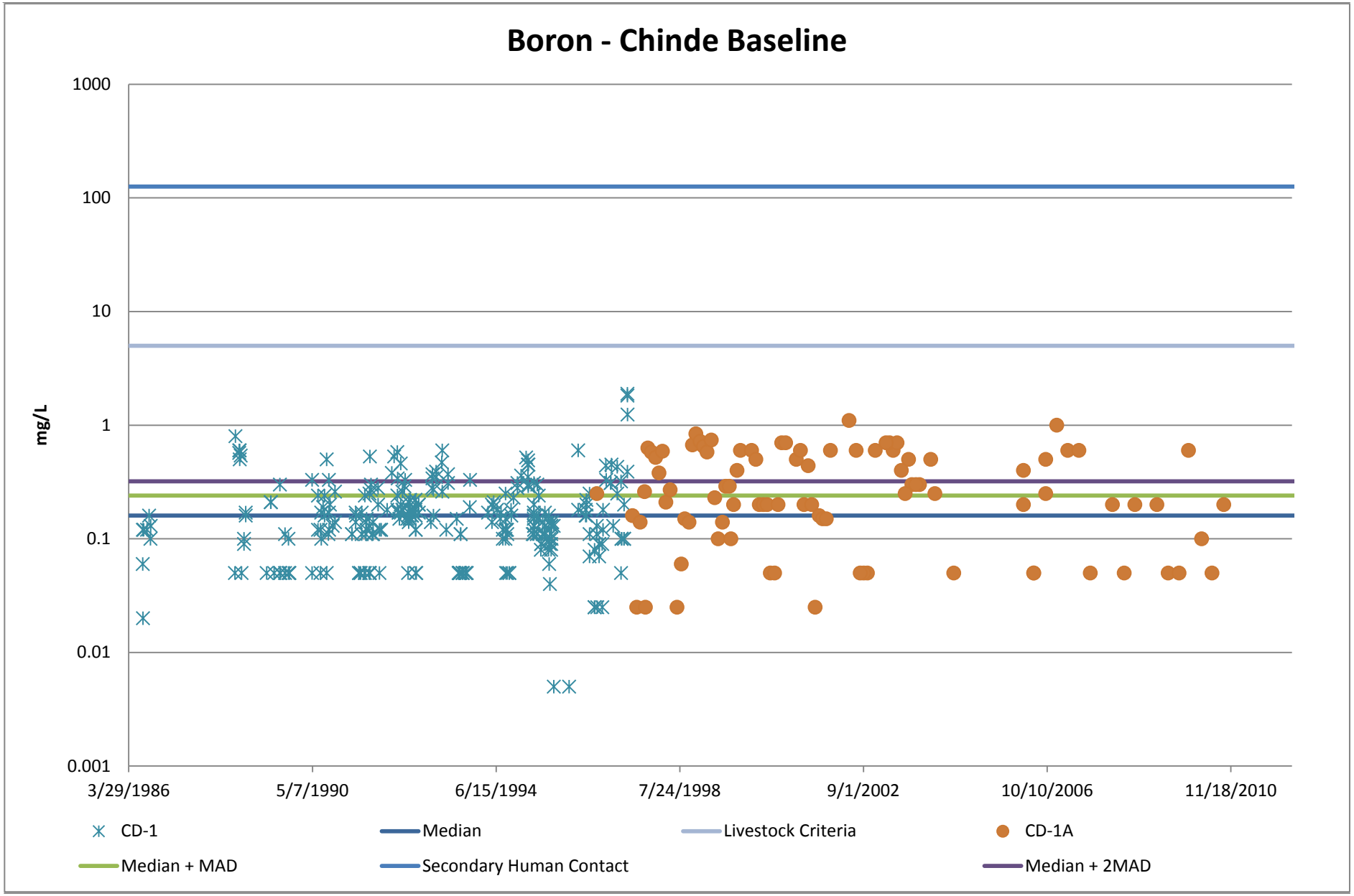

Manganese - Chaco Downstream
1
0.1
0.01
0.001
0.0001
mg/L
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Baseline Median + 2MAD

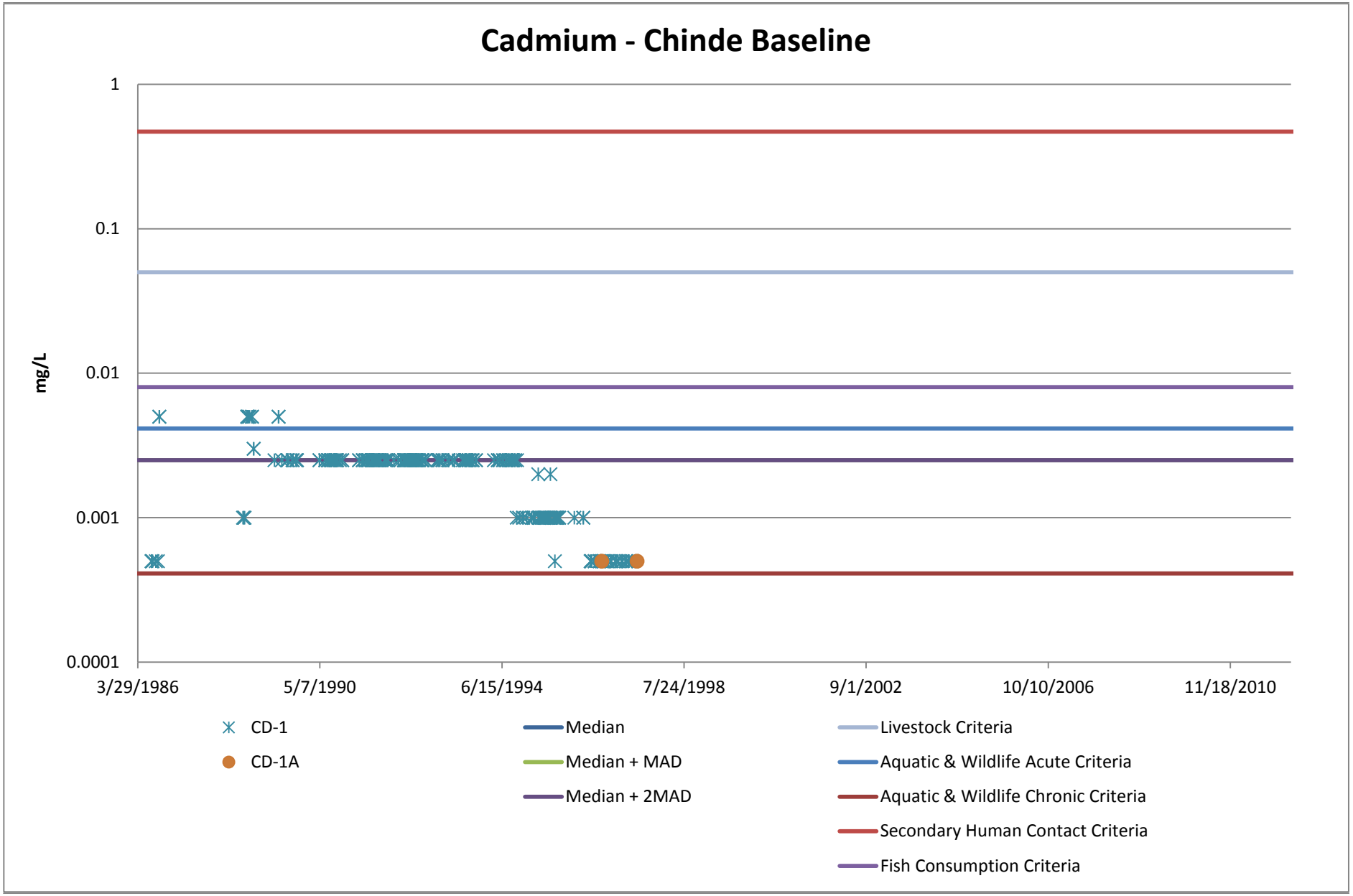

Mercury - Chaco Downstream
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
6/11/1968
7/20/1972
8/28/1976
10/6/1980
11/14/1984
12/23/1988
1/31/1993
USGS # 09367950
Fish Consumption
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Baseline Median + 2MAD

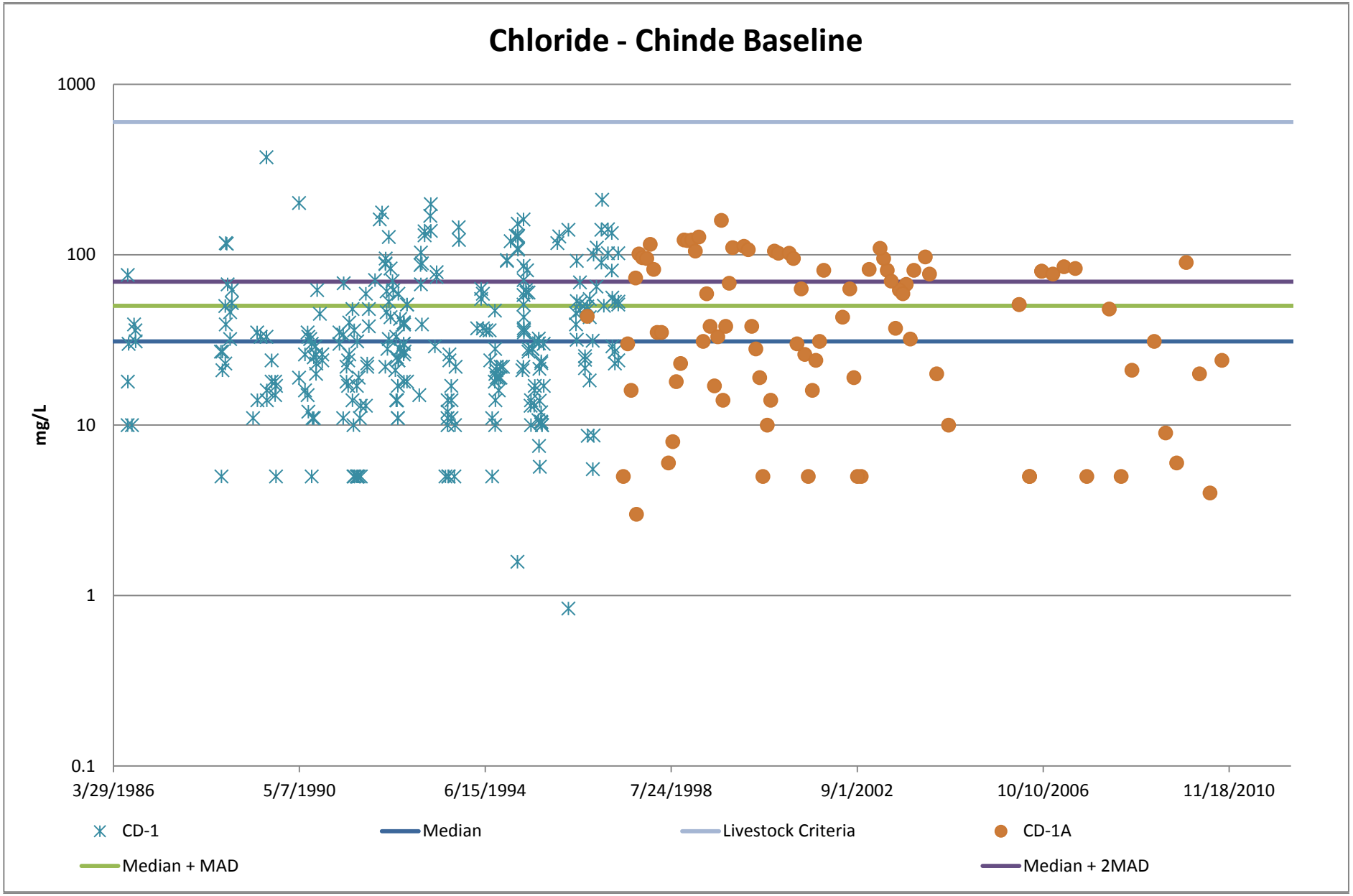

Aluminum - Chinde Baseline
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria

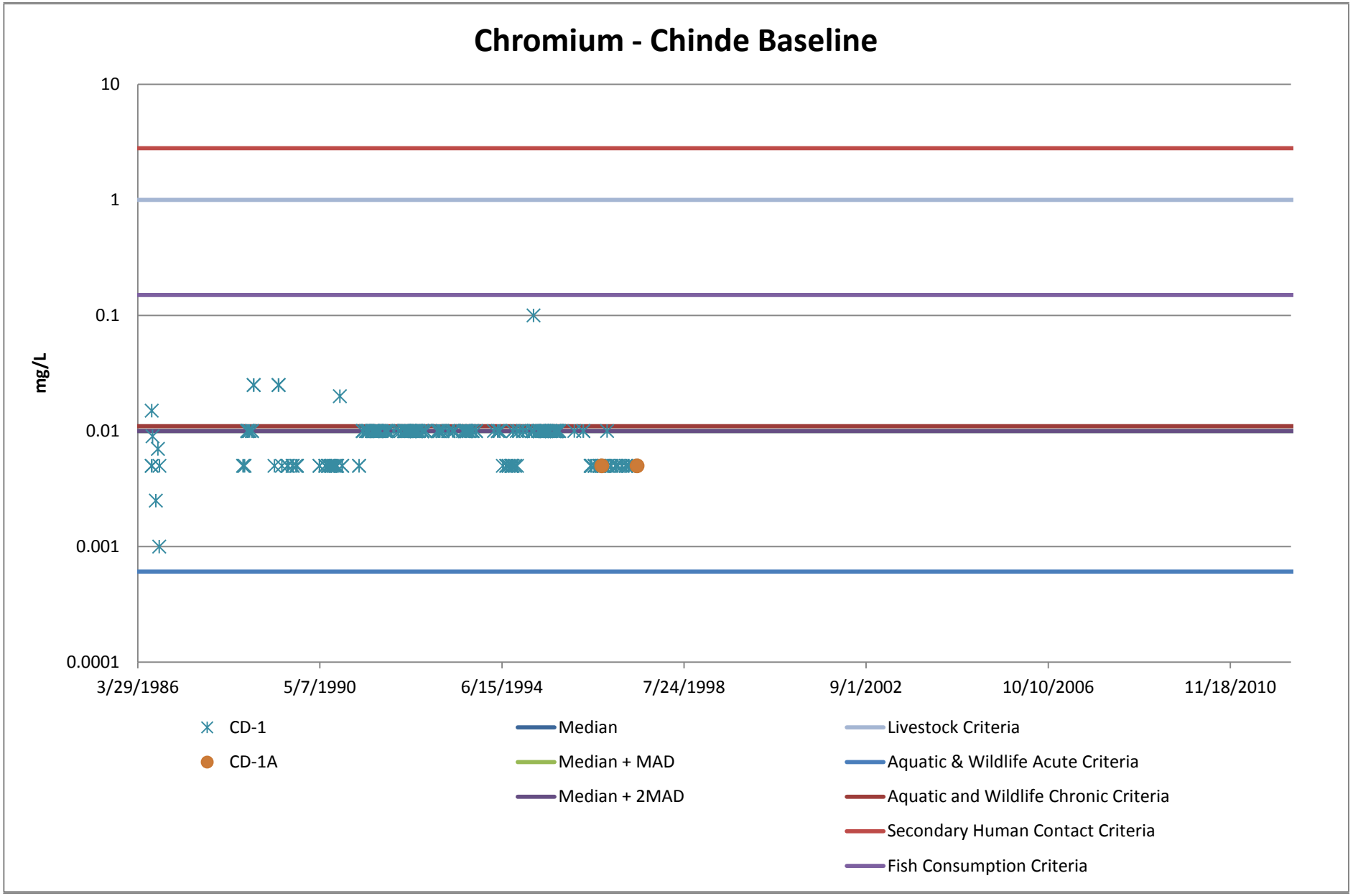

Arsenic - Chinde Baseline
mg/L
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria

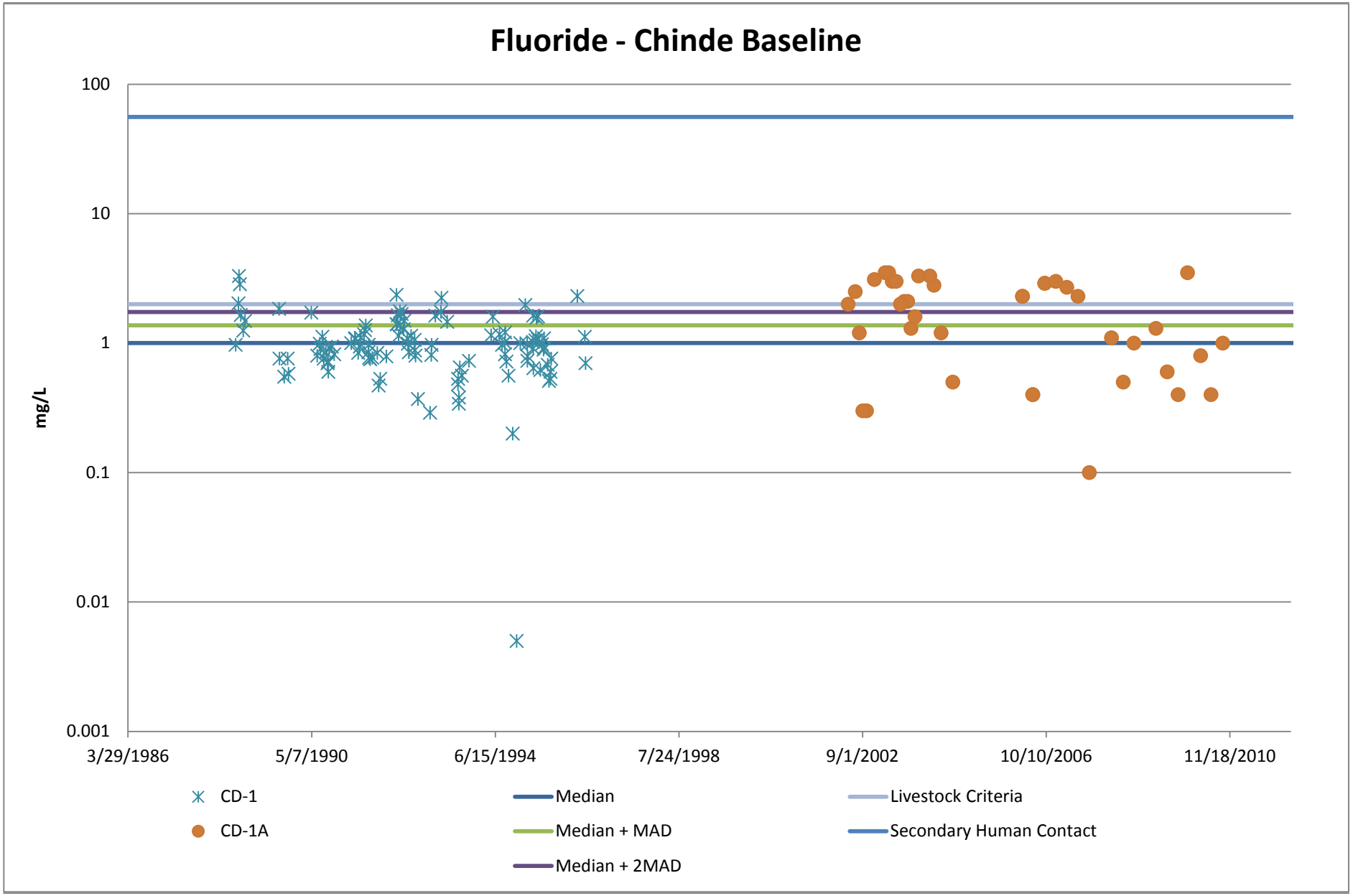

Barium - Chinde Baseline
mg/L
100
10
1
0.1
0.01
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Secondary Human Contact Criteria

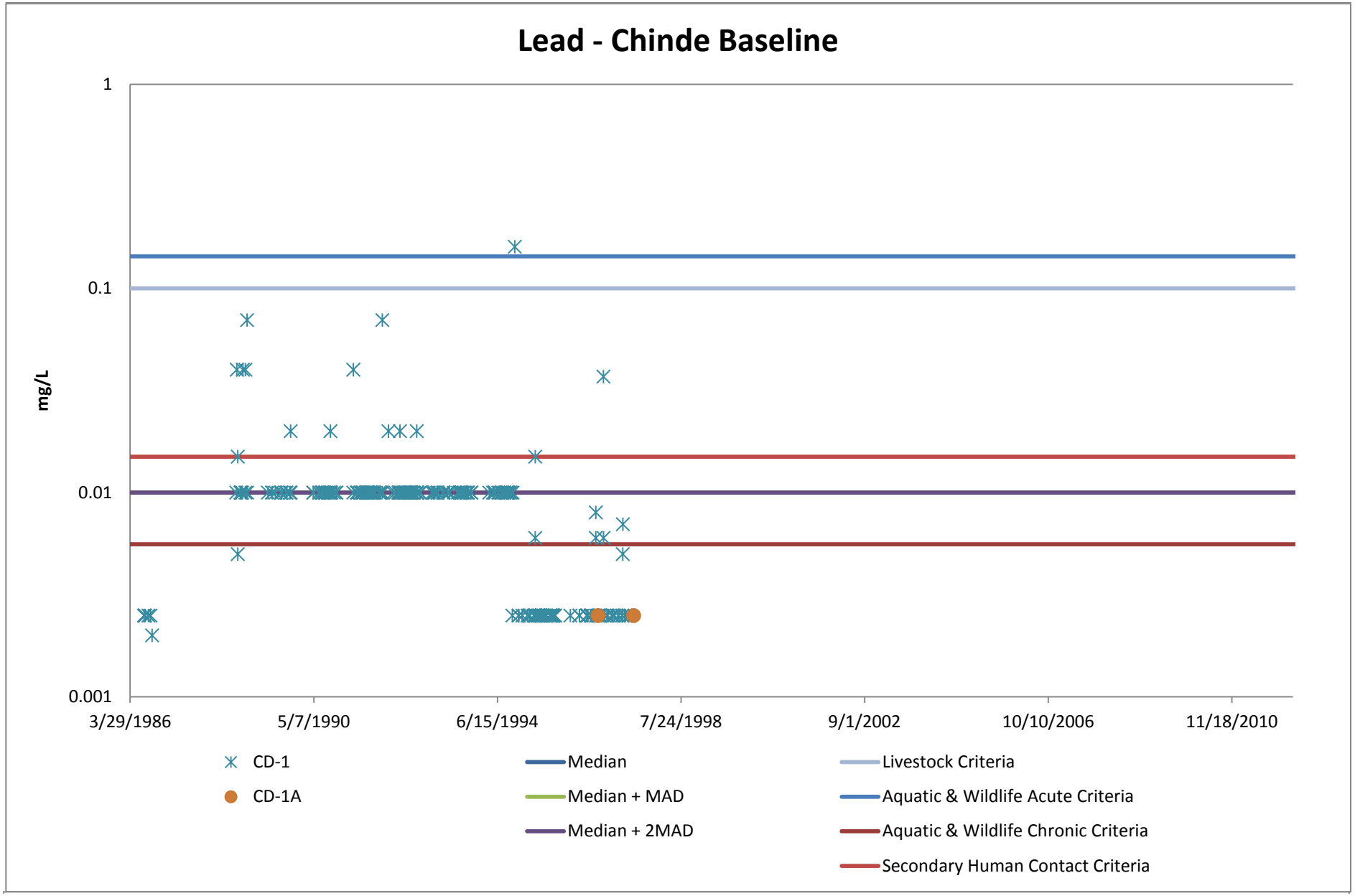

Boron - Chinde Baseline
mg/L
1000
100
10
1
0.1
0.01
0.001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
Median
Livestock Criteria
CD-1A
Median + MAD
Secondary Human Contact
Median + 2MAD

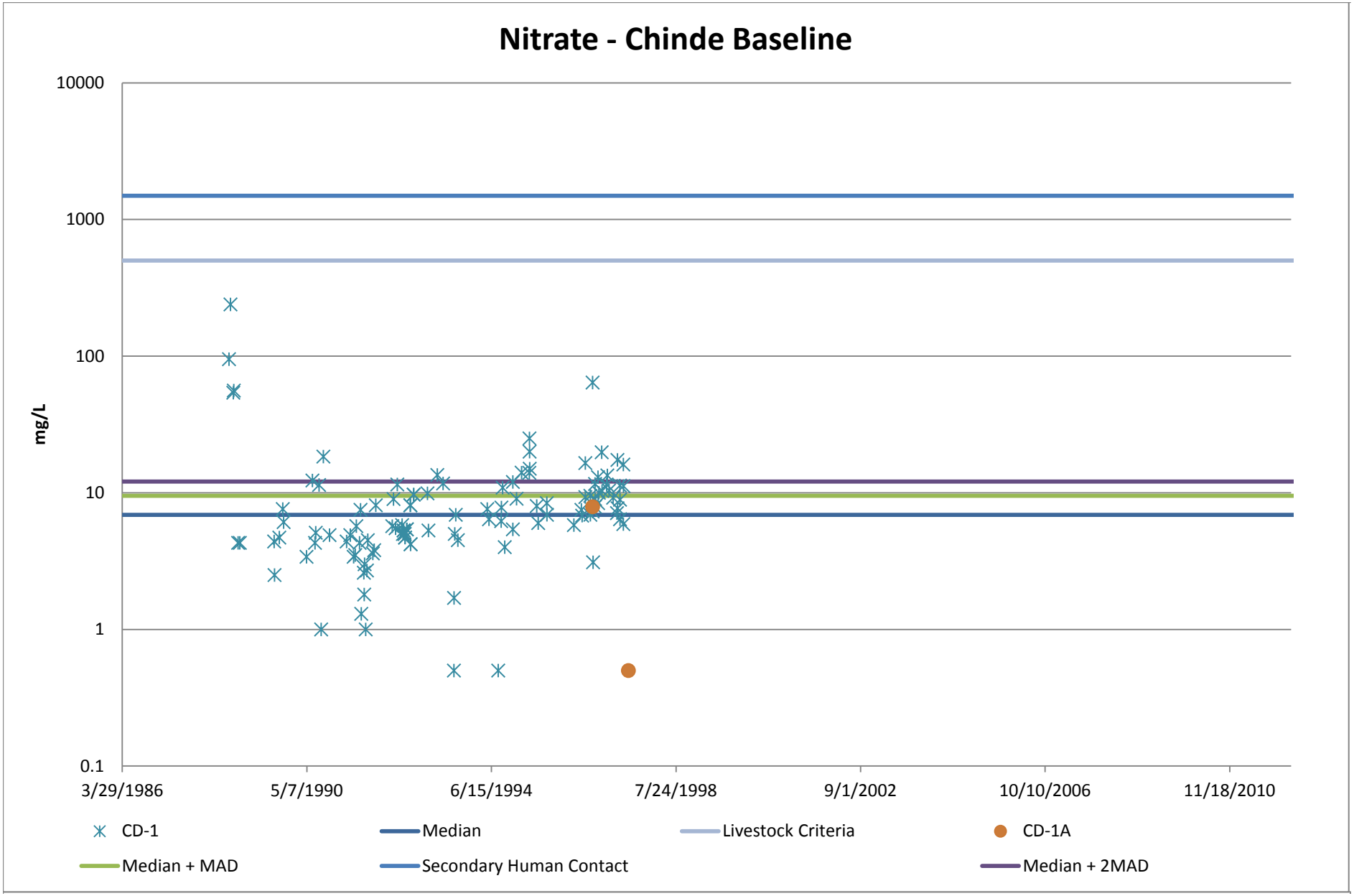

Cadmium - Chinde Baseline
mg/L
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

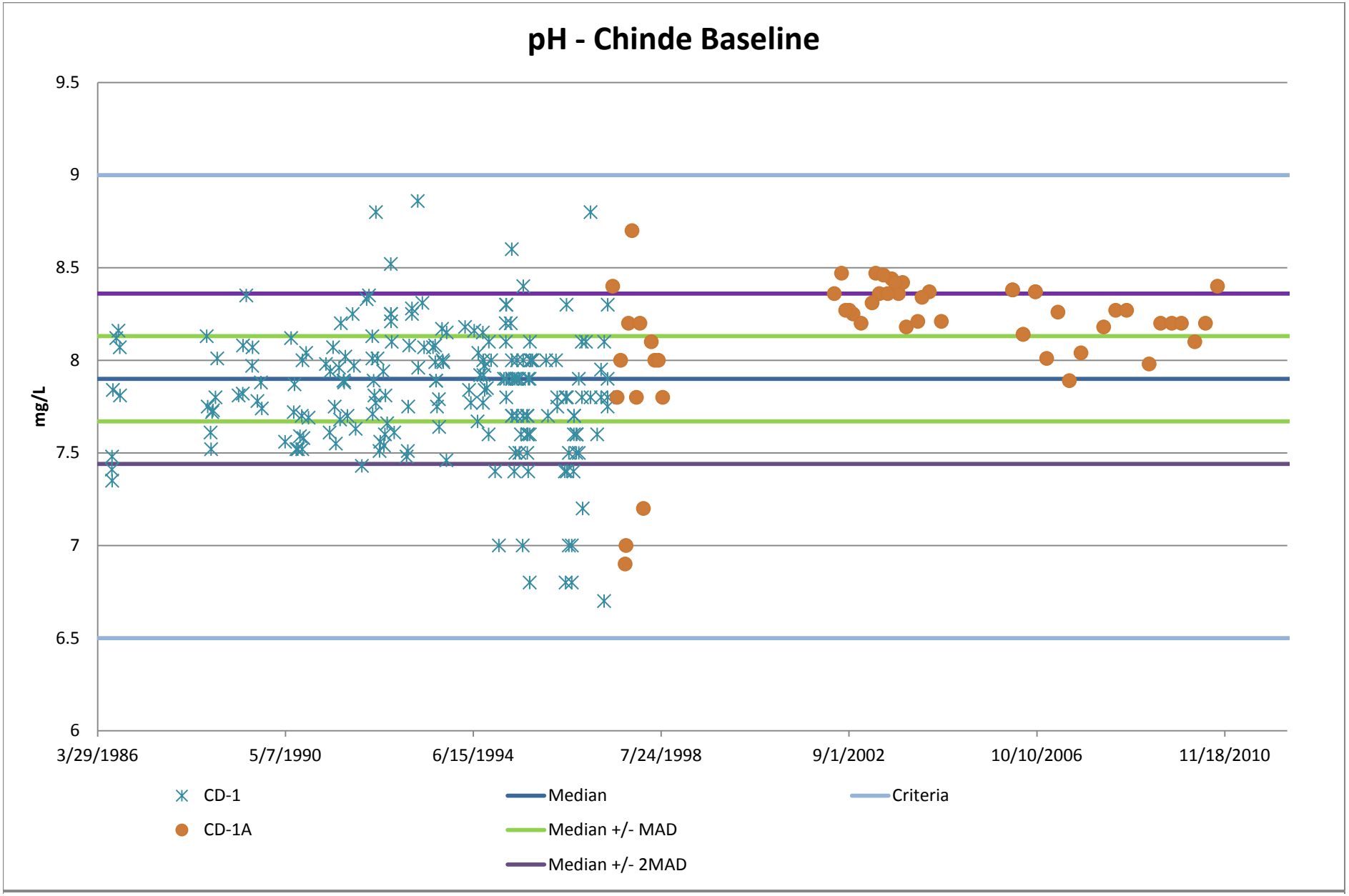

Chloride - Chinde Baseline
1000
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
Median
Livestock Criteria
CD-1A
Median + MAD
Median + 2MAD

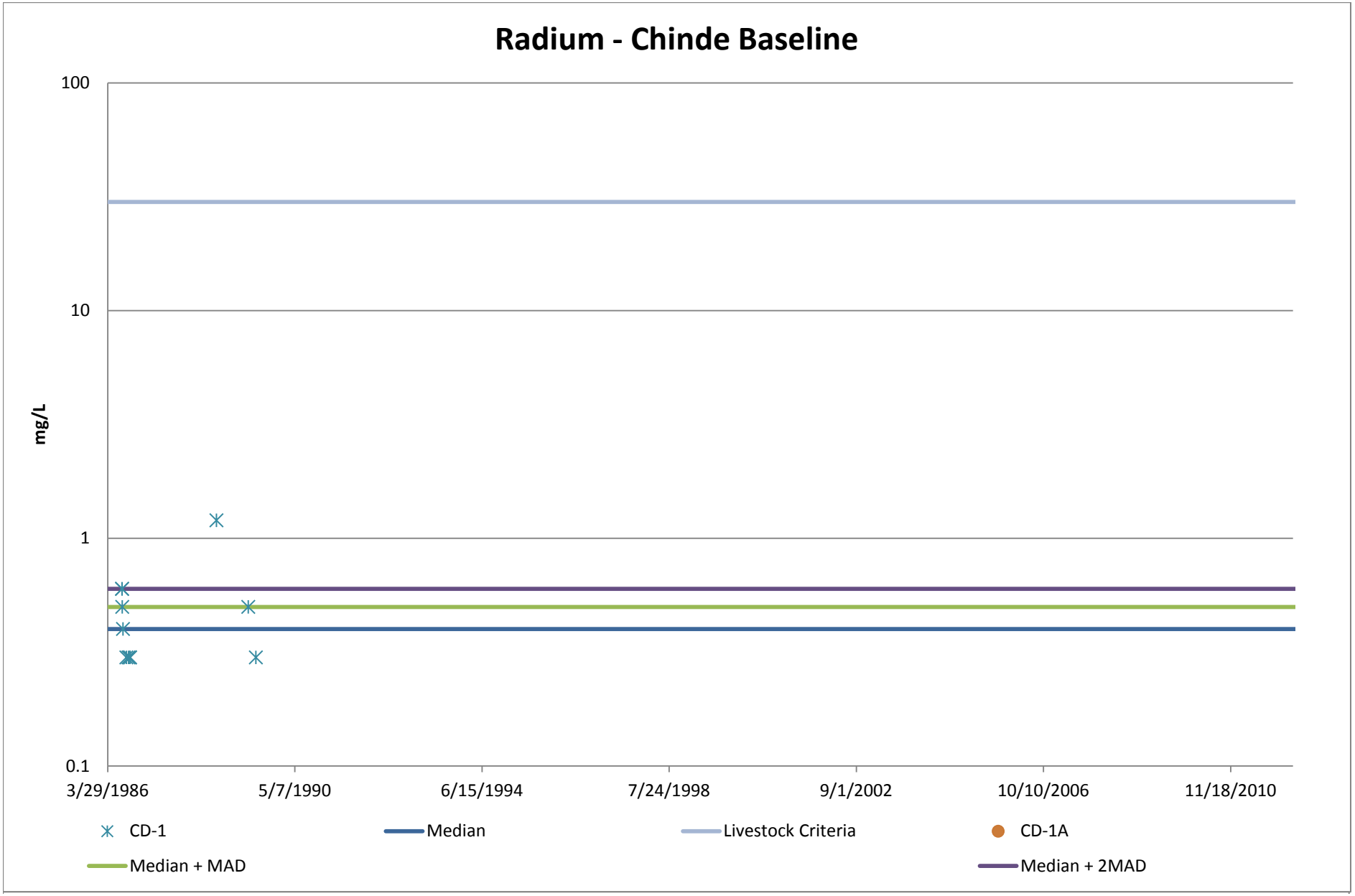

Chromium - Chinde Baseline
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

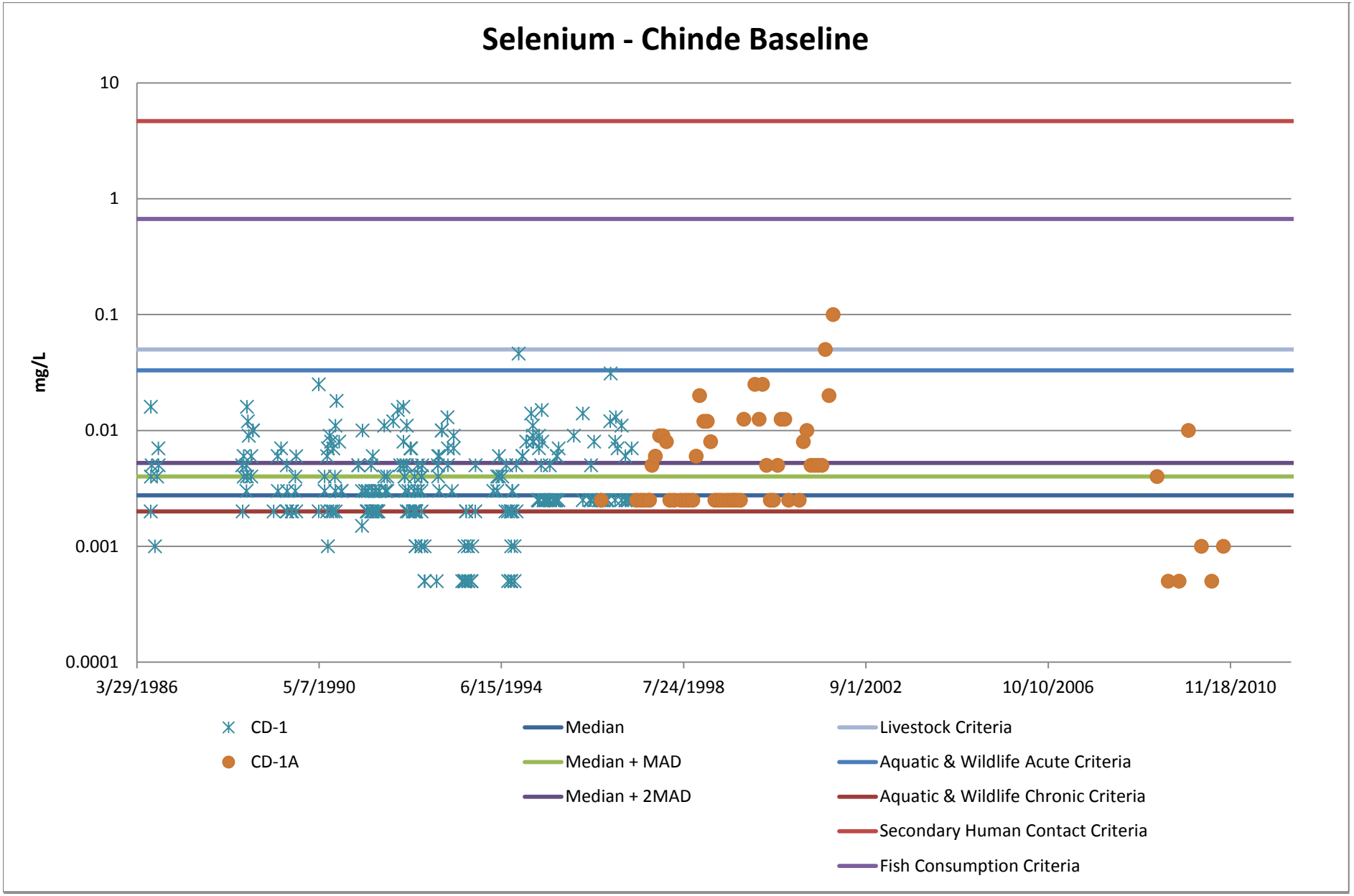

Fluoride - Chinde Baseline
100
10
1
0.1
0.01
0.001
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Secondary Human Contact

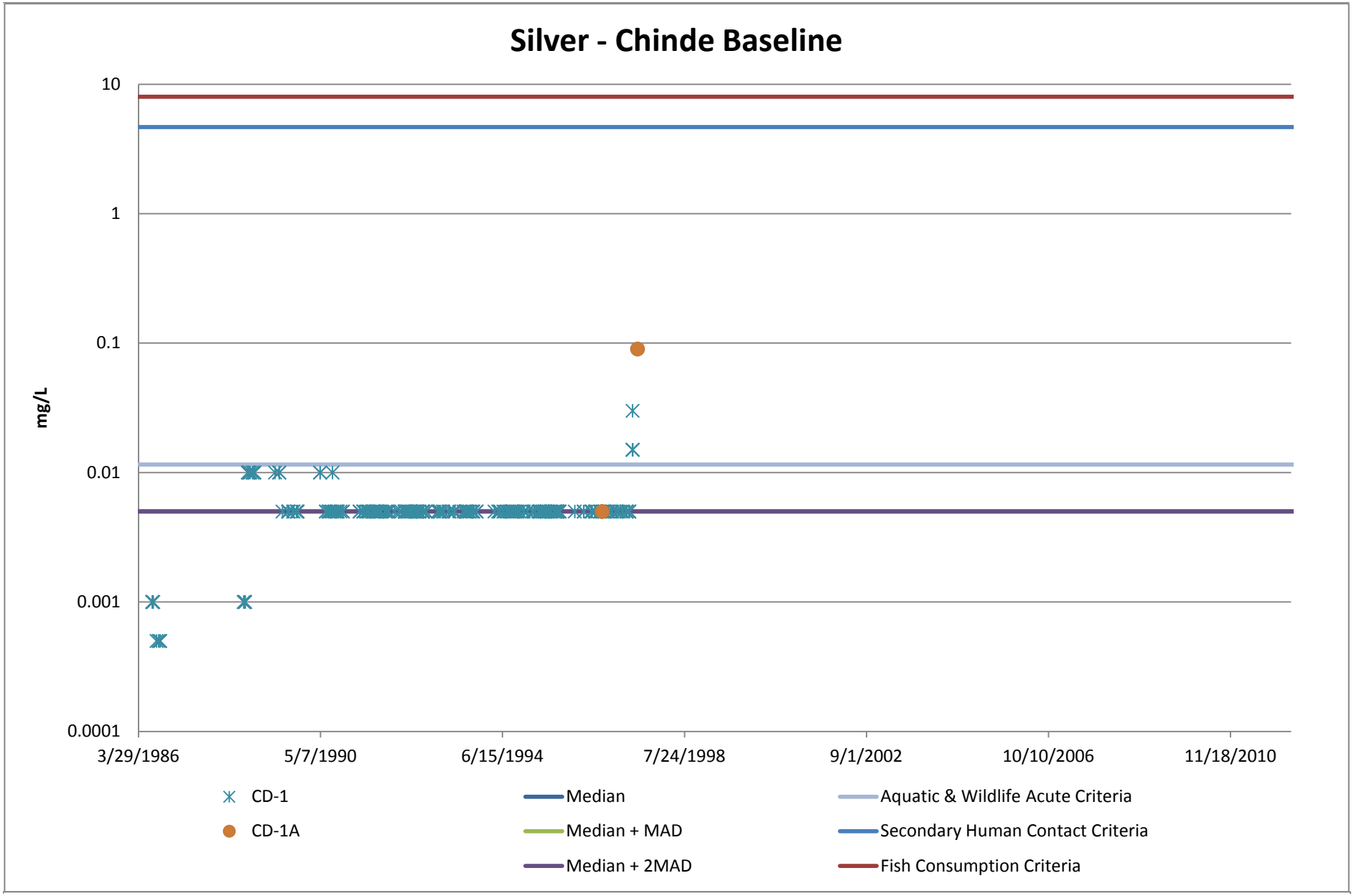

Lead - Chinde Baseline
mg/L
1
0.1
0.01
0.001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

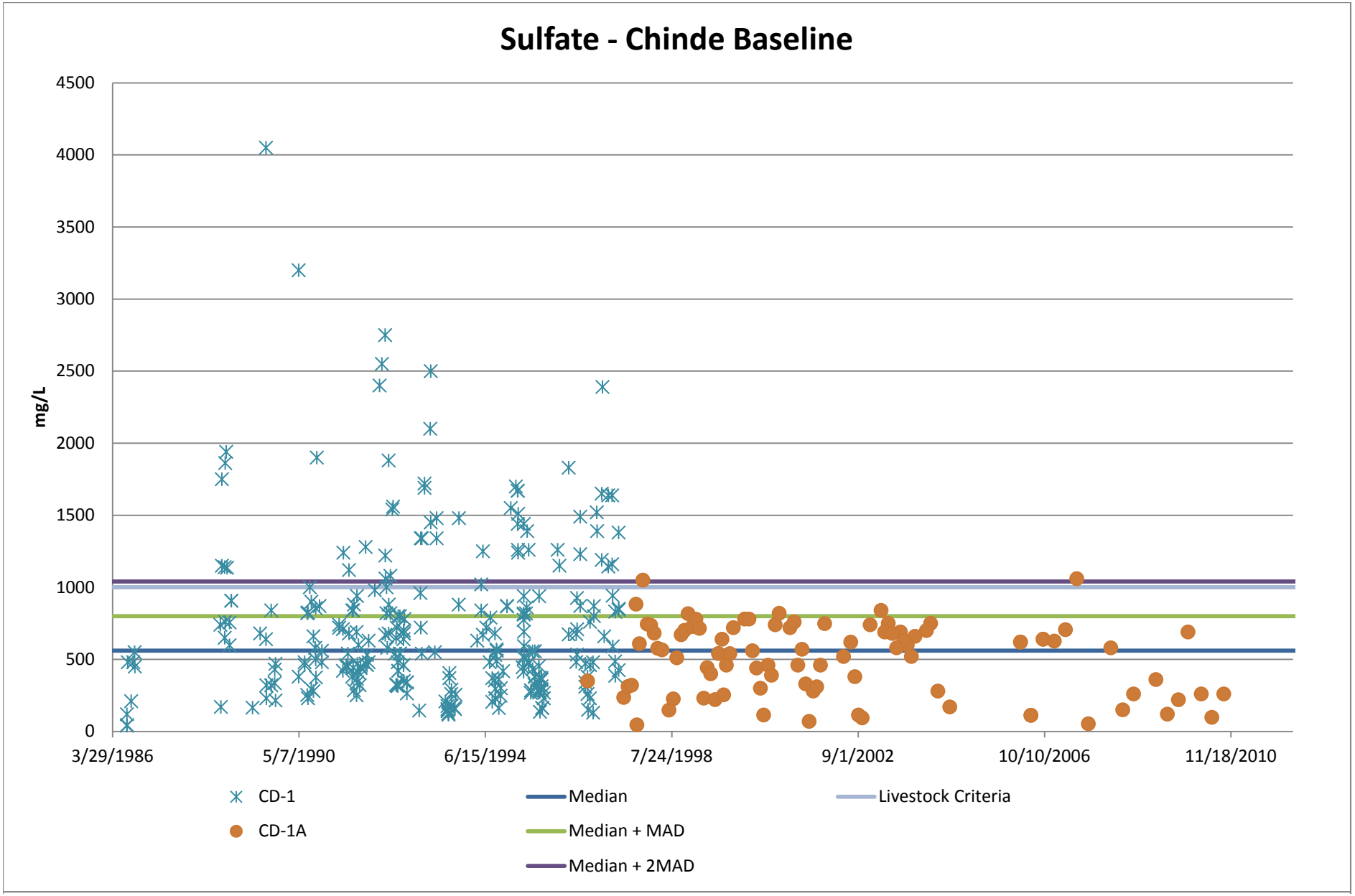

Nitrate - Chinde Baseline
10000
1000
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
Median
Livestock Criteria
CD-1A
Median + MAD
Secondary Human Contact
Median + 2MAD

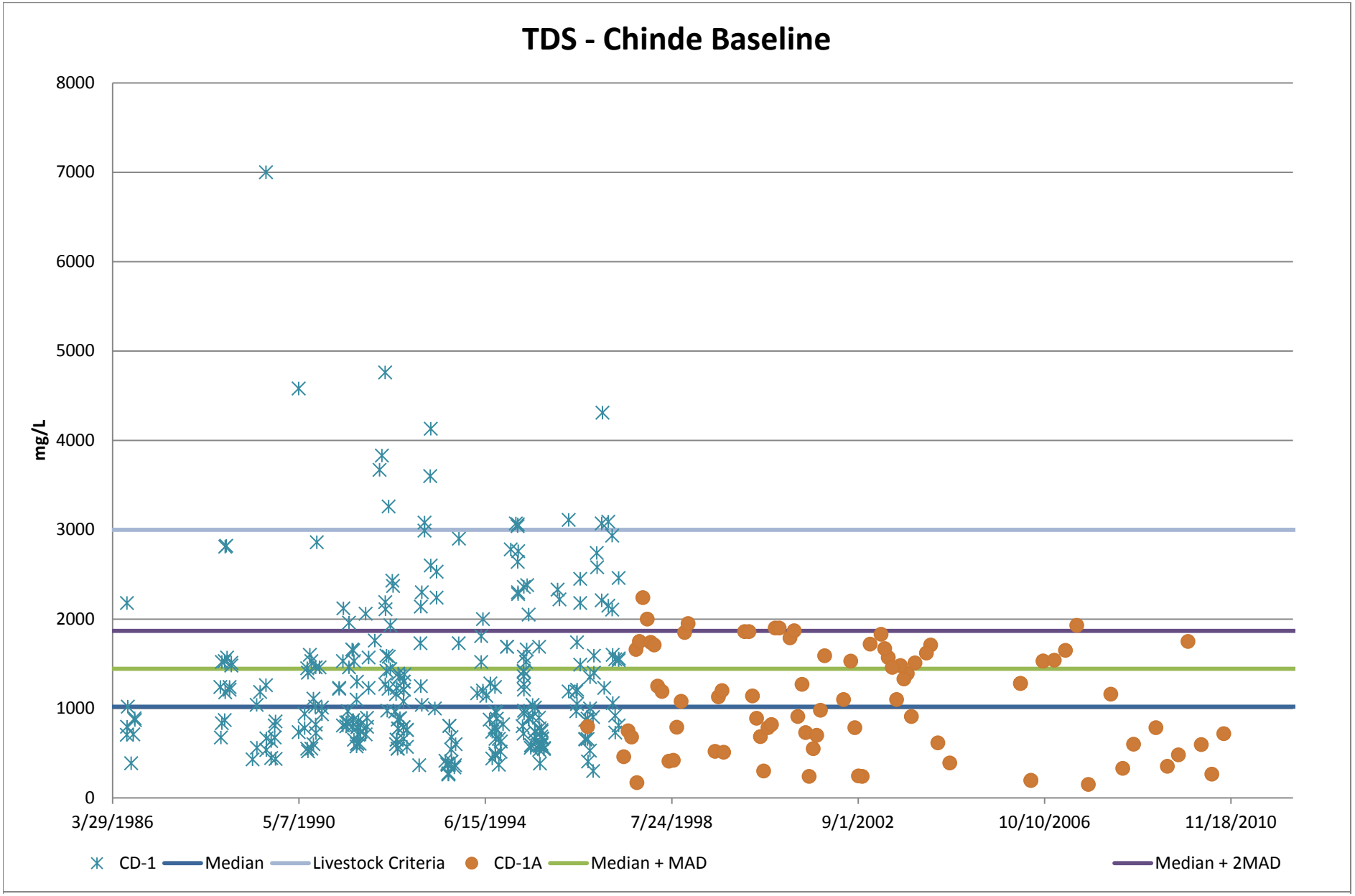

pH - Chinde Baseline
9.5
9
8.5
8
7.5
7
6.5
6
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median +/- MAD
Median +/- 2MAD
Criteria

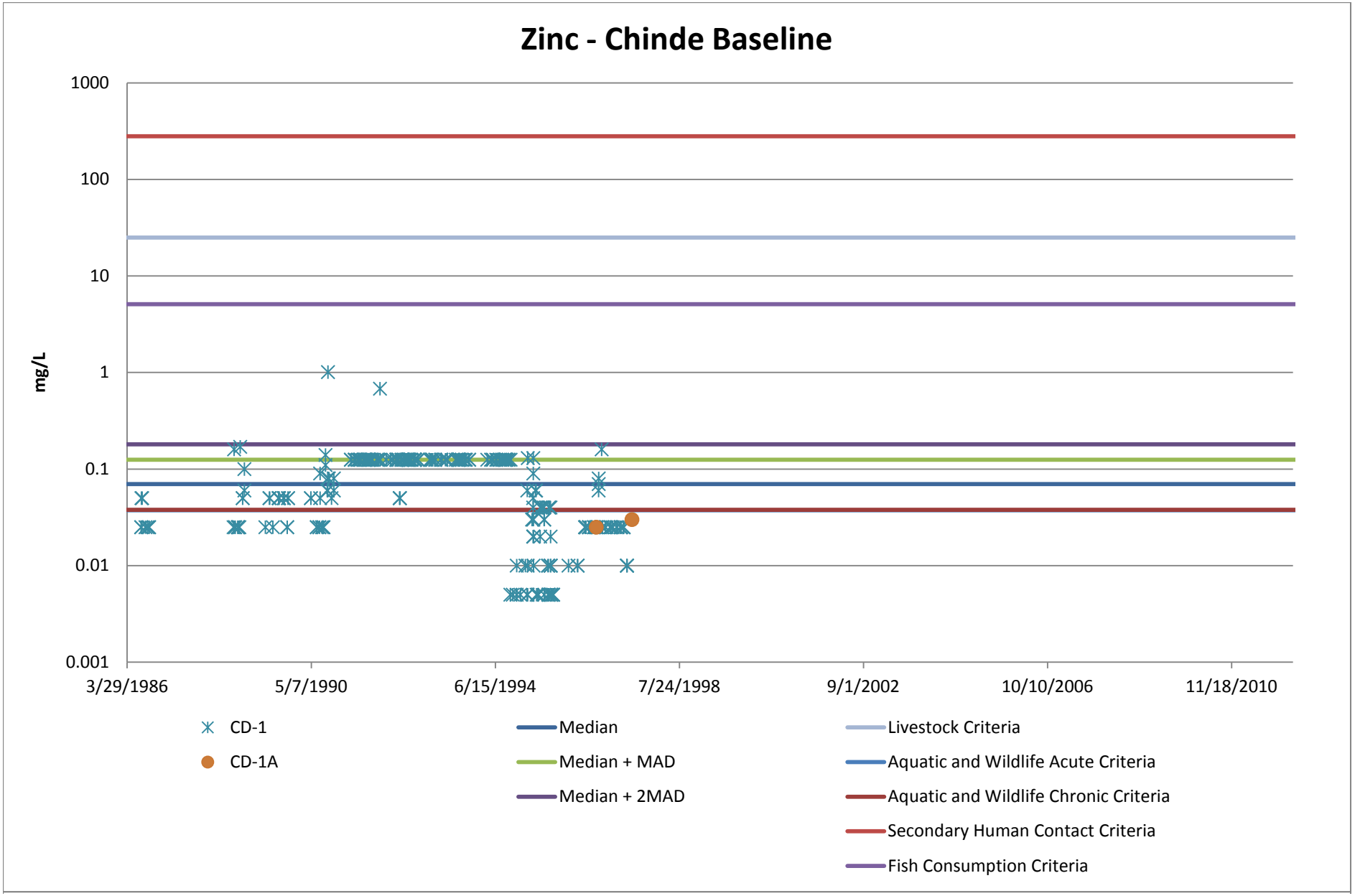

Radium - Chinde Baseline
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
Median
Livestock Criteria
CD-1A
Median + MAD
Median + 2MAD

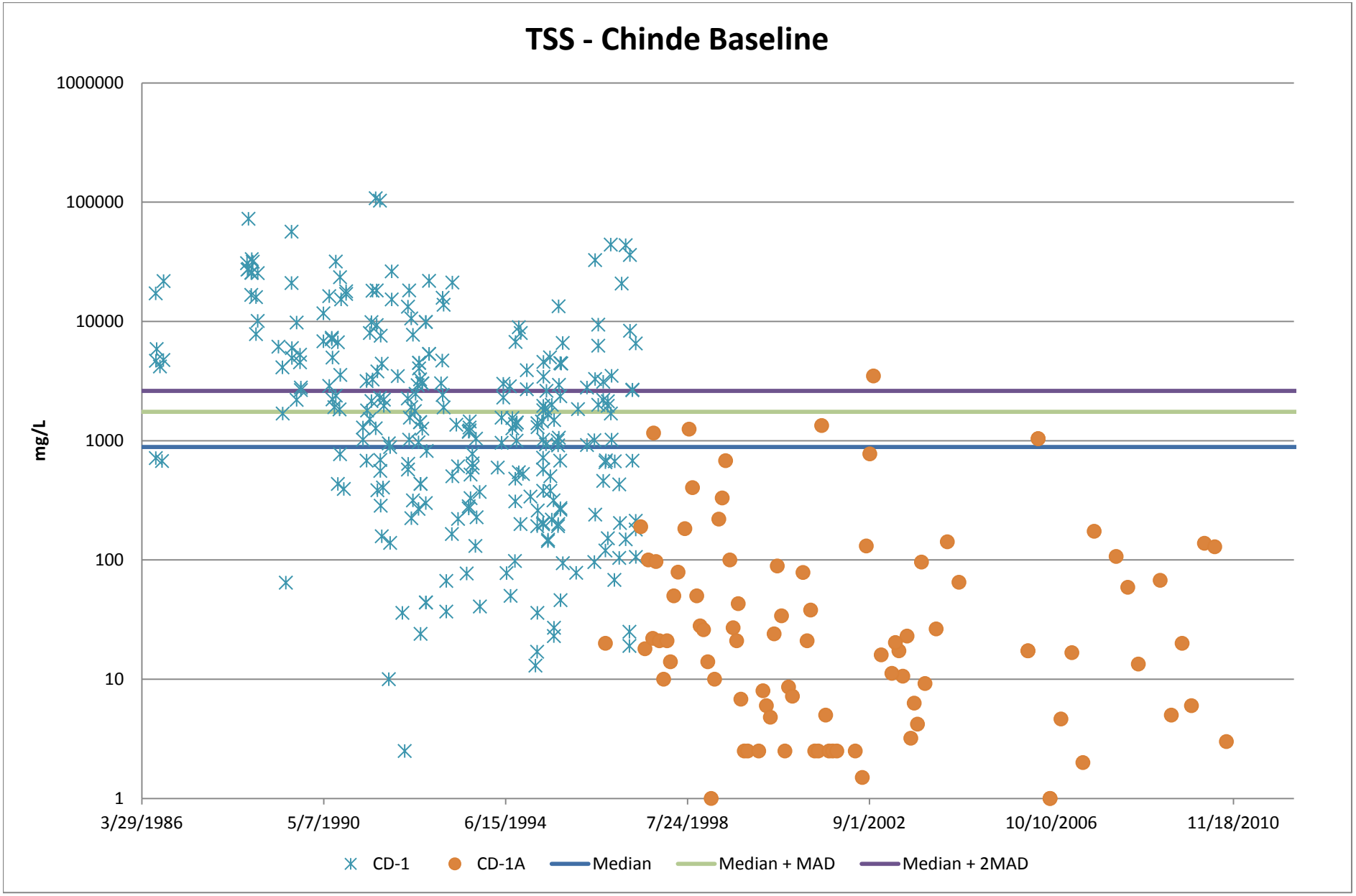

Selenium - Chinde Baseline
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

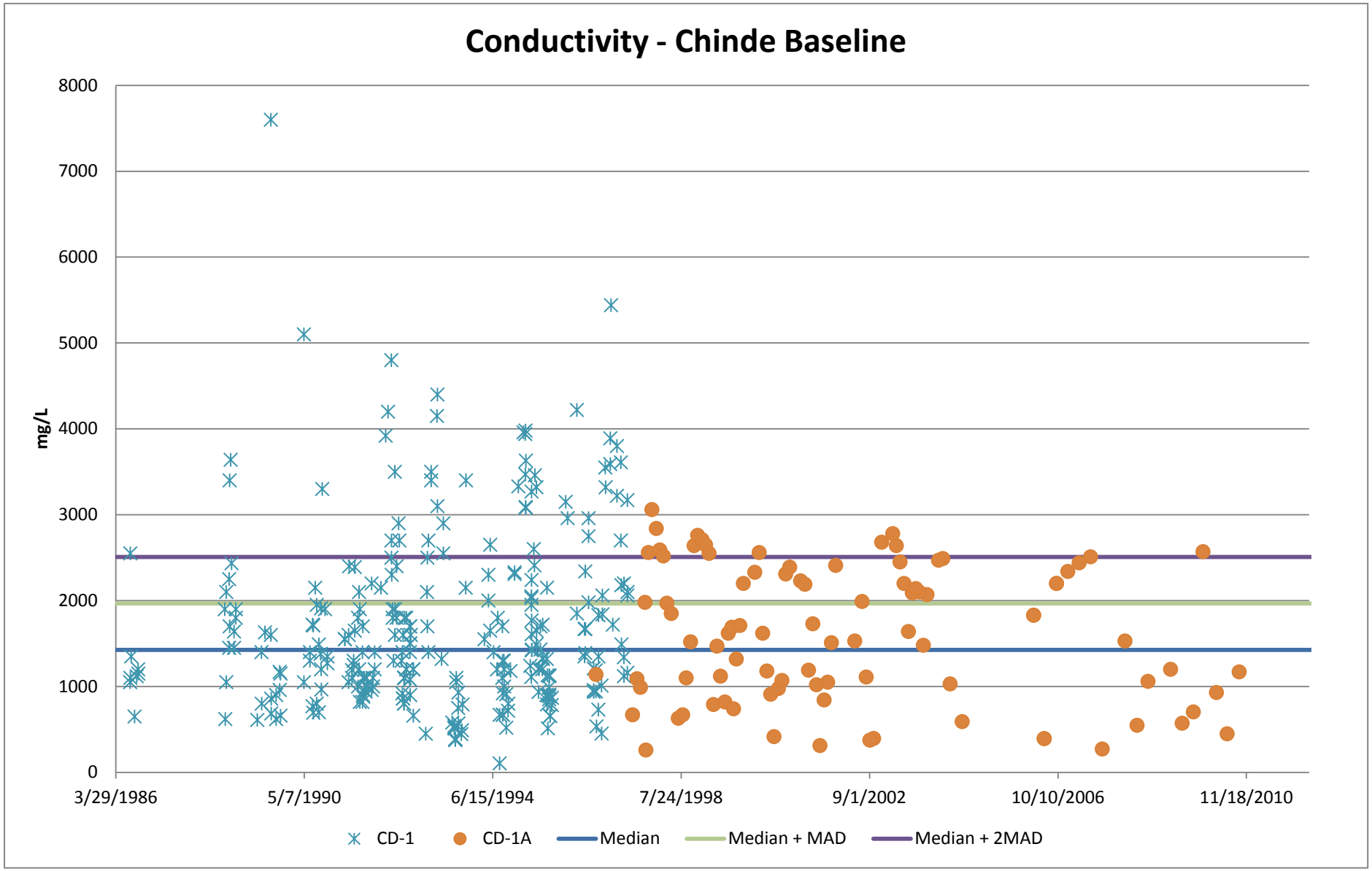

Silver - Chinde Baseline
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

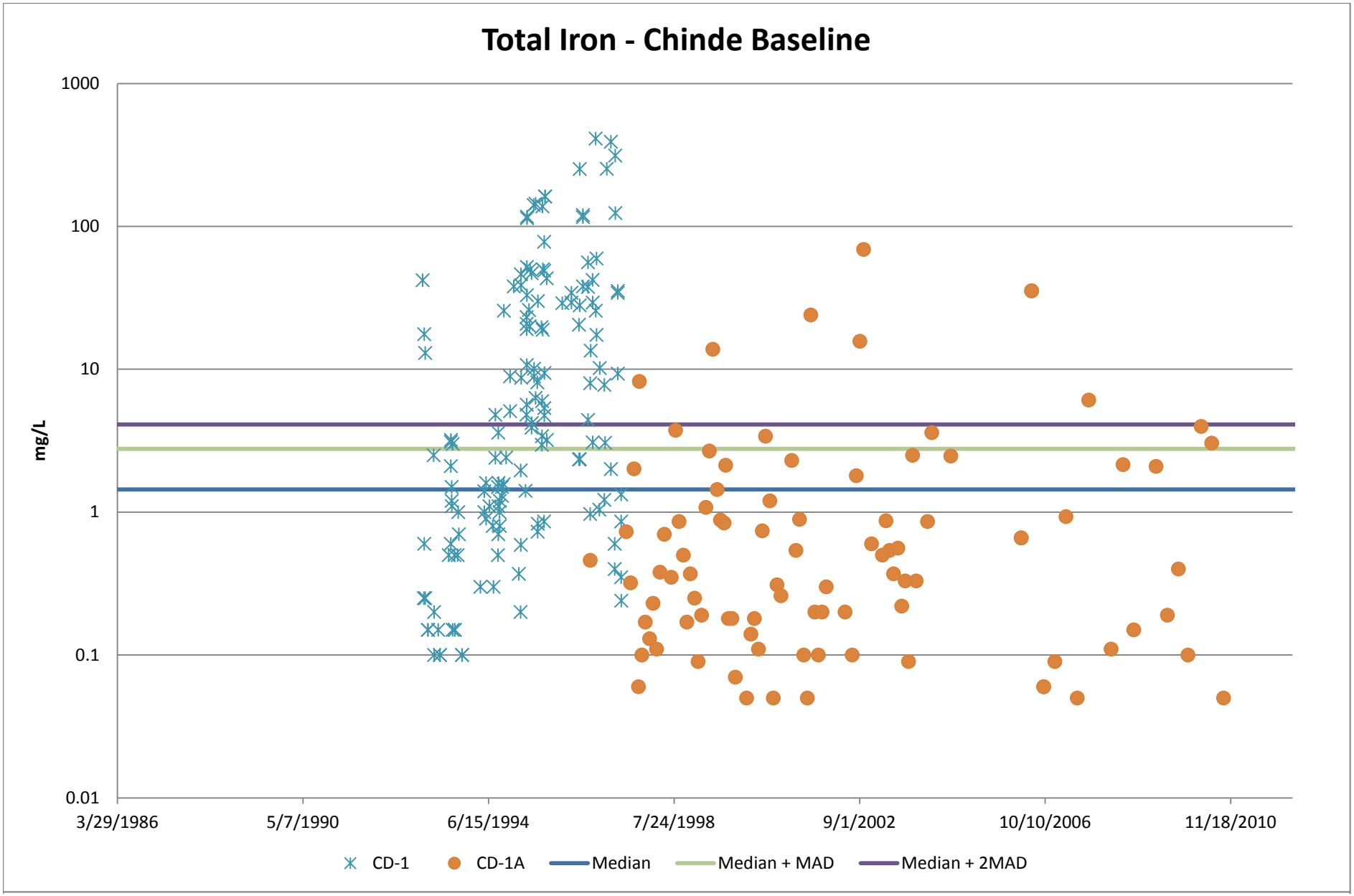

Sulfate - Chinde Baseline
mg/L
4500
4000
3500
3000
2500
2000
1500
1000
500
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria

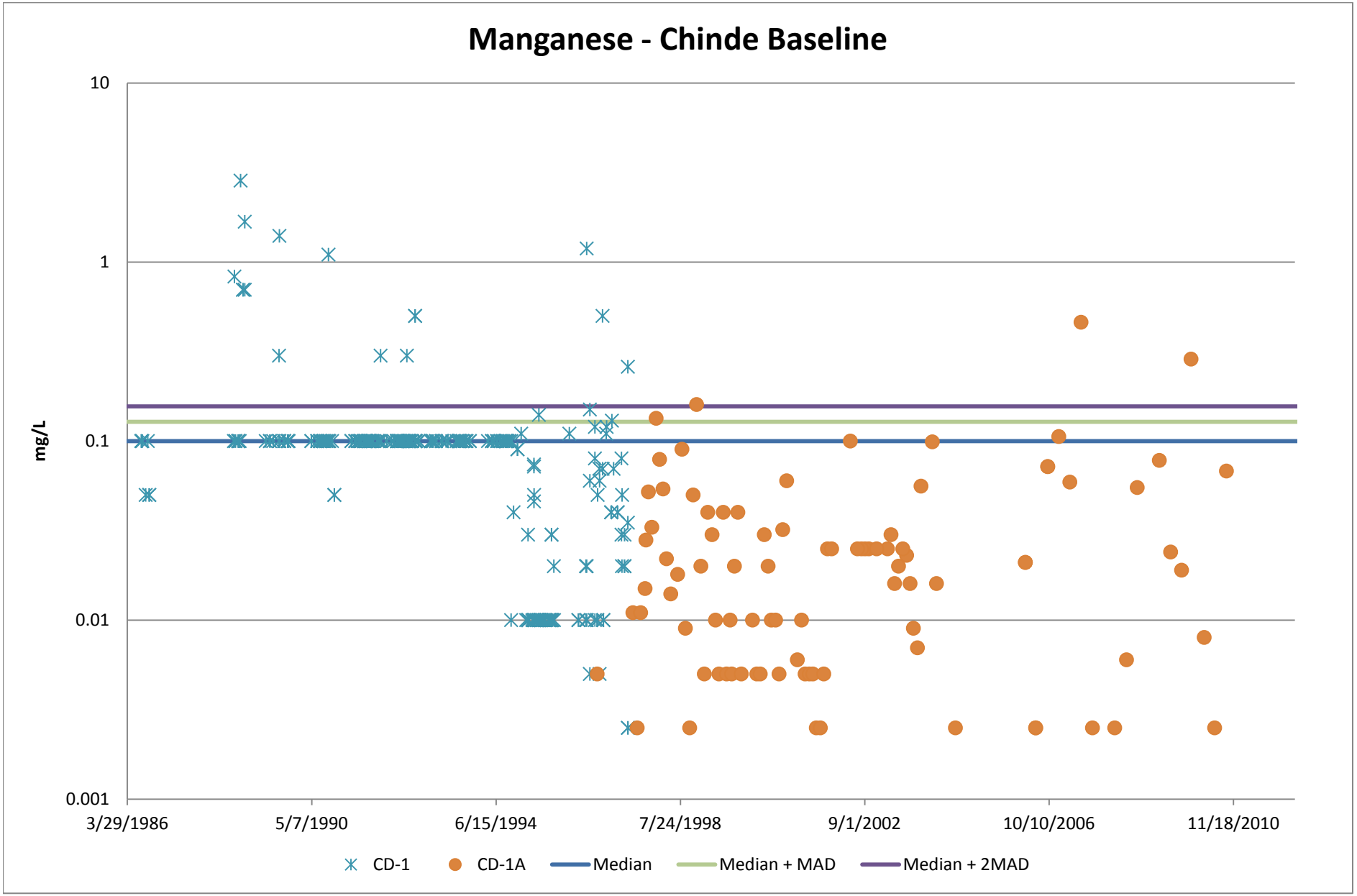

TDS - Chinde Baseline
mg/L
8000
7000
6000
5000
4000
3000
2000
1000
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
Median
Livestock Criteria
CD-1A
Median + MAD
Median + 2MAD

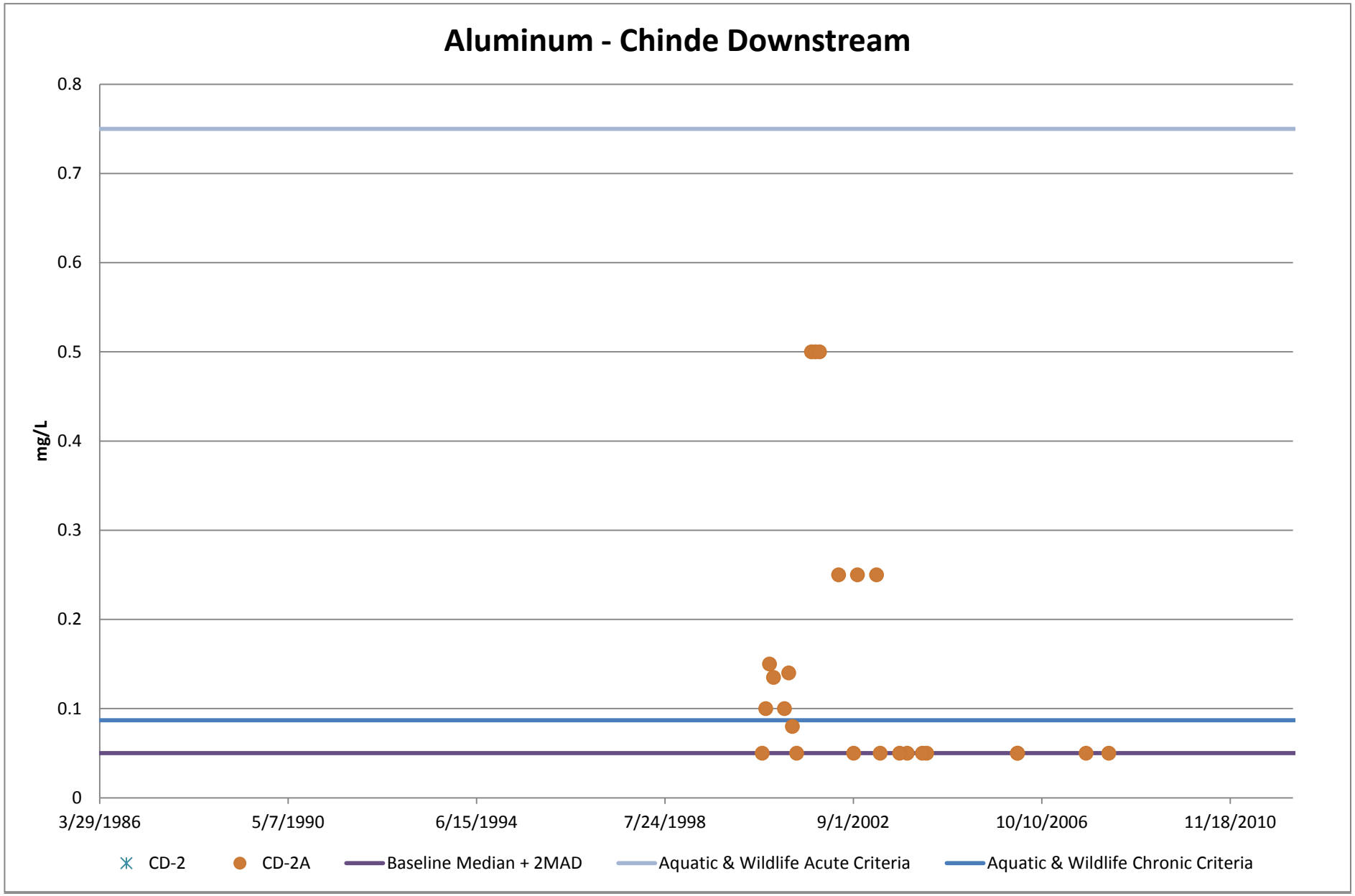

Zinc - Chinde Baseline
mg/L
1000
100
10
1
0.1
0.01
0.001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

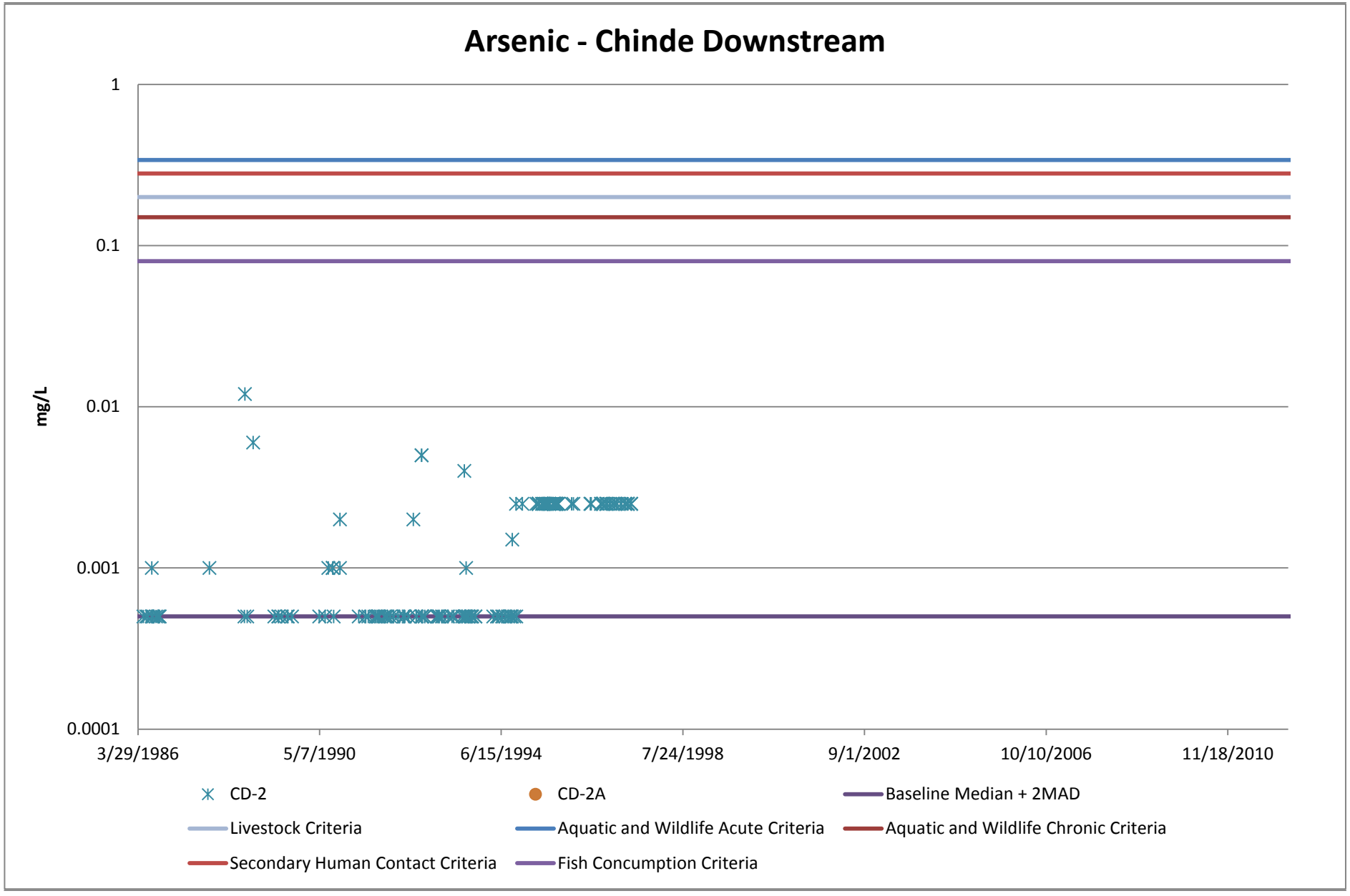

TSS - Chinde Baseline
1000000
100000
10000
1000
100
10
1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD

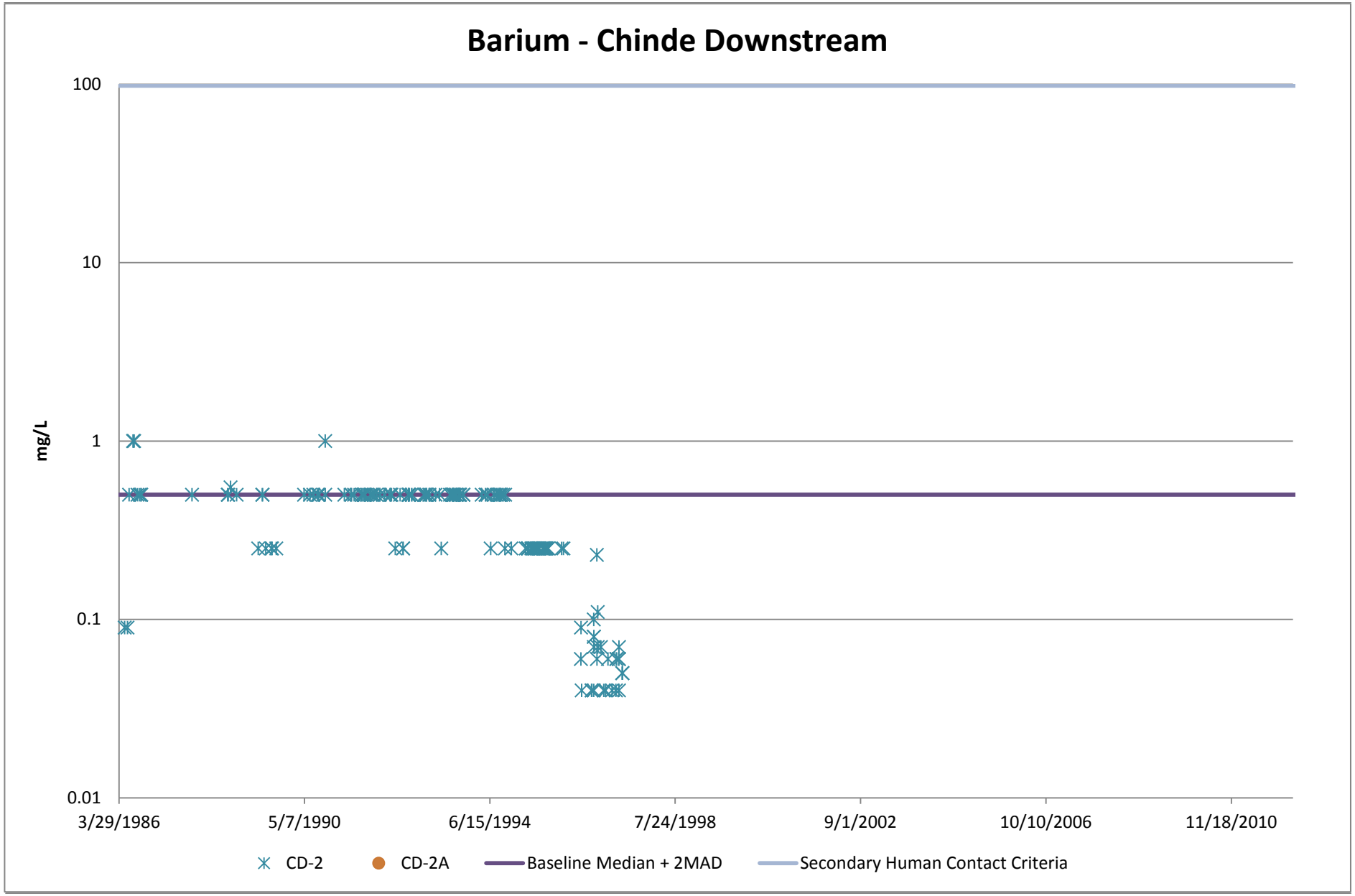

Conductivity - Chinde Baseline
mg/L
8000
7000
6000
5000
4000
3000
2000
1000
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD

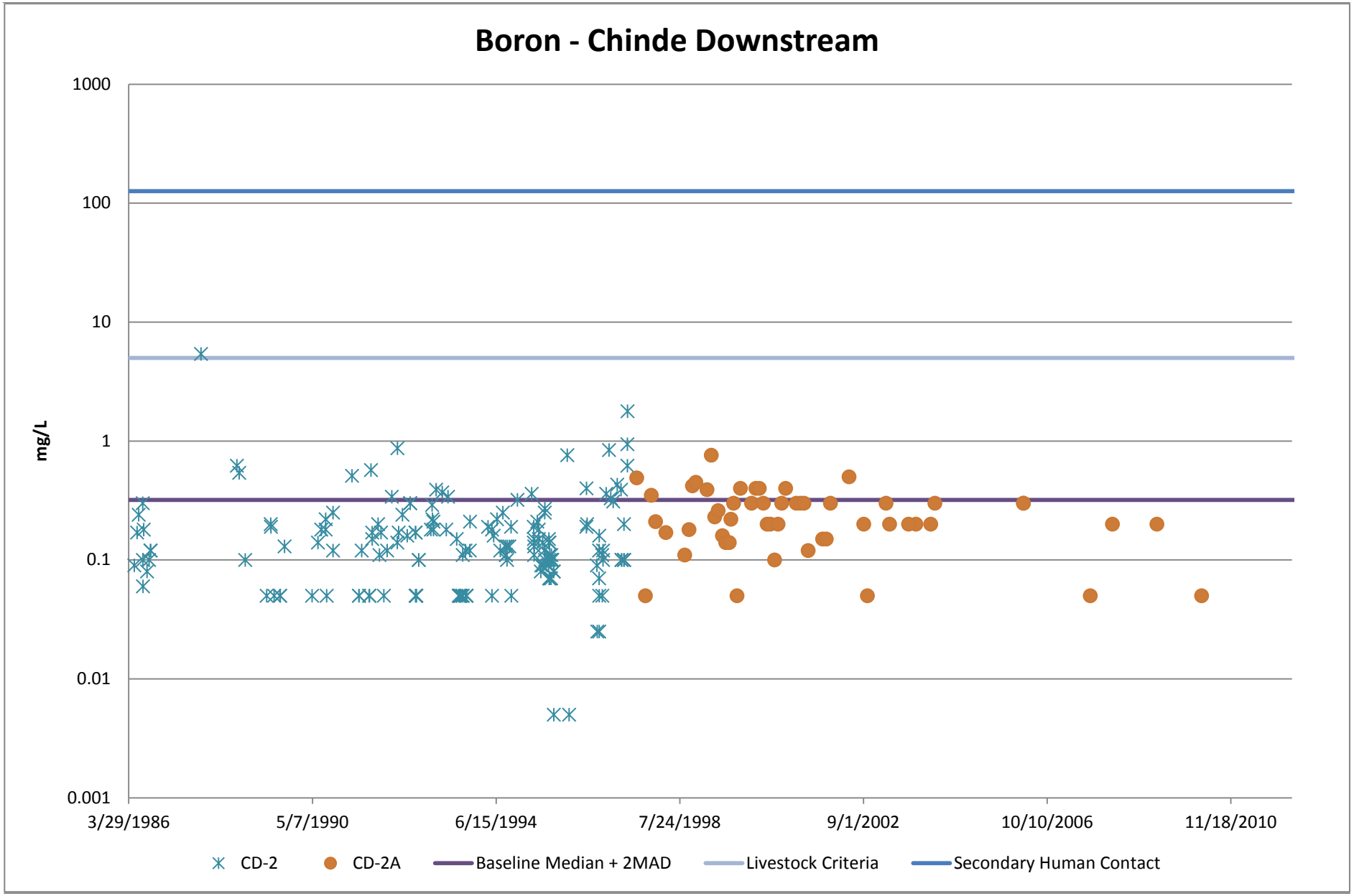

Total Iron - Chinde Baseline
1000
100
10
1
0.1
0.01
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD

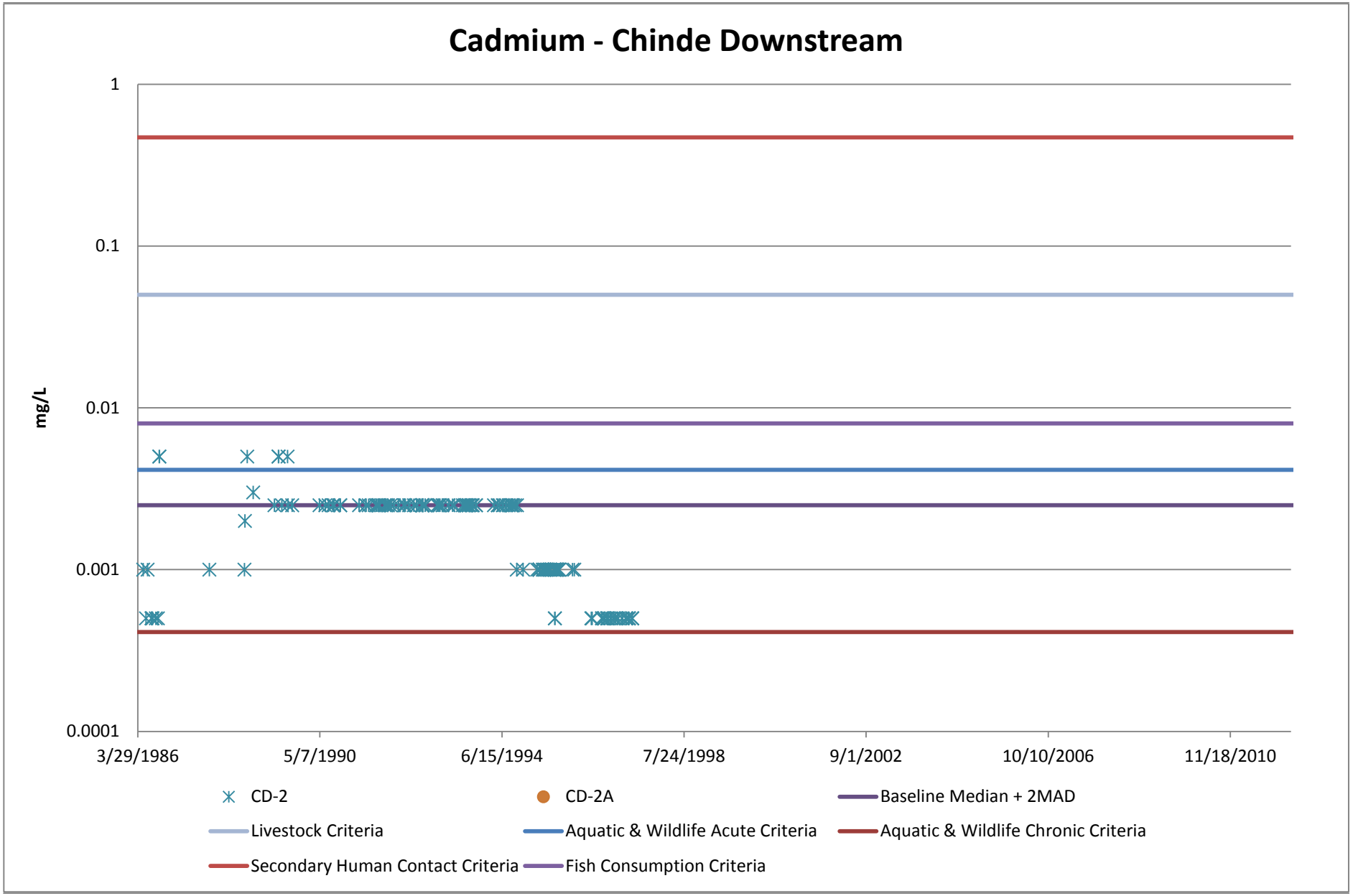

Manganese - Chinde Baseline
10
1
0.1
0.01
0.001
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-1
CD-1A
Median
Median + MAD
Median + 2MAD

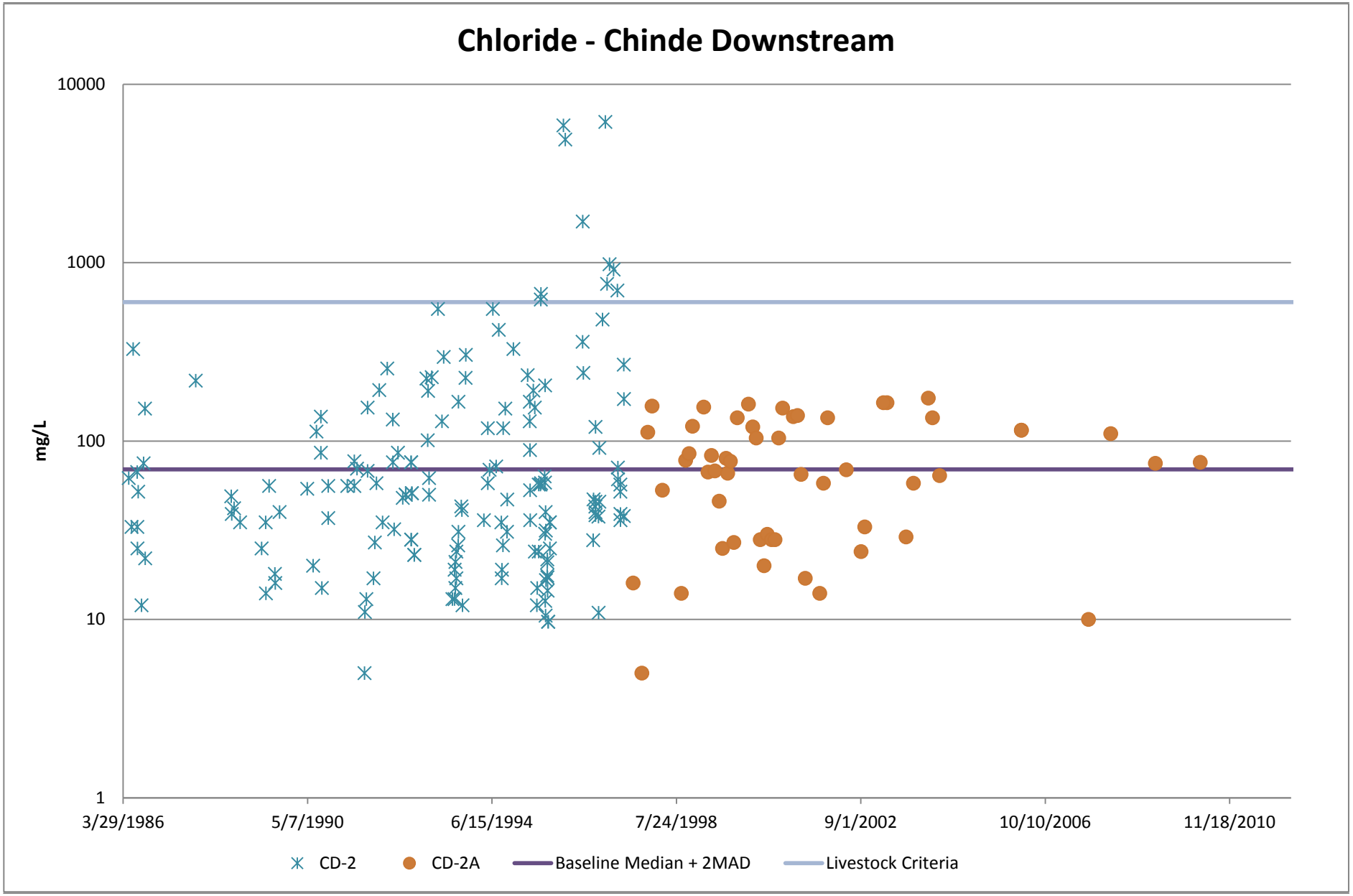

Aluminum - Chinde Downstream
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria

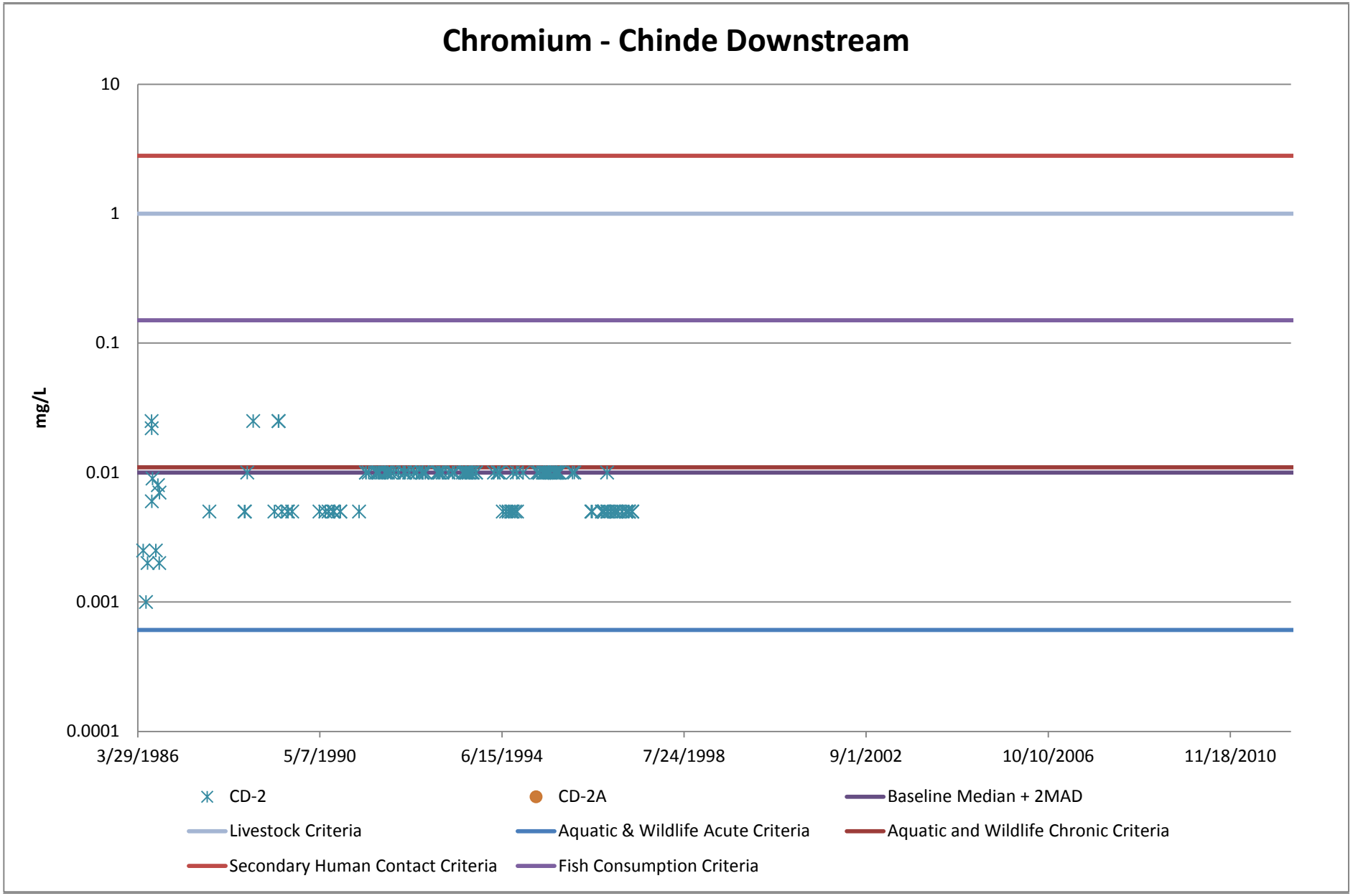

Arsenic - Chinde Downstream
mg/L
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria

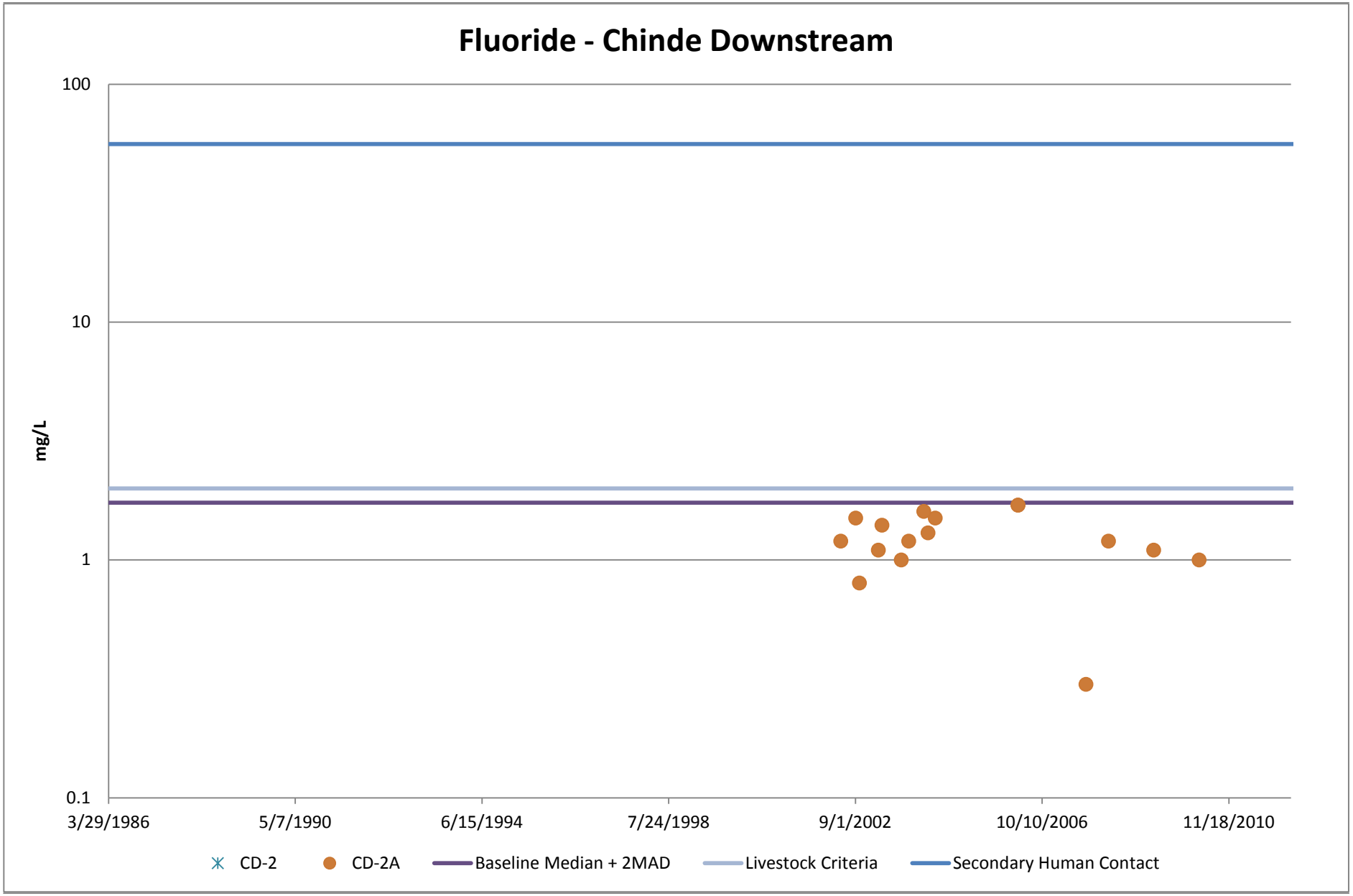

Barium - Chinde Downstream
mg/L
100
10
1
0.1
0.01
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Secondary Human Contact Criteria

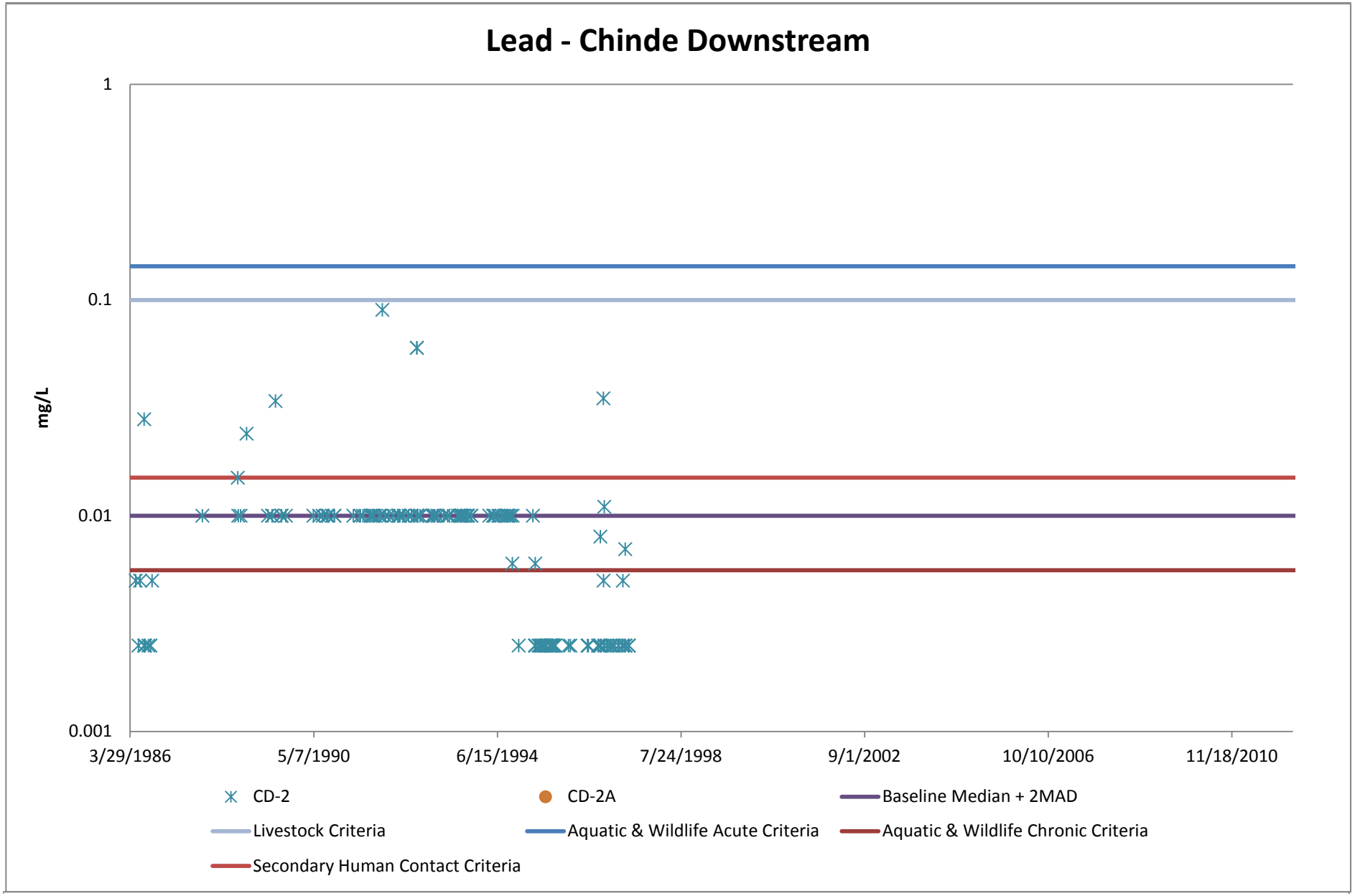

Boron - Chinde Downstream
1000
100
10
1
0.1
0.01
0.001
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Secondary Human Contact

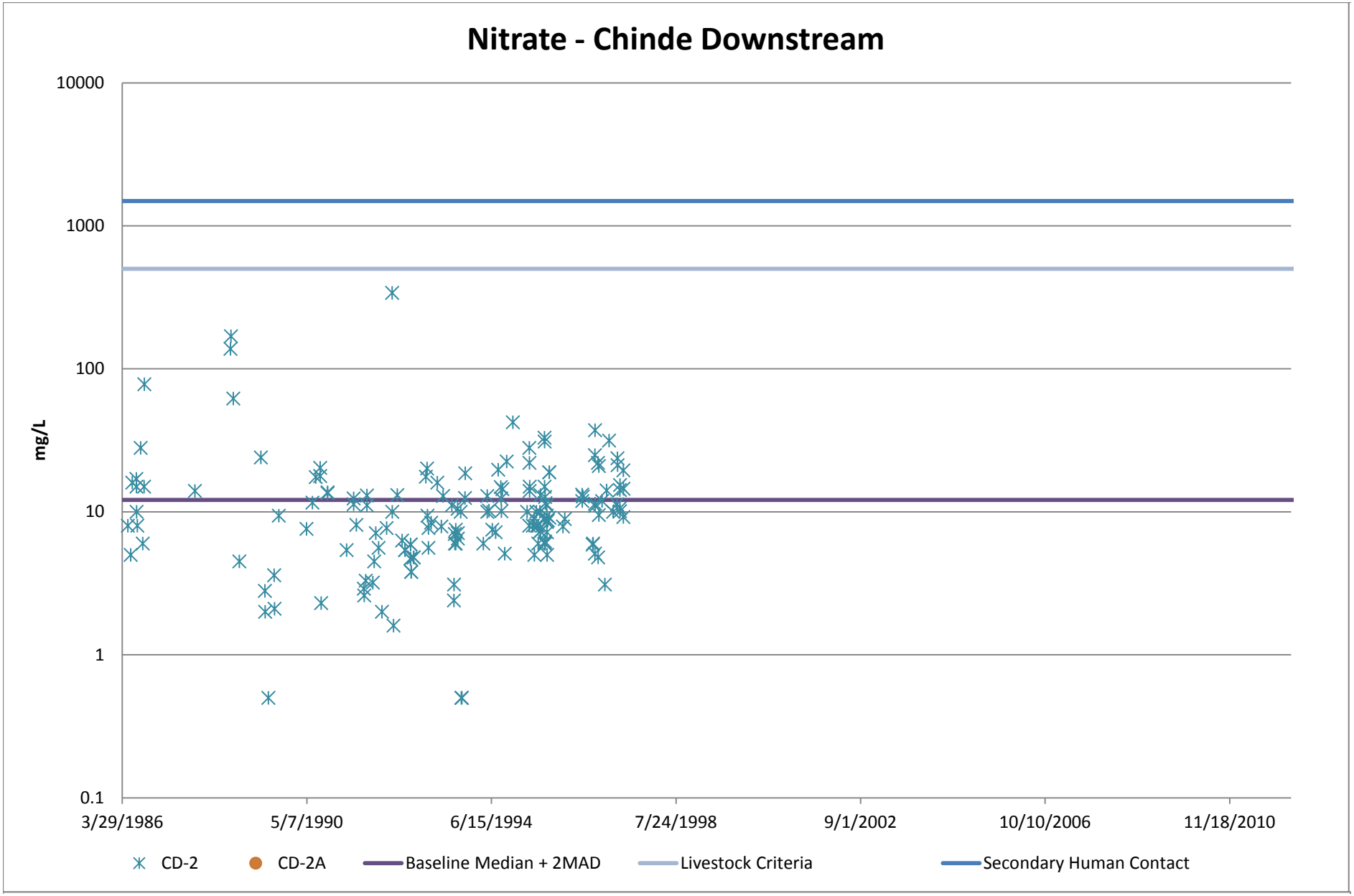

Cadmium - Chinde Downstream
mg/L
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

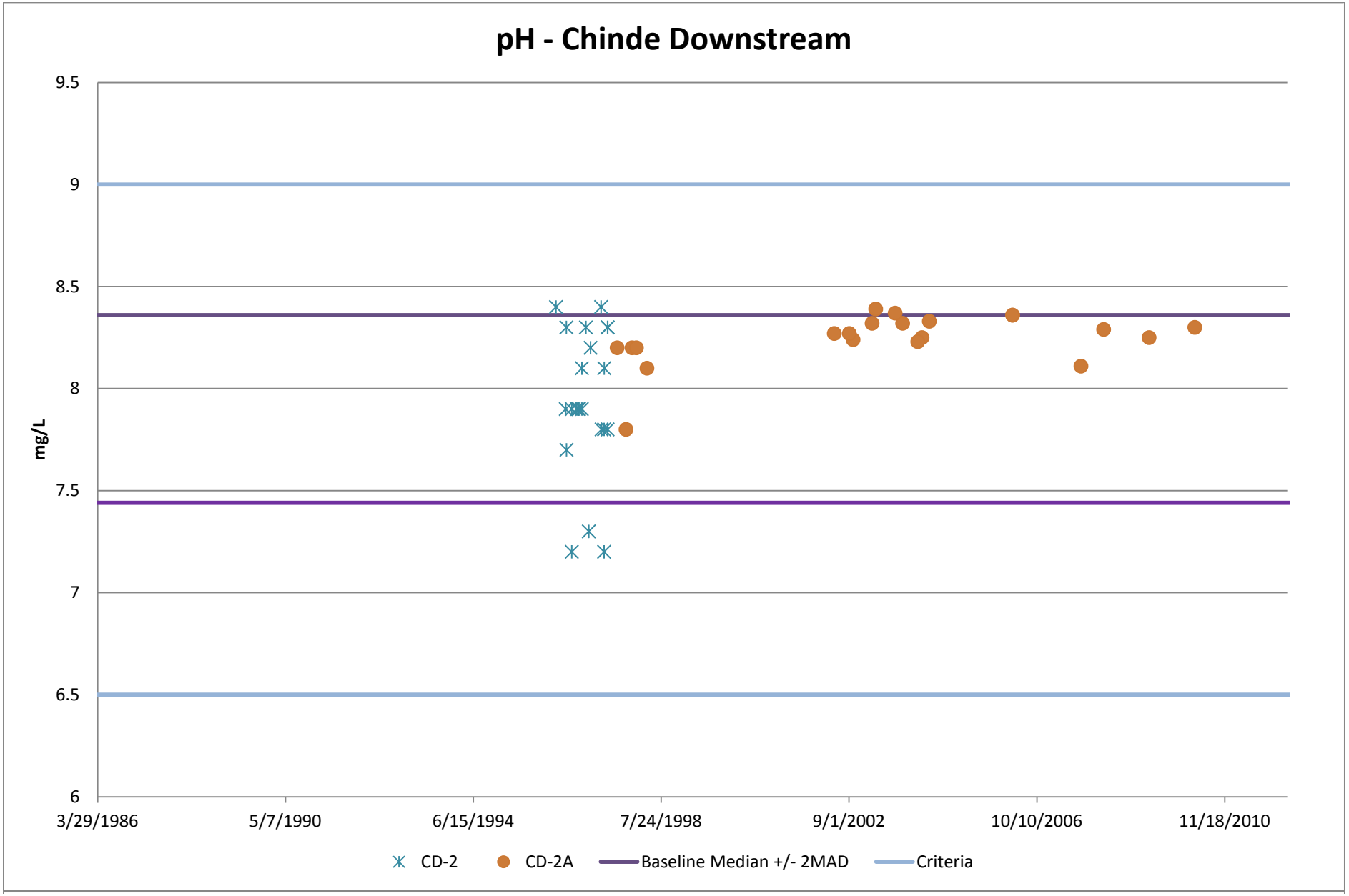

Chloride - Chinde Downstream
10000
1000
100
10
1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria

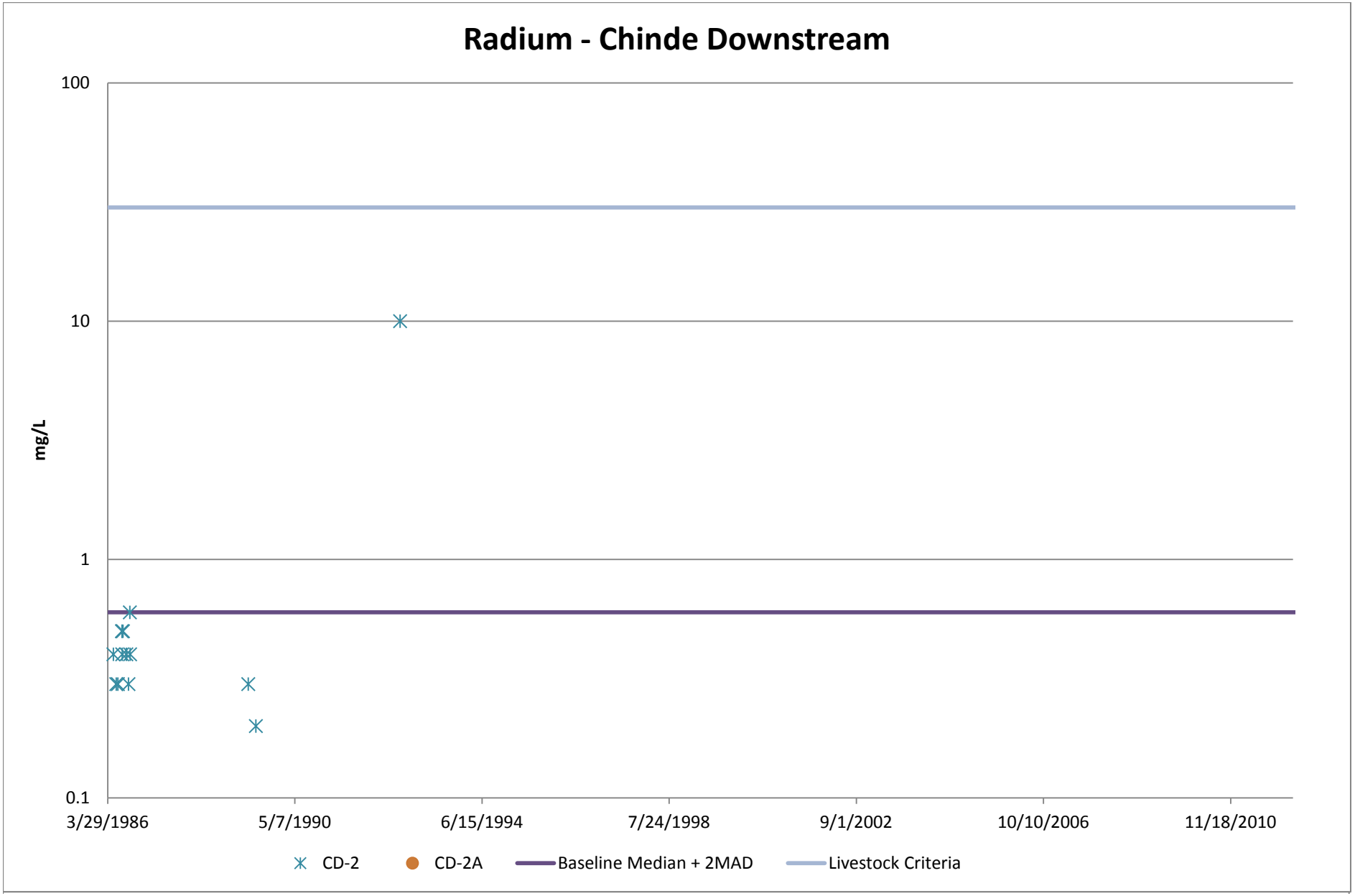

Chromium - Chinde Downstream
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

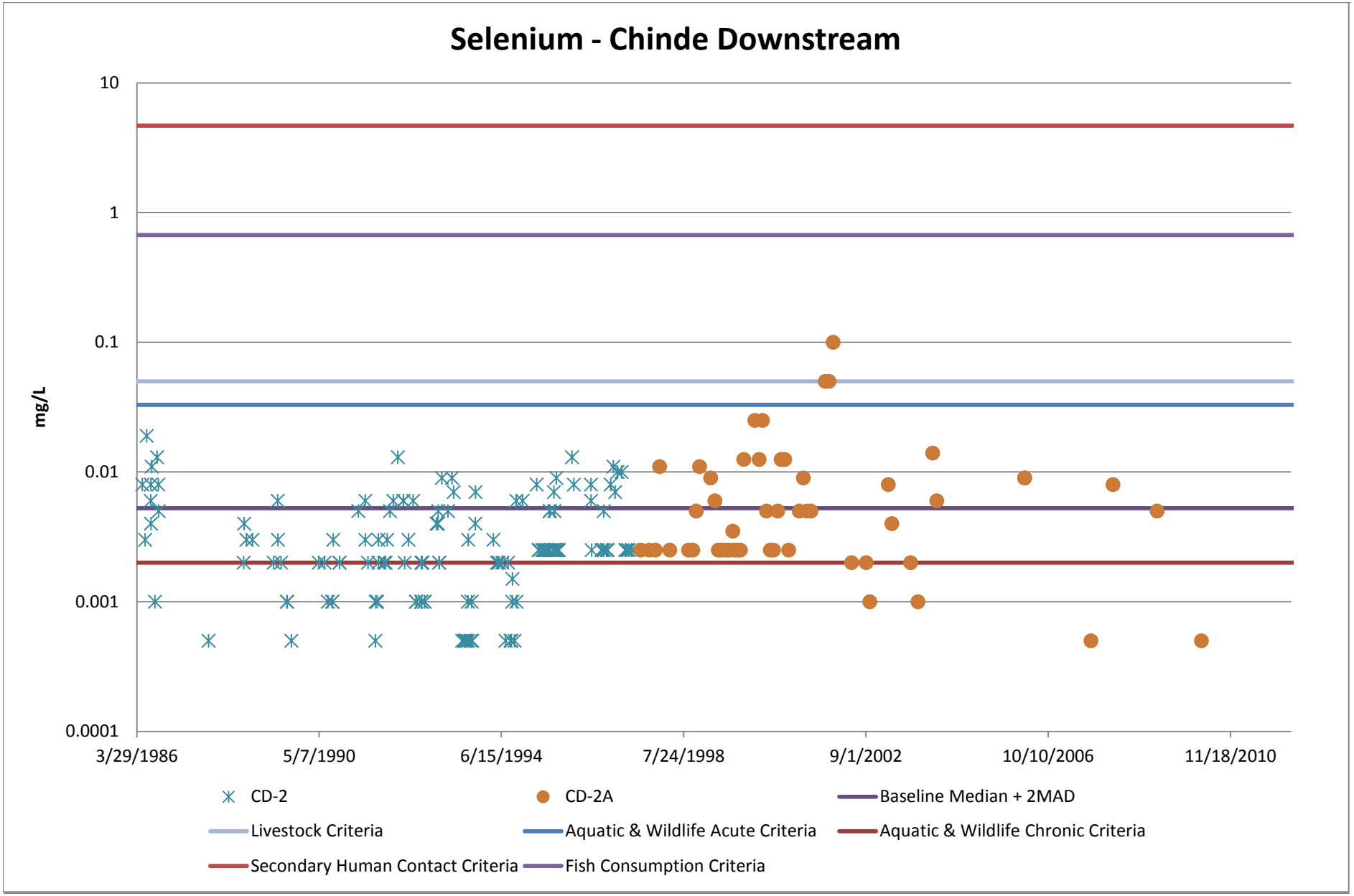

Fluoride - Chinde Downstream
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Secondary Human Contact

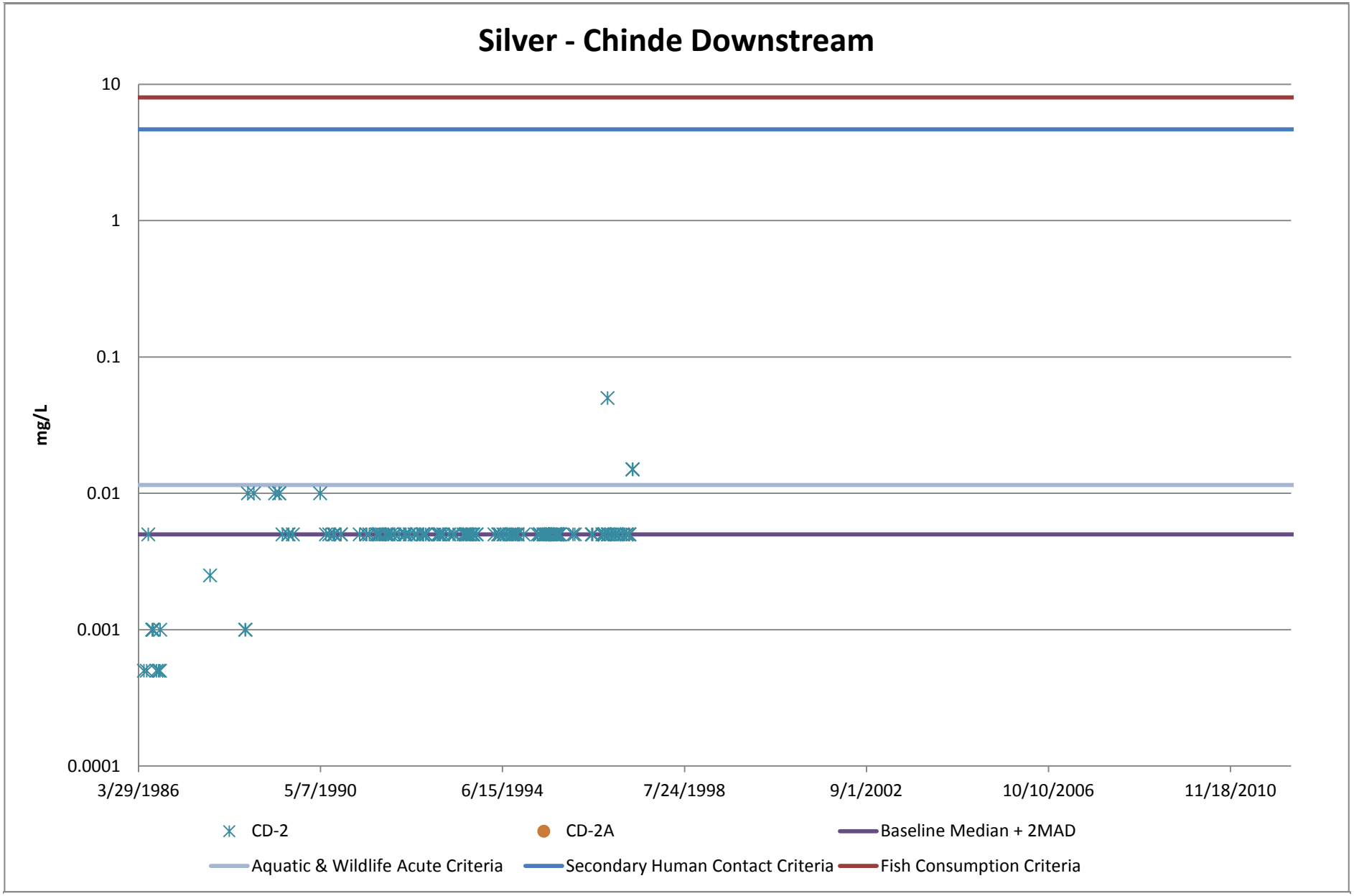

Lead - Chinde Downstream
mg/L
1
0.1
0.01
0.001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

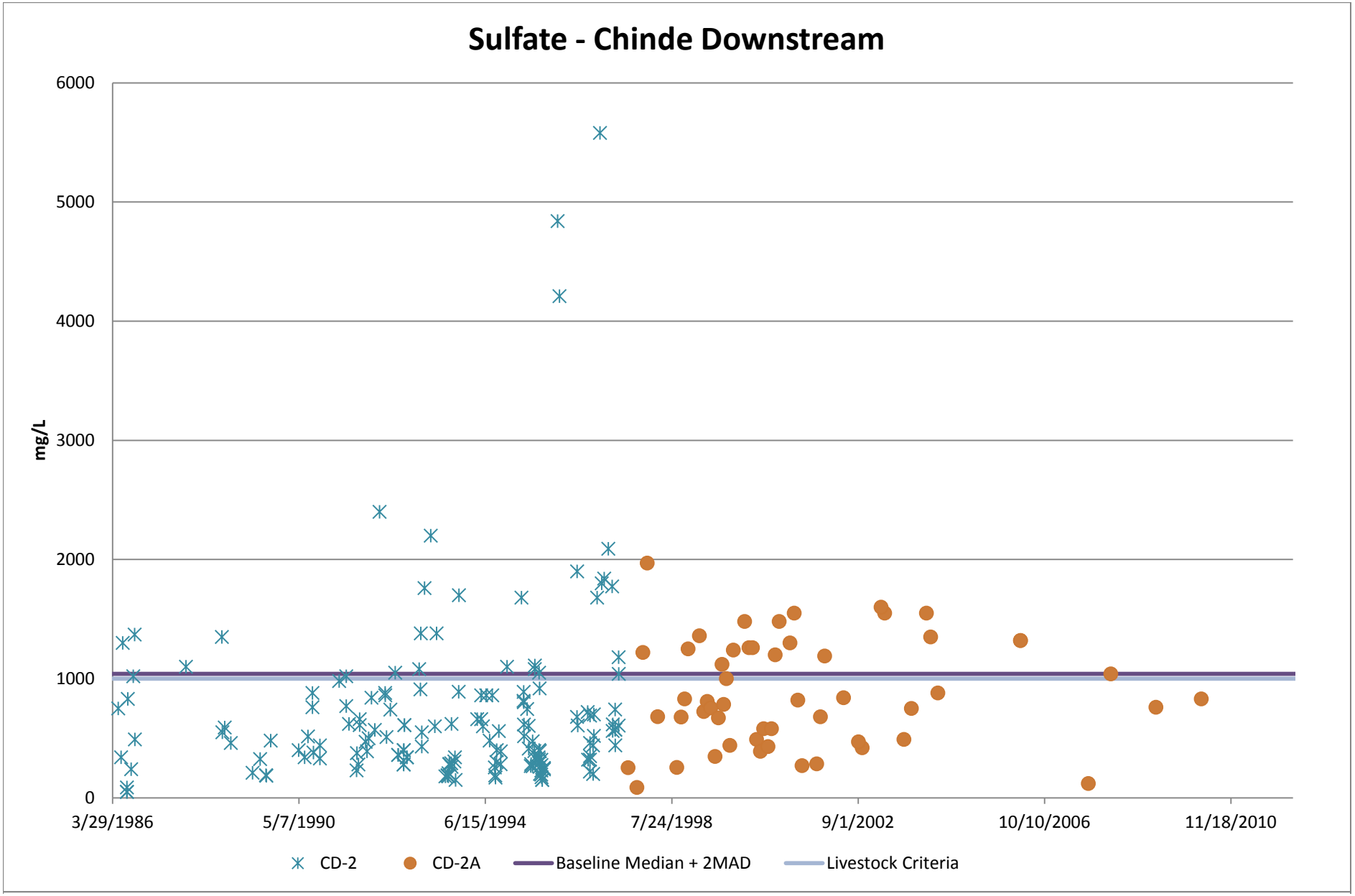

Nitrate - Chinde Downstream
10000
1000
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Secondary Human Contact

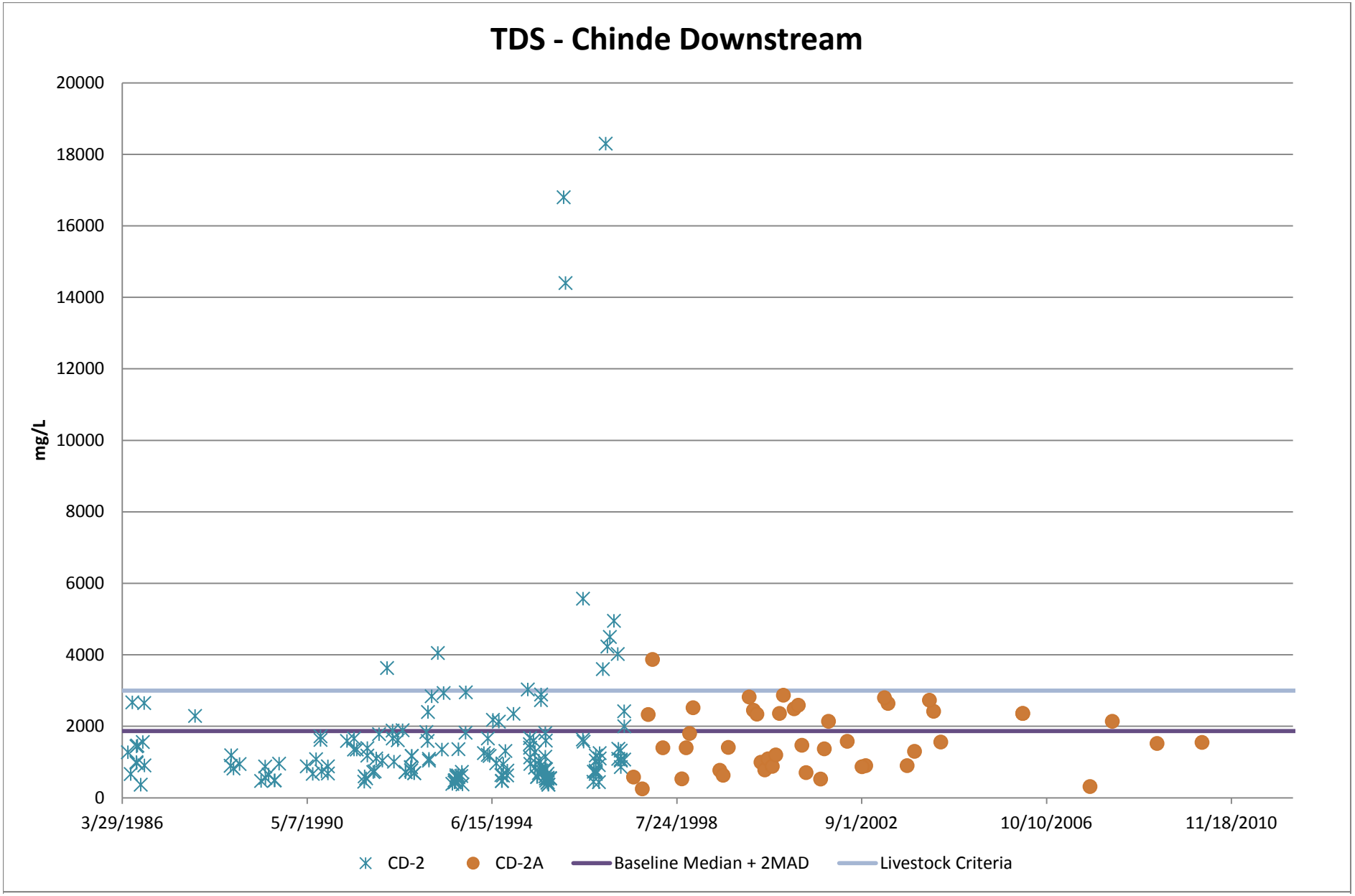

pH - Chinde Downstream
9.5
9
8.5
8
7.5
7
6.5
6
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median +/- 2MAD
Criteria

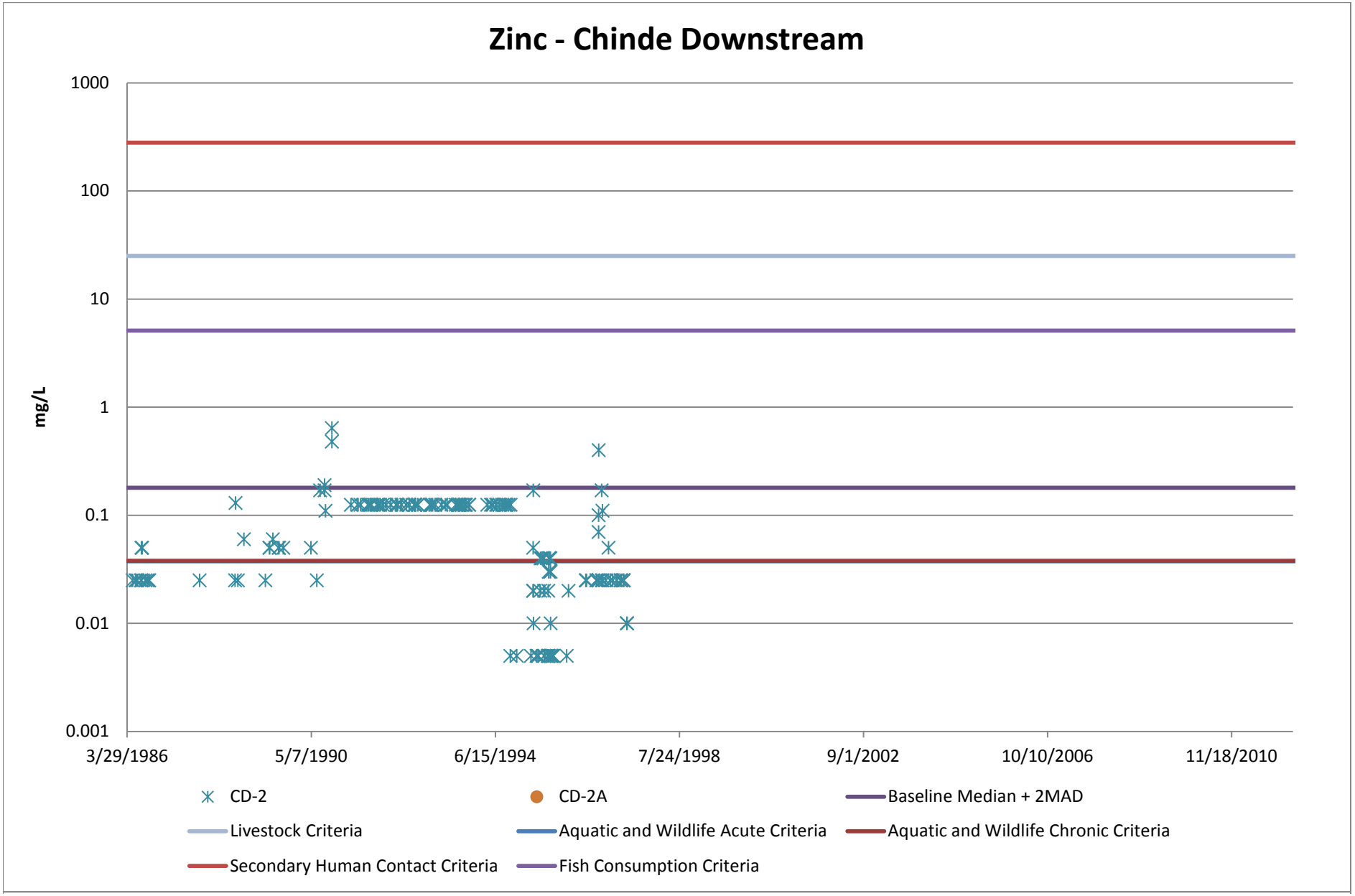

Radium - Chinde Downstream
100
10
1
0.1
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria

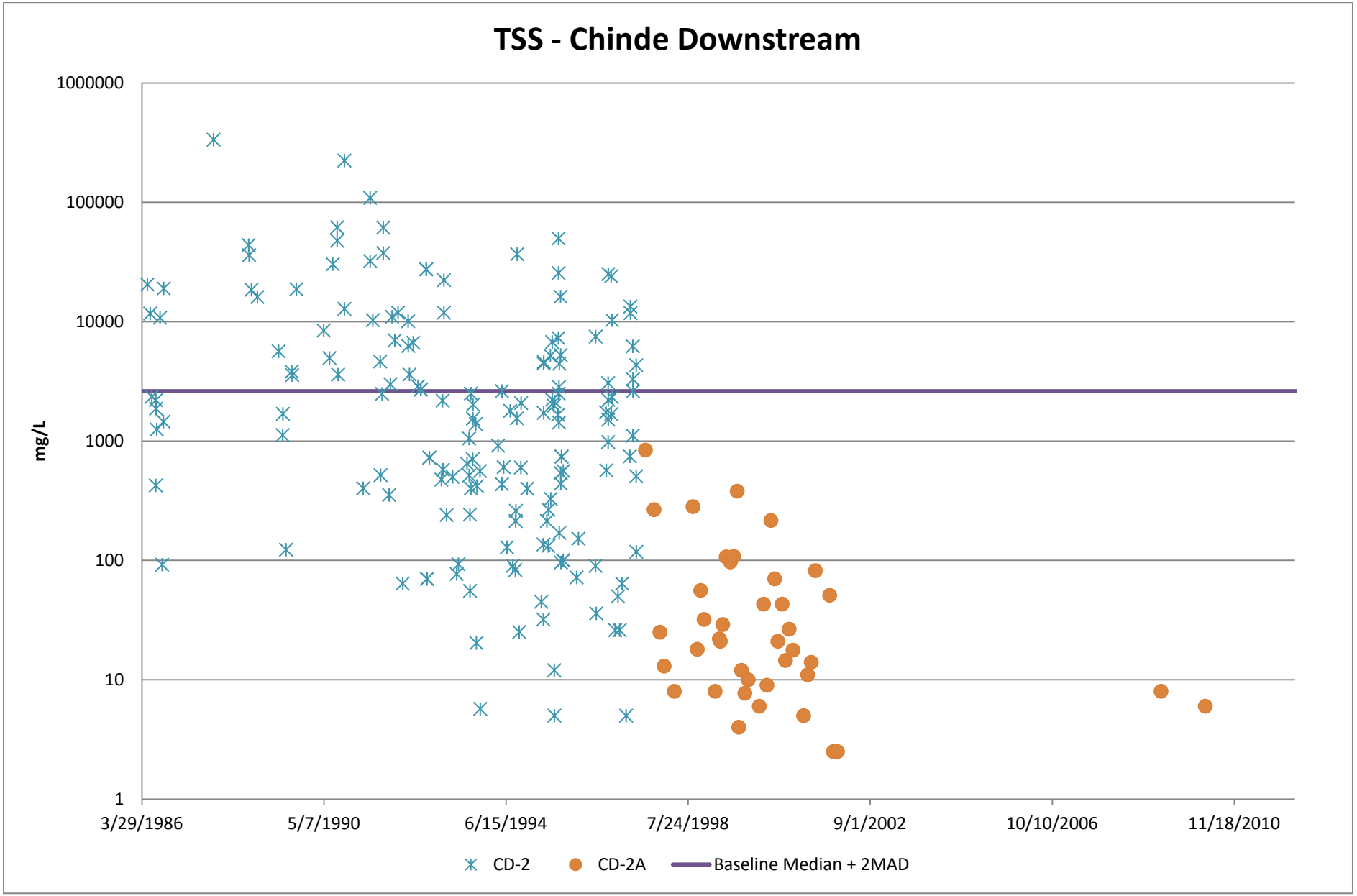

Selenium - Chinde Downstream
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

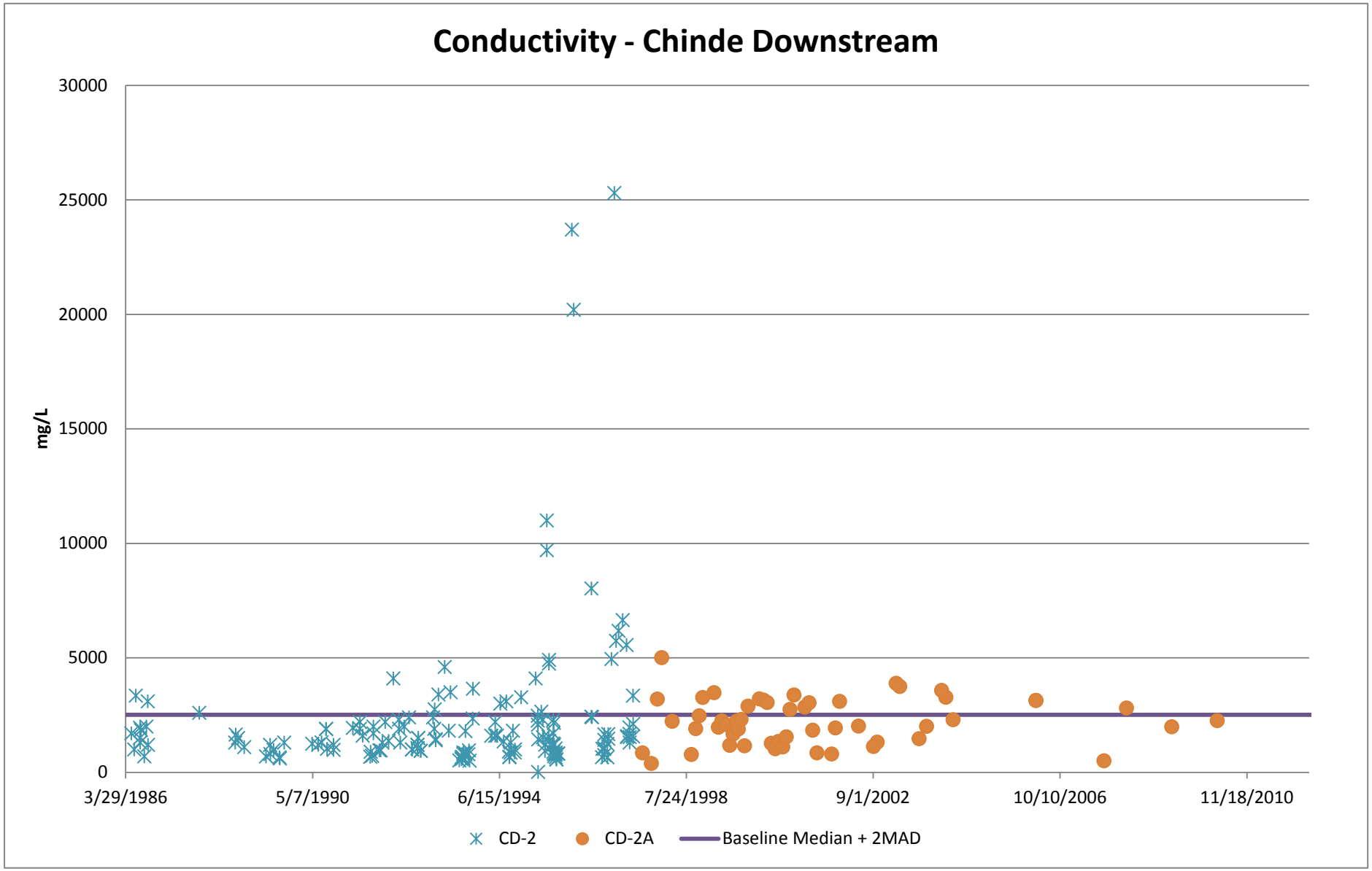

Silver - Chinde Downstream
mg/L
10
1
0.1
0.01
0.001
0.0001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Aquatic & Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

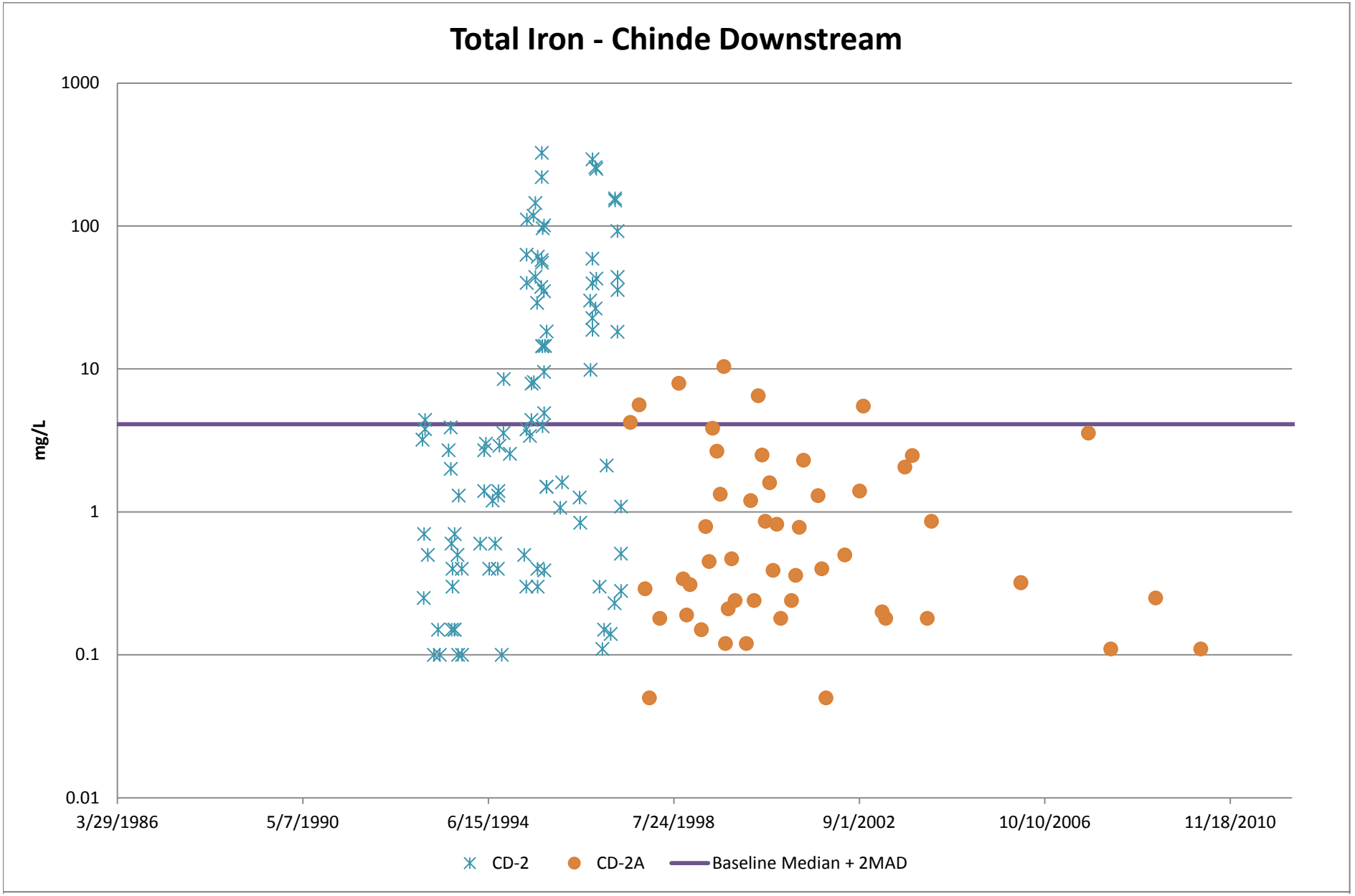

Sulfate - Chinde Downstream
mg/L
6000
5000
4000
3000
2000
1000
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria

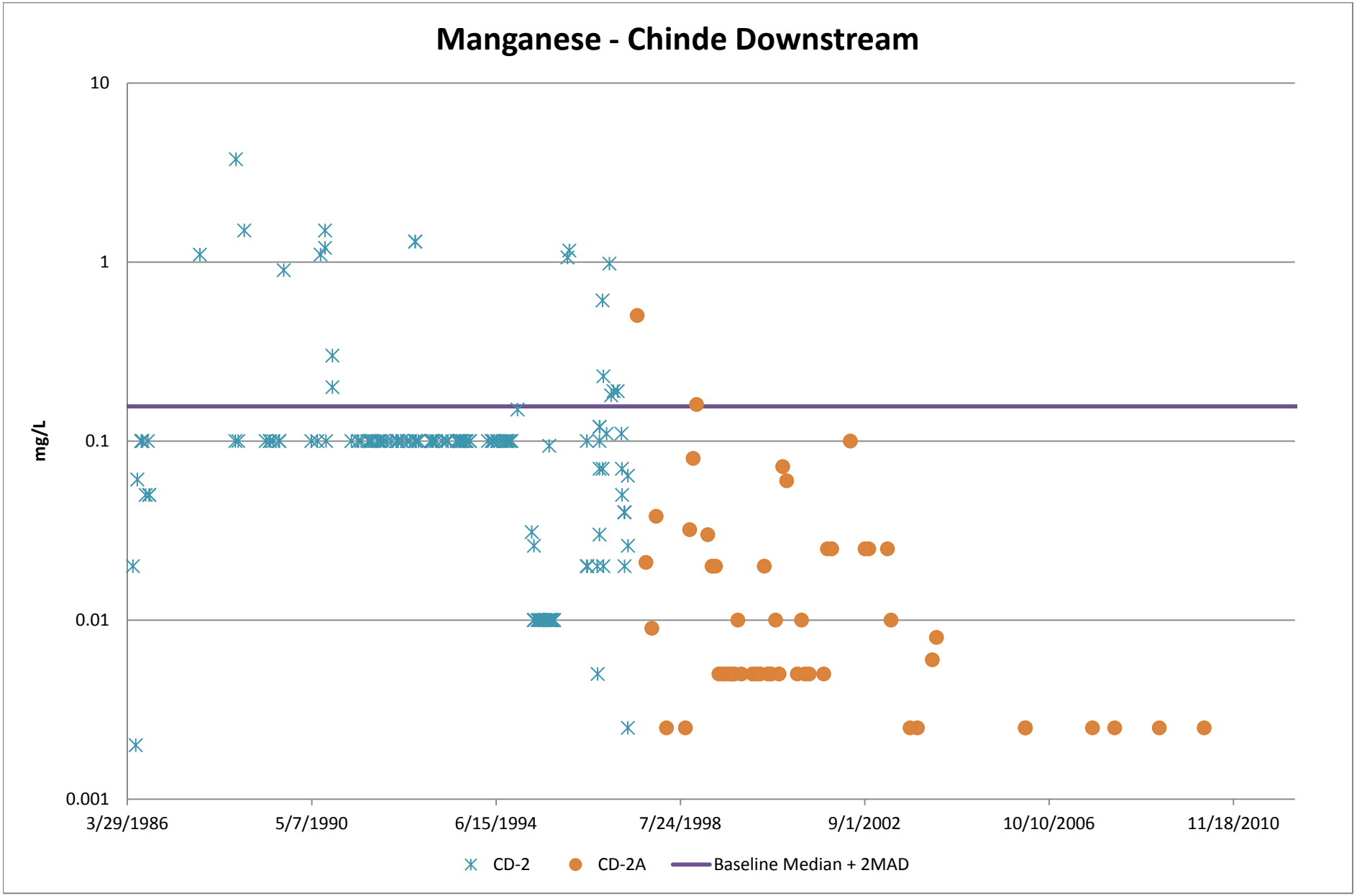

TDS - Chinde Downstream
mg/L
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria

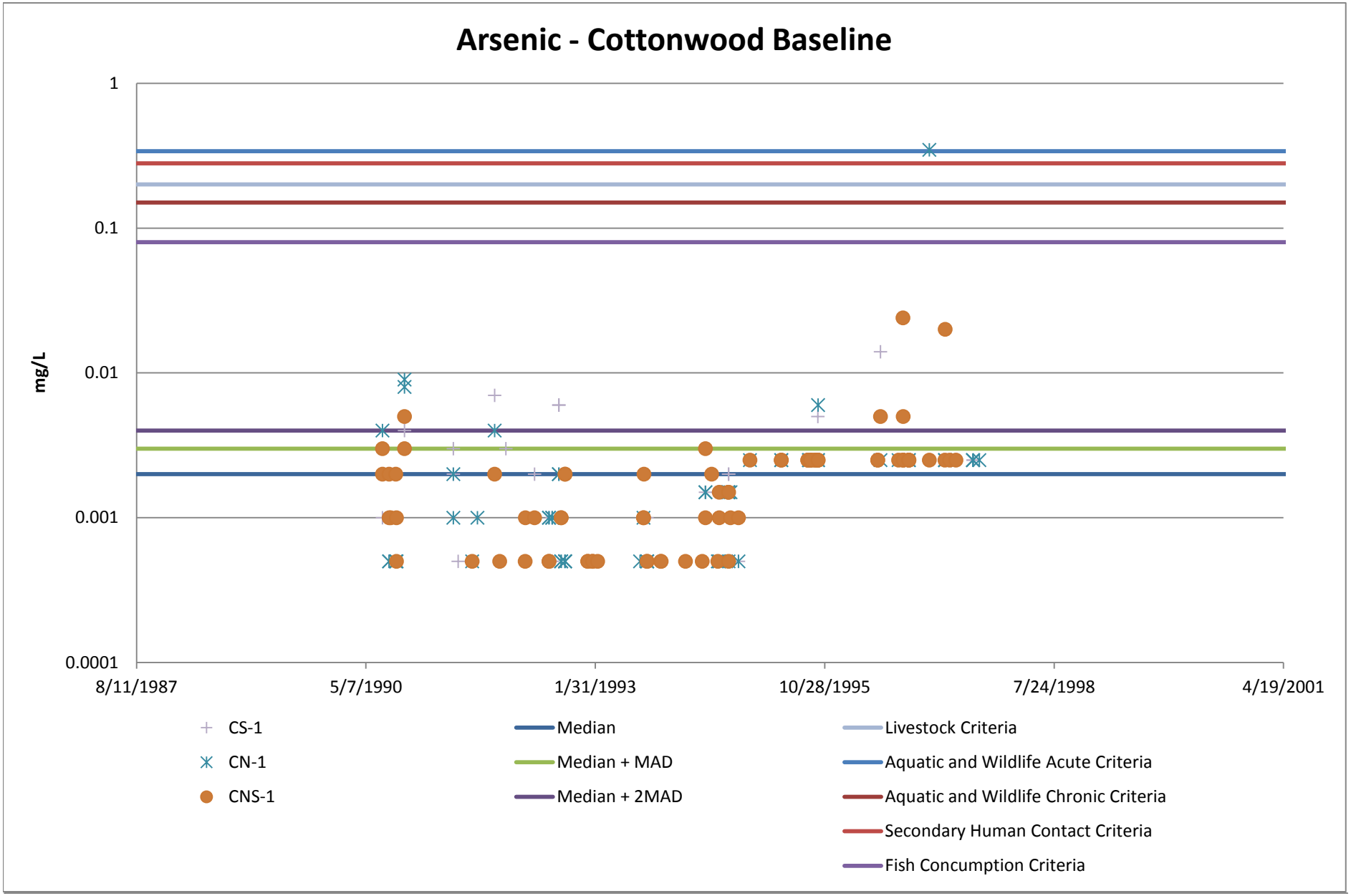

Zinc - Chinde Downstream
mg/L
1000
100
10
1
0.1
0.01
0.001
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

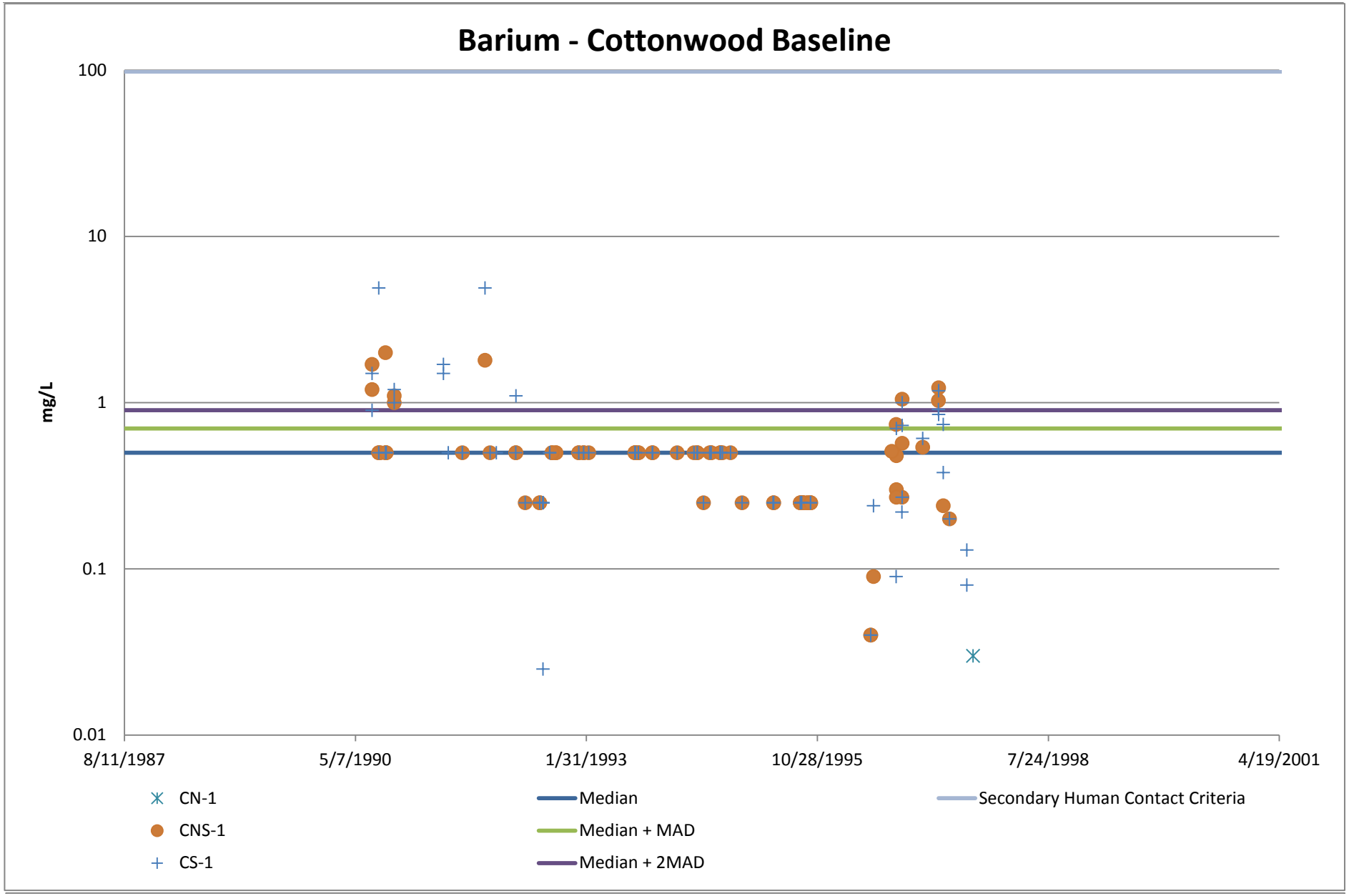

TSS - Chinde Downstream
mg/L
1000000
100000
10000
1000
100
10
1
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD

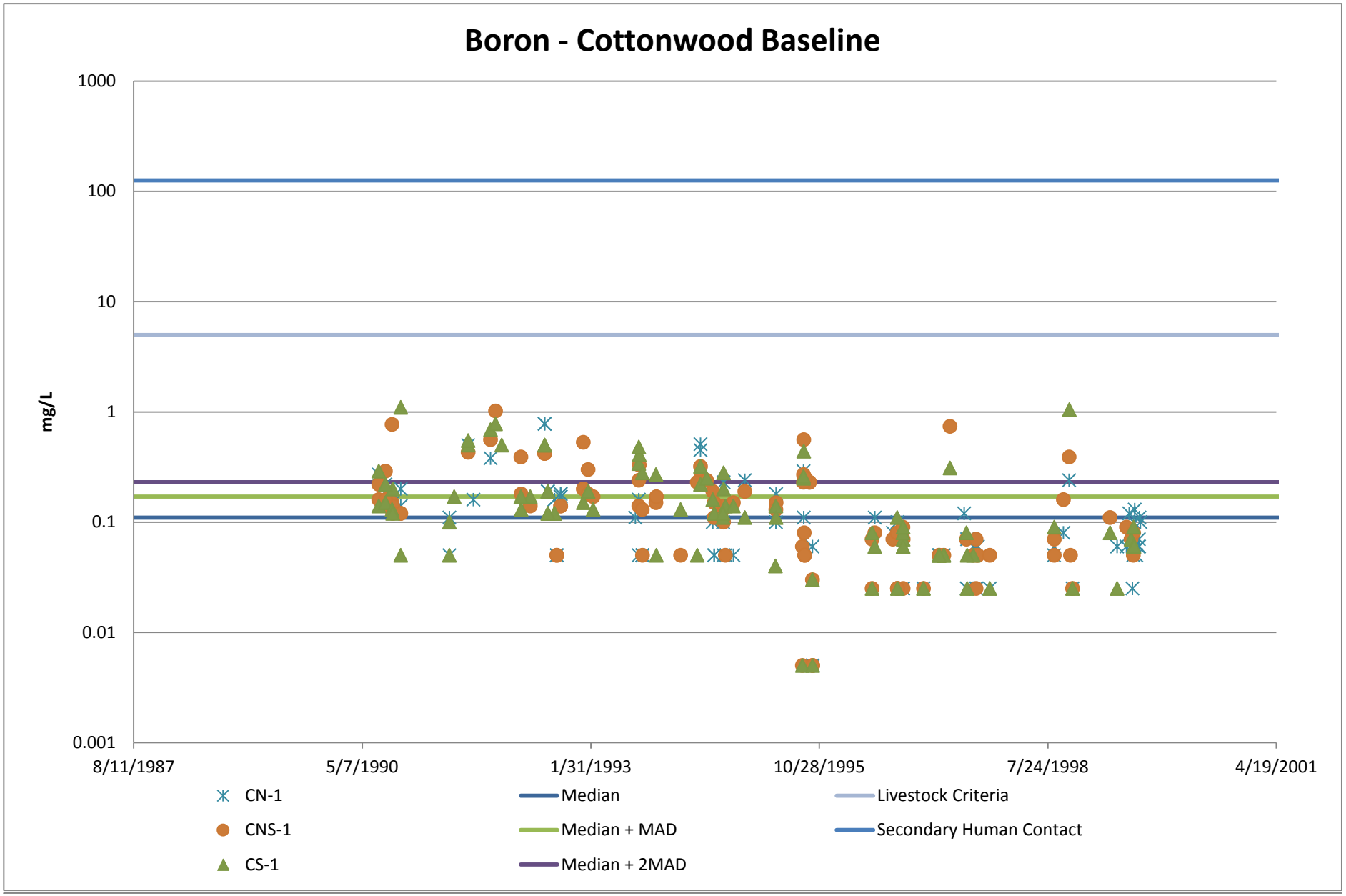

Conductivity - Chinde Downstream
mg/L
30000
25000
20000
15000
10000
5000
0
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD

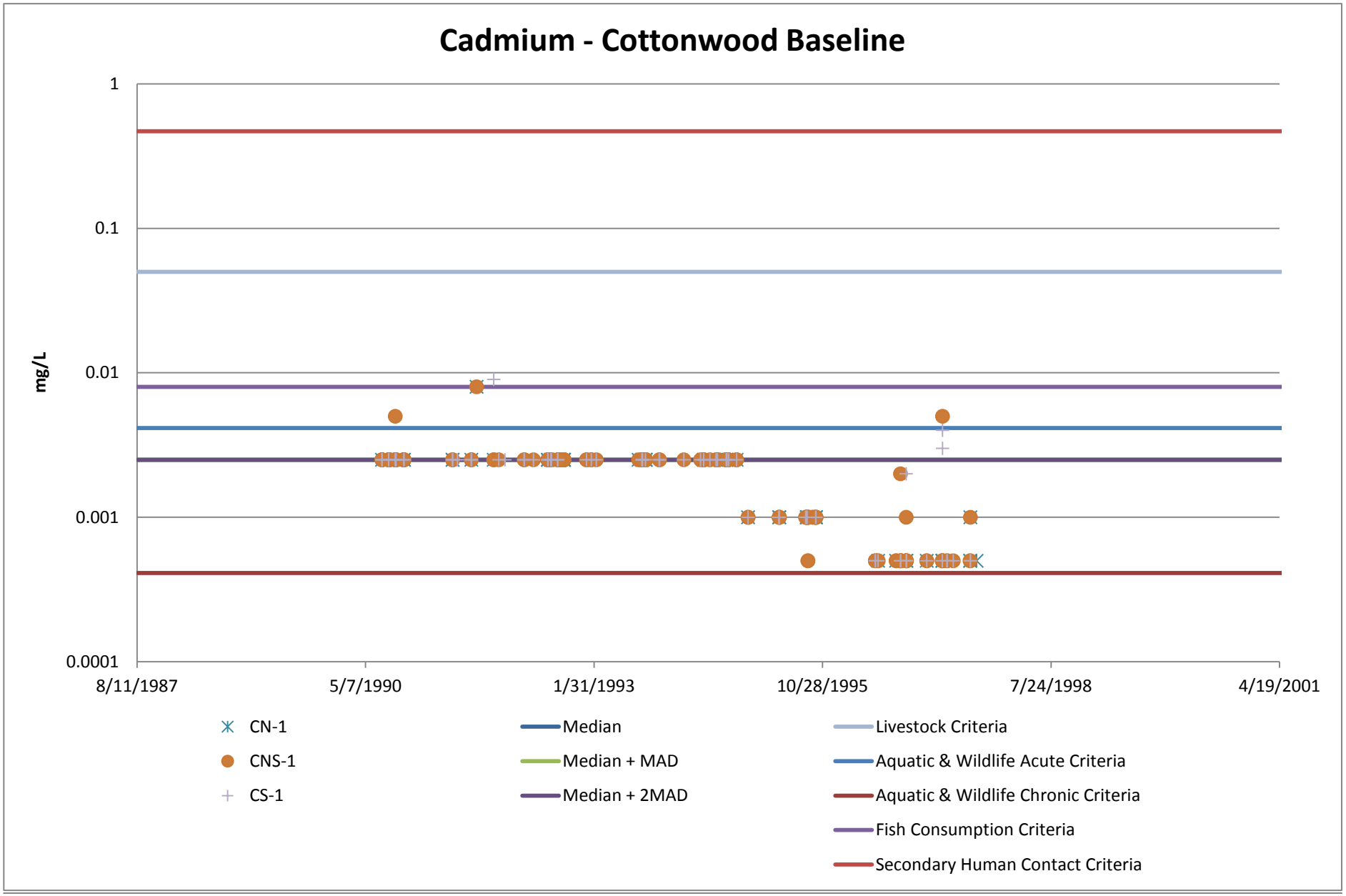

Total Iron - Chinde Downstream
1000
100
10
1
0.1
0.01
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD

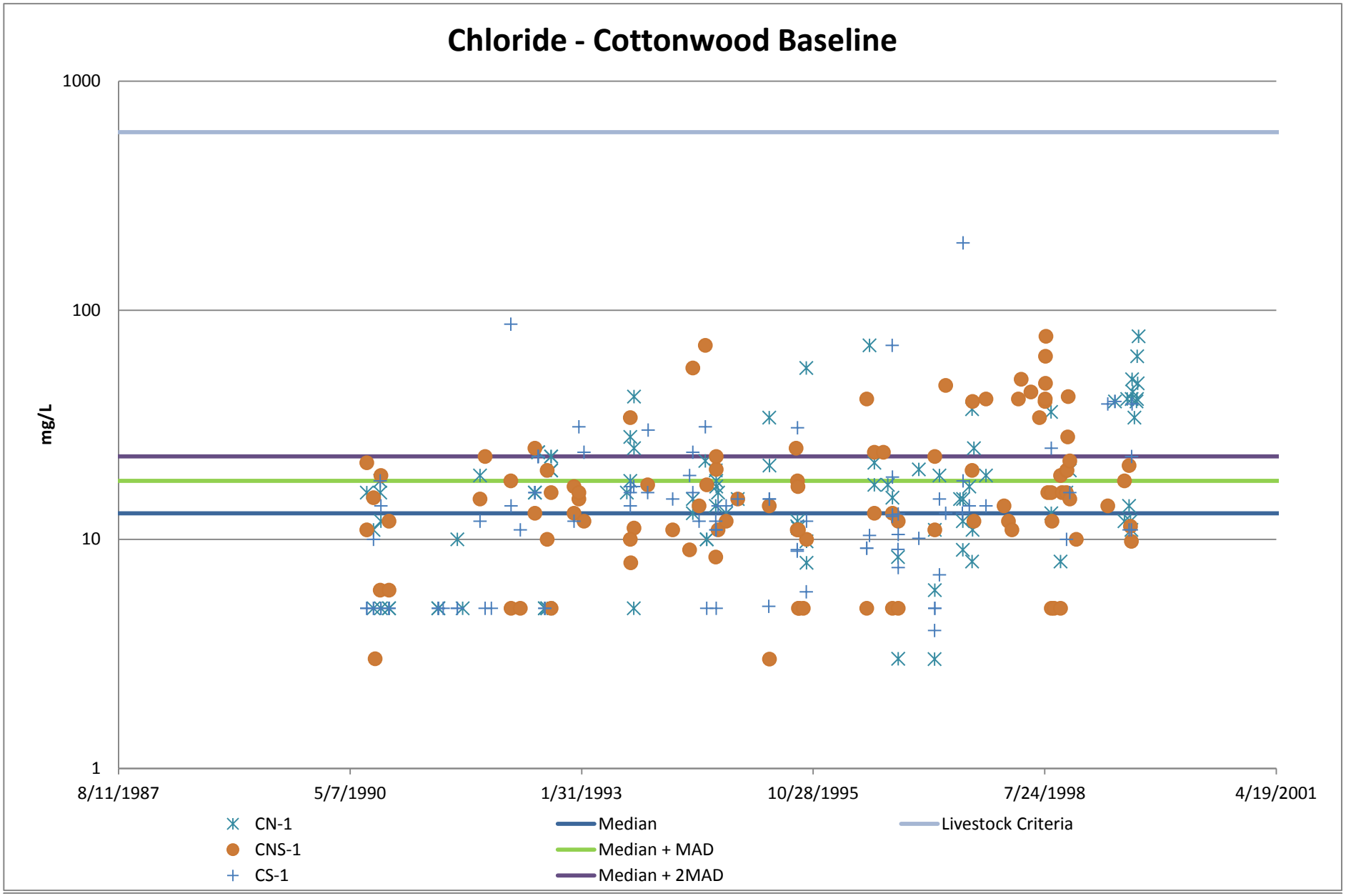

Manganese - Chinde Downstream
10
1
0.1
0.01
0.001
mg/L
3/29/1986
5/7/1990
6/15/1994
7/24/1998
9/1/2002
10/10/2006
11/18/2010
CD-2
CD-2A
Baseline Median + 2MAD

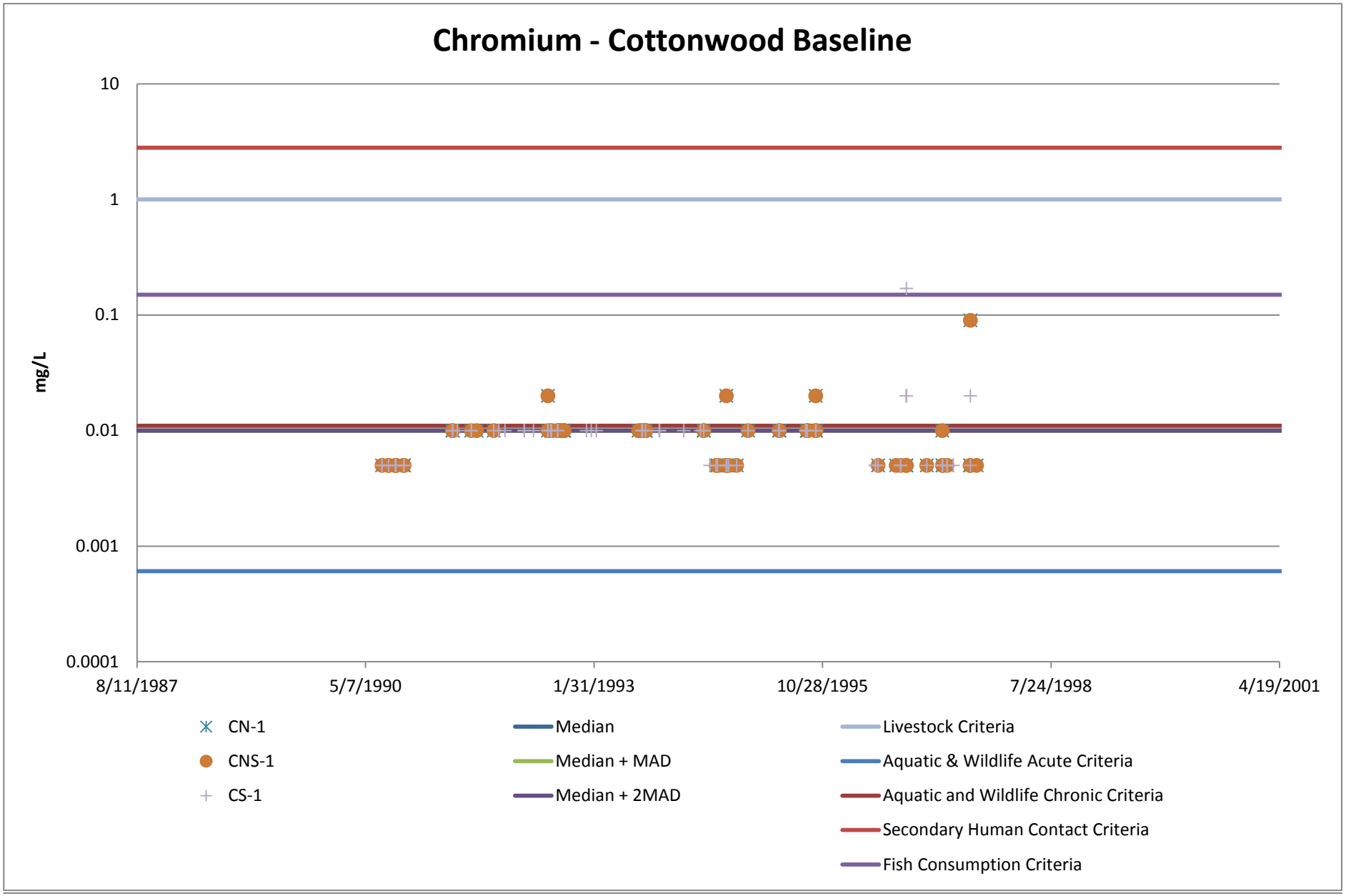

Arsenic - Cottonwood Baseline
mg/L
1
0.1
0.01
0.001
0.0001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CS-1
CN-1
CNS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria

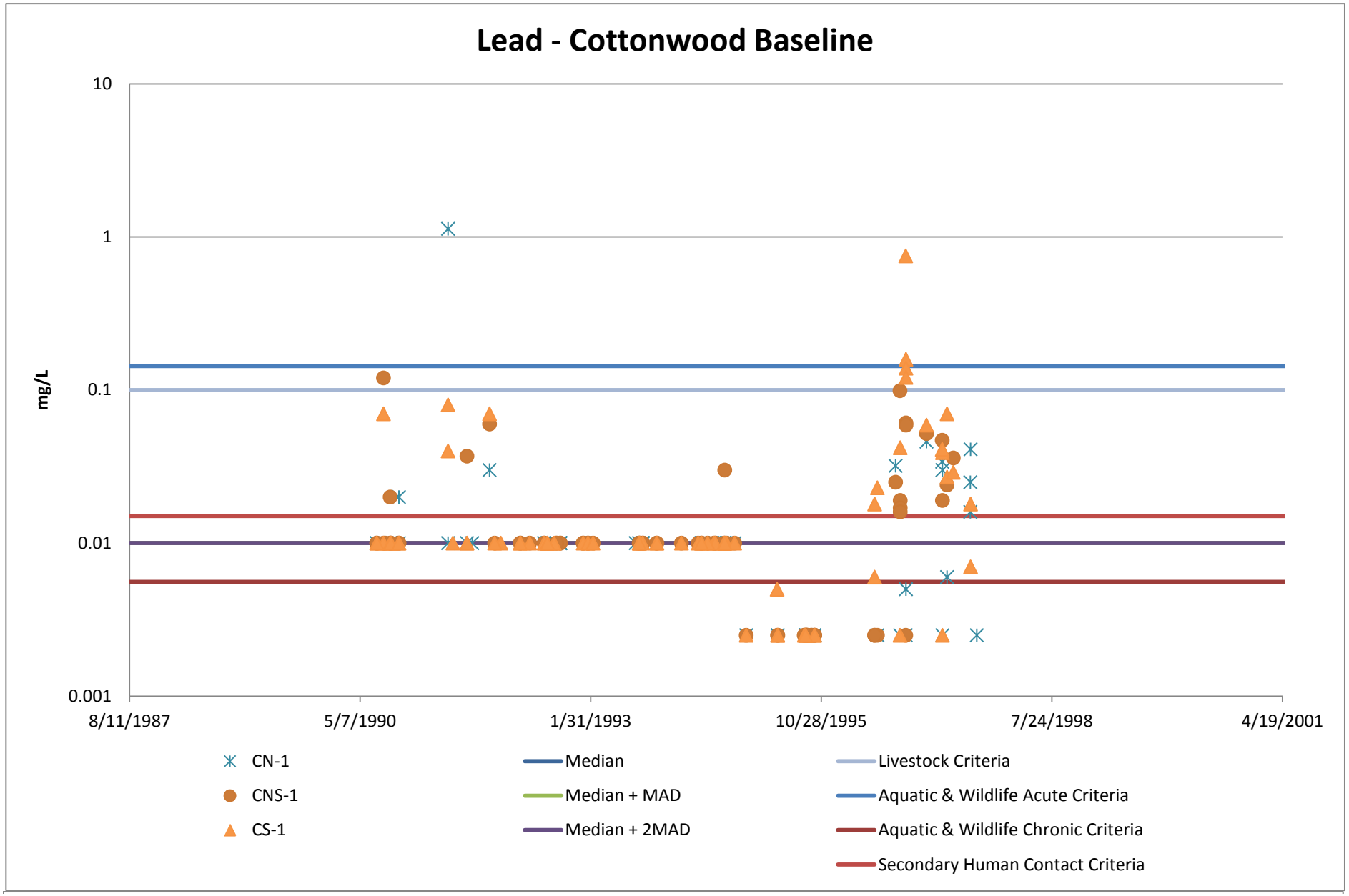

Barium - Cottonwood Baseline
100
10
1
0.1
0.01
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Secondary Human Contact Criteria

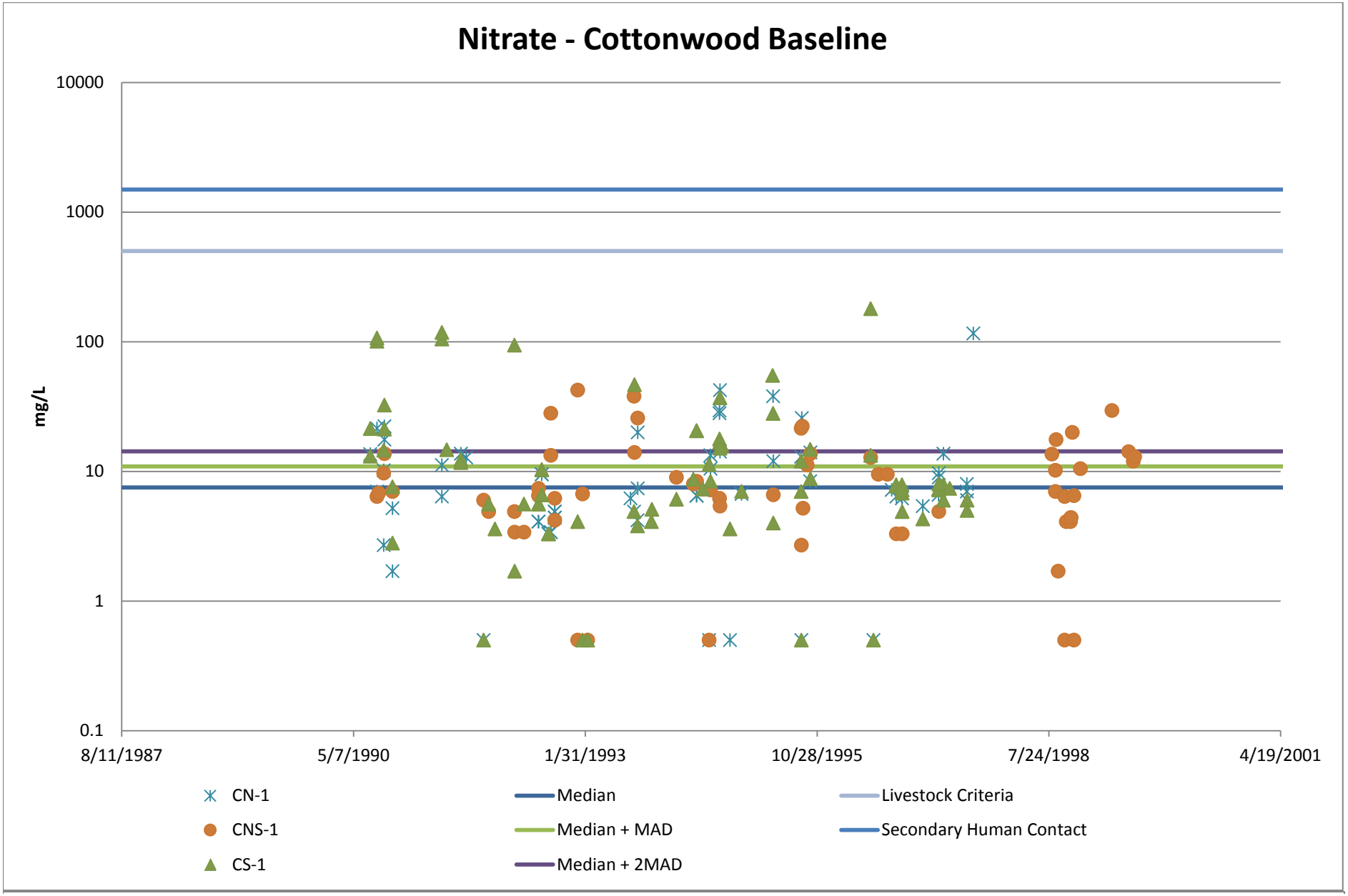

Boron - Cottonwood Baseline
mg/L
1000
100
10
1
0.1
0.01
0.001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Secondary Human Contact

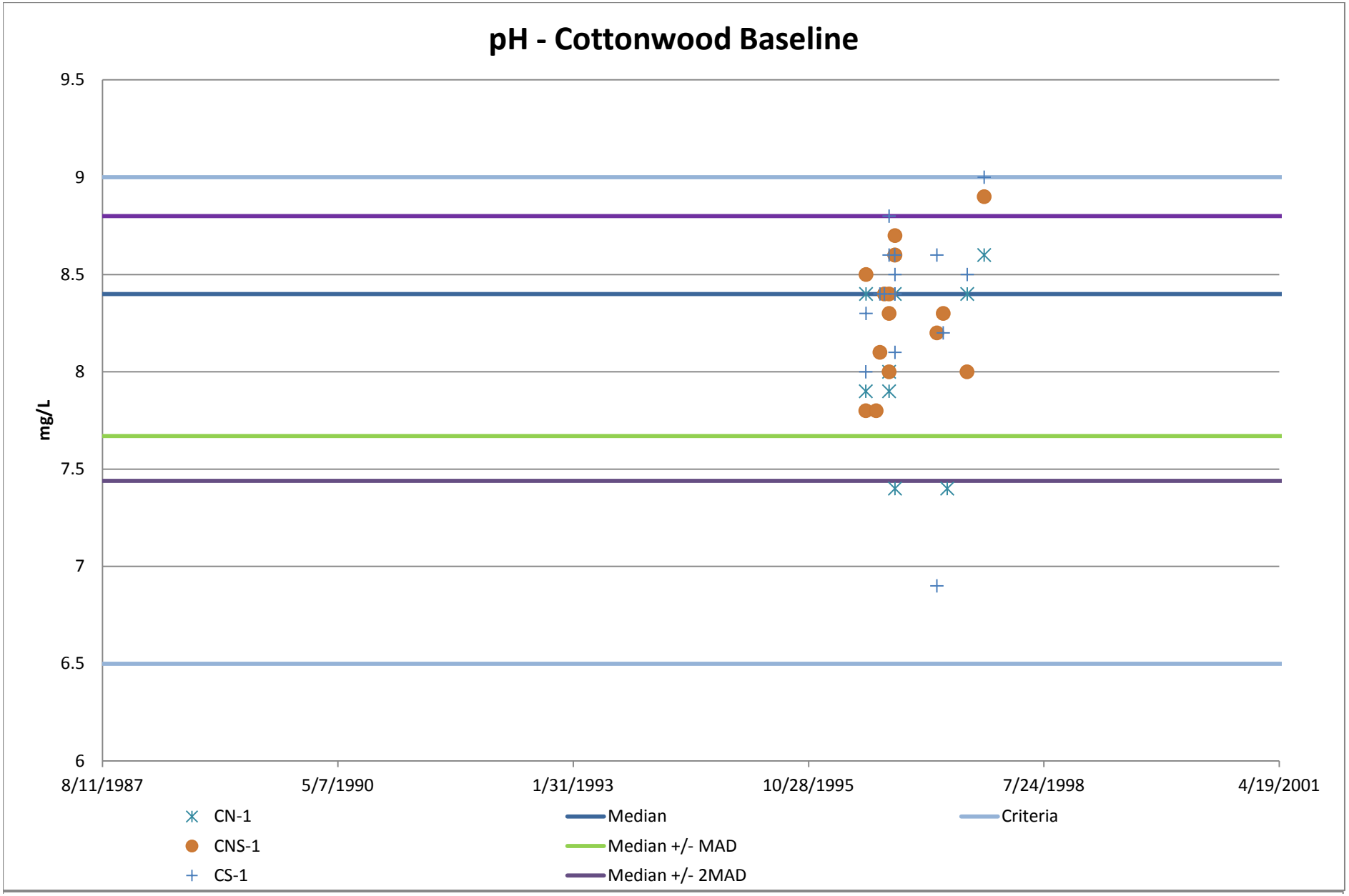

Cadmium - Cottonwood Baseline
mg/L
1
0.1
0.01
0.001
0.0001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Fish Consumption Criteria
Secondary Human Contact Criteria

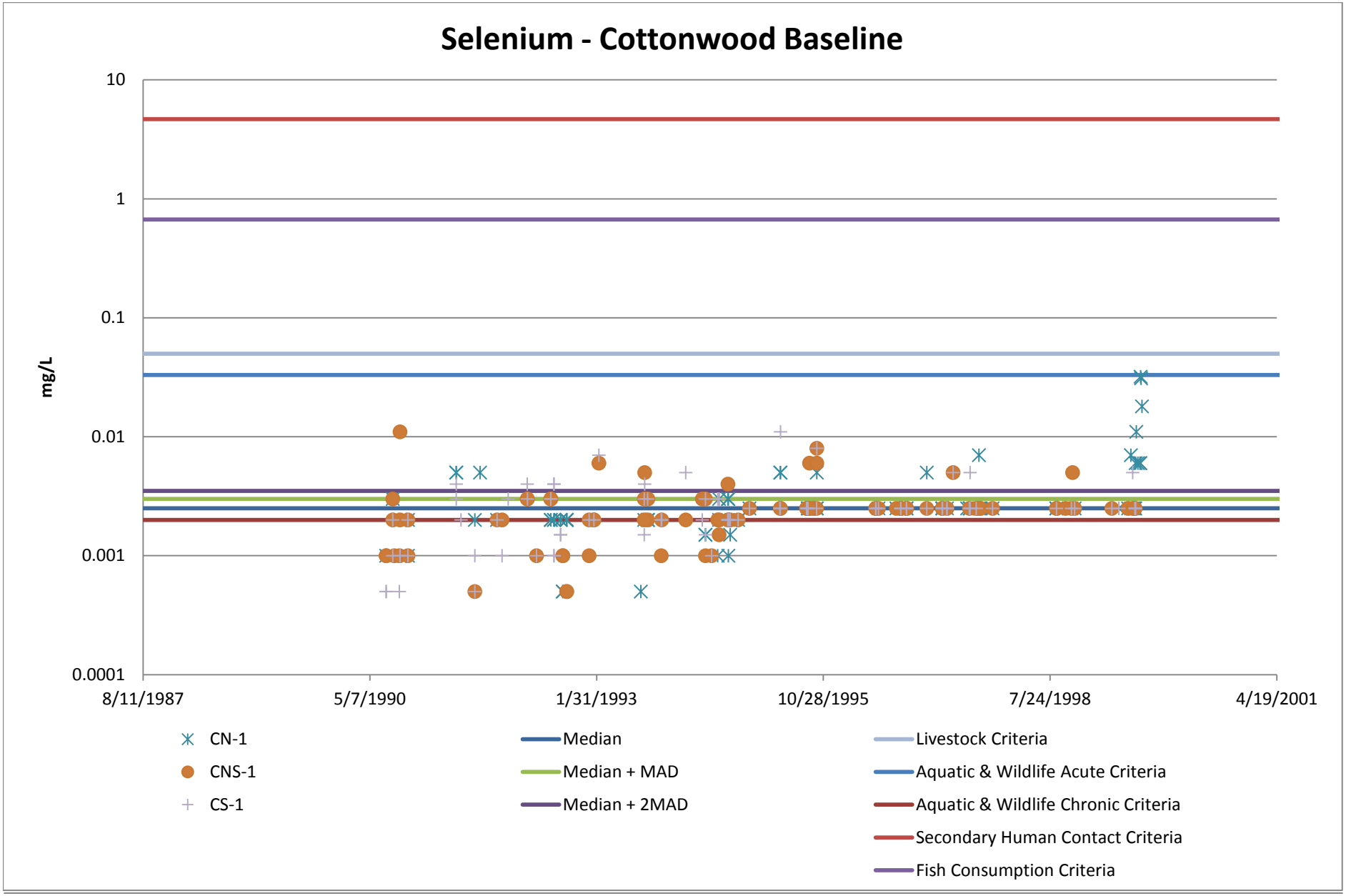

Chloride - Cottonwood Baseline
1000
100
10
1
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria

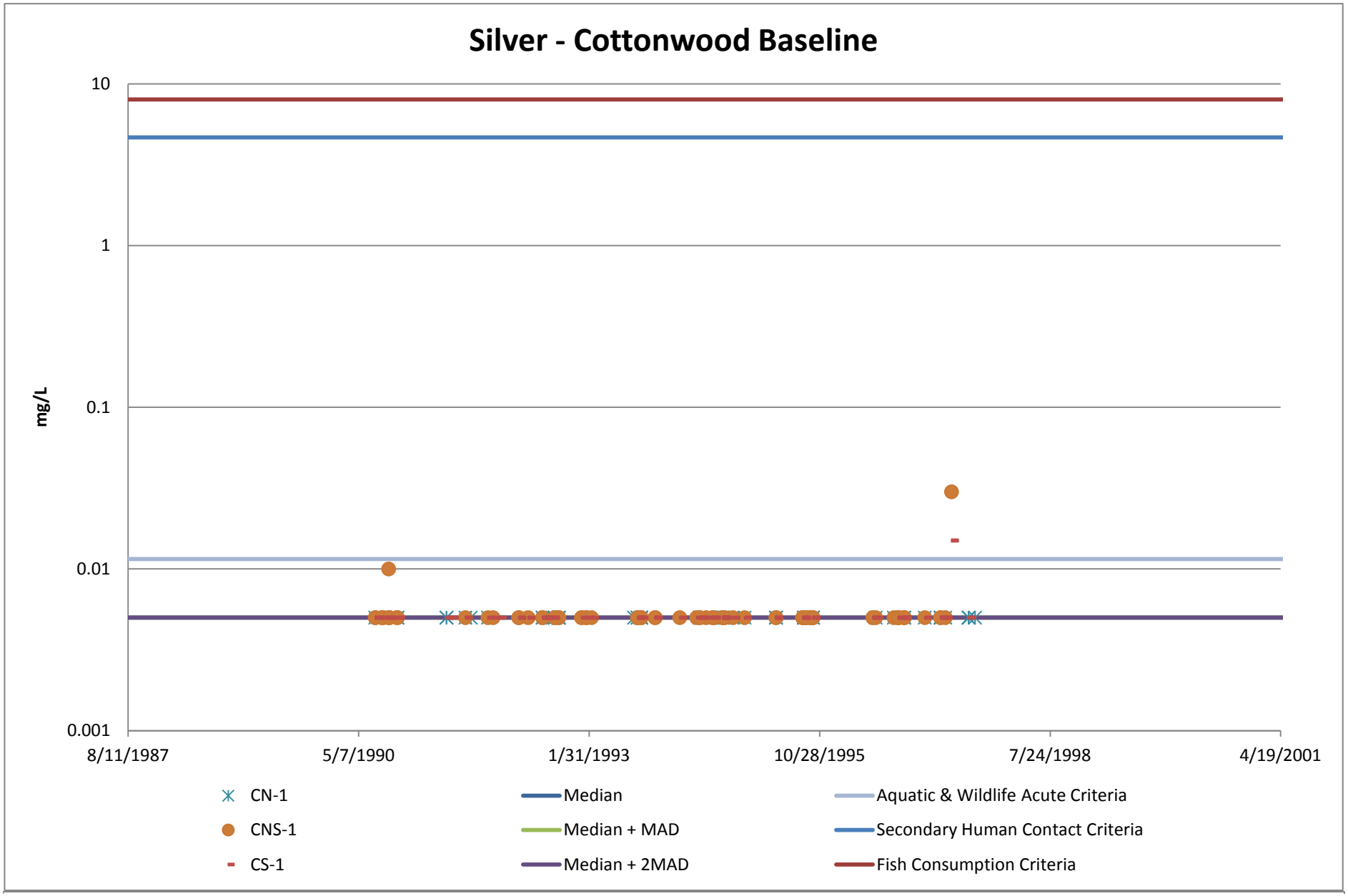

Chromium - Cottonwood Baseline
mg/L
10
1
0.1
0.01
0.001
0.0001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

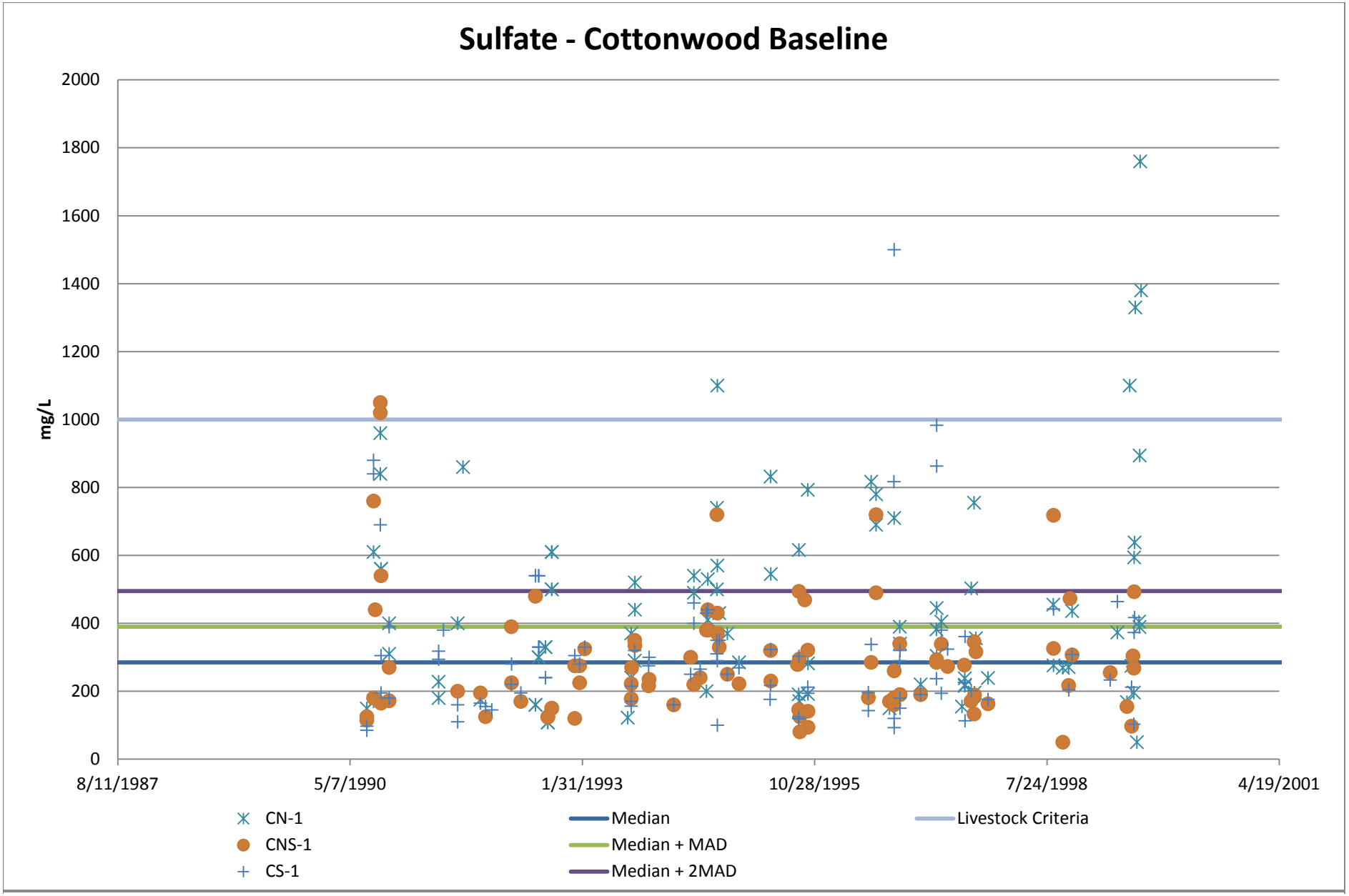

Lead - Cottonwood Baseline
10
1
0.1
0.01
0.001
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

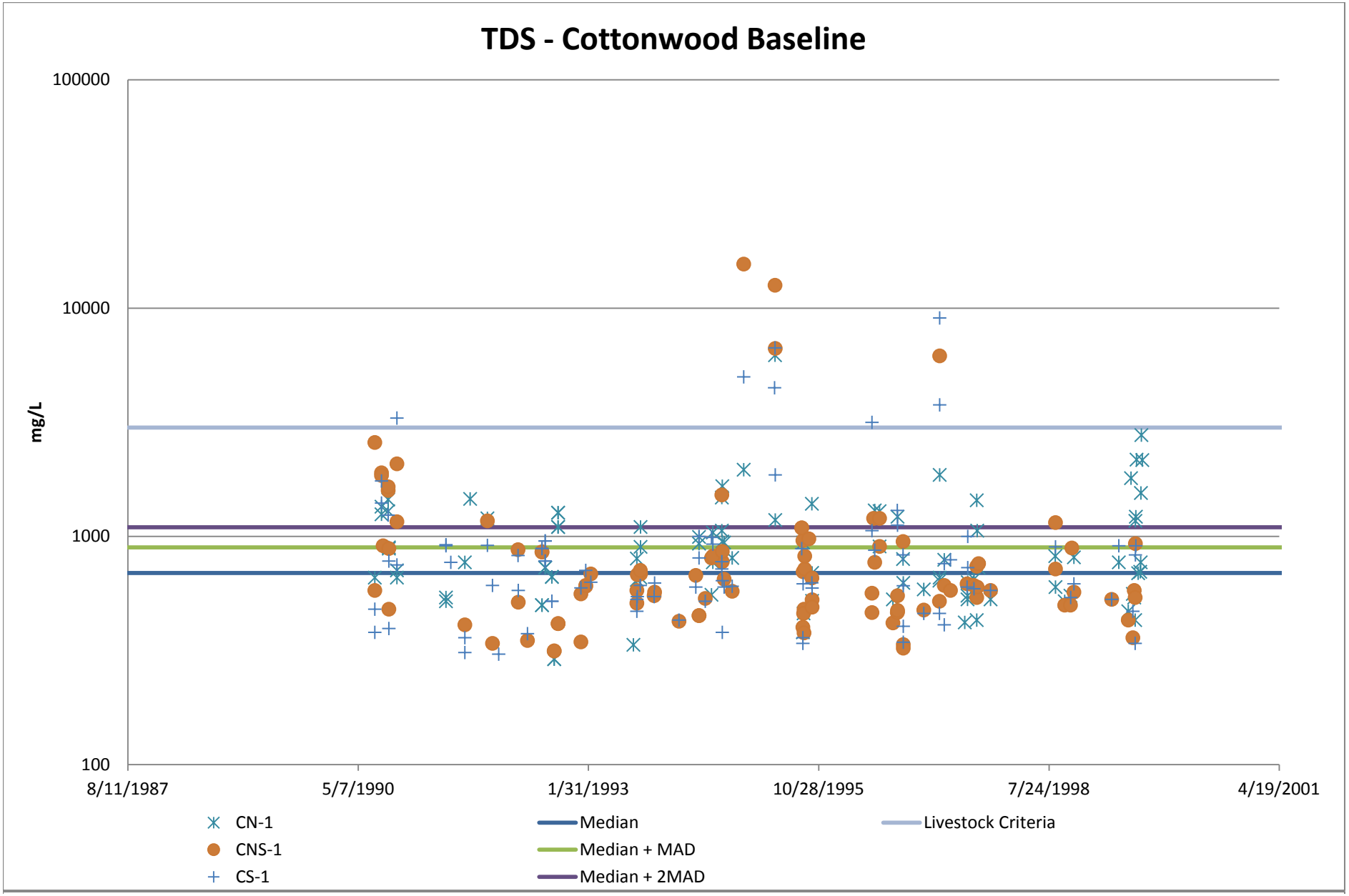

Nitrate - Cottonwood Baseline
10000
1000
100
10
1
0.1
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Secondary Human Contact

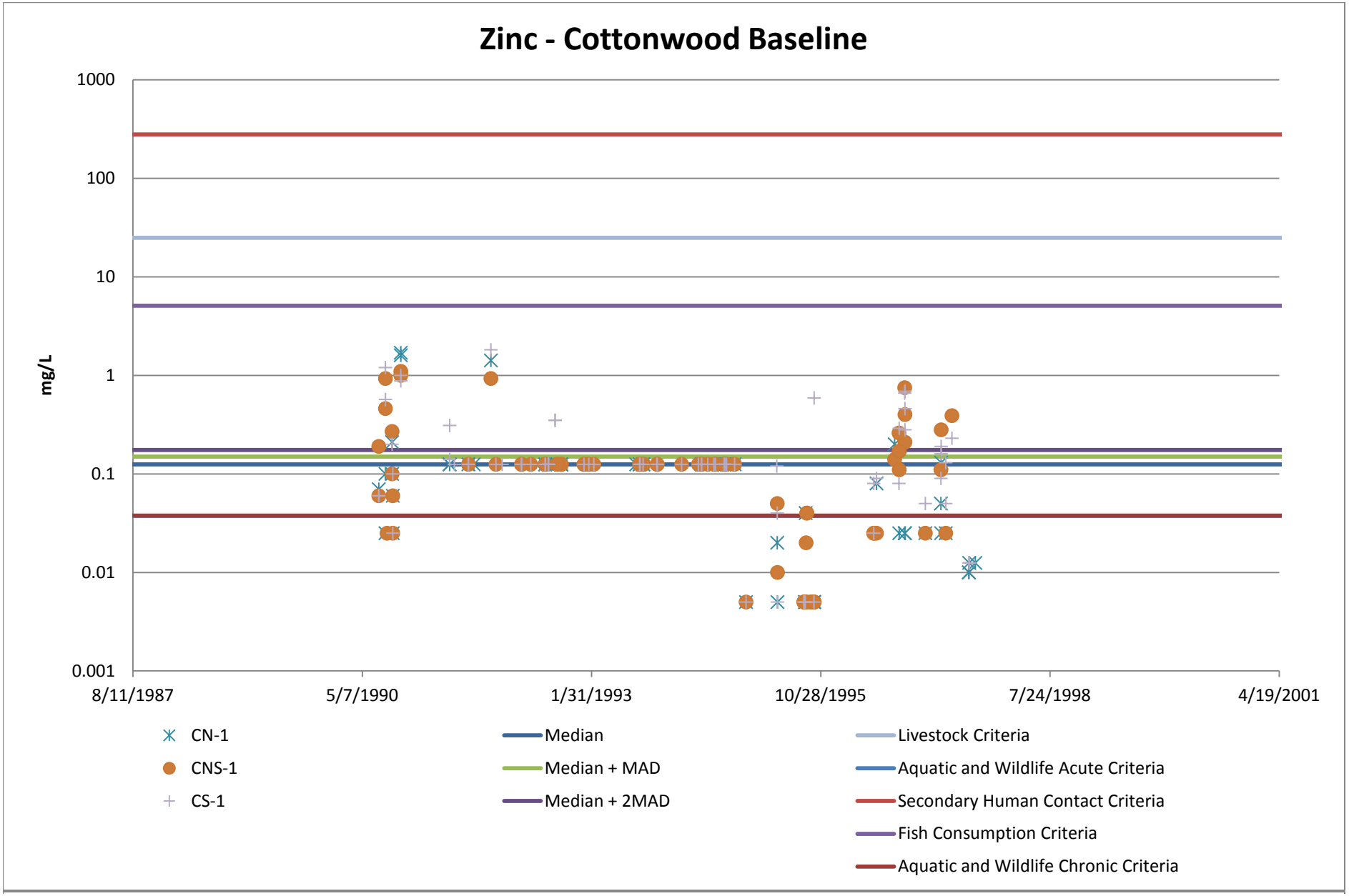

pH - Cottonwood Baseline
9.5
9
8.5
8
7.5
7
6.5
6
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median +/- MAD
Median +/- 2MAD
Criteria

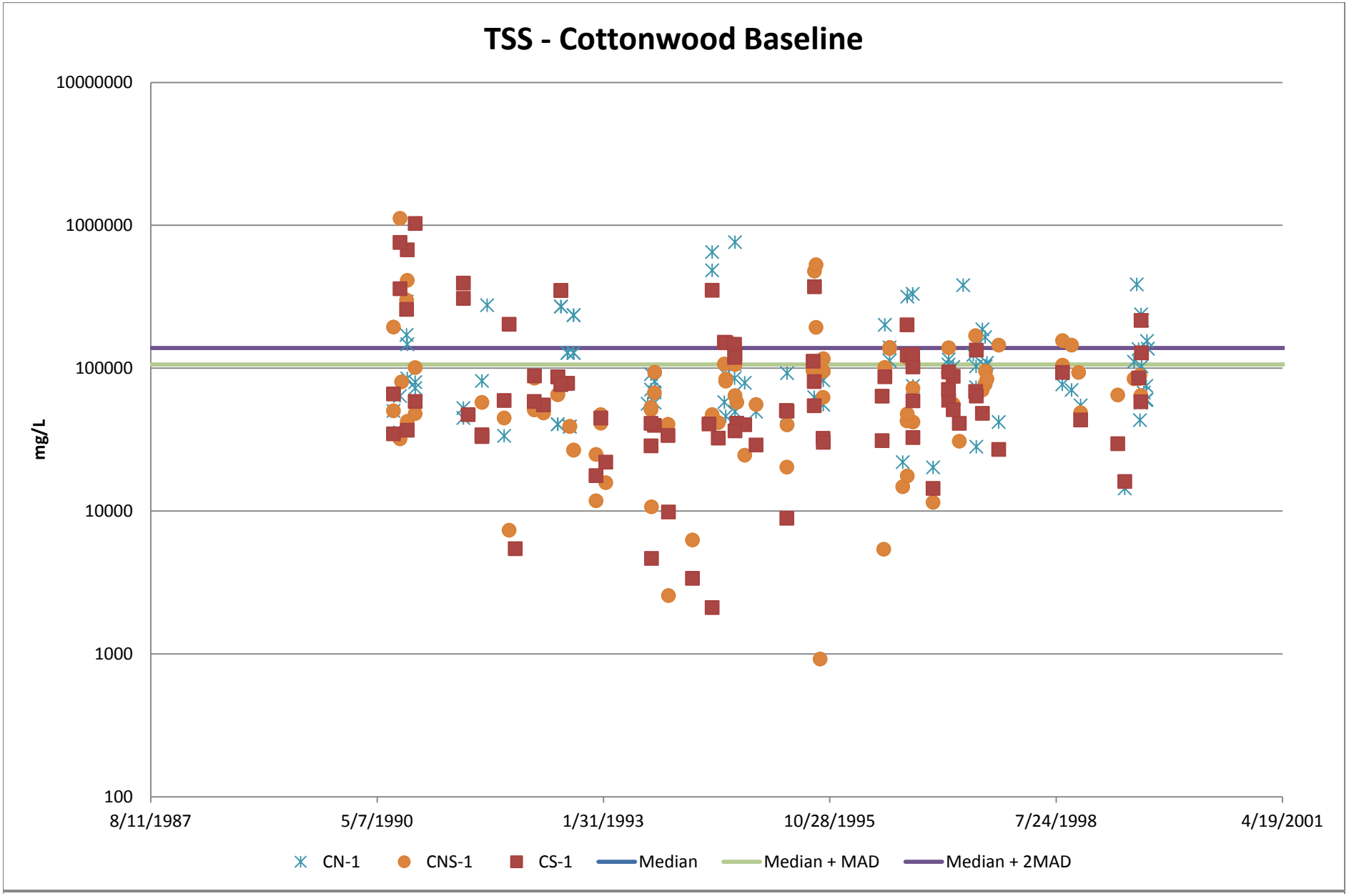

Selenium - Cottonwood Baseline
mg/L
10
1
0.1
0.01
0.001
0.0001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

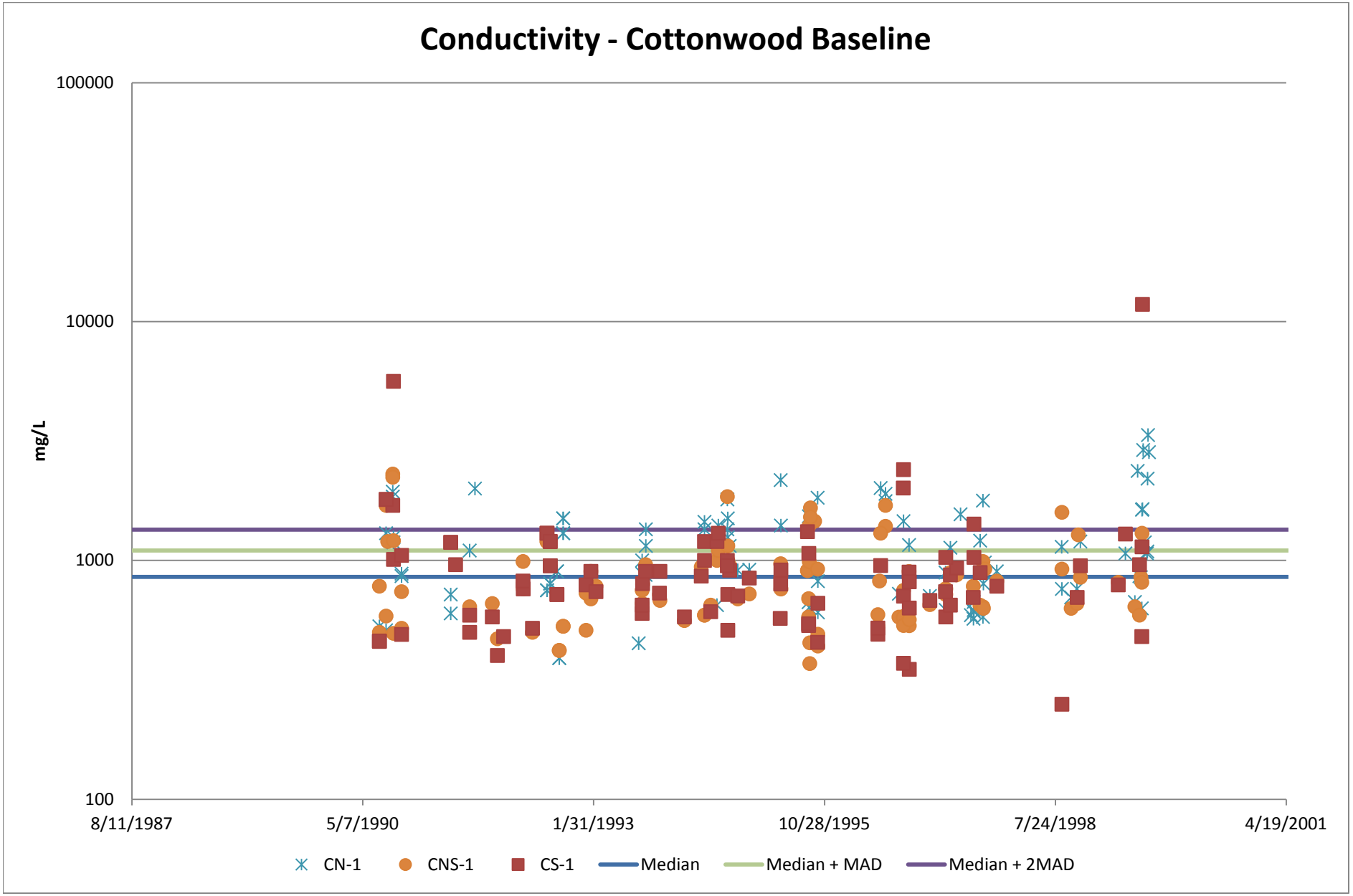

Silver - Cottonwood Baseline
mg/L
10
1
0.1
0.01
0.001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

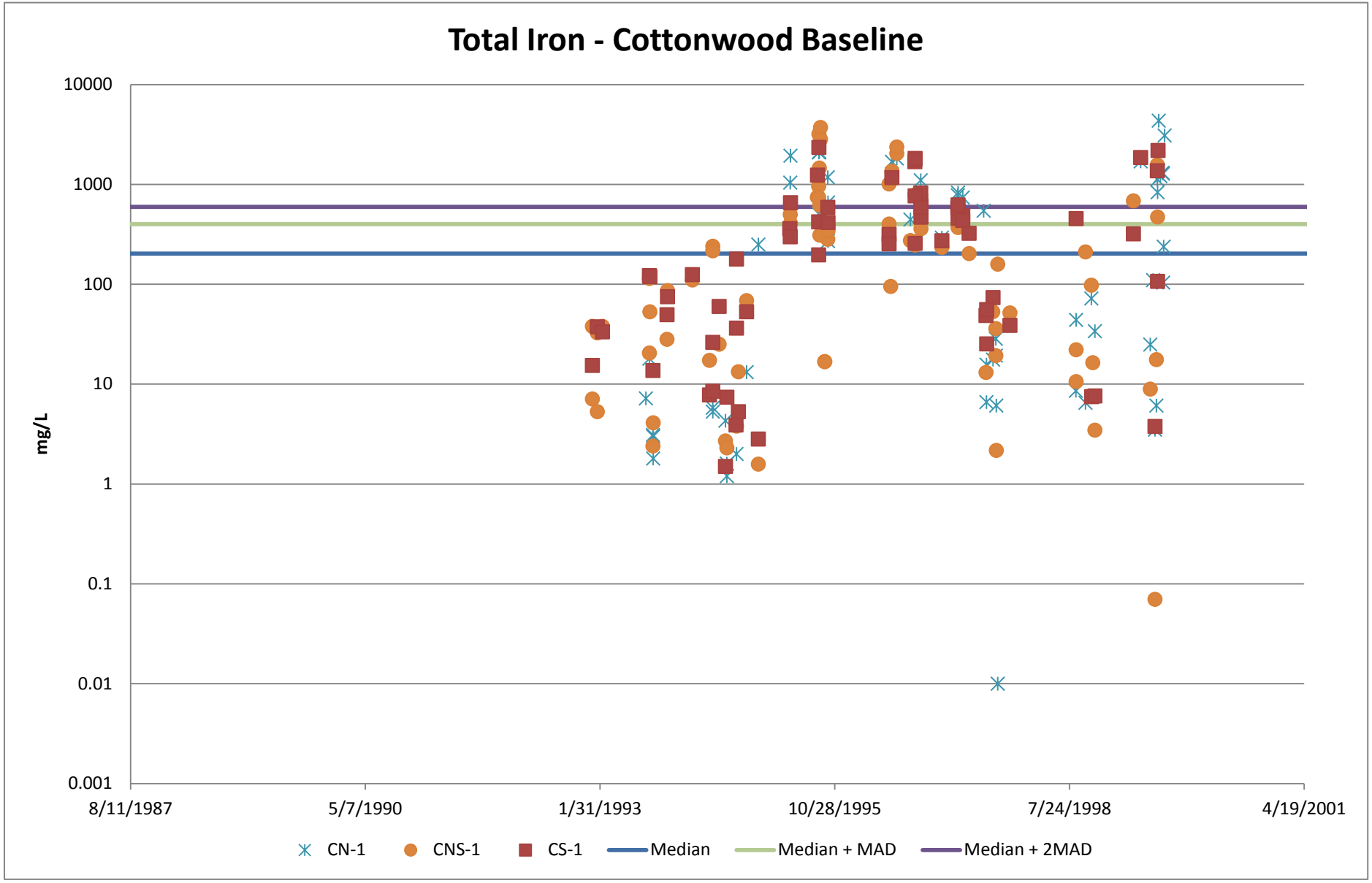

Sulfate - Cottonwood Baseline
mg/L
2000
1800
1600
1400
1200
1000
800
600
400
200
0
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria

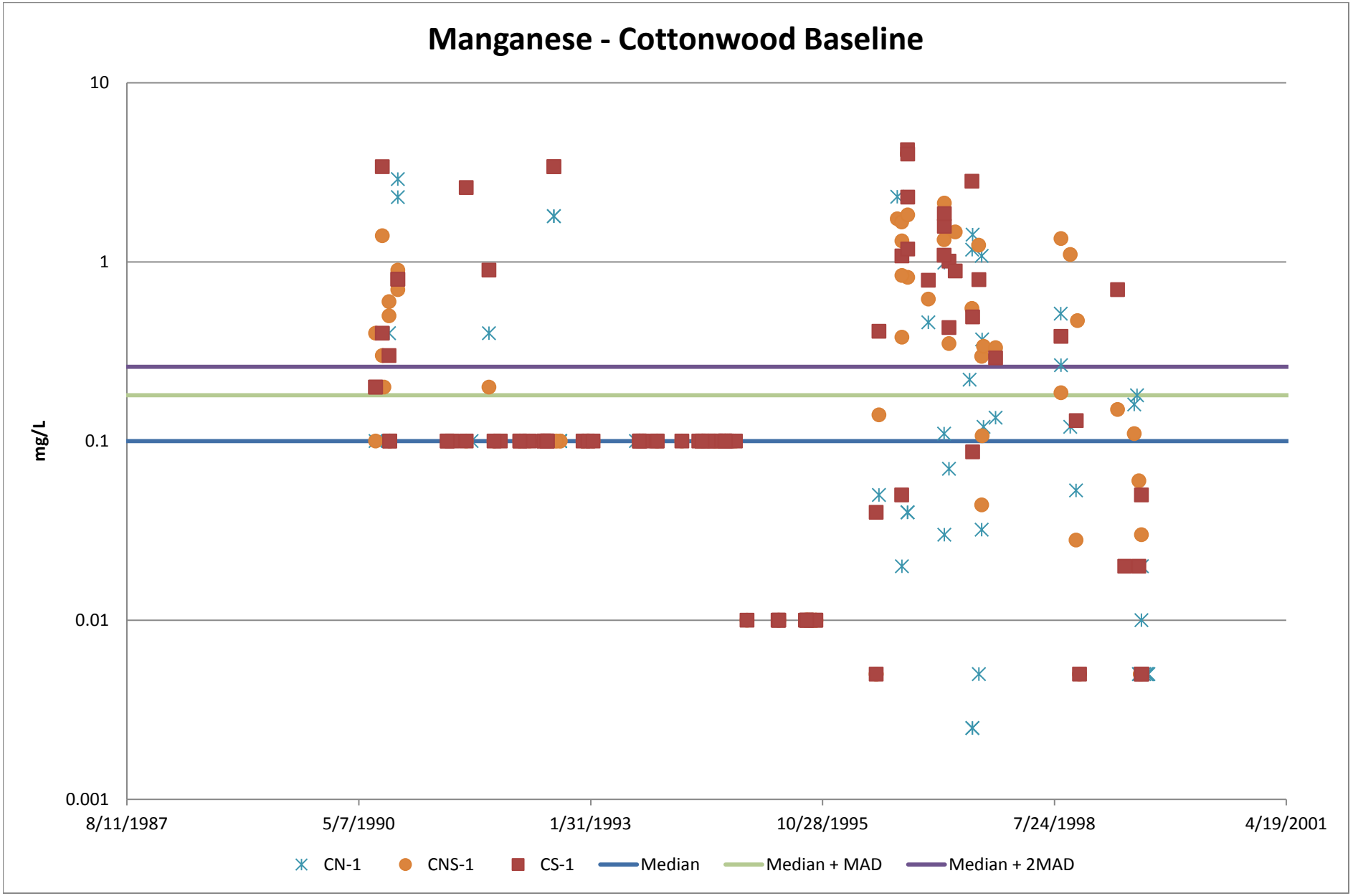

TDS - Cottonwood Baseline
100000
10000
1000
100
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria

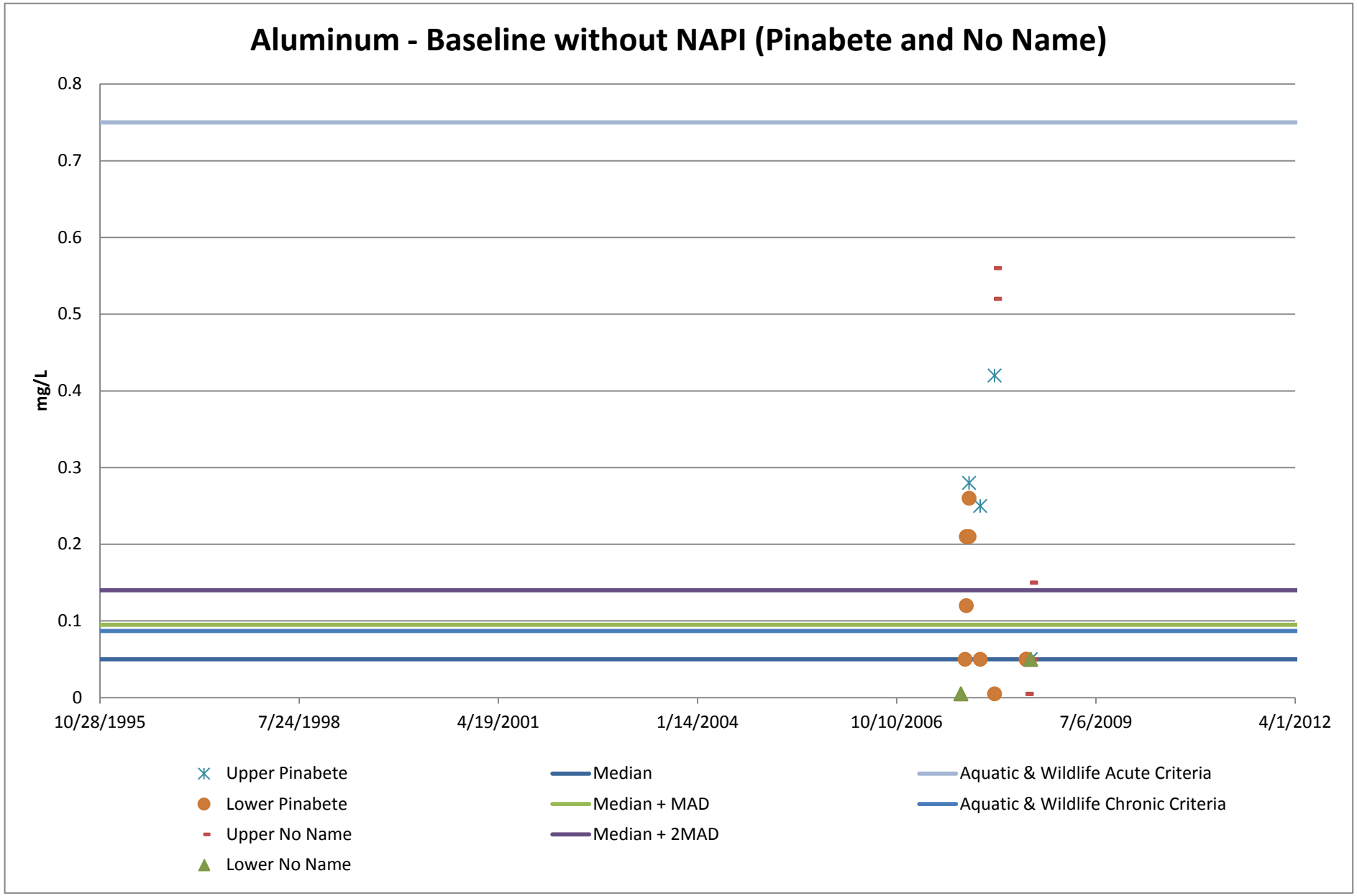

Zinc - Cottonwood Baseline
mg/L
1000
100
10
1
0.1
0.01
0.001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Aquatic and Wildlife Chronic Criteria

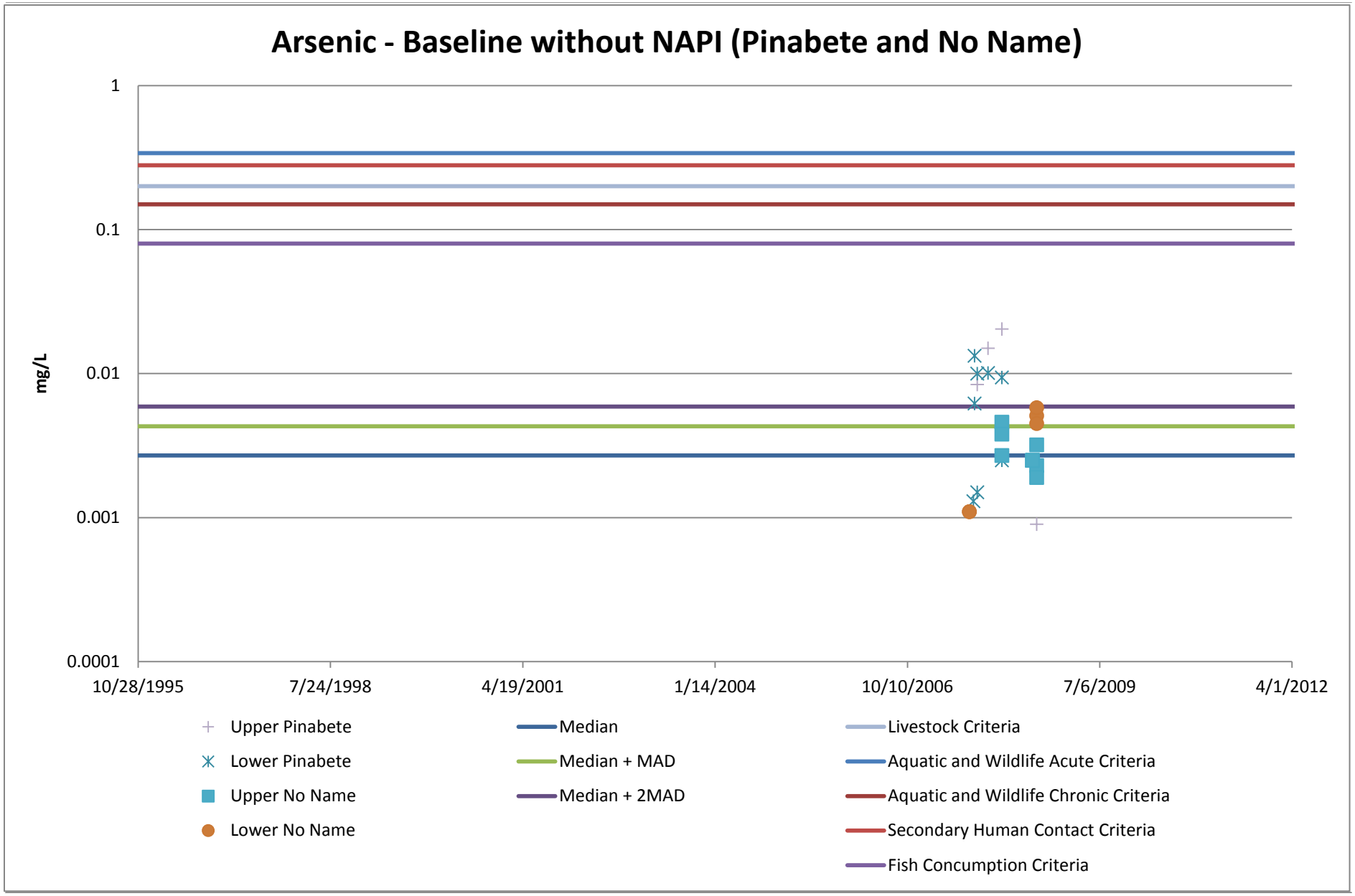

TSS - Cottonwood Baseline
10000000
1000000
100000
10000
1000
100
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD

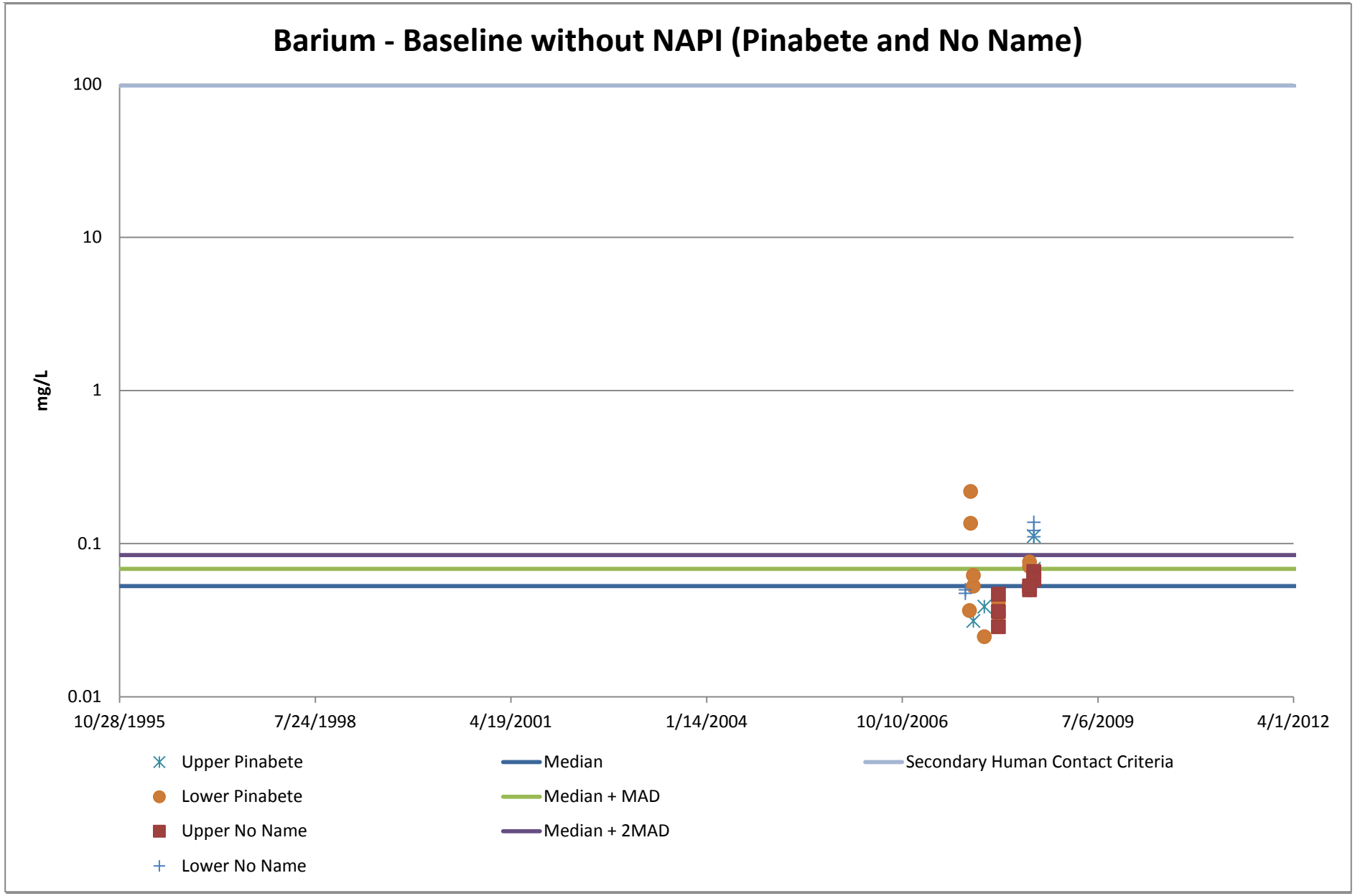

Conductivity - Cottonwood Baseline
100000
10000
1000
100
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD

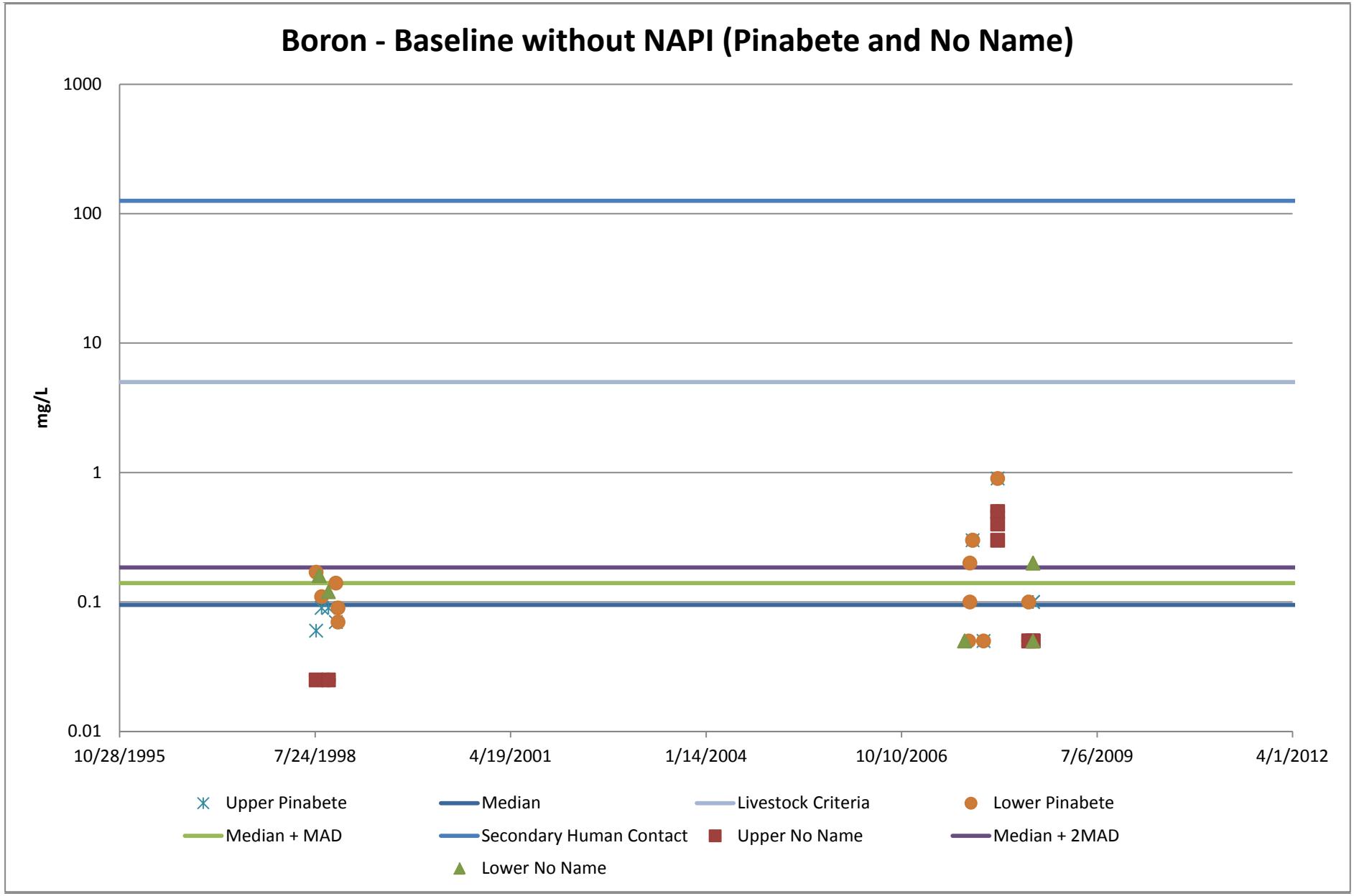

Total Iron - Cottonwood Baseline
mg/L
10000
1000
100
10
1
0.1
0.01
0.001
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD

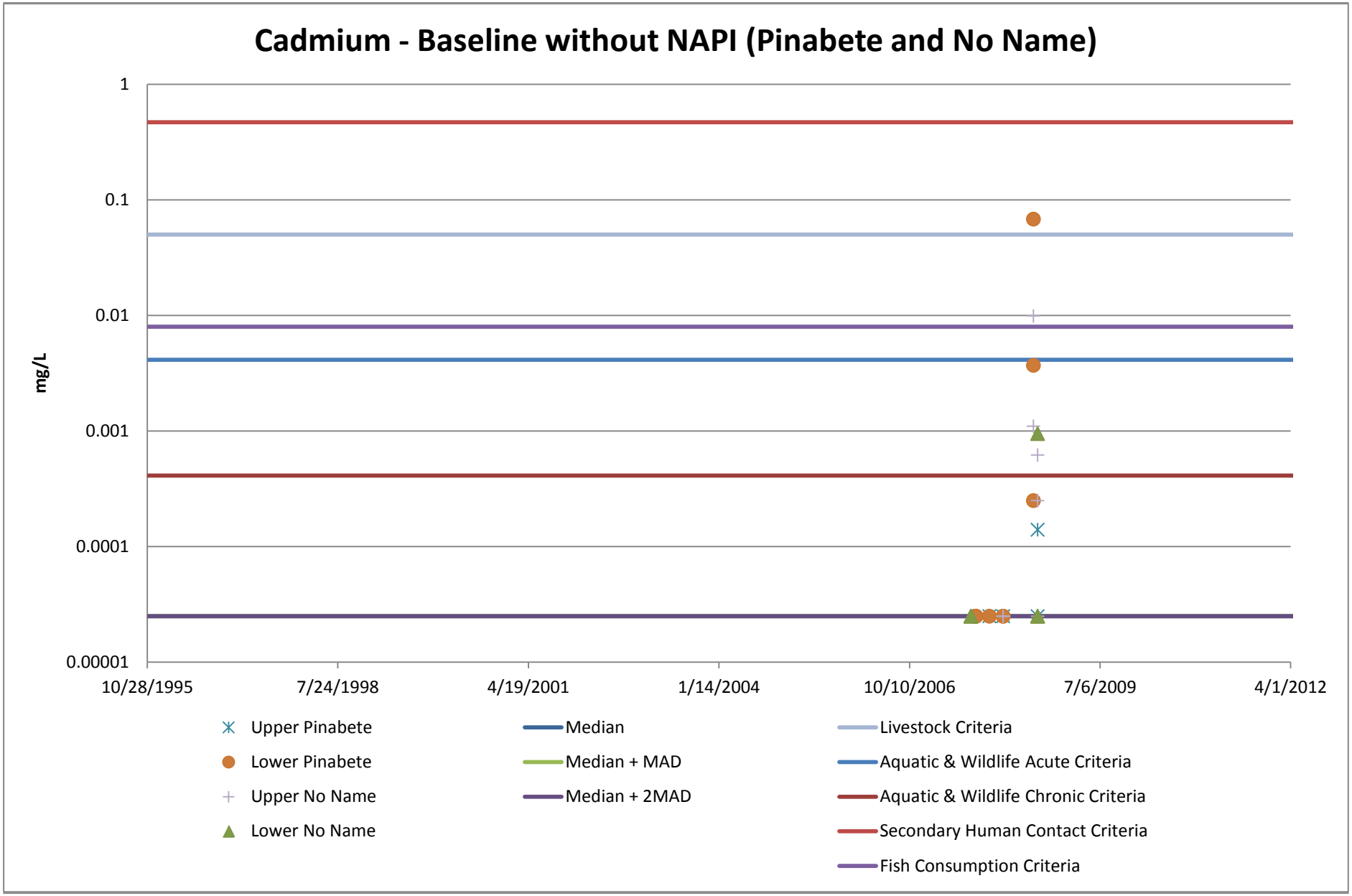

Manganese - Cottonwood Baseline
10
1
0.1
0.01
0.001
mg/L
8/11/1987
5/7/1990
1/31/1993
10/28/1995
7/24/1998
4/19/2001
CN-1
CNS-1
CS-1
Median
Median + MAD
Median + 2MAD

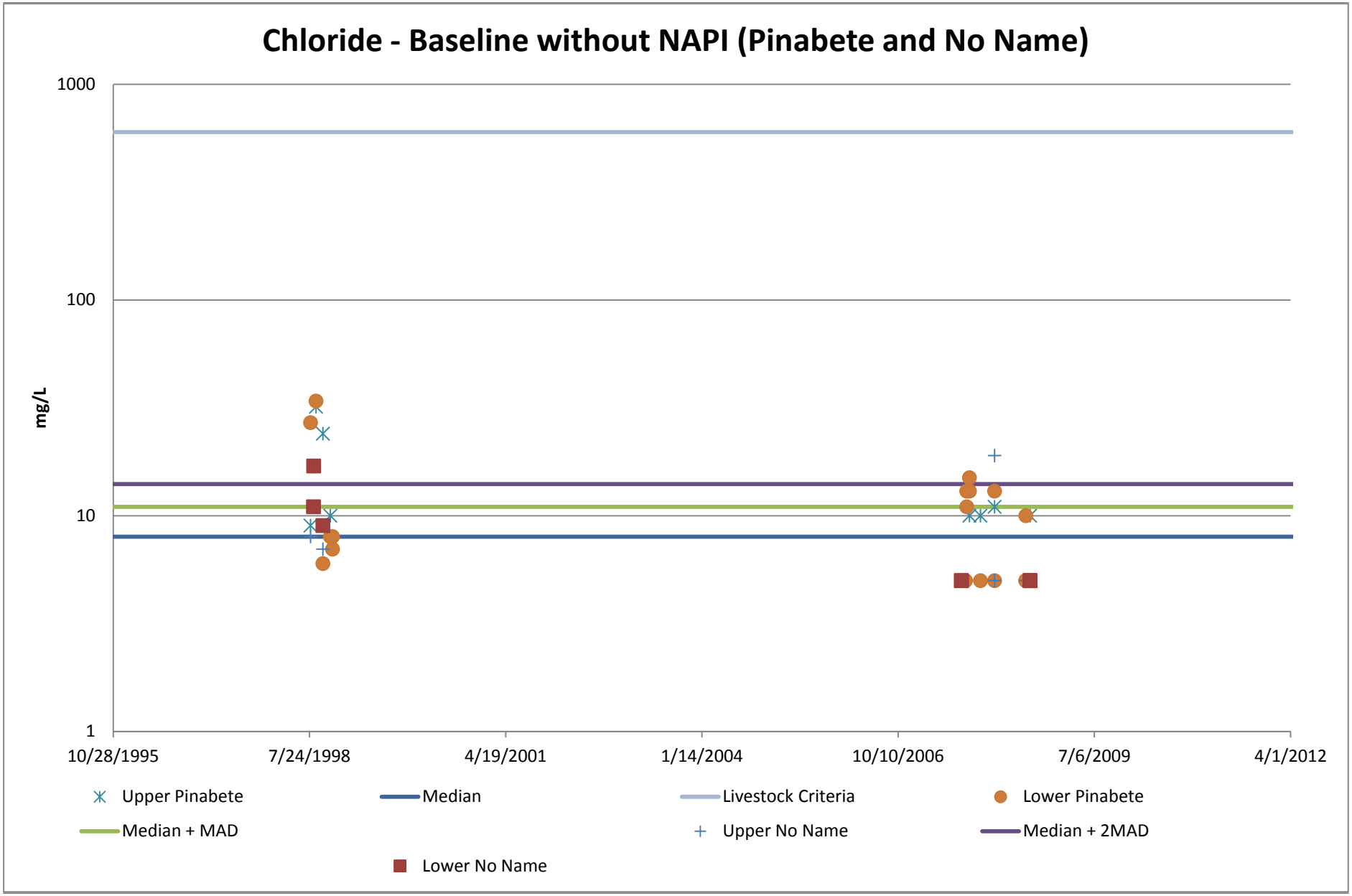

Aluminum - Baseline without NAPI (Pinabete and No Name)
mg/L
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria

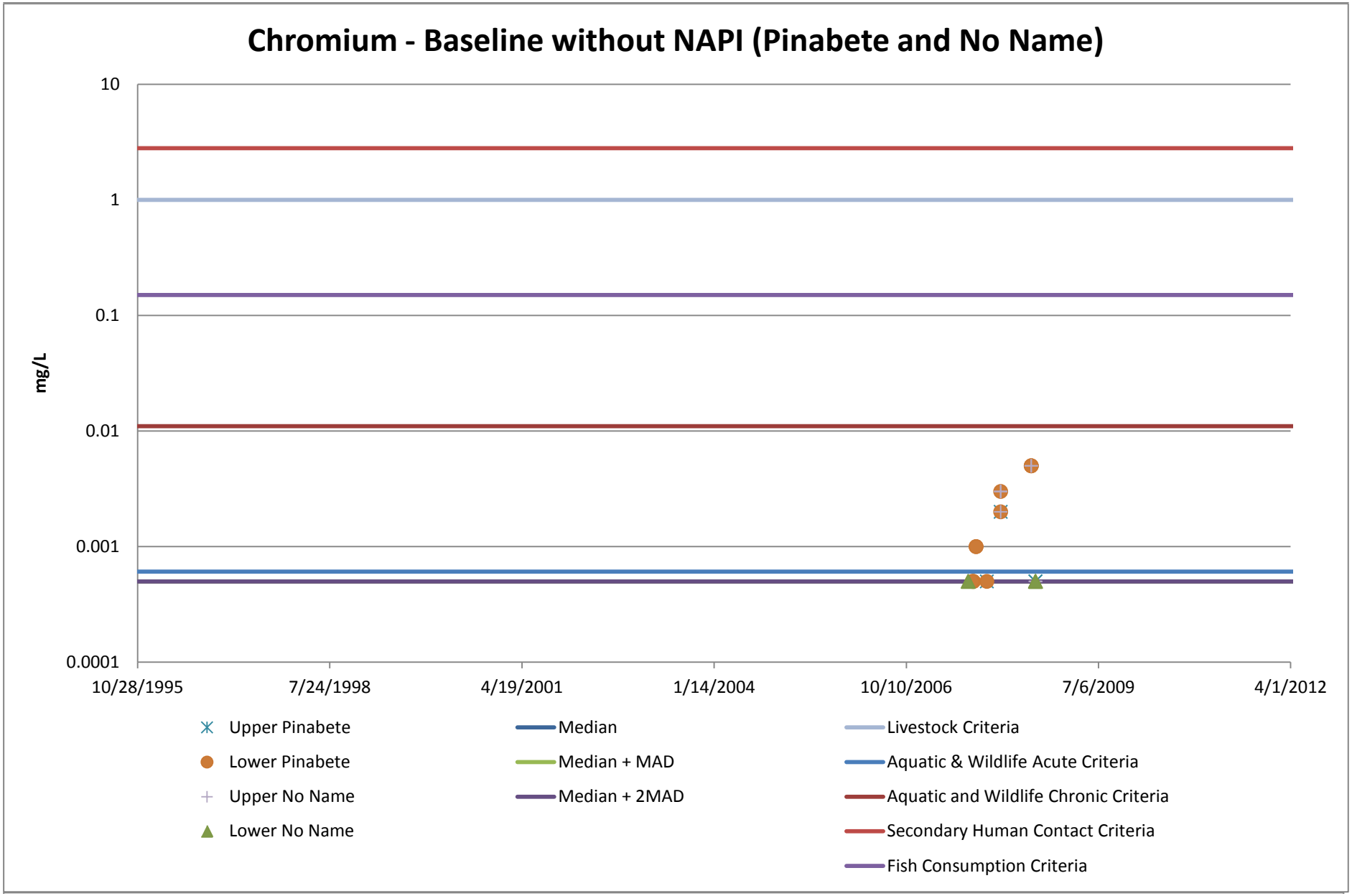

Arsenic - Baseline without NAPI (Pinabete and No Name)
mg/L
1
0.1
0.01
0.001
0.0001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Concumption Criteria

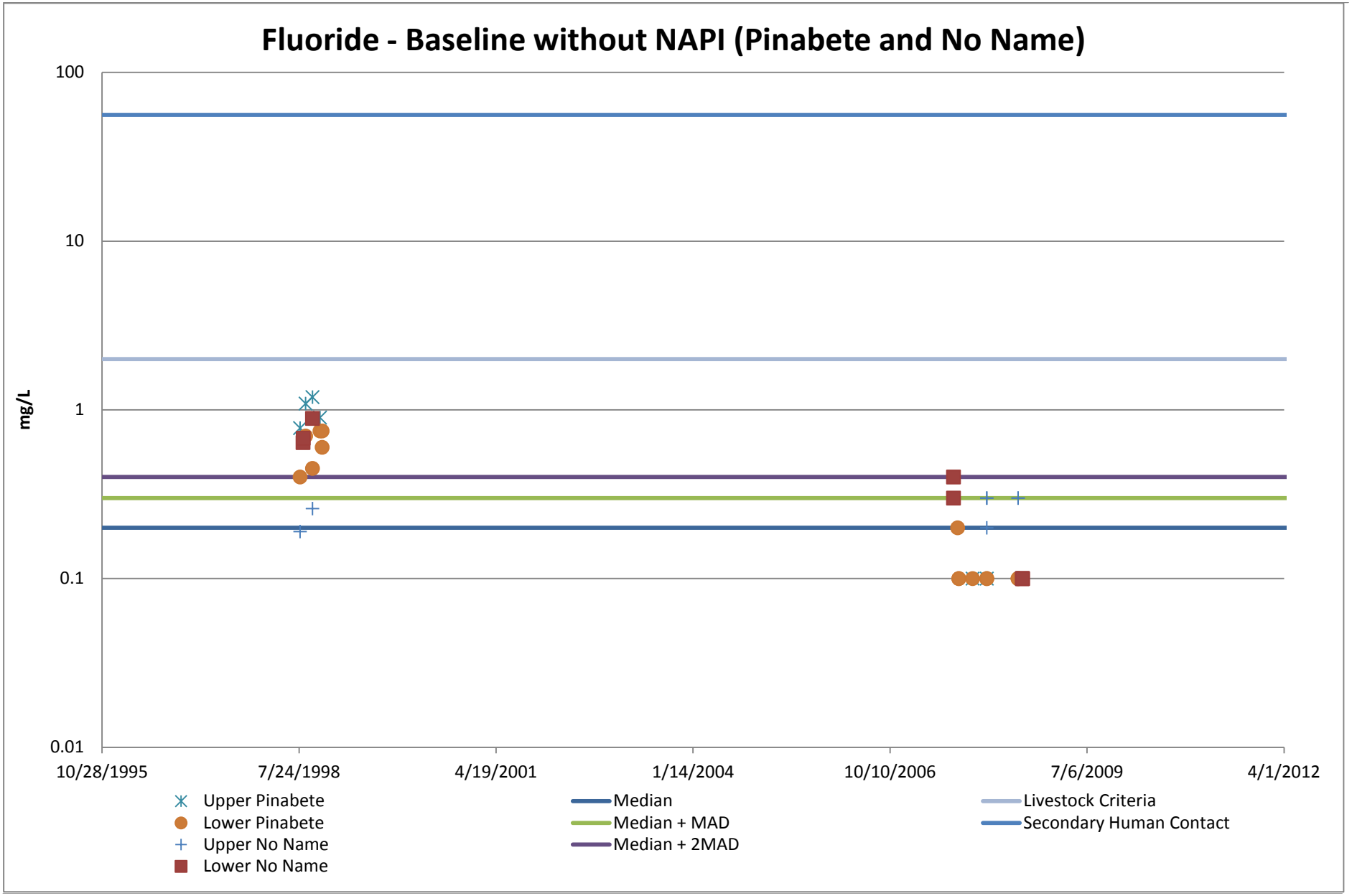

Barium - Baseline without NAPI (Pinabete and No Name)
mg/L
100
10
1
0.1
0.01
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Secondary Human Contact Criteria

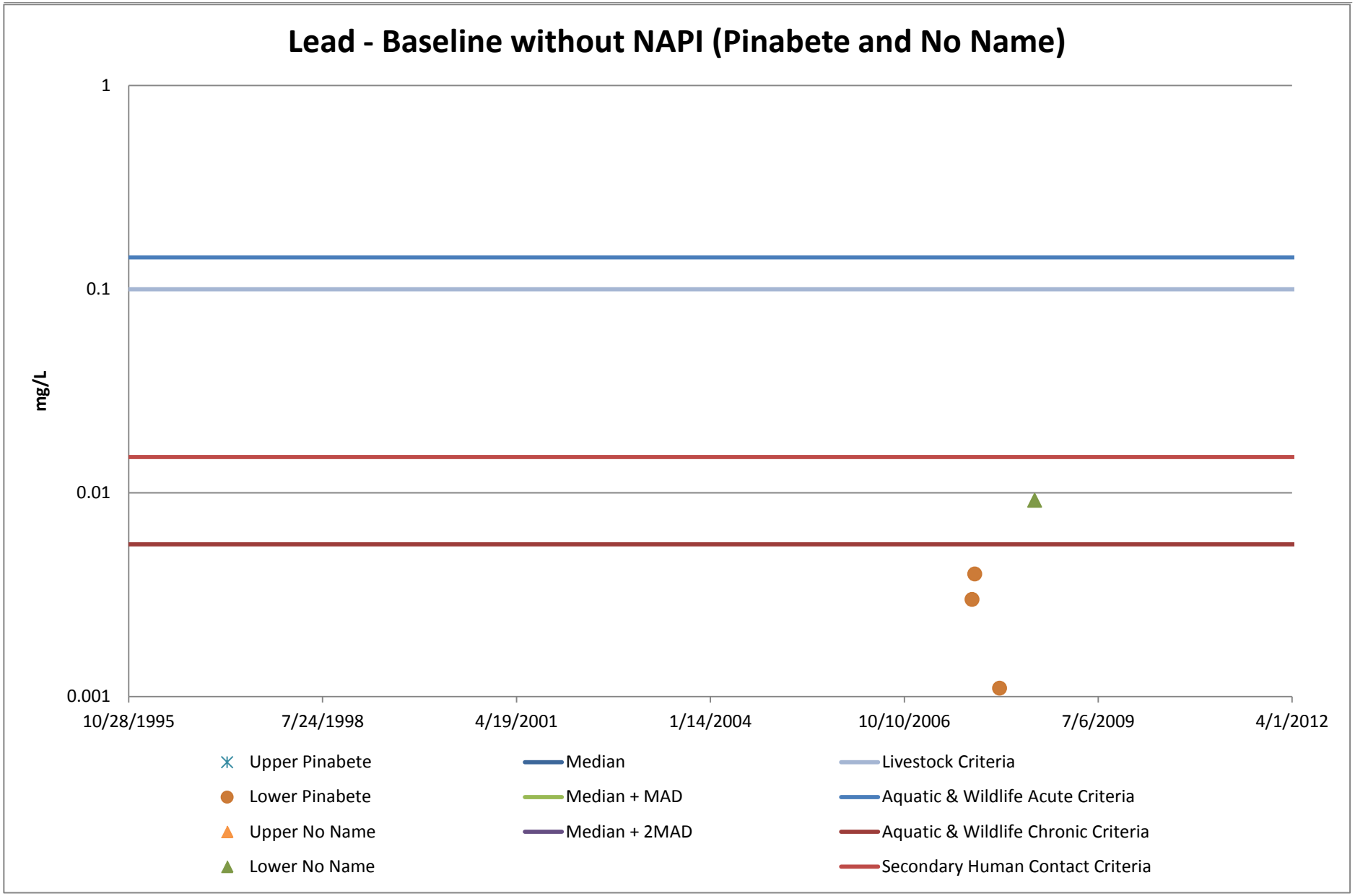

Boron - Baseline without NAPI (Pinabete and No Name)
1000
100
10
1
0.1
0.01
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Median
Livestock Criteria
Lower Pinabete
Median + MAD
Secondary Human Contact
Upper No Name
Median + 2MAD
Lower No Name

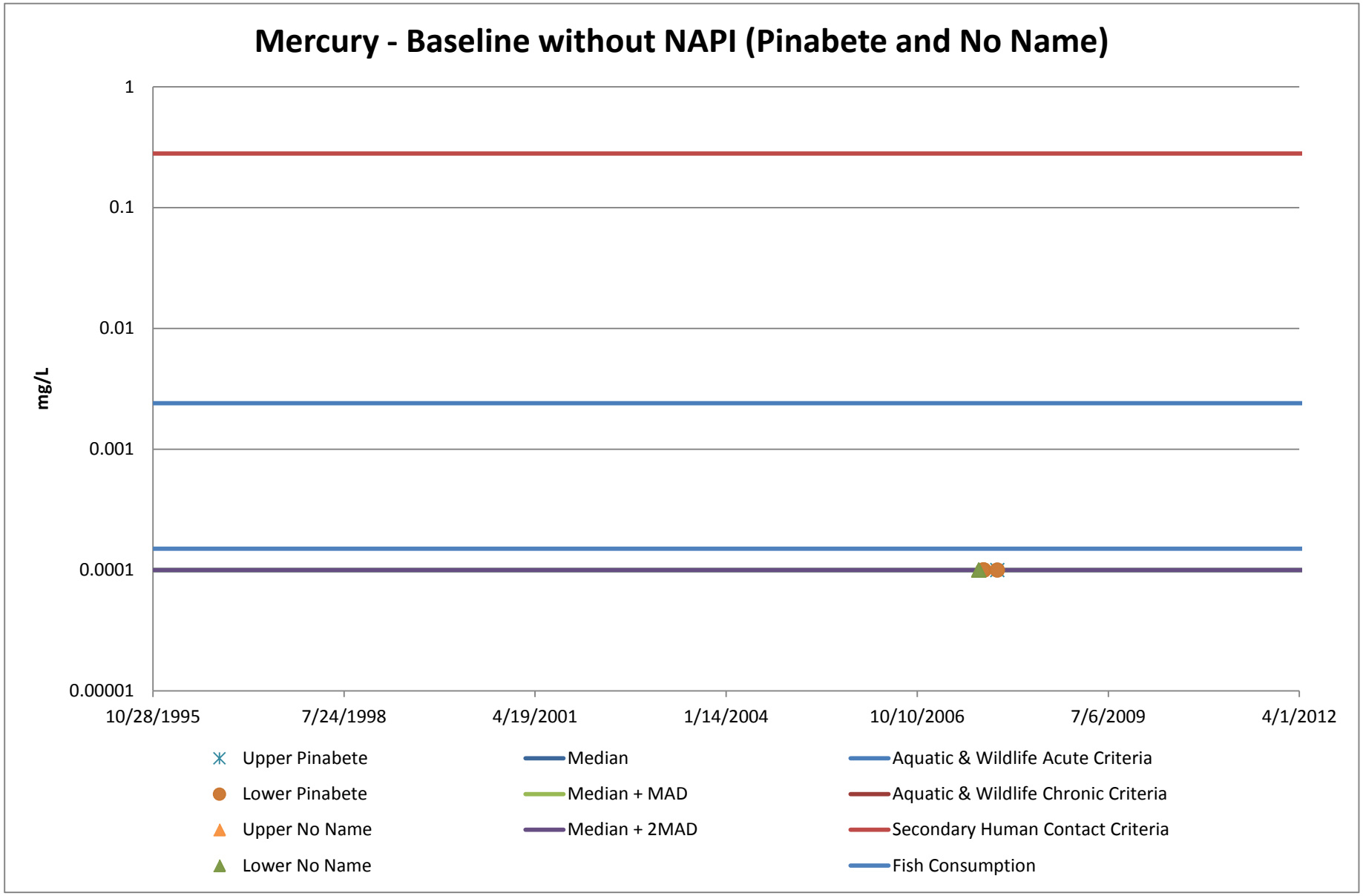

Cadmium - Baseline without NAPI (Pinabete and No Name)
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

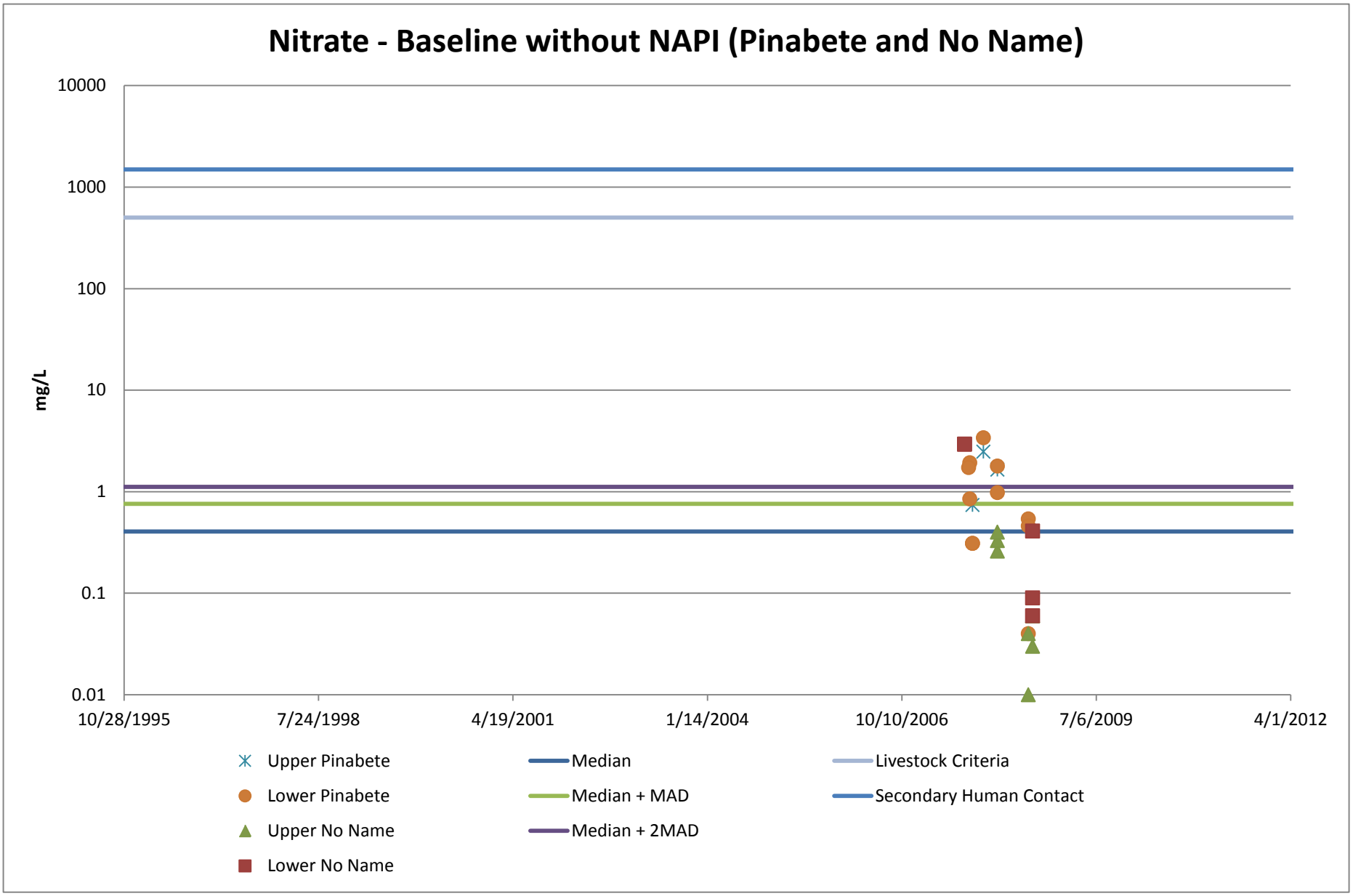

Chloride - Baseline without NAPI (Pinabete and No Name)
1000
100
10
1
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Median
Livestock Criteria
Lower Pinabete
Median + MAD
Upper No Name
Median + 2MAD
Lower No Name

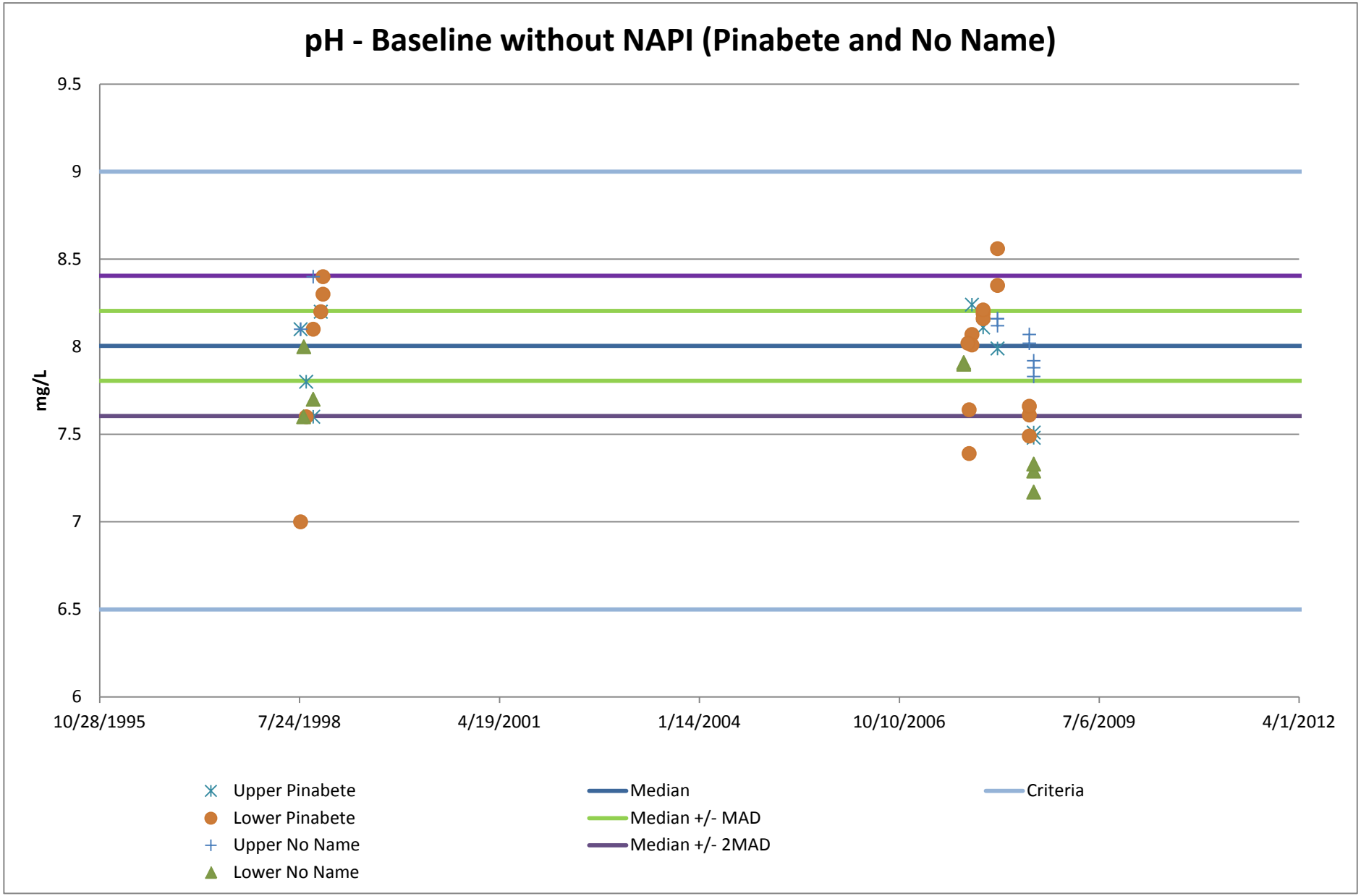

Chromium - Baseline without NAPI (Pinabete and No Name)
mg/L
10
1
0.1
0.01
0.001
0.0001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic and Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

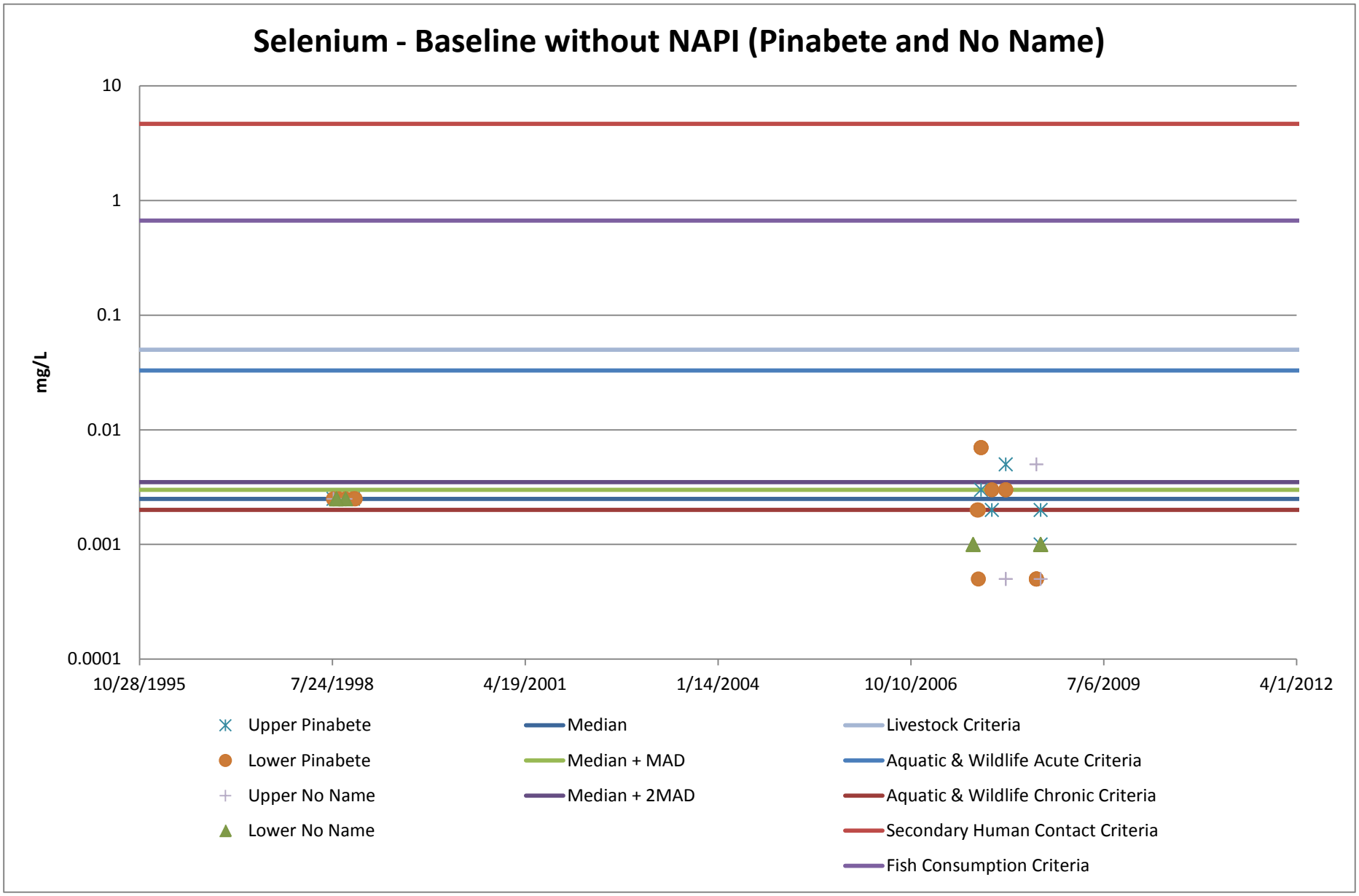

Fluoride - Baseline without NAPI (Pinabete and No Name)
mg/L
100
10
1
0.1
0.01
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Secondary Human Contact

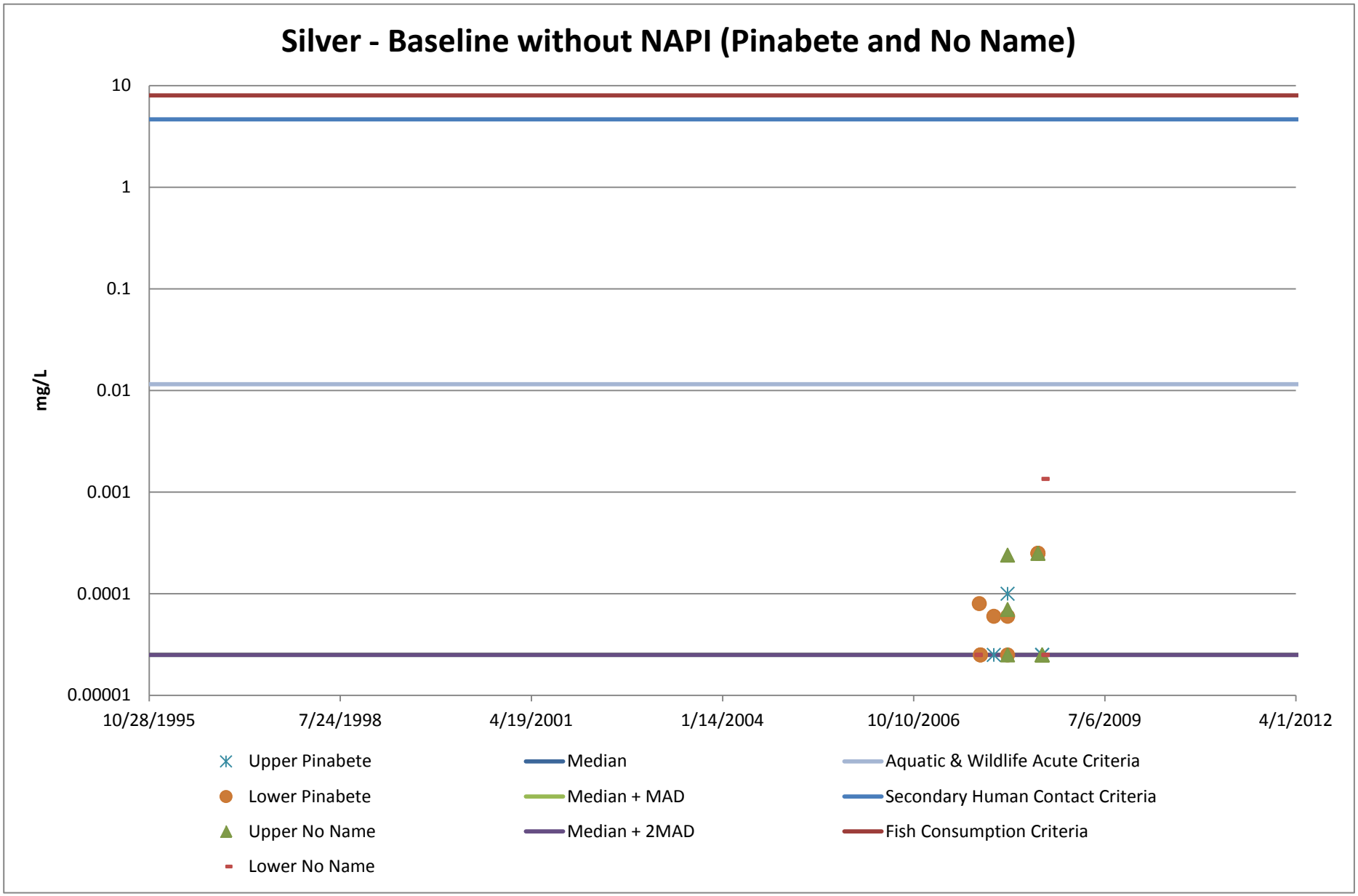

Lead - Baseline without NAPI (Pinabete and No Name)
mg/L
1
0.1
0.01
0.001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria

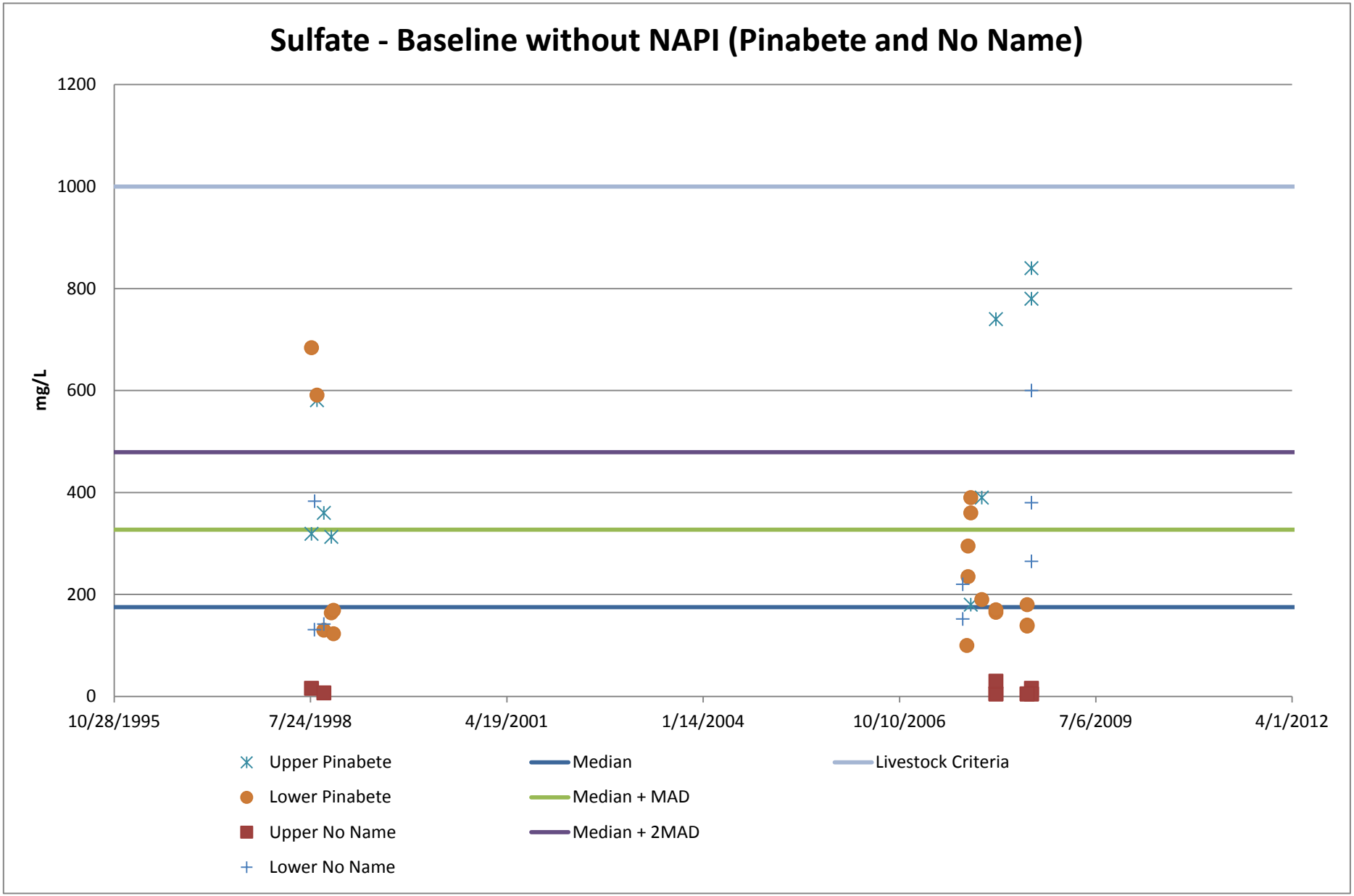

Mercury - Baseline without NAPI (Pinabete and No Name)
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption

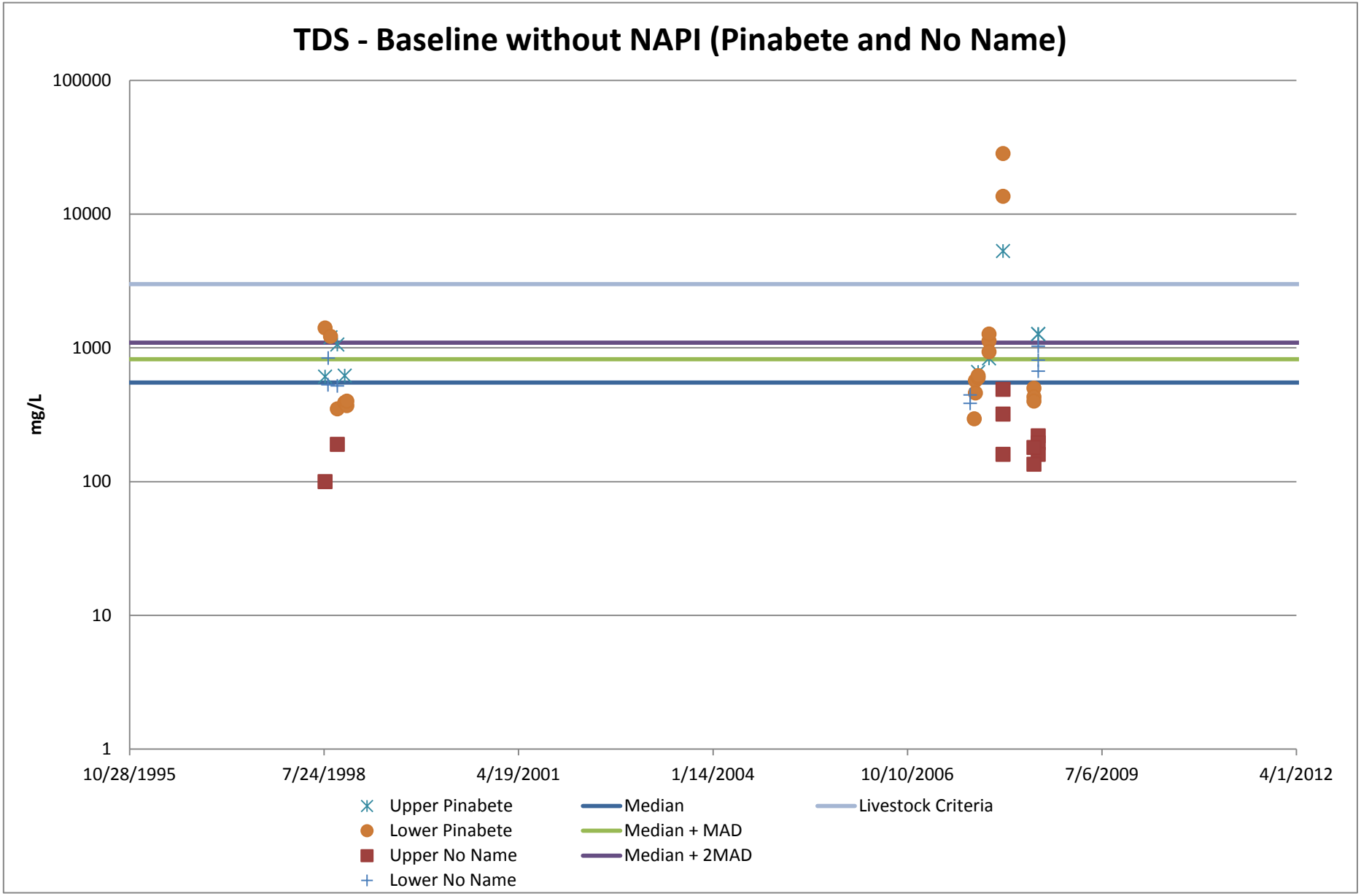

Nitrate - Baseline without NAPI (Pinabete and No Name)
mg/L
10000
1000
100
10
1
0.1
0.01
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Secondary Human Contact

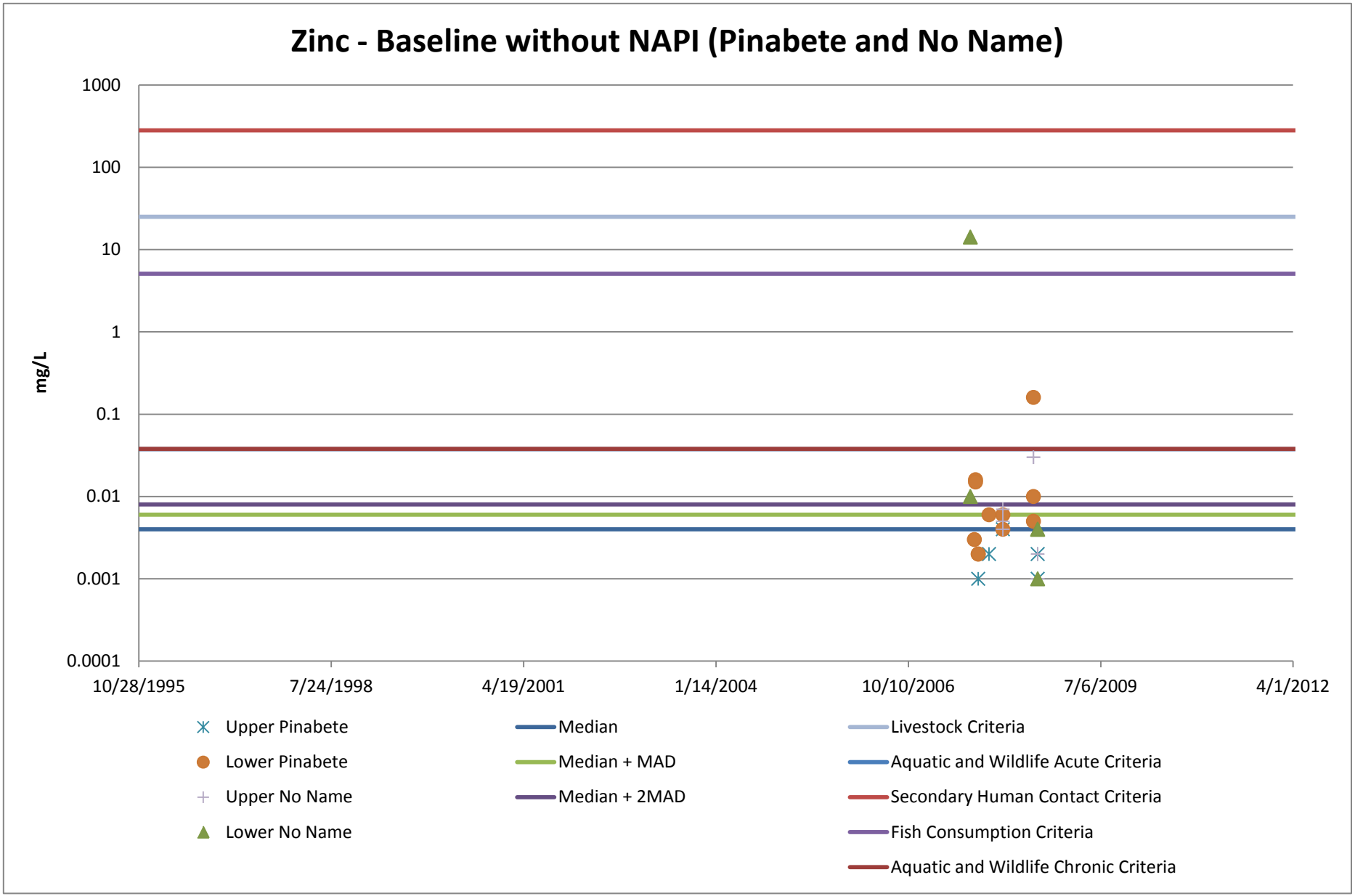

pH - Baseline without NAPI (Pinabete and No Name)
9.5
9
8.5
8
7.5
7
6.5
6
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median +/- MAD
Median +/- 2MAD
Criteria

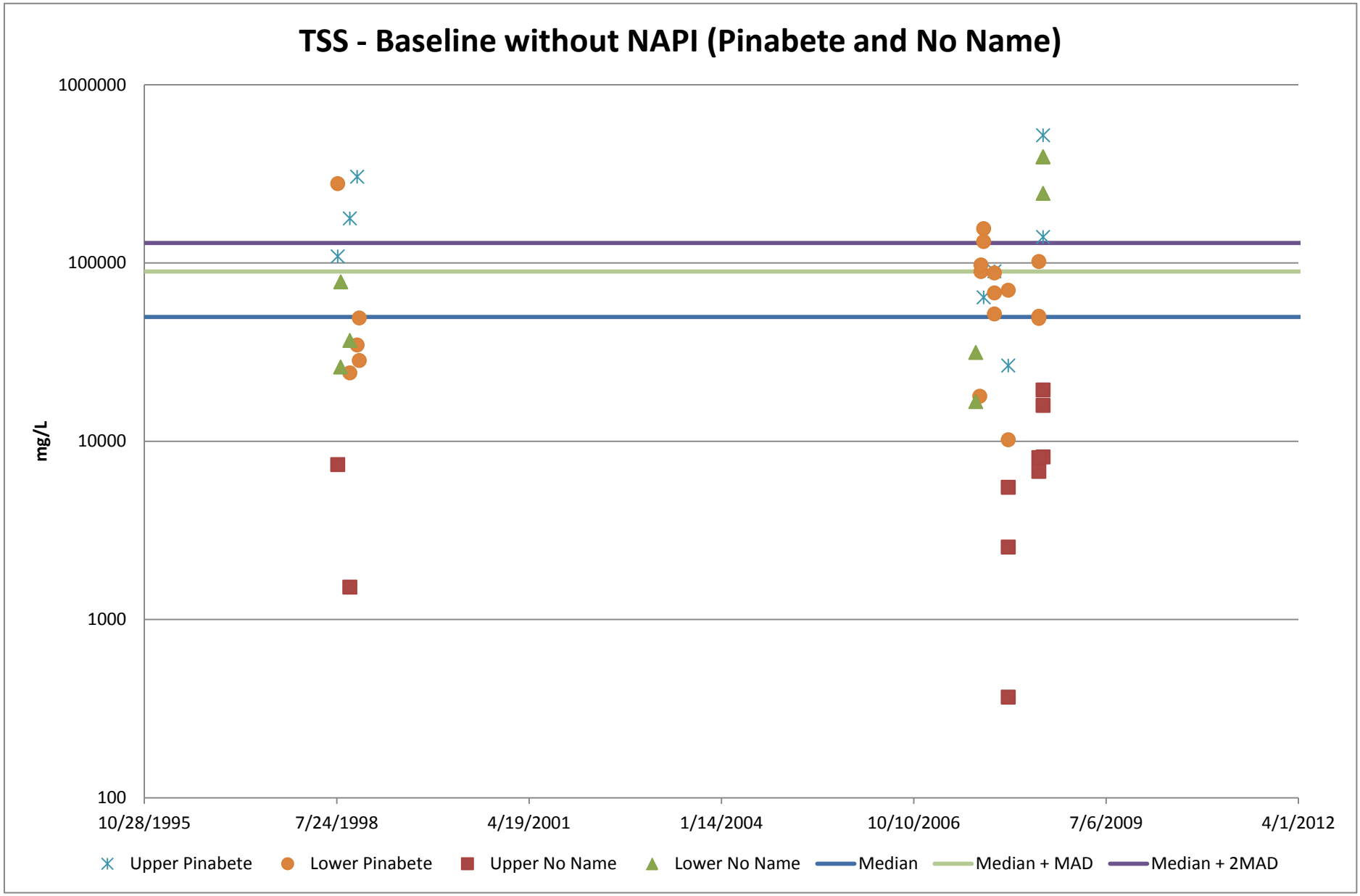

Selenium - Baseline without NAPI (Pinabete and No Name)
mg/L
10
1
0.1
0.01
0.001
0.0001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic & Wildlife Acute Criteria
Aquatic & Wildlife Chronic Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

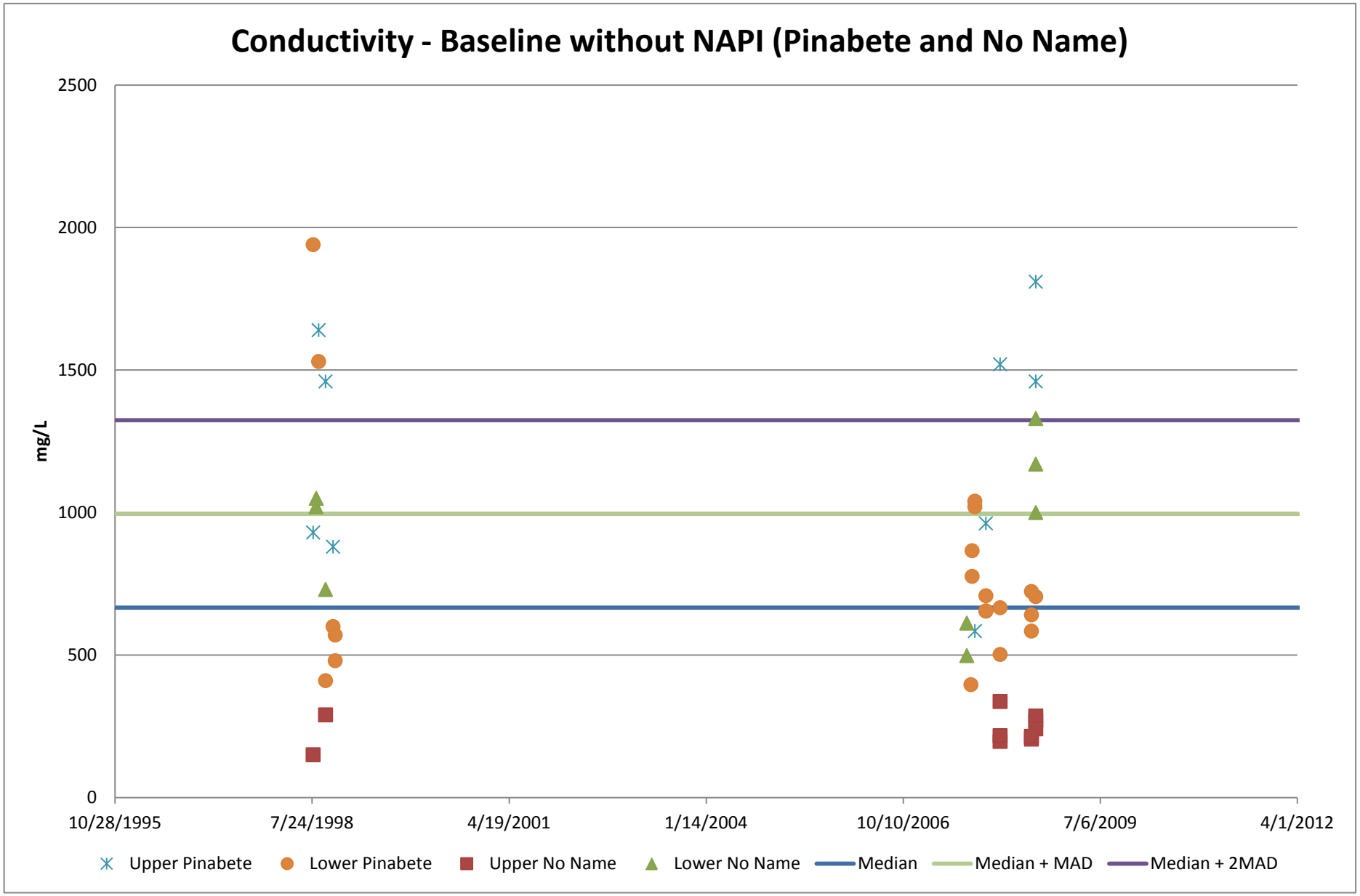

Silver - Baseline without NAPI (Pinabete and No Name)
mg/L
10
1
0.1
0.01
0.001
0.0001
0.00001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Aquatic & Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria

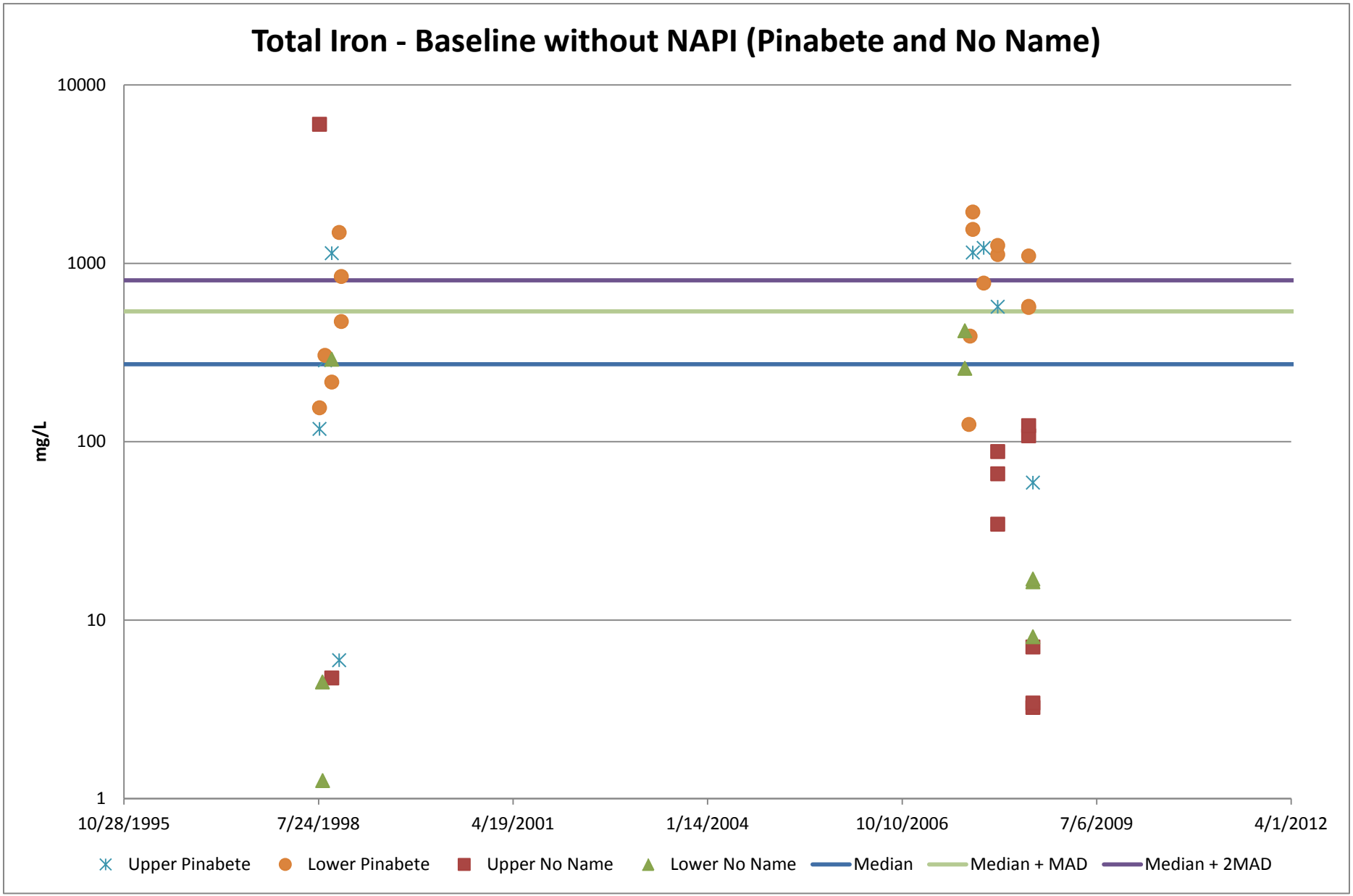

Sulfate - Baseline without NAPI (Pinabete and No Name)
mg/L
1200
1000
800
600
400
200
0
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria

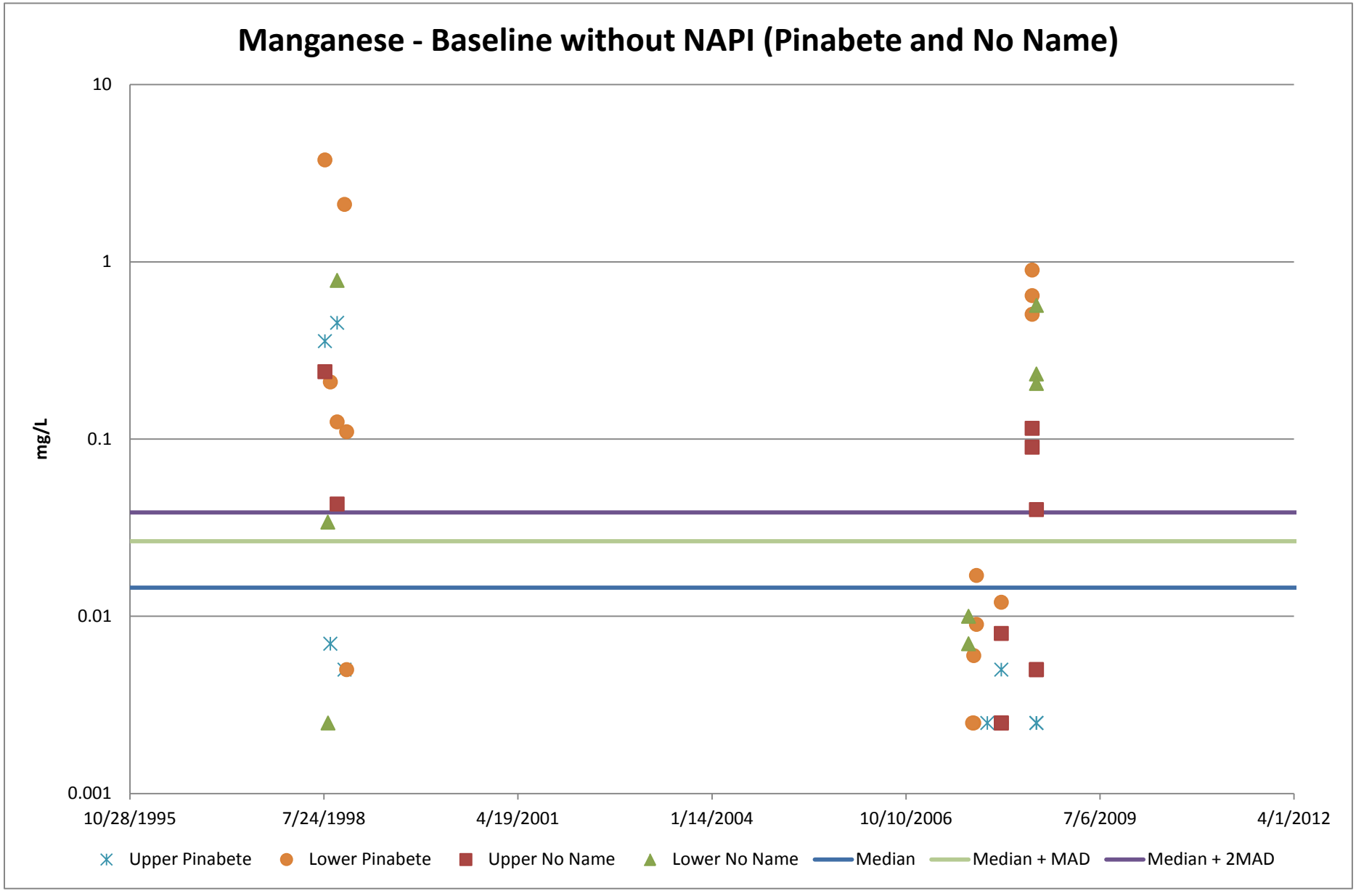

TDS - Baseline without NAPI (Pinabete and No Name)
100000
10000
1000
100
10
1
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria


Zinc - Baseline without NAPI (Pinabete and No Name)
mg/L
1000
100
10
1
0.1
0.01
0.001
0.0001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD
Livestock Criteria
Aquatic and Wildlife Acute Criteria
Secondary Human Contact Criteria
Fish Consumption Criteria
Aquatic and Wildlife Chronic Criteria


TSS - Baseline without NAPI (Pinabete and No Name)
1000000
100000
10000
1000
100
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD


Conductivity - Baseline without NAPI (Pinabete and No Name)
mg/L
2500
2000
1500
1000
500
0
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD


Total Iron - Baseline without NAPI (Pinabete and No Name)
10000
1000
100
10
1
mg/L
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD


Manganese - Baseline without NAPI (Pinabete and No Name)
mg/L
10
1
0.1
0.01
0.001
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
Upper Pinabete
Lower Pinabete
Upper No Name
Lower No Name
Median
Median + MAD
Median + 2MAD

Appendix E: SEDCAD Modeling Reports

Coal Creek Watershed Pre-Mining

OSM

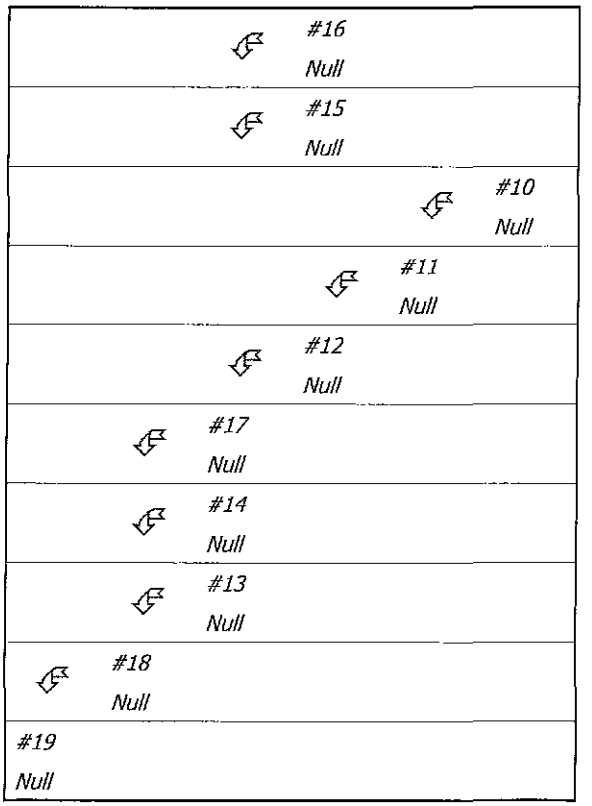
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#10	==>	#11	0.000	0.000	
Null	#11	==>	#12	0.541	0.326	
Null	#12	==>	#17	0.990	0.322	
Null	#13	==>	#18	0.000	0.000	
Null	#14	==>	#18	0.000	0.000	
Null	#15	==>	#17	0.000	0.000	
Null	#16	==>	#17	0.000	0.000	
Null	#17	==>	#18	3.667	0.234	
Null	#18	==>	#19	2.962	0.234	
Null	#19	==>	End	0.000	0.000	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#11	8. Large gullies, diversions, and low flowing streams	1.13	70.00	6,200.72	3.18	0.541

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#11	**Muskingum K:**					**0.541**
#12	8. Large gullies, diversions, and low flowing streams	1.05	115.00	10,950.29	3.07	0.990
#12	**Muskingum K:**					**0.990**
#17	8. Large gullies, diversions, and low flowing streams	0.25	50.00	19,801.98	1.50	3.667
#17	**Muskingum K:**					**3.667**
#18	8. Large gullies, diversions, and low flowing streams	0.25	40.00	16,000.00	1.50	2.962
#18	**Muskingum K:**					**2.962**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#16	7,300.000	7,300.000	467.26	213.70
#15	3,530.000	3,530.000	388.14	103.33
#10	2,860.000	2,860.000	370.09	85.50
#11	3,930.000	6,790.000	898.95	202.93
#12	940.000	7,730.000	933.82	223.67
#17	5,060.000	23,620.000	1,827.86	689.00
#14	1,280.000	1,280.000	261.33	39.01
#13	1,762.000	1,762.000	250.23	53.97
#18	1,590.000	28,252.000	1,757.70	829.50
#19	0.000	28,252.000	1,719.96	829.50

Structure Detail:

Structure #16 (Null)

Structure #15 (Null)

Structure #10 (Null)

Structure #11 (Null)

Structure #12 (Null)

Structure #17 (Null)

Structure #14 (Null)

Structure #13 (Null)

Structure #18 (Null)

Structure #19 (Null)

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#16	1	3,500.000	1.666	1.666	0.319	88.000	M	482.75	102.471
	2	3,800.000	3.588	3.588	0.293	88.000	M	301.20	111.230
	Σ	**7,300.000**						**467.26**	**213.701**
#15	1	3,530.000	2.208	2.208	0.308	88.000	M	397.56	103.325
	Σ	**3,530.000**						**388.14**	**103.325**
#10	1	1,660.000	1.043	1.043	0.355	87.000	M	282.80	44.218
	2	800.000	0.442	0.442	0.360	89.000	M	280.42	25.735
	3	400.000	0.221	0.221	0.360	91.000	M	220.98	15.547
	Σ	**2,860.000**						**370.09**	**85.500**
#11	1	2,230.000	1.084	0.885	0.360	87.000	M	370.48	59.441
	2	1,200.000	0.442	0.442	0.360	89.000	M	420.64	38.603
	3	500.000	0.271	0.271	0.353	91.000	M	260.01	19.385
	Σ	**6,790.000**						**898.95**	**202.930**
#12	1	940.000	0.268	0.000	0.000	85.000	M	269.99	20.743
	Σ	**7,730.000**						**933.82**	**223.673**
#17	1	5,060.000	0.559	0.559	0.362	88.000	M	1,412.31	148.302
	Σ	**23,620.000**						**1,827.86**	**689.002**
#14	1	780.000	0.667	0.667	0.372	88.000	M	196.46	22.870
	2	500.000	0.308	0.308	0.372	89.000	M	205.13	16.137
	Σ	**1,280.000**						**261.33**	**39.007**
#13	1	940.000	1.151	1.151	0.360	88.000	M	167.40	27.528
	2	822.000	0.533	0.533	0.367	89.000	M	261.43	26.444
	Σ	**1,762.000**						**250.23**	**53.972**
#18	1	1,590.000	0.141	0.141	0.388	88.000	M	732.90	47.524
	Σ	**28,252.000**						**1,757.70**	**829.505**
#19	Σ	**28,252.000**						**1,719.96**	**829.505**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	1	8. Large gullies, diversions, and low flowing streams	1.94	305.00	15,700.60	4.180	1.043

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	**1**	**Time of Concentration:**					**1.043**
#10	2	8. Large gullies, diversions, and low flowing streams	2.14	150.00	7,000.18	4.390	0.442
#10	**2**	**Time of Concentration:**					**0.442**
#10	3	8. Large gullies, diversions, and low flowing streams	2.14	75.00	3,500.09	4.390	0.221
#10	**3**	**Time of Concentration:**					**0.221**
#11	1	8. Large gullies, diversions, and low flowing streams	1.88	300.00	15,999.99	4.100	1.084
#11	**1**	**Time of Concentration:**					**1.084**
#11	2	8. Large gullies, diversions, and low flowing streams	2.14	150.00	7,000.18	4.390	0.442
#11	**2**	**Time of Concentration:**					**0.442**
#11	3	8. Large gullies, diversions, and low flowing streams	1.88	75.00	3,999.99	4.100	0.271
#11	**3**	**Time of Concentration:**					**0.271**
#12	1	5. Nearly bare and untilled, and alluvial valley fans	5.23	115.00	2,200.03	2.280	0.268
#12	**1**	**Time of Concentration:**					**0.268**
#13	1	8. Large gullies, diversions, and low flowing streams	2.14	390.00	18,200.48	4.390	1.151
#13	**1**	**Time of Concentration:**					**1.151**
#13	2	8. Large gullies, diversions, and low flowing streams	2.44	220.00	9,000.00	4.690	0.533
#13	**2**	**Time of Concentration:**					**0.533**
#14	1	8. Large gullies, diversions, and low flowing streams	2.73	325.00	11,900.40	4.950	0.667
#14	**1**	**Time of Concentration:**					**0.667**
#14	2	8. Large gullies, diversions, and low flowing streams	2.73	150.00	5,500.14	4.950	0.308
#14	**2**	**Time of Concentration:**					**0.308**
#15	1	8. Large gullies, diversions, and low flowing streams	0.83	180.00	21,702.43	2.730	2.208
#15	**1**	**Time of Concentration:**					**2.208**
#16	1	8. Large gullies, diversions, and low flowing streams	1.00	180.00	18,000.00	3.000	1.666
#16	**1**	**Time of Concentration:**					**1.666**
#16	2	8. Large gullies, diversions, and low flowing streams	0.65	200.00	31,002.94	2.400	3.588
#16	**2**	**Time of Concentration:**					**3.588**
#17	1	8. Large gullies, diversions, and low flowing streams	2.22	200.00	9,000.09	4.470	0.559
#17	**1**	**Time of Concentration:**					**0.559**
#18	1	8. Large gullies, diversions, and low flowing streams	3.83	115.00	3,000.02	5.870	0.141
#18	**1**	**Time of Concentration:**					**0.141**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	1	8. Large gullies, diversions, and low flowing streams	1.94	305.00	15,700.60	4.180	1.043
#10	**1**	**Muskingum K:**					**1.043**
#10	2	8. Large gullies, diversions, and low flowing streams	2.14	150.00	7,000.18	4.390	0.442
#10	**2**	**Muskingum K:**					**0.442**
#10	3	8. Large gullies, diversions, and low flowing streams	2.14	75.00	3,500.09	4.390	0.221
#10	**3**	**Muskingum K:**					**0.221**
#11	1	8. Large gullies, diversions, and low flowing streams	2.14	300.00	14,000.37	4.390	0.885
#11	**1**	**Muskingum K:**					**0.885**
#11	2	8. Large gullies, diversions, and low flowing streams	2.14	150.00	7,000.00	4.390	0.442
#11	**2**	**Muskingum K:**					**0.442**
#11	3	8. Large gullies, diversions, and low flowing streams	1.88	75.00	3,999.99	4.100	0.271
#11	**3**	**Muskingum K:**					**0.271**
#13	1	8. Large gullies, diversions, and low flowing streams	2.14	390.00	18,200.48	4.390	1.151
#13	**1**	**Muskingum K:**					**1.151**
#13	2	8. Large gullies, diversions, and low flowing streams	2.44	220.00	9,000.16	4.690	0.533
#13	**2**	**Muskingum K:**					**0.533**
#14	1	8. Large gullies, diversions, and low flowing streams	2.73	325.00	11,900.40	4.950	0.667
#14	**1**	**Muskingum K:**					**0.667**
#14	2	8. Large gullies, diversions, and low flowing streams	2.73	150.00	5,500.14	4.950	0.308
#14	**2**	**Muskingum K:**					**0.308**
#15	1	8. Large gullies, diversions, and low flowing streams	0.83	180.00	21,702.43	2.730	2.208
#15	**1**	**Muskingum K:**					**2.208**
#16	1	8. Large gullies, diversions, and low flowing streams	1.00	180.00	18,000.00	3.000	1.666
#16	**1**	**Muskingum K:**					**1.666**
#16	2	8. Large gullies, diversions, and low flowing streams	0.65	200.00	31,002.94	2.400	3.588
#16	**2**	**Muskingum K:**					**3.588**
#17	1	8. Large gullies, diversions, and low flowing streams	2.22	200.00	9,000.09	4.470	0.559
#17	**1**	**Muskingum K:**					**0.559**
#18	1	8. Large gullies, diversions, and low flowing streams	3.83	115.00	3,000.02	5.870	0.141
#18	**1**	**Muskingum K:**					**0.141**

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Chaco-Chinde Watershed Post Mining

OSM

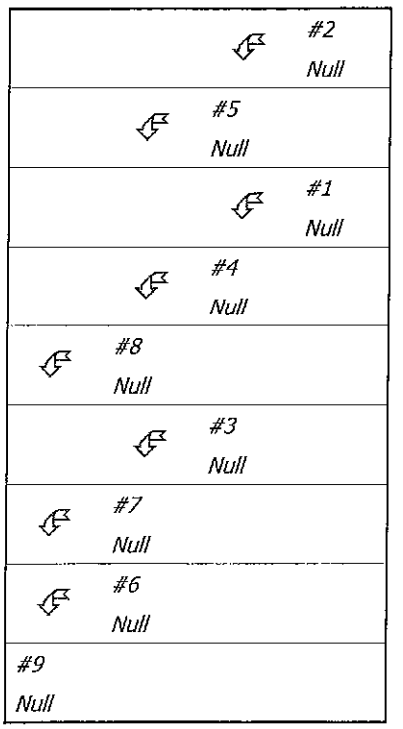
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	#4	0.000	0.000	
Null	#2	==>	#5	0.000	0.000	
Null	#3	==>	#7	0.000	0.000	
Null	#4	==>	#8	0.770	0.355	
Null	#5	==>	#8	0.658	0.358	
Null	#6	==>	#9	0.000	0.000	
Null	#7	==>	#9	0.967	0.340	
Null	#8	==>	#9	0.385	0.320	
Null	#9	==>	End	0.000	0.000	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#4	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.00	4.18	0.770
#4	**Muskingum K:**					**0.770**
#5	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.30	0.658

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#5	**Muskingum K:**					**0.658**
#7	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.00	3.62	0.967
#7	**Muskingum K:**					**0.967**
#8	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.00	3.03	0.385
#8	**Muskingum K:**					**0.385**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2	1,650.000	1,650.000	81.38	11.14
#5	750.000	2,400.000	262.42	33.13
#1	850.000	850.000	32.21	5.70
#4	1,250.000	2,100.000	307.04	42.33
#8	980.000	5,480.000	575.42	104.18
#3	1,140.000	1,140.000	161.25	25.03
#7	1,225.000	2,365.000	326.80	51.91
#6	1,985.000	1,985.000	406.98	58.12
#9	2,930.000	12,760.000	1,331.61	292.27

Structure Detail:

Structure #2 (Null)

Structure #5 (Null)

Structure #1 (Null)

Structure #4 (Null)

Structure #8 (Null)

Structure #3 (Null)

Structure #7 (Null)

Structure #6 (Null)

Structure #9 (Null)

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#2	1	1,650.000	0.272	0.818	0.364	75.000	M	99.12	11.135
	Σ	**1,650.000**						**81.38**	**11.135**
#5	1	750.000	0.658	0.658	0.358	88.000	M	190.45	21.992
	Σ	**2,400.000**						**262.42**	**33.127**
#1	1	850.000	0.632	0.632	0.363	75.000	M	32.81	5.704
	Σ	**850.000**						**32.21**	**5.704**
#4	1	1,250.000	0.770	0.770	0.355	88.000	M	288.29	36.631
	Σ	**2,100.000**						**307.04**	**42.334**
#8	1	980.000	0.385	0.385	0.320	88.000	M	329.99	28.722
	Σ	**5,480.000**						**575.42**	**104.182**
#3	1	1,140.000	0.900	1.106	0.353	85.000	M	169.76	25.026
	Σ	**1,140.000**						**161.25**	**25.026**
#7	1	1,225.000	0.967	0.967	0.340	85.000	M	174.30	26.882
	Σ	**2,365.000**						**326.80**	**51.908**
#6	1	1,985.000	0.867	0.867	0.358	88.000	M	424.81	58.115
	Σ	**1,985.000**						**406.98**	**58.115**
#9	1	2,930.000	1.129	1.129	0.372	87.000	M	473.76	78.066
	Σ	**12,760.000**						**1,331.61**	**292.272**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	8. Large gullies, diversions, and low flowing streams	2.25	230.00	10,225.40	4.490	0.632
#1	**1**	**Time of Concentration:**					**0.632**
#2	1	9. Small streams flowing bankfull	2.29	305.00	13,340.00	13.600	0.272
#2	**1**	**Time of Concentration:**					**0.272**
#4	1	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.45	4.180	0.770
#4	**1**	**Time of Concentration:**					**0.770**
#5	1	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.300	0.658
#5	**1**	**Time of Concentration:**					**0.658**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#6	1	8. Large gullies, diversions, and low flowing streams	2.04	272.00	13,360.00	4.280	0.867
#6	**1**	**Time of Concentration:**					**0.867**
#7	1	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.00	3.620	0.967
#7	**1**	**Time of Concentration:**					**0.967**
#8	1	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.00	3.030	0.385
#8	**1**	**Time of Concentration:**					**0.385**
#9	1	8. Large gullies, diversions, and low flowing streams	2.70	540.00	20,000.00	4.920	1.129
#9	**1**	**Time of Concentration:**					**1.129**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	8. Large gullies, diversions, and low flowing streams	2.25	230.00	10,225.40	4.490	0.632
#1	**1**	**Muskingum K:**					**0.632**
#2	1	8. Large gullies, diversions, and low flowing streams	2.29	305.00	13,340.33	4.530	0.818
#2	**1**	**Muskingum K:**					**0.818**
#3	1	8. Large gullies, diversions, and low flowing streams	1.86	302.00	16,250.53	4.080	1.106
#3	**1**	**Muskingum K:**					**1.106**
#4	1	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.45	4.180	0.770
#4	**1**	**Muskingum K:**					**0.770**
#5	1	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.300	0.658
#5	**1**	**Muskingum K:**					**0.658**
#6	1	8. Large gullies, diversions, and low flowing streams	2.04	272.00	13,360.18	4.280	0.867
#6	**1**	**Muskingum K:**					**0.867**
#7	1	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.51	3.620	0.967
#7	**1**	**Muskingum K:**					**0.967**
#8	1	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.03	3.030	0.385
#8	**1**	**Muskingum K:**					**0.385**
#9	1	8. Large gullies, diversions, and low flowing streams	2.70	540.00	20,000.00	4.920	1.129
#9	**1**	**Muskingum K:**					**1.129**

Chaco-Chinde Watershed Pre-Mining

OSM

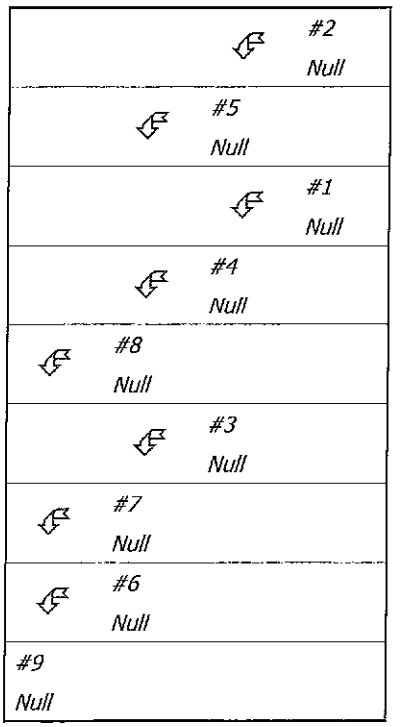
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	#4	0.000	0.000	
Null	#2	==>	#5	0.000	0.000	
Null	#3	==>	#7	0.000	0.000	
Null	#4	==>	#8	0.770	0.355	
Null	#5	==>	#8	0.658	0.358	
Null	#6	==>	#9	0.000	0.000	
Null	#7	==>	#9	0.967	0.340	
Null	#8	==>	#9	0.385	0.320	
Null	#9	==>	End	0.000	0.000	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#4	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.00	4.18	0.770
#4	**Muskingum K:**					**0.770**
#5	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.30	0.658

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#5	**Muskingum K:**					**0.658**
#7	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.00	3.62	0.967
#7	**Muskingum K:**					**0.967**
#8	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.00	3.03	0.385
#8	**Muskingum K:**					**0.385**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#2	2,010.000	2,010.000	680.13	59.21
#5	1,100.000	3,110.000	929.94	91.46
#1	1,210.000	1,210.000	298.30	35.44
#4	1,540.000	2,750.000	609.87	80.57
#8	980.000	6,840.000	1,408.08	200.75
#3	1,565.000	1,565.000	221.37	34.36
#7	1,650.000	3,215.000	444.33	70.56
#6	1,235.000	1,235.000	253.21	36.16
#9	2,930.000	14,220.000	2,096.39	385.54

Structure Detail:

Structure #2 (Null)

Structure #5 (Null)

Structure #1 (Null)

Structure #4 (Null)

Structure #8 (Null)

Structure #3 (Null)

Structure #7 (Null)

Structure #6 (Null)

Structure #9 (Null)

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#2	1	2,010.000	0.272	0.818	0.364	88.000	M	779.56	59.208
	Σ	**2,010.000**						**680.13**	**59.208**
#5	1	1,100.000	0.658	0.658	0.358	88.000	M	279.32	32.254
	Σ	**3,110.000**						**929.94**	**91.462**
#1	1	1,210.000	0.632	0.632	0.363	88.000	M	314.58	35.439
	Σ	**1,210.000**						**298.30**	**35.439**
#4	1	1,540.000	0.770	0.770	0.355	88.000	M	355.18	45.129
	Σ	**2,750.000**						**609.87**	**80.568**
#8	1	980.000	0.385	0.385	0.320	88.000	M	329.99	28.722
	Σ	**6,840.000**						**1,408.08**	**200.752**
#3	1	1,565.000	0.900	1.106	0.353	85.000	M	233.04	34.356
	Σ	**1,565.000**						**221.37**	**34.356**
#7	1	1,650.000	0.967	0.967	0.340	85.000	M	234.78	36.208
	Σ	**3,215.000**						**444.33**	**70.564**
#6	1	1,235.000	0.867	0.867	0.358	88.000	M	264.30	36.157
	Σ	**1,235.000**						**253.21**	**36.157**
#9	1	2,930.000	1.129	1.129	0.372	87.000	M	473.76	78.066
	Σ	**14,220.000**						**2,096.39**	**385.539**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	8. Large gullies, diversions, and low flowing streams	2.25	230.00	10,225.40	4.490	0.632
#1	**1**	**Time of Concentration:**					**0.632**
#2	1	9. Small streams flowing bankfull	2.29	305.00	13,340.00	13.600	0.272
#2	**1**	**Time of Concentration:**					**0.272**
#4	1	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.45	4.180	0.770
#4	**1**	**Time of Concentration:**					**0.770**
#5	1	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.300	0.658
#5	**1**	**Time of Concentration:**					**0.658**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#6	1	8. Large gullies, diversions, and low flowing streams	2.04	272.00	13,360.00	4.280	0.867
#6	**1**	**Time of Concentration:**					**0.867**
#7	1	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.00	3.620	0.967
#7	**1**	**Time of Concentration:**					**0.967**
#8	1	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.00	3.030	0.385
#8	**1**	**Time of Concentration:**					**0.385**
#9	1	8. Large gullies, diversions, and low flowing streams	2.70	540.00	20,000.00	4.920	1.129
#9	**1**	**Time of Concentration:**					**1.129**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	8. Large gullies, diversions, and low flowing streams	2.25	230.00	10,225.40	4.490	0.632
#1	**1**	**Muskingum K:**					**0.632**
#2	1	8. Large gullies, diversions, and low flowing streams	2.29	305.00	13,340.33	4.530	0.818
#2	**1**	**Muskingum K:**					**0.818**
#3	1	8. Large gullies, diversions, and low flowing streams	1.86	302.00	16,250.53	4.080	1.106
#3	**1**	**Muskingum K:**					**1.106**
#4	1	8. Large gullies, diversions, and low flowing streams	1.95	226.00	11,600.45	4.180	0.770
#4	**1**	**Muskingum K:**					**0.770**
#5	1	8. Large gullies, diversions, and low flowing streams	2.06	210.00	10,200.11	4.300	0.658
#5	**1**	**Muskingum K:**					**0.658**
#6	1	8. Large gullies, diversions, and low flowing streams	2.04	272.00	13,360.18	4.280	0.867
#6	**1**	**Muskingum K:**					**0.867**
#7	1	8. Large gullies, diversions, and low flowing streams	1.46	184.00	12,610.51	3.620	0.967
#7	**1**	**Muskingum K:**					**0.967**
#8	1	8. Large gullies, diversions, and low flowing streams	1.02	43.00	4,200.03	3.030	0.385
#8	**1**	**Muskingum K:**					**0.385**
#9	1	8. Large gullies, diversions, and low flowing streams	2.70	540.00	20,000.00	4.920	1.129
#9	**1**	**Muskingum K:**					**1.129**

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Coal Creek Watershed Post-Mining

OSM

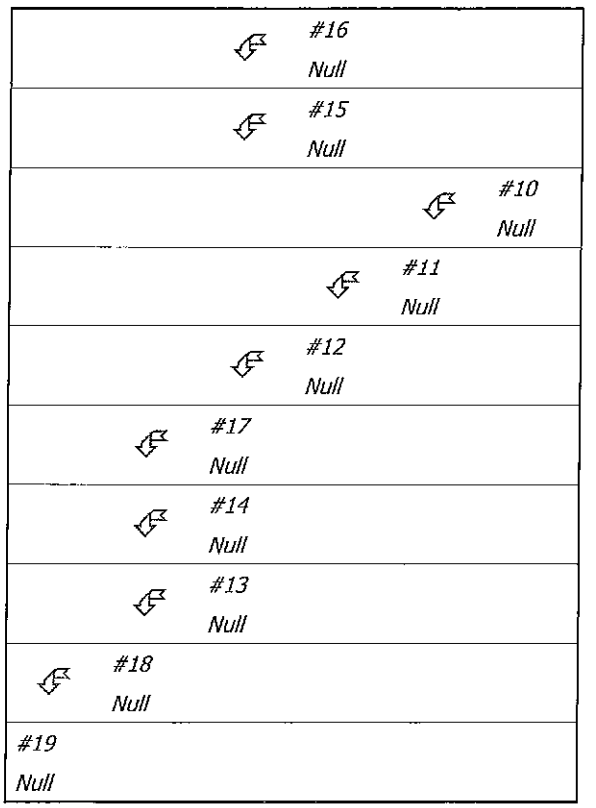
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 6 hr
Rainfall Depth:	1.300 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#10	==>	#11	0.000	0.000	
Null	#11	==>	#12	0.541	0.326	
Null	#12	==>	#17	0.990	0.322	
Null	#13	==>	#18	0.000	0.000	
Null	#14	==>	#18	0.000	0.000	
Null	#15	==>	#17	0.000	0.000	
Null	#16	==>	#17	0.000	0.000	
Null	#17	==>	#18	3.667	0.234	
Null	#18	==>	#19	2.962	0.234	
Null	#19	==>	End	0.000	0.000	



Structure Routing Details:

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#11	8. Large gullies, diversions, and low flowing streams	1.13	70.00	6,200.72	3.18	0.541

Stru #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#11	**Muskingum K:**					**0.541**
#12	8. Large gullies, diversions, and low flowing streams	1.05	115.00	10,950.29	3.07	0.990
#12	**Muskingum K:**					**0.990**
#17	8. Large gullies, diversions, and low flowing streams	0.25	50.00	19,801.98	1.50	3.667
#17	**Muskingum K:**					**3.667**
#18	8. Large gullies, diversions, and low flowing streams	0.25	40.00	16,000.00	1.50	2.962
#18	**Muskingum K:**					**2.962**

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#16	7,300.000	7,300.000	467.26	213.70
#15	3,530.000	3,530.000	388.14	103.33
#10	2,860.000	2,860.000	240.25	46.02
#11	3,930.000	6,790.000	500.47	96.60
#12	940.000	7,730.000	523.35	117.35
#17	5,060.000	23,620.000	1,471.57	582.68
#14	1,280.000	1,280.000	261.33	39.01
#13	1,762.000	1,762.000	250.23	53.97
#18	1,590.000	28,252.000	1,383.23	723.18
#19	0.000	28,252.000	1,335.69	723.18

Structure Detail:

Structure #16 (Null)

Structure #15 (Null)

Structure #10 (Null)

Structure #11 (Null)

Structure #12 (Null)

Structure #17 (Null)

Structure #14 (Null)

Structure #13 (Null)

Structure #18 (Null)

Structure #19 (Null)

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#16	1	3,500.000	1.666	1.666	0.319	88.000	M	482.75	102.471
	2	3,800.000	3.588	3.588	0.293	88.000	M	301.20	111.230
	Σ	**7,300.000**						**467.26**	**213.701**
#15	1	3,530.000	2.208	2.208	0.308	88.000	M	397.56	103.325
	Σ	**3,530.000**						**388.14**	**103.325**
#10	1	2,860.000	1.177	1.043	0.355	82.000	M	245.19	46.024
	Σ	**2,860.000**						**240.25**	**46.024**
#11	1	3,930.000	1.084	0.885	0.360	80.000	M	269.11	50.580
	Σ	**6,790.000**						**500.47**	**96.605**
#12	1	940.000	0.268	0.000	0.000	85.000	M	269.99	20.743
	Σ	**7,730.000**						**523.35**	**117.348**
#17	1	5,060.000	0.559	0.559	0.362	88.000	M	1,412.31	148.302
	Σ	**23,620.000**						**1,471.57**	**582.676**
#14	1	780.000	0.667	0.667	0.372	88.000	M	196.46	22.870
	2	500.000	0.308	0.308	0.372	89.000	M	205.13	16.137
	Σ	**1,280.000**						**261.33**	**39.007**
#13	1	940.000	1.151	1.151	0.360	88.000	M	167.40	27.528
	2	822.000	0.533	0.533	0.367	89.000	M	261.43	26.444
	Σ	**1,762.000**						**250.23**	**53.972**
#18	1	1,590.000	0.141	0.141	0.388	88.000	M	732.90	47.524
	Σ	**28,252.000**						**1,383.23**	**723.179**
#19	Σ	**28,252.000**						**1,335.69**	**723.179**

Subwatershed Time of Concentration Details:

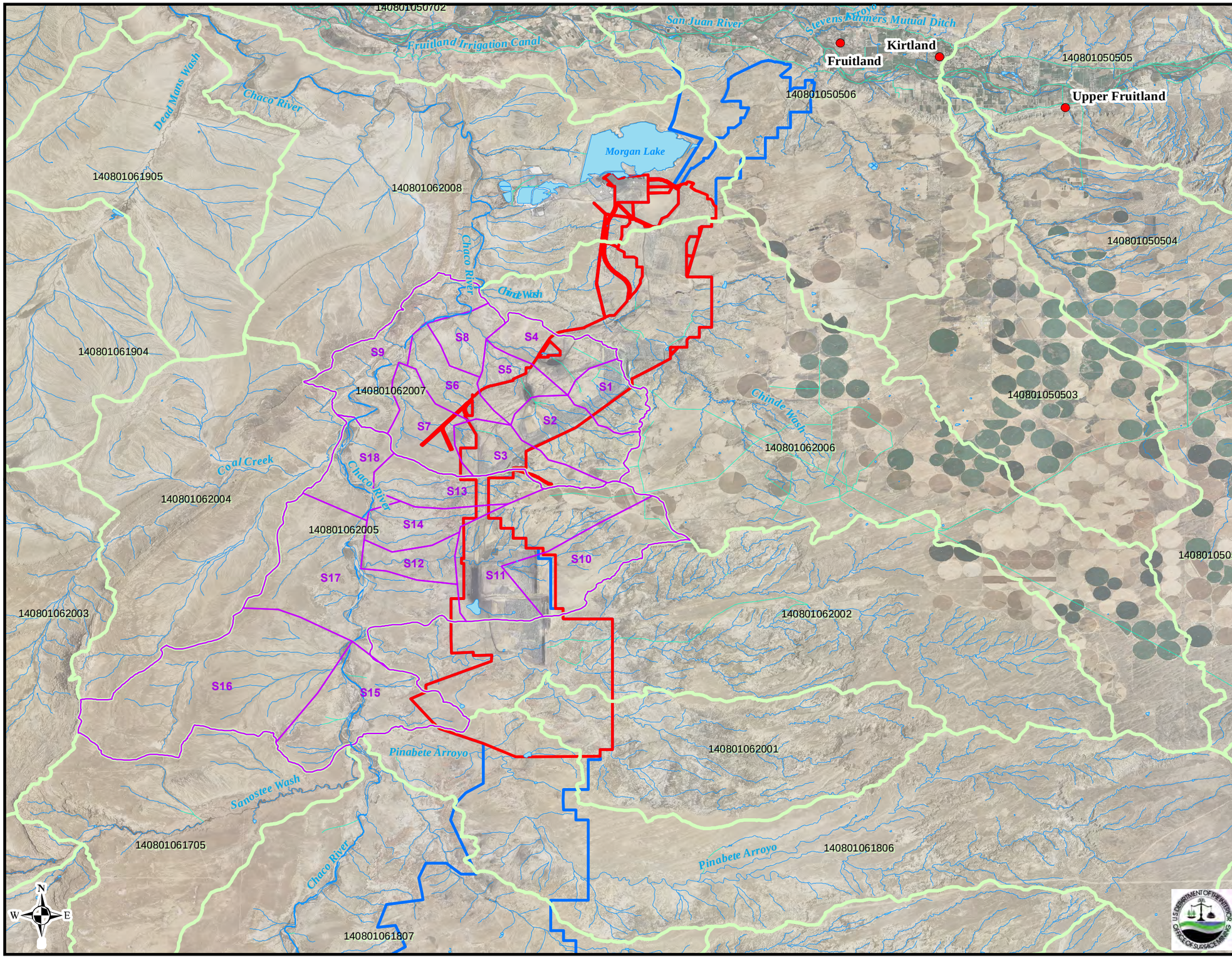
Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	1	8. Large gullies, diversions, and low flowing streams	1.79	305.00	17,000.16	4.010	1.177
#10	**1**	**Time of Concentration:**					**1.177**
#11	1	8. Large gullies, diversions, and low flowing streams	1.88	300.00	15,999.99	4.100	1.084
#11	**1**	**Time of Concentration:**					**1.084**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#12	1	5. Nearly bare and untilled, and alluvial valley fans	5.23	115.00	2,200.03	2.280	0.268
#12	**1**	**Time of Concentration:**					**0.268**
#13	1	8. Large gullies, diversions, and low flowing streams	2.14	390.00	18,200.48	4.390	1.151
#13	**1**	**Time of Concentration:**					**1.151**
#13	2	8. Large gullies, diversions, and low flowing streams	2.44	220.00	9,000.00	4.690	0.533
#13	**2**	**Time of Concentration:**					**0.533**
#14	1	8. Large gullies, diversions, and low flowing streams	2.73	325.00	11,900.40	4.950	0.667
#14	**1**	**Time of Concentration:**					**0.667**
#14	2	8. Large gullies, diversions, and low flowing streams	2.73	150.00	5,500.14	4.950	0.308
#14	**2**	**Time of Concentration:**					**0.308**
#15	1	8. Large gullies, diversions, and low flowing streams	0.83	180.00	21,702.43	2.730	2.208
#15	**1**	**Time of Concentration:**					**2.208**
#16	1	8. Large gullies, diversions, and low flowing streams	1.00	180.00	18,000.00	3.000	1.666
#16	**1**	**Time of Concentration:**					**1.666**
#16	2	8. Large gullies, diversions, and low flowing streams	0.65	200.00	31,002.94	2.400	3.588
#16	**2**	**Time of Concentration:**					**3.588**
#17	1	8. Large gullies, diversions, and low flowing streams	2.22	200.00	9,000.09	4.470	0.559
#17	**1**	**Time of Concentration:**					**0.559**
#18	1	8. Large gullies, diversions, and low flowing streams	3.83	115.00	3,000.02	5.870	0.141
#18	**1**	**Time of Concentration:**					**0.141**

Subwatershed Muskingum Routing Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#10	1	8. Large gullies, diversions, and low flowing streams	1.94	305.00	15,700.60	4.180	1.043
#10	**1**	**Muskingum K:**					**1.043**
#11	1	8. Large gullies, diversions, and low flowing streams	2.14	300.00	14,000.37	4.390	0.885
#11	**1**	**Muskingum K:**					**0.885**
#13	1	8. Large gullies, diversions, and low flowing streams	2.14	390.00	18,200.48	4.390	1.151
#13	**1**	**Muskingum K:**					**1.151**
#13	2	8. Large gullies, diversions, and low flowing streams	2.44	220.00	9,000.16	4.690	0.533
#13	**2**	**Muskingum K:**					**0.533**

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#14	1	8. Large gullies, diversions, and low flowing streams	2.73	325.00	11,900.40	4.950	0.667
#14	**1**	**Muskingum K:**					**0.667**
#14	2	8. Large gullies, diversions, and low flowing streams	2.73	150.00	5,500.14	4.950	0.308
#14	**2**	**Muskingum K:**					**0.308**
#15	1	8. Large gullies, diversions, and low flowing streams	0.83	180.00	21,702.43	2.730	2.208
#15	**1**	**Muskingum K:**					**2.208**
#16	1	8. Large gullies, diversions, and low flowing streams	1.00	180.00	18,000.00	3.000	1.666
#16	**1**	**Muskingum K:**					**1.666**
#16	2	8. Large gullies, diversions, and low flowing streams	0.65	200.00	31,002.94	2.400	3.588
#16	**2**	**Muskingum K:**					**3.588**
#17	1	8. Large gullies, diversions, and low flowing streams	2.22	200.00	9,000.09	4.470	0.559
#17	**1**	**Muskingum K:**					**0.559**
#18	1	8. Large gullies, diversions, and low flowing streams	3.83	115.00	3,000.02	5.870	0.141
#18	**1**	**Muskingum K:**					**0.141**

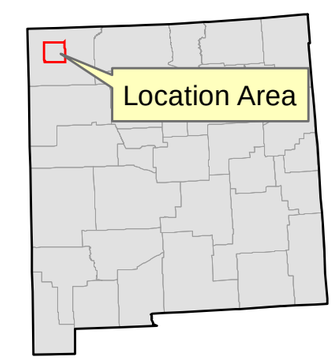


Legend

- SEDCAD Sub-drainages
- HUC12 Watersheds [1]
- Natural Stream [1]
- Artifical Path/Ditch [1]
- Coal Lease Area
- Permit Area
- Population Centers

Data Sources:
Aerial Photography (San Juan County) 2009
[1] USGS National Hydrography Dataset

1 0 1 2 3 4
Miles



Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree

Navajo Mine CHIA

SEDCAD Sub-drainages Used in Modeling San Juan County, NM

Figure E-1

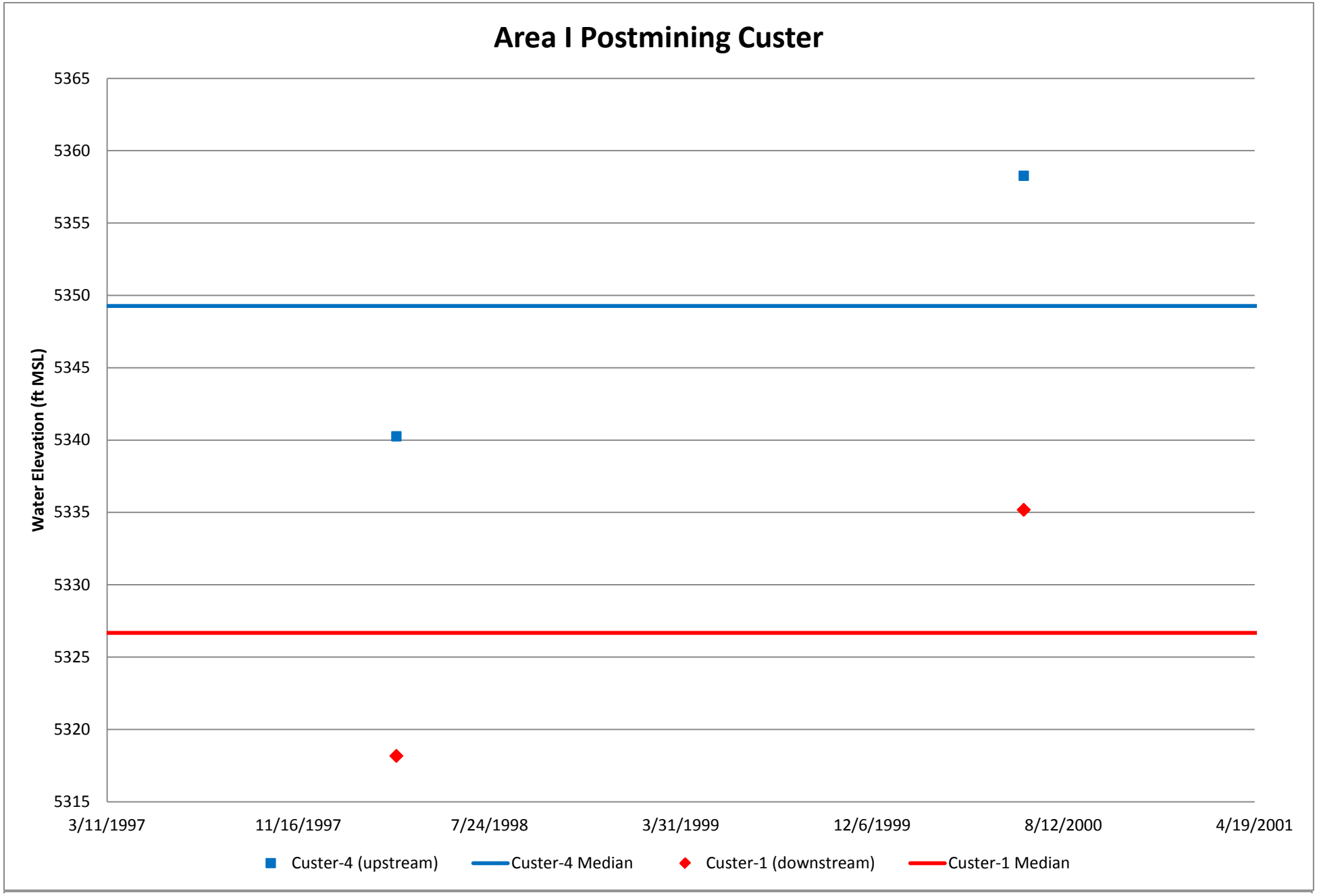
Appendix F: Groundwater Data Summary

Alluvial Water Level Data

Well	n (% Not Dry)	% Not Dry	n (Water Level)	Water Level Range (ft MSL)	Median	MAD	Average	StDev	%RSD	Q3	Q1	95th%	5th%
CUSTER-4	8	25	2	(5358.27-5340.26)	5349.27	9.01	5349.27	12.73	0.24	5353.77	5344.76	5357.37	5341.16
CUSTER-4	8	25	2	(5358.27-5340.26)	5349.27	9.01	5349.27	12.73	0.24	5353.77	5344.76	5357.37	5341.16
BIGHAN-1	21	100	12	(5416.16-5413.51)	5414.08	0.51	5414.37	0.90	0.02	5414.86	5413.69	5415.83	5413.52
BIGHAN-1	21	100	12	(5416.16-5413.51)	5414.08	0.51	5414.37	0.90	0.02	5414.86	5413.69	5415.83	5413.52
CUSTER-1	8	25	2	(5335.18-5318.17)	5326.68	8.51	5326.68	12.03	0.23	5330.93	5322.42	5334.33	5319.02
CUSTER-1	8	25	2	(5335.18-5318.17)	5326.68	8.51	5326.68	12.03	0.23	5330.93	5322.42	5334.33	5319.02
QAC-1	110	100	61	(5192.92-5188.12)	5189.95	0.68	5190.24	1.06	0.02	5191.02	5189.37	5192.18	5188.95
QAC-1	110	100	61	(5192.92-5188.12)	5189.95	0.68	5190.24	1.06	0.02	5191.02	5189.37	5192.18	5188.95
QACW-1	48	54	15	(5280.79-5279.08)	5279.46	0.08	5279.59	0.44	0.01	5279.54	5279.38	5280.43	5279.23
QACW-1	48	54	15	(5280.79-5279.08)	5279.46	0.08	5279.59	0.44	0.01	5279.54	5279.38	5280.43	5279.23
QACW-2	59	66	20	(5192.34-5179.93)	5187.22	0.50	5185.82	3.12	0.06	5187.39	5184.54	5188.04	5180.22
QACW-2	59	66	20	(5192.34-5179.93)	5187.22	0.50	5185.82	3.12	0.06	5187.39	5184.54	5188.04	5180.22
QACW-2B	44	100	36	(5236.64-5230.)	5235.73	0.48	5235.33	1.66	0.03	5236.22	5235.27	5236.60	5230.41
QACW-2B	44	100	36	(5236.64-5230.)	5235.73	0.48	5235.33	1.66	0.03	5236.22	5235.27	5236.60	5230.41
PA-1	27	96	23	(5341.9-5340.7)	5341.20	0.30	5341.23	0.37	0.01	5341.49	5340.90	5341.88	5340.76
PA-1	27	96	23	(5341.9-5340.7)	5341.20	0.30	5341.23	0.37	0.01	5341.49	5340.90	5341.88	5340.76
PA-2	28	100	22	(5426.43-5422.23)	5423.19	0.48	5423.34	1.03	0.02	5423.54	5422.69	5425.82	5422.40
PA-2	28	100	22	(5426.43-5422.23)	5423.19	0.48	5423.34	1.03	0.02	5423.54	5422.69	5425.82	5422.40
NNA-1	26	27	6	(5418.76-5417.93)	5418.40	0.12	5418.38	0.27	0.01	5418.49	5418.32	5418.70	5418.02
NNA-1	26	27	6	(5418.76-5417.93)	5418.40	0.12	5418.38	0.27	0.01	5418.49	5418.32	5418.70	5418.02

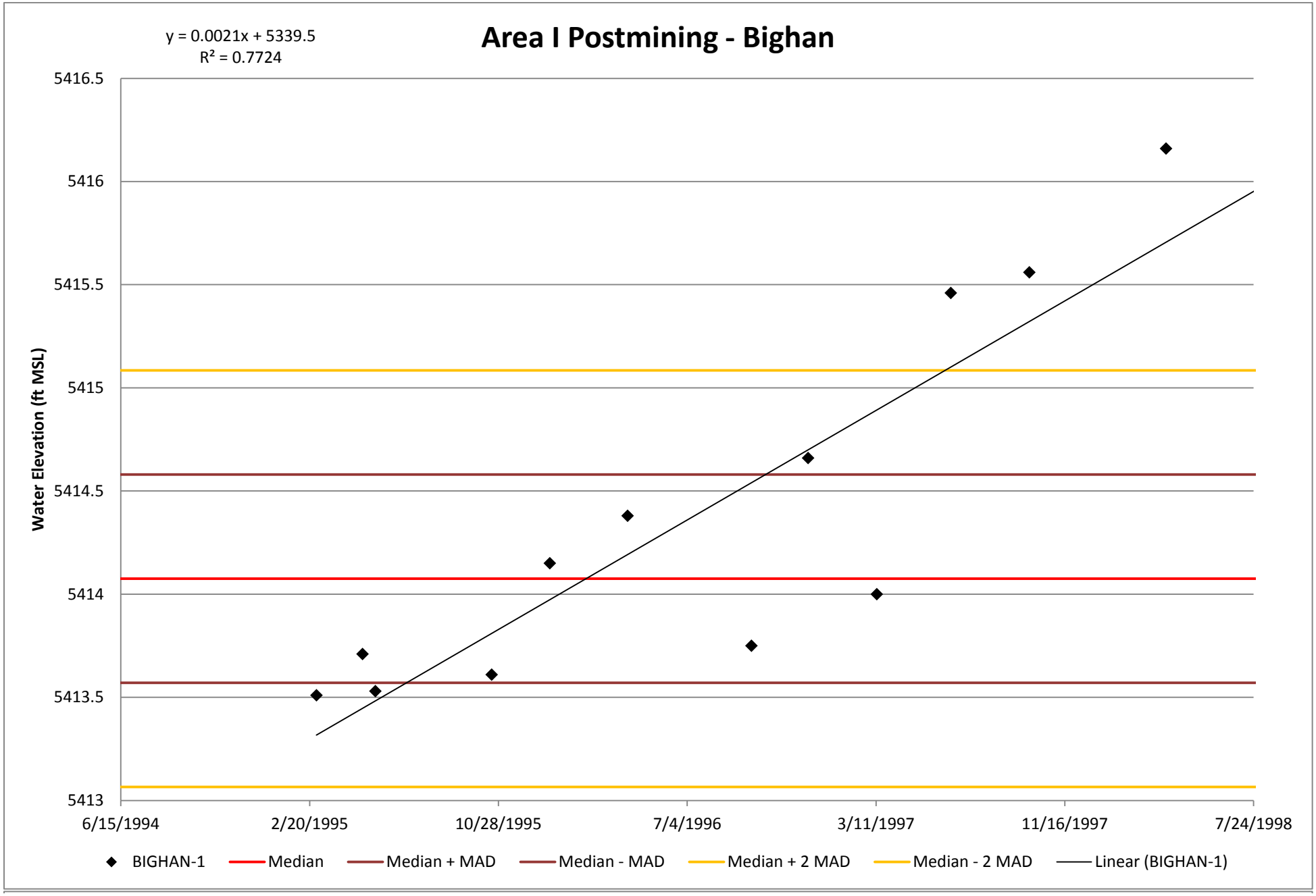
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



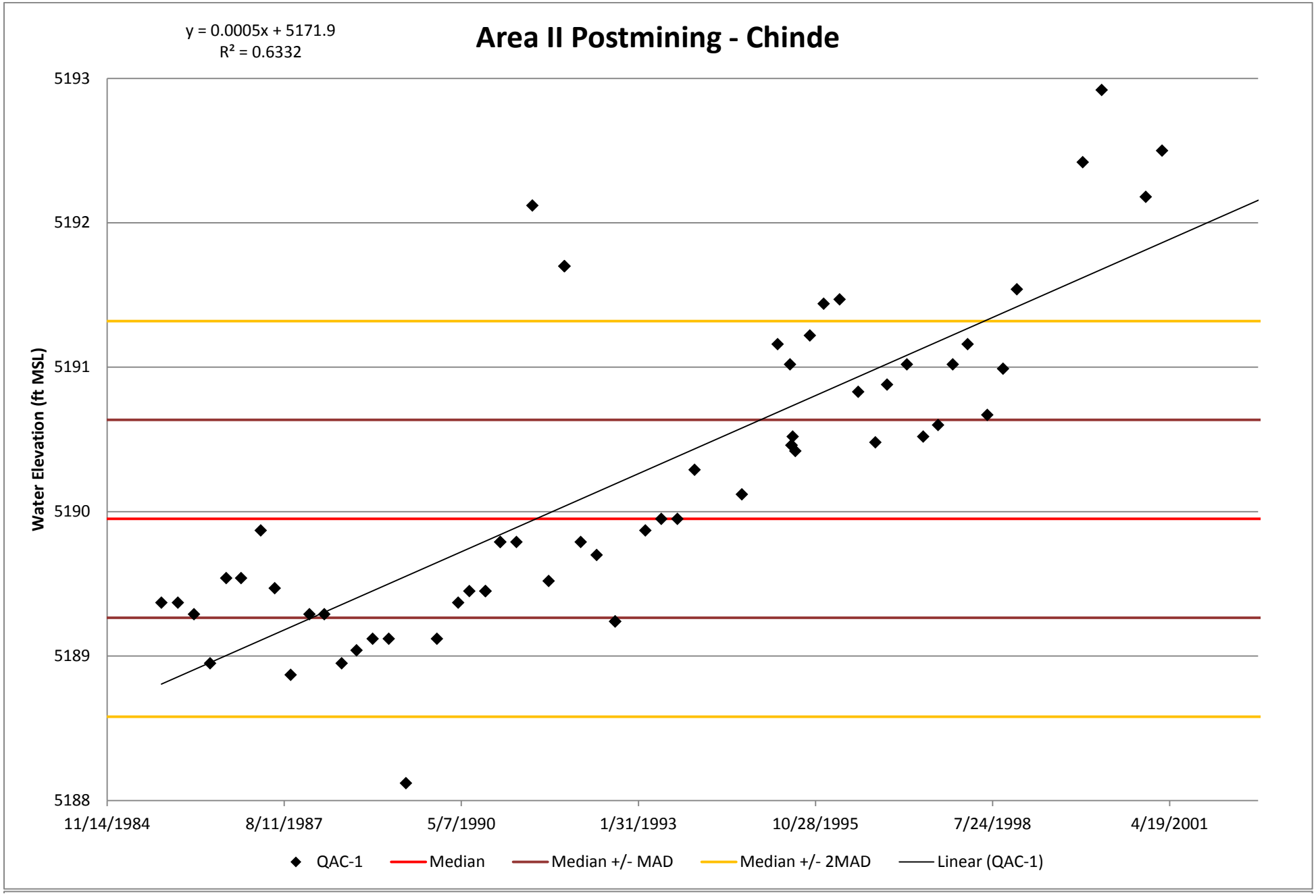
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



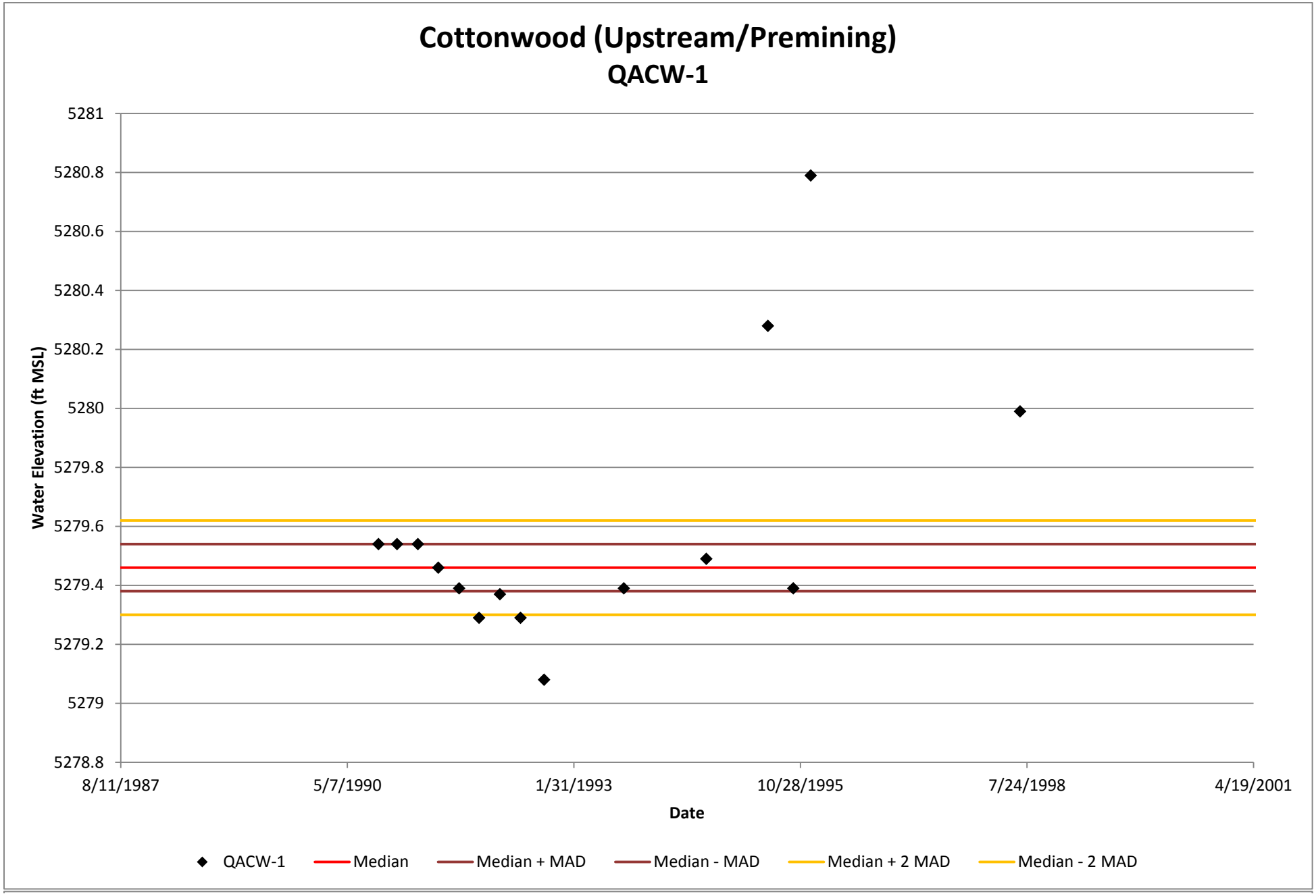
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



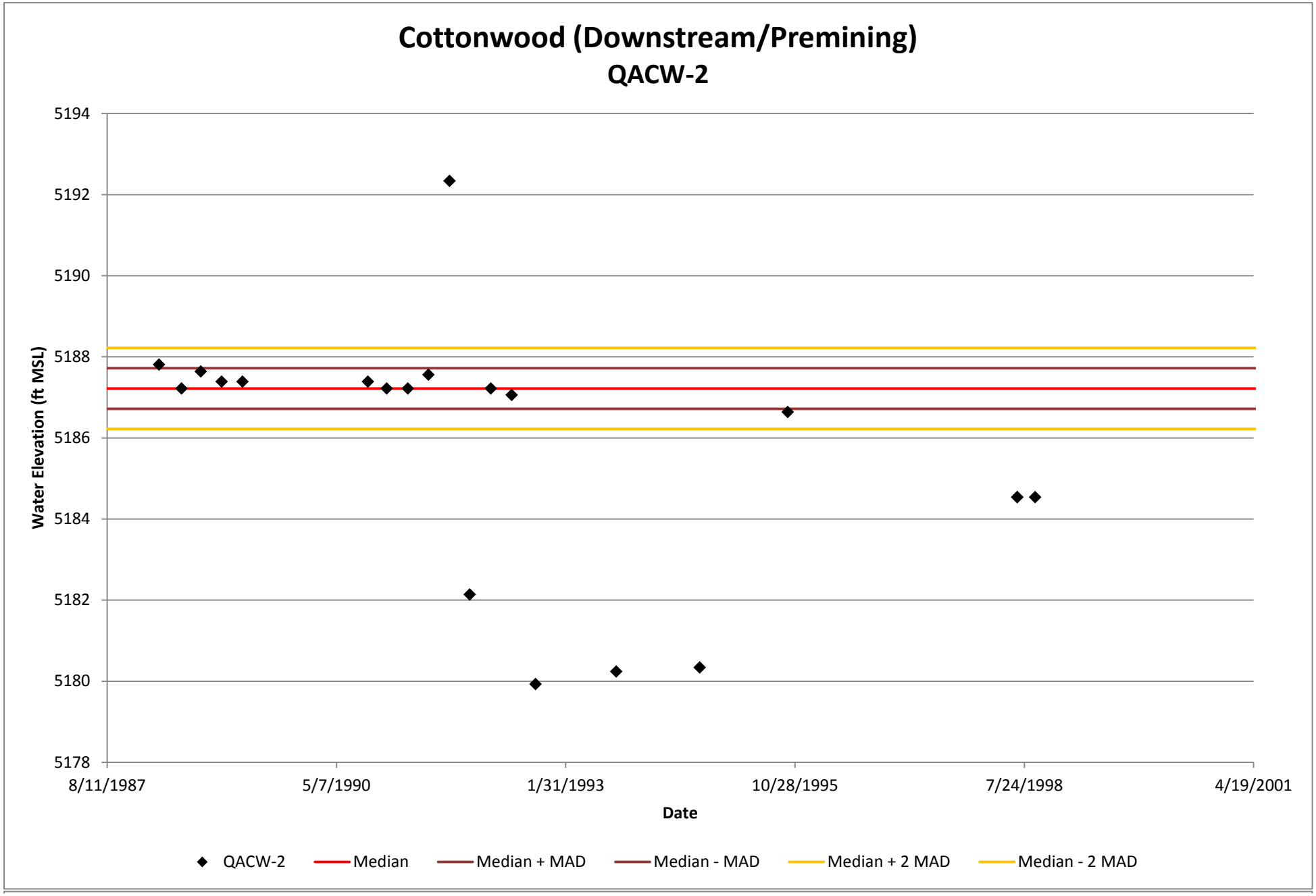
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



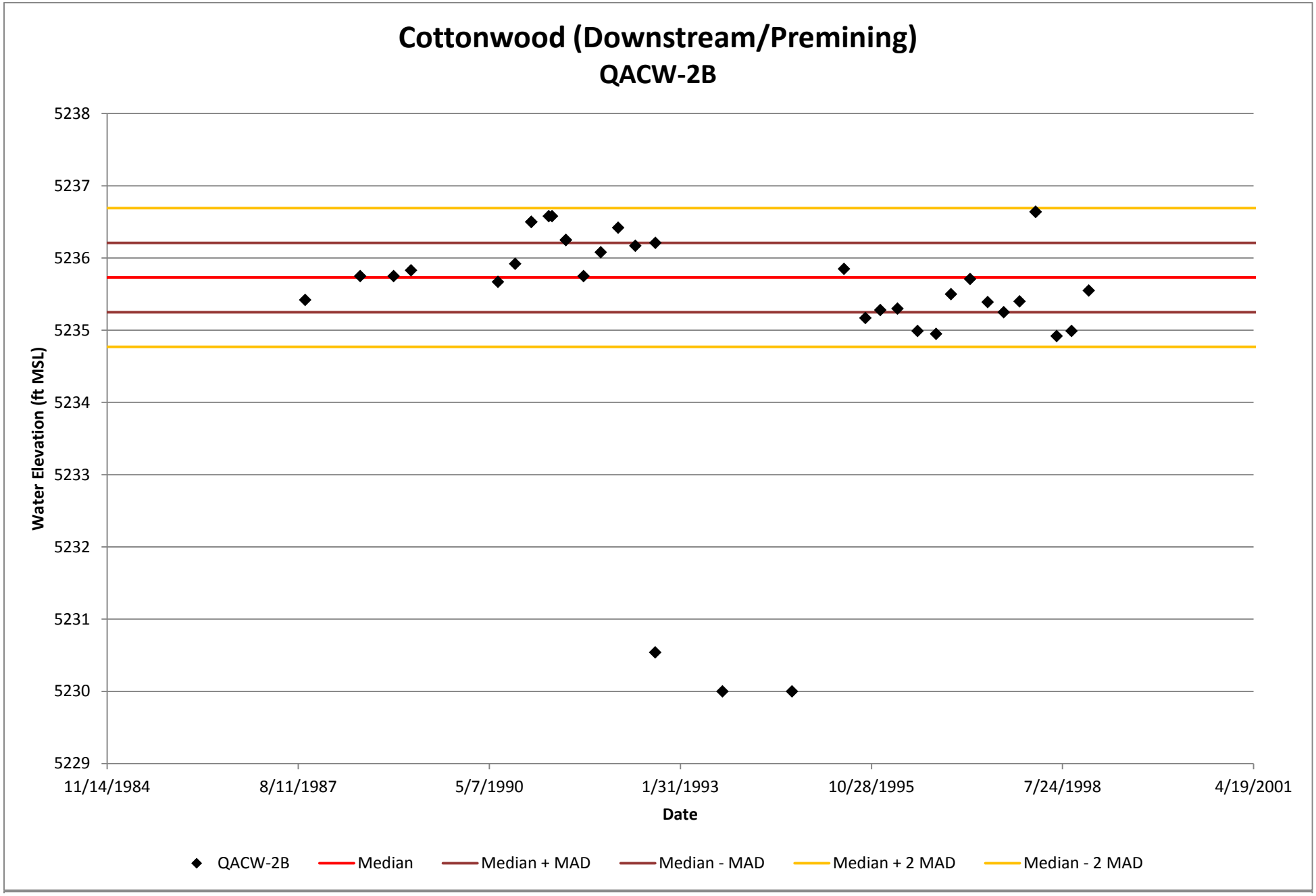
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



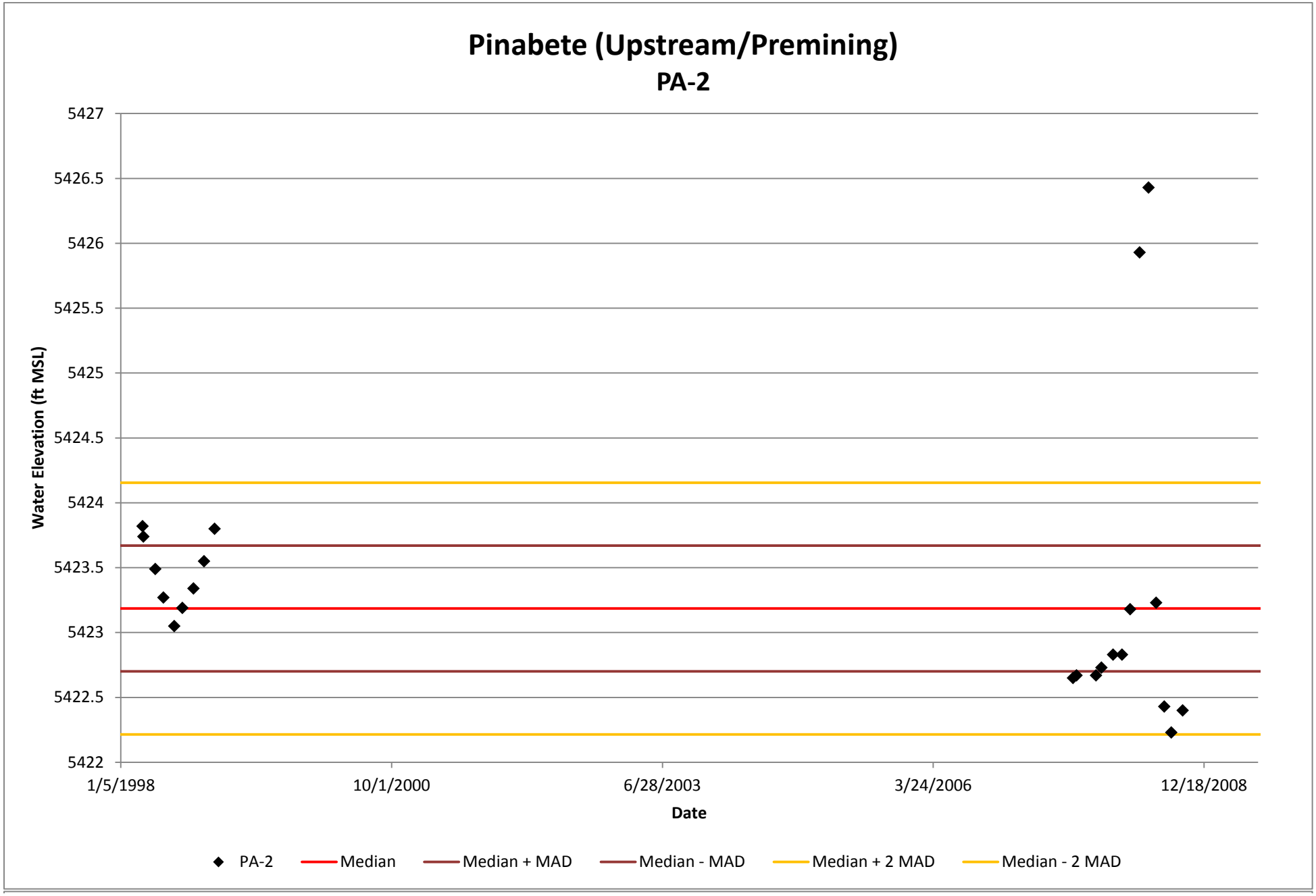
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



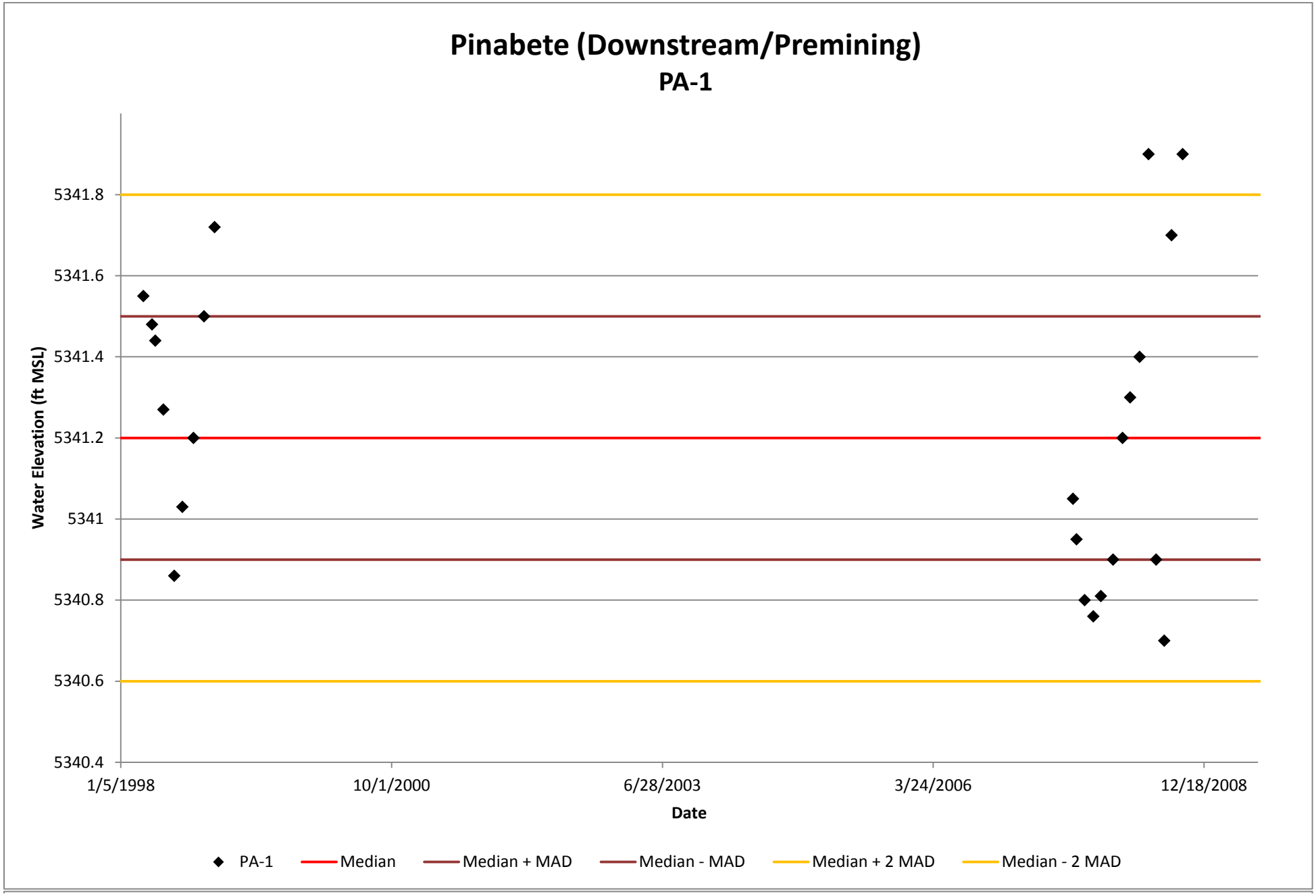
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



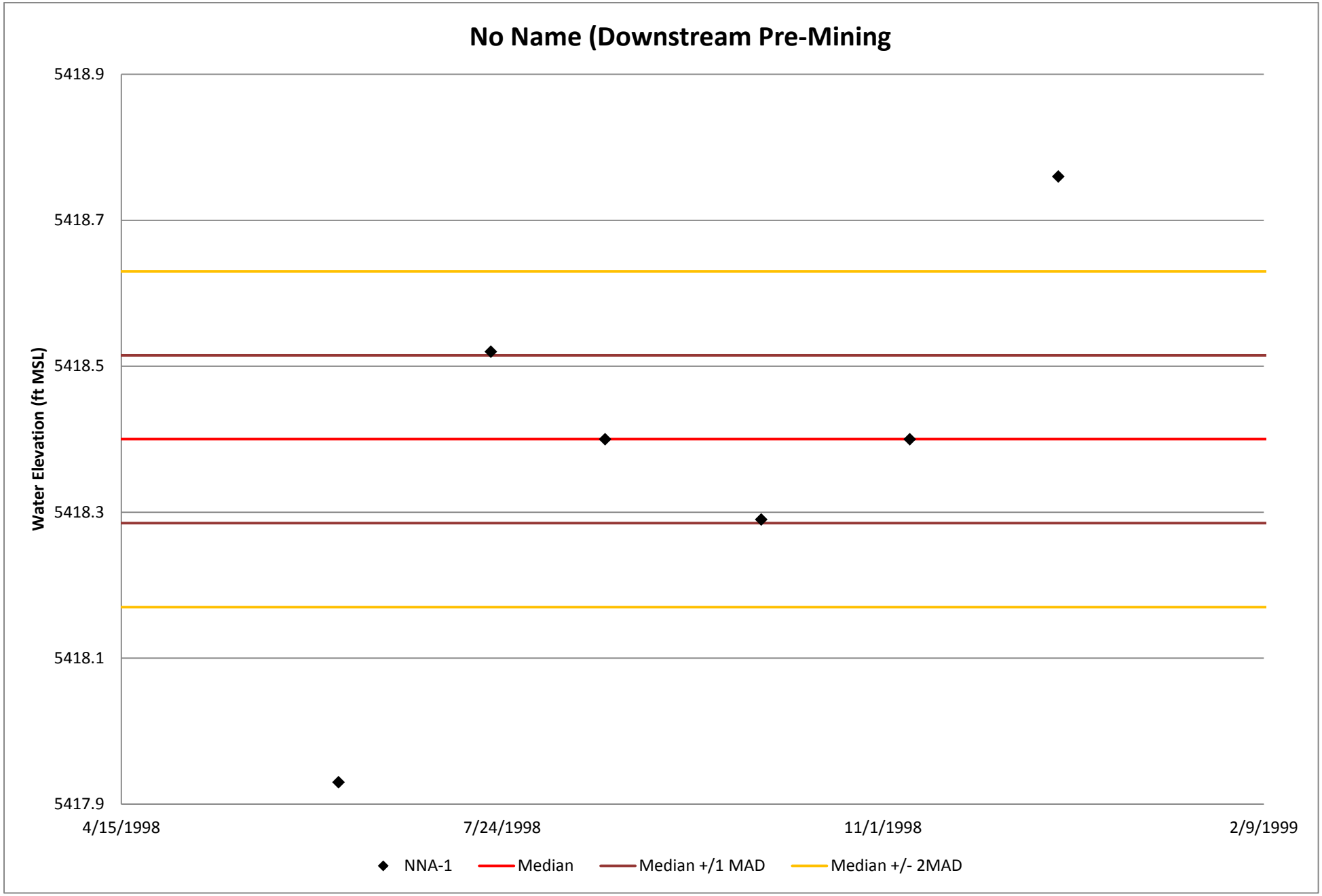
Appendix F: Groundwater Data Summary

Alluvial Water Level Data



Appendix F: Groundwater Data Summary

Alluvial Water Level Data



Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chaco Alluvial Wells (GM-24, GM-25 and GM-34)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Livestock Criteria Exceedance	
											n	%
pH	(11/16/1974-03/04/1977)	**18**	(6.5-8.1)	**7.67**	0.1	**7.61**	0.35	**4.59**	7.72	**8.10**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/04/1977)	**18**	(1350.-24300.)	**4500**	2590	**6687**	7207	**108**	6360	**23875**	0	**0**
Arsenic	(11/16/1974-03/04/1977)	**19**	(0.005-0.4)	**0.01**	0.005	**0.091**	0.136	**149.689**	0.150	**0.400**	4	**21**
Boron	(11/16/1974-03/04/1977)	**19**	(0.05-1.1)	**0.3**	0.1	**0.32**	0.23	**74.27**	0.39	**0.65**	0	**0**
Cadmium	(11/16/1974-03/04/1977)	**19**	(0.0005-0.005)	**0.0005**	0	**0.0026**	0.0023	**87.7211**	0.0050	**0.0050**	0	**0**
Chromium												
Copper	(11/16/1974-03/04/1977)	**19**	(0.002-0.496)	**0.008**	0.006	**0.037**	0.111	**298.734**	0.020	**0.081**	0	**0**
Iron (total)												
Lead	(11/16/1974-03/04/1977)	**19**	(0.0005-0.13)	**0.003**	0.0025	**0.0192**	0.0326	**169.9202**	0.0250	**0.0715**	1	**5**
Manganese	(11/16/1974-03/04/1977)	**19**	(0.055-4.6)	**1.98**	0.74	**1.863**	1.286692	**69.0656**	2.25	**4.06**	0	**0**
Mercury	(11/16/1974-03/04/1977)	**18**	(0.000014-0.013)	**0.000225**	0.000025	**0.00112**	0.00300	**267.85978**	0.00063	**0.00365**	1	**6**
Selenium	(11/16/1974-03/04/1977)	**19**	(0.0005-0.25)	**0.005**	0	**0.037**	0.068	**182.443**	0.025	**0.160**	3	**16**
Zinc	(11/16/1974-03/04/1977)	**19**	(0.012-0.864)	**0.076**	0.054	**0.187**	0.263	**141.028**	0.159	**0.838**	0	**0**
Chloride	(11/16/1974-03/04/1977)	**18**	(5.-920.)	**86.5**	81.05	**267**	305	**114**	503	**835**	2	**11**
Fluoride	(11/16/1974-03/04/1977)	**18**	(0.48-2.1)	**0.86**	0.335	**1.01**	0.43	**42.24**	1.29	**1.59**	1	**6**
Nitrate	(05/19/1976-03/04/1977)	**7**	(0.05-0.51)	**0.2**	0.15	**0.25**	0.20	**78.26**	0.41	**0.51**	0	**0**
Sulfate	(11/16/1974-03/04/1977)	**18**	(384.-24443.)	**1800**	1271	**3549**	5737	**162**	2900	**11274**	12	**67**
TDS - 180°C	(11/16/1974-03/04/1977)	**18**	(1216.-54730.)	**4101.5**	1802.5	**10079**	14692	**146**	6167	**37399**	13	**72**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chaco Alluvial Well GM-24	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Livestock Criteria Exceedance	
											n	%
pH	(11/16/1974-03/04/1977)	**7**	(8.1-8.1)	**7.6**	0.2	**7.49**	0.51	**6.79**	7.75	**8.01**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/04/1977)	**7**	(2800.-2800.)	**1670**	110	**1904**	559	**29**	2150	**2740**	0	**0**
Arsenic	(11/16/1974-03/04/1977)	**7**	(0.4-0.4)	**0.01**	0.005	**0.118**	0.157	**133.234**	0.200	**0.355**	2	**29**
Boron	(11/16/1974-03/04/1977)	**7**	(1.1-1.1)	**0.3**	0.2	**0.39**	0.36	**91.51**	0.47	**0.95**	0	**0**
Cadmium	(11/16/1974-03/04/1977)	**7**	(0.005-0.005)	**0.005**	0	**0.0031**	0.0024	**78.3138**	0.0050	**0.0050**	0	**0**
Chromium												
Copper	(11/16/1974-03/04/1977)	**7**	(0.025-0.025)	**0.005**	0.002	**0.011**	0.009	**83.308**	0.018	**0.024**	0	**0**
Iron (total)												
Lead	(11/16/1974-03/04/1977)	**7**	(0.13-0.13)	**0.005**	0.0045	**0.0269**	0.0467	**173.5468**	0.0250	**0.0985**	1	**14**
Manganese	(11/16/1974-03/04/1977)	**7**	(2.4-2.4)	**1.42**	0.58	**1.286**	0.8303	**64.56457**	1.75	**2.28**	0	**0**
Mercury	(11/16/1974-08/06/1976)	**6**	(0.001-0.001)	**0.000225**	0.00003	**0.00038**	0.00032	**84.57580**	0.00037	**0.00085**	0	**0**
Selenium	(11/16/1974-03/04/1977)	**7**	(0.15-0.15)	**0.01**	0.005	**0.032**	0.053	**164.099**	0.025	**0.113**	1	**14**
Zinc	(11/16/1974-03/04/1977)	**7**	(0.864-0.864)	**0.05**	0.026	**0.154**	0.314	**203.615**	0.054	**0.622**	0	**0**
Chloride	(11/16/1974-08/06/1976)	**6**	(820.-820.)	**23**	15.05	**224**	342	**153**	353	**730**	1	**17**
Fluoride	(11/16/1974-08/06/1976)	**6**	(1.1-1.1)	**0.8**	0.03	**0.80**	0.18	**22.65**	0.82	**1.03**	0	**0**
Nitrate	(05/19/1976-08/06/1976)	**2**	(0.51-0.51)	**0.355**	0.155	**0.36**	0.22	**61.75**	0.43	**0.49**	0	**0**
Sulfate	(11/16/1974-08/06/1976)	**6**	(1400.-1400.)	**606**	191.5	**790**	452	**57**	1161	**1375**	2	**33**
TDS - 180°C	(11/16/1974-08/06/1976)	**6**	(3194.-3194.)	**1663.5**	446.5	**1944**	832	**43**	2505	**3073**	1	**17**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chaco Alluvial Well GM-25	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Livestock Criteria Exceedance	
											n	%
pH	(11/16/1974-03/03/1977)	**4**	(7.9-7.9)	**7.675**	0.05	**7.71**	0.13	**1.70**	7.75	**7.87**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/03/1977)	**4**	(24300.-24300.)	**18915**	5135	**18520**	6445	**35**	23925	**24225**	0	**0**
Arsenic	(11/16/1974-03/03/1977)	**4**	(0.25-0.25)	**0.015**	0.0075	**0.071**	0.119	**167.480**	0.078	**0.216**	1	**25**
Boron	(11/16/1974-03/03/1977)	**4**	(0.4-0.4)	**0.39**	0.01	**0.32**	0.15	**45.93**	0.40	**0.40**	0	**0**
Cadmium	(11/16/1974-03/03/1977)	**4**	(0.005-0.005)	**0.0005**	0	**0.0016**	0.0023	**138.4615**	0.0016	**0.0043**	0	**0**
Chromium											0	**0**
Copper	(11/16/1974-03/03/1977)	**4**	(0.035-0.035)	**0.01**	0.0035	**0.015**	0.014	**90.921**	0.018	**0.032**	0	**0**
Iron (total)											0	**0**
Lead	(11/16/1974-03/03/1977)	**4**	(0.025-0.025)	**0.002**	0.00125	**0.0074**	0.0118	**159.9938**	0.0085	**0.0217**	0	**0**
Manganese	(11/16/1974-03/03/1977)	**4**	(4.-4.)	**2.99**	0.96	**2.99**	1.110015	**37.12425**	3.925	**3.985**	0	**0**
Mercury	(11/16/1974-03/03/1977)	**4**	(0.00025-0.00025)	**0.0002**	0	**0.00021**	0.00003	**11.76471**	0.00021	**0.00024**	0	**0**
Selenium	(11/16/1974-03/03/1977)	**4**	(0.025-0.025)	**0.005**	0.00225	**0.009**	0.011	**123.463**	0.010	**0.022**	0	**0**
Zinc	(11/16/1974-03/03/1977)	**4**	(0.177-0.177)	**0.0835**	0.0205	**0.099**	0.055	**55.844**	0.113	**0.164**	0	**0**
Chloride	(11/16/1974-03/03/1977)	**4**	(920.-920.)	**596.5**	41.35	**658**	179	**27**	680	**872**	1	**25**
Fluoride	(11/16/1974-03/03/1977)	**4**	(0.9-0.9)	**0.68**	0.14	**0.69**	0.18	**26.80**	0.80	**0.88**	0	**0**
Nitrate	(05/19/1976-03/03/1977)	**3**	(0.51-0.51)	**0.3**	0.21	**0.29**	0.23	**80.33**	0.41	**0.49**	0	**0**
Sulfate	(11/16/1974-03/03/1977)	**4**	(24443.-24443.)	**8318.5**	4259.5	**10378**	10100	**97**	12823	**22119**	3	**75**
TDS - 180°C	(11/16/1974-03/03/1977)	**4**	(54730.-54730.)	**32142.5**	9459.5	**33609**	16236	**48**	39438	**51672**	4	**100**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chaco Alluvial Well GM-34	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Livestock Criteria Exceedance	
											n	%
pH	(11/16/1974-03/04/1977)	**7**	(8.1-8.1)	**7.69**	0.04	**7.68**	0.22	**2.86**	7.71	**7.99**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/04/1977)	**7**	(6880.-6880.)	**4790**	190	**4707**	1222	**26**	4800	**6256**	0	**0**
Arsenic	(11/16/1974-03/04/1977)	**8**	(0.4-0.4)	**0.015**	0.01	**0.078**	0.139	**179.622**	0.056	**0.313**	1	**13**
Boron	(11/16/1974-03/04/1977)	**8**	(0.4-0.4)	**0.28**	0.065	**0.25**	0.11	**44.69**	0.31	**0.38**	0	**0**
Cadmium	(11/16/1974-03/04/1977)	**8**	(0.005-0.005)	**0.00275**	0.00225	**0.0028**	0.0024	**87.4673**	0.0050	**0.0050**	0	**0**
Chromium												
Copper	(11/16/1974-03/04/1977)	**8**	(0.496-0.496)	**0.0115**	0.009	**0.072**	0.172	**239.695**	0.021	**0.331**	0	**0**
Iron (total)												
Lead	(11/16/1974-03/04/1977)	**8**	(0.065-0.065)	**0.00275**	0.00225	**0.0184**	0.0258	**140.6399**	0.0313	**0.0598**	0	**0**
Manganese	(11/16/1974-03/04/1977)	**8**	(4.6-4.6)	**1.67**	0.9	**1.804375**	1.440688	**79.84415**	2.275	**3.97**	0	**0**
Mercury	(11/16/1974-03/04/1977)	**8**	(0.013-0.013)	**0.000475**	0.000275	**0.00213**	0.00444	**207.95377**	0.00103	**0.00915**	1	**13**
Selenium	(11/16/1974-03/04/1977)	**8**	(0.25-0.25)	**0.005**	0	**0.056**	0.093	**165.189**	0.056	**0.215**	2	**25**
Zinc	(11/16/1974-03/04/1977)	**8**	(0.835-0.835)	**0.136**	0.075	**0.260**	0.285	**109.806**	0.290	**0.739**	0	**0**
Chloride	(11/16/1974-03/04/1977)	**8**	(306.-306.)	**67.4**	26.5	**105**	97	**92**	123	**265**	0	**0**
Fluoride	(11/16/1974-03/04/1977)	**8**	(2.1-2.1)	**1.3**	0.115	**1.32**	0.44	**33.10**	1.45	**1.89**	1	**13**
Nitrate	(10/06/1976-03/04/1977)	**2**	(0.14-0.14)	**0.095**	0.045	**0.10**	0.06	**66.99**	0.12	**0.14**	0	**0**
Sulfate	(11/16/1974-03/04/1977)	**8**	(3380.-3380.)	**2329**	529	**2204**	906	**41**	2676	**3251**	7	**88**
TDS - 180°C	(11/16/1974-03/04/1977)	**8**	(6728.-6728.)	**4209.5**	219	**4414**	984	**22**	4386	**5942**	8	**100**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Area I Alluvial Well GM-7	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Criteria**			
											Live-stock		**Cotton-wood Baseline Median + 2MAD**	
											n	%	n	%
pH	(03/24/1975-10/16/1976)	**4**	(7.1-7.9)	**7.525**	0.35	**7.51**	0.42	**5.60**	7.86	**7.89**	0	**0**	1	**25**
Conductivity (umho/cm)	(03/24/1975-10/16/1976)	**4**	(2630.-4500.)	**3530**	510	**3548**	770	**22**	3863	**4373**	0	**0**	1	**25**
Arsenic	(03/24/1975-10/16/1976)	**4**	(0.005-0.4)	**0.0125**	0.0075	**0.108**	0.195	**181.515**	0.115	**0.343**	1	**25**	4	**100**
Boron	(03/24/1975-10/16/1976)	**4**	(0.05-0.75)	**0.45**	0.175	**0.43**	0.29	**68.26**	0.56	**0.71**	0	**0**	3	**75**
Cadmium	(03/24/1975-10/16/1976)	**4**	(0.0005-0.005)	**0.00275**	0.00225	**0.0028**	0.0026	**94.4755**	0.0050	**0.0050**	0	**0**	0	**0**
Chromium											0	**0**	0	**0**
Copper	(03/24/1975-10/16/1976)	**4**	(0.008-0.025)	**0.014**	0.006	**0.015**	0.009	**56.504**	0.021	**0.024**	0	**0**	0	**0**
Iron (total)											0	**0**	0	**0**
Lead	(03/24/1975-10/16/1976)	**4**	(0.0005-0.025)	**0.00275**	0.00225	**0.0078**	0.0117	**150.8905**	0.0100	**0.0220**	0	**0**	1	**25**
Manganese	(03/24/1975-10/16/1976)	**4**	(0.012-0.047)	**0.0195**	0.0065	**0.0245**	0.016052	**65.51836**	0.0305	**0.0437**	0	**0**	0	**0**
Mercury	(03/24/1975-10/16/1976)	**4**	(0.0002-0.001)	**0.00022**	0.00002	**0.00041**	0.00039	**96.04513**	0.00043	**0.00089**	0	**0**	0	**0**
Selenium	(03/24/1975-10/16/1976)	**4**	(0.005-0.25)	**0.005**	0	**0.066**	0.123	**184.906**	0.066	**0.213**	1	**25**	1	**25**
Zinc	(03/24/1975-10/16/1976)	**4**	(0.075-0.12)	**0.0945**	0.017	**0.096**	0.022	**22.838**	0.112	**0.118**	0	**0**	0	**0**
Chloride	(03/24/1975-10/16/1976)	**4**	(180.-650.)	**204**	14	**310**	227	**73**	319	**584**	1	**25**	4	**100**
Fluoride	(03/24/1975-10/16/1976)	**4**	(4.62-6.)	**5.63**	0.37	**5.47**	0.67	**12.17**	6.00	**6.00**	4	**100**	4	**100**
Nitrate	(03/24/1975-10/16/1976)	**3**	(0.5-1.62)	**0.79**	0.29	**0.97**	0.58	**59.93**	1.21	**1.54**	0	**0**	1	**33**
Sulfate	(03/24/1975-10/16/1976)	**4**	(730.-1706.)	**1290**	253	**1254**	407	**32**	1462	**1657**	3	**75**	0	**0**
TDS - 180°C	(03/24/1975-10/16/1976)	**4**	(2583.-3027.)	**2700.5**	65	**2753**	191	**7**	2792	**2980**	1	**25**	0	**0**
Radium (pCi/l)														

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Area I Alluvial Well Bighan-1	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Live-stock		Cotton-wood Baseline Median + 2MAD	
											n	%	n	%
pH	(03/01/1995-08/07/2001)	**21**	(7.6-8.17)	**7.95**	0.05	**7.92**	0.15	**1.84**	8.00	**8.10**	0	**0**	0	**0**
Conductivity (umho/cm)	(03/01/1995-08/07/2001)	**20**	(1460.-2260.)	**1760**	65	**1810**	198	**11**	1905	**2232**	0	**0**	0	**0**
Arsenic	(03/01/1995-08/07/2001)	**19**	(0.0005-0.019)	**0.0025**	0	**0.004**	0.004	**109.574**	0.003	**0.006**	0	**0**	18	**95**
Boron	(03/01/1995-08/07/2001)	**20**	(0.99-1.67)	**1.4**	0.205	**1.39**	0.20	**14.42**	1.57	**1.63**	0	**0**	20	**100**
Cadmium	(03/01/1995-08/07/2001)	**20**	(0.0005-0.0025)	**0.001**	0.0005	**0.0010**	0.0006	**62.8281**	0.0010	**0.0025**	0	**0**	0	**0**
Chromium	(03/01/1995-08/07/2001)	**19**	(0.0025-0.03)	**0.005**	0.0025	**0.008289**	0.005896	**71.12221**	0.01	**0.012**	0	**0**	1	**5**
Copper	(03/01/1995-08/07/2001)	**19**	(0.0025-0.005)	**0.005**	0	**0.005**	0.001	**16.641**	0.005	**0.005**	0	**0**	0	**0**
Iron (total)	(03/01/1995-08/07/2001)	**20**	(0.05-58.)	**1.7**	0.975	**6.4595**	13.30538	**205.9816**	4.77	**25.51**	0	**0**	10	**50**
Lead	(03/01/1995-08/07/2001)	**20**	(0.002-0.005)	**0.0025**	0	**0.0026**	0.0006	**22.1473**	0.0025	**0.0026**	0	**0**	0	**0**
Manganese	(03/01/1995-08/07/2001)	**20**	(0.0025-0.15)	**0.01**	0.00625	**0.02515**	0.032966	**131.0765**	0.0265	**0.0645**	0	**0**	0	**0**
Mercury	(03/01/1995-08/07/2001)	**19**	(0.00005-0.0005)	**0.0005**	0	**0.00045**	0.00014	**31.34686**	0.00050	**0.00050**	0	**0**	0	**0**
Selenium	(03/01/1995-08/07/2001)	**20**	(0.01-0.026)	**0.016**	0.003	**0.017**	0.004	**26.237**	0.020	**0.026**	0	**0**	20	**100**
Zinc	(03/01/1995-08/07/2001)	**19**	(0.0025-0.05)	**0.01**	0.005	**0.014**	0.011	**74.977**	0.020	**0.027**	0	**0**	0	**0**
Chloride	(03/01/1995-08/07/2001)	**20**	(12.-59.)	**29**	9	**30**	12	**42**	36	**50**	0	**0**	0	**0**
Fluoride	(03/01/1995-08/07/2001)	**20**	(4.81-21.)	**9.045**	0.785	**10.06**	3.71	**36.86**	10.13	**19.10**	20	**100**	20	**100**
Nitrate	(03/01/1995-03/12/1997)	**11**	(23.3-30.2)	**28.5**	0.7	**28.45**	1.90	**6.69**	29.70	**30.10**	11	**100**	11	**100**
Sulfate	(03/01/1995-08/07/2001)	**20**	(260.-428.)	**328**	26.5	**334**	50	**15**	347	**424**	0	**0**	0	**0**
TDS - 180°C	(03/01/1995-08/07/2001)	**13**	(1020.-1360.)	**1250**	70	**1232**	100	**8**	1310	**1360**	0	**0**	0	**0**
Radium (pCi/l)	(01/04/1996-03/30/1998)	**9**	(0.7-3.6)	**1.8**	0.2	**1.81**	0.83	**46**	1.9	**3.04**	0	**0**	1	**11**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Alluvial Wells (GM-9, GM-10, QAC-1)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Live-stock		Cotton-wood Baseline Median + 2MAD	
											n	%	n	%
pH	(03/23/1975-09/24/2008)	**106**	(6.45-8.19)	**7.295**	0.195	**7.37**	0.30	**4.08**	7.58	**7.88**	1	**1**	25	**24**
Conductivity (umho/cm)	(03/23/1975-09/24/2008)	**106**	(1280.-26700.)	**18050**	4050	**16998**	6010	**35**	21500	**25075**	0	**0**	100	**94**
Arsenic	(03/23/1975-09/09/2002)	**69**	(0.00005-0.4)	**0.0005**	0.0003	**0.009**	0.048	**553.434**	0.003	**0.013**	1	**1**	30	**43**
Boron	(03/23/1975-09/09/2002)	**89**	(0.05-2.92)	**1.42**	0.12	**1.30**	0.41	**31.49**	1.50	**1.60**	0	**0**	87	**98**
Cadmium	(03/23/1975-09/09/2002)	**90**	(0.00005-0.12)	**0.0025**	0.002	**0.0059**	0.0141	**238.4930**	0.0045	**0.0250**	1	**1**	14	**16**
Chromium	(09/10/1979-09/09/2002)	**41**	(0.002-0.13)	**0.02**	0.01	**0.022634**	0.024737	**109.2912**	0.03	**0.06**	0	**0**	21	**51**
Copper	(03/23/1975-09/09/2002)	**37**	(0.002-0.28)	**0.02**	0.015	**0.038**	0.062	**163.496**	0.025	**0.190**	0	**0**	7	**19**
Iron (total)	(09/10/1979-09/09/2002)	**54**	(0.01-70.)	**2.855**	1.62	**6.416111**	12.28497	**191.4706**	6.275	**24.065**	0	**0**	40	**74**
Lead	(03/23/1975-09/09/2002)	**66**	(0.0005-0.43)	**0.009**	0.0065	**0.0325**	0.0784	**241.6349**	0.0195	**0.2325**	5	**8**	34	**52**
Manganese	(03/23/1975-09/09/2002)	**90**	(0.019-11.9)	**4.695**	0.675	**4.2198**	2.359095	**55.90539**	5.33	**6.8**	0	**0**	79	**88**
Mercury	(03/23/1975-03/06/2002)	**35**	(0.0000005-0.001)	**0.0001**	0.00007	**0.00020**	0.00023	**114.31215**	0.00021	**0.00050**	0	**0**	0	**0**
Selenium	(03/23/1975-09/24/2008)	**114**	(0.000005-0.5)	**0.002**	0.0015	**0.022**	0.065	**291.804**	0.005	**0.100**	8	**7**	28	**25**
Zinc	(03/23/1975-03/06/2002)	**67**	(0.0025-5.3)	**0.05**	0.0475	**0.394**	0.935	**237.204**	0.246	**2.294**	0	**0**	6	**9**
Chloride	(03/23/1975-09/24/2008)	**113**	(200.-5400.)	**3730**	820	**3467**	1418	**41**	4640	**5100**	104	**92**	113	**100**
Fluoride	(03/23/1975-09/09/2002)	**90**	(0.005-7.5)	**0.84**	0.135	**1.33**	1.35	**101.85**	1.02	**4.60**	10	**11**	10	**11**
Nitrate	(03/23/1975-12/05/1996)	**33**	(0.06-36.4)	**0.37**	0.27	**1.70**	6.26	**367.51**	0.73	**2.10**	1	**3**	6	**18**
Sulfate	(03/23/1975-03/23/2006)	**103**	(440.-6565.)	**4300**	500	**4169**	1018	**24**	4825	**5390**	101	**98**	98	**95**
TDS - 180°C	(03/23/1975-09/24/2008)	**112**	(830.-17200.)	**12700**	1250	**12281**	3129	**25**	14300	**15700**	110	**98**	109	**97**
Radium (pCi/l)	(09/16/1985-12/15/1999)	**28**	(0.2-22.3)	**1.8**	1.85	**4.87**	5.77	**118**	4.375	**19.145**	0	**0**	14	**50**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Alluvial Wells GM-9	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Live-stock		Cotton-wood Baseline Median + 2MAD	
											n	%	n	%
pH														
Conductivity (umho/cm)														
Arsenic	(09/10/1979-09/23/1980)	**3**	(0.0005-0.0008)	**0.0008**	0	**0.001**	0.000	**24.744**	0.001	**0.001**	0	**0**	2	**67**
Boron	(09/10/1979-09/23/1980)	**3**	(0.11-0.51)	**0.3**	0.19	**0.31**	0.20	**65.24**	0.41	**0.49**	0	**0**	2	**67**
Cadmium	(09/10/1979-09/23/1980)	**3**	(0.0005-0.005)	**0.005**	0	**0.0035**	0.0026	**74.2307**	0.0050	**0.0050**	0	**0**	0	**0**
Chromium	(09/10/1979-09/23/1980)	**3**	(0.004-0.04)	**0.03**	0.01	**0.024667**	0.018583	**75.33708**	0.035	**0.039**	0	**0**	2	**67**
Copper	(09/10/1979-09/23/1980)	**3**	(0.005-0.12)	**0.02**	0.015	**0.048**	0.063	**129.345**	0.070	**0.110**	0	**0**	1	**33**
Iron (total)	(09/10/1979-09/23/1980)	**3**	(0.01-0.06)	**0.06**	0	**0.043333**	0.028868	**66.61734**	0.06	**0.06**	0	**0**	0	**0**
Lead	(09/10/1979-09/23/1980)	**3**	(0.014-0.43)	**0.03**	0.016	**0.1580**	0.2357	**149.1739**	0.2300	**0.3900**	1	**33**	3	**100**
Manganese	(09/10/1979-09/23/1980)	**3**	(0.06-1.02)	**0.19**	0.13	**0.423333**	0.520801	**123.0238**	0.605	**0.937**	0	**0**	1	**33**
Mercury	(09/10/1979-09/23/1980)	**3**	(0.00004-0.00019)	**0.0001**	0.00006	**0.00011**	0.00008	**68.63486**	0.00015	**0.00018**	0	**0**	0	**0**
Selenium	(09/10/1979-09/23/1980)	**3**	(0.0006-0.002)	**0.0016**	0.0004	**0.001**	0.001	**51.508**	0.002	**0.002**	0	**0**	0	**0**
Zinc	(09/10/1979-09/23/1980)	**3**	(0.03-3.)	**0.13**	0.1	**1.053**	1.687	**160.121**	1.565	**2.713**	0	**0**	1	**33**
Chloride	(09/10/1979-09/23/1980)	**3**	(211.-227.)	**218**	7	**219**	8	**4**	223	**226**	0	**0**	3	**100**
Fluoride	(09/10/1979-09/23/1980)	**3**	(1.38-1.8)	**1.6**	0.2	**1.59**	0.21	**13.18**	1.70	**1.78**	0	**0**	0	**0**
Nitrate	(09/10/1979-09/23/1980)	**3**	(0.59-1.9)	**1.5**	0.4	**1.33**	0.67	**50.48**	1.70	**1.86**	0	**0**	2	**67**
Sulfate	(09/10/1979-09/23/1980)	**3**	(440.-6565.)	**5440**	1125	**4148**	3260	**79**	6003	**6453**	2	**67**	2	**67**
TDS - 180°C	(09/10/1979-09/23/1980)	**3**	(830.-10060.)	**9235**	825	**6708**	5107	**76**	9648	**9978**	2	**67**	2	**67**
Radium (pCi/l)														

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Alluvial Wells GM-10	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Live-stock		Cotton-wood Baseline Median + 2MAD	
											n	%	n	%
pH	(03/23/1975-09/29/1982)	**10**	(6.45-7.5)	**6.95**	0.15	**6.98**	0.28	**4.02**	7.10	**7.37**	1	**10**	8	**80**
Conductivity (umho/cm)	(03/23/1975-09/29/1982)	**10**	(3600.-18600.)	**4650**	665	**6437**	4521	**70**	6850	**13830**	0	**0**	6	**60**
Arsenic	(03/23/1975-09/29/1982)	**15**	(0.00005-0.4)	**0.0002**	0.00015	**0.030**	0.103	**347.986**	0.003	**0.141**	1	**7**	5	**33**
Boron	(03/23/1975-09/29/1982)	**14**	(0.05-1.33)	**0.73**	0.145	**0.73**	0.33	**45.72**	0.84	**1.31**	0	**0**	13	**93**
Cadmium	(03/23/1975-09/29/1982)	**15**	(0.00005-0.01)	**0.001**	0.00095	**0.0028**	0.0034	**120.6141**	0.0050	**0.0100**	0	**0**	2	**13**
Chromium	(09/10/1979-09/29/1982)	**11**	(0.005-0.13)	**0.03**	0.01	**0.038182**	0.034516	**90.3994**	0.04	**0.095**	0	**0**	9	**82**
Copper	(03/23/1975-09/29/1982)	**15**	(0.002-0.187)	**0.01**	0.008	**0.031**	0.051	**165.875**	0.025	**0.133**	0	**0**	2	**13**
Iron (total)	(09/10/1979-09/29/1982)	**10**	(0.05-70.)	**7.87**	7.17	**15.398**	22.22039	**144.307**	15.575	**55.15**	0	**0**	6	**60**
Lead	(03/23/1975-09/29/1982)	**15**	(0.0005-0.27)	**0.005**	0.004	**0.0321**	0.0722	**225.1755**	0.0100	**0.1650**	2	**13**	7	**47**
Manganese	(03/23/1975-09/29/1982)	**15**	(0.08-0.92)	**0.47**	0.267	**0.4742**	0.282505	**59.575**	0.7	**0.885**	0	**0**	8	**53**
Mercury	(03/23/1975-09/29/1982)	**15**	(0.0000005-0.001)	**0.00011**	0.00009	**0.00016**	0.00025	**155.37990**	0.00018	**0.00045**	0	**0**	0	**0**
Selenium	(03/23/1975-09/29/1982)	**15**	(0.000005-0.25)	**0.0005**	0.00045	**0.031**	0.079	**253.382**	0.005	**0.215**	2	**13**	2	**13**
Zinc	(03/23/1975-09/29/1982)	**15**	(0.22-5.3)	**0.56**	0.21	**1.212**	1.529	**126.122**	1.005	**4.432**	0	**0**	4	**27**
Chloride	(03/23/1975-09/29/1982)	**15**	(200.-4190.)	**660**	280	**1076**	1069	**99**	1280	**2797**	9	**60**	15	**100**
Fluoride	(03/23/1975-09/29/1982)	**15**	(0.6-5.8)	**0.72**	0.08	**1.10**	1.31	**118.25**	0.87	**2.51**	1	**7**	1	**7**
Nitrate	(03/23/1975-09/29/1982)	**15**	(0.1-2.)	**0.45**	0.25	**0.66**	0.61	**92.55**	0.89	**1.82**	0	**0**	2	**13**
Sulfate	(03/23/1975-09/29/1982)	**15**	(1340.-4090.)	**2915**	285	**2819**	775	**27**	3190	**3845**	15	**100**	12	**80**
TDS - 180°C	(03/23/1975-09/29/1982)	**15**	(2903.-13200.)	**6075**	1065	**6401**	2572	**40**	7295	**10351**	14	**93**	13	**87**
Radium (pCi/l)														

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Chinde Alluvial Wells QAC-1	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Live-stock		Cotton-wood Baseline Median + 2MAD	
											n	%	n	%
pH	(09/16/1985-09/24/2008)	**96**	(6.885-8.19)	**7.325**	0.175	**7.41**	0.27	**3.69**	7.59	**7.88**	0	**0**	17	**18**
Conductivity (umho/cm)	(09/16/1985-09/24/2008)	**96**	(1280.-26700.)	**18450**	4450	**18098**	5003	**28**	21825	**25100**	0	**0**	94	**98**
Arsenic	(09/16/1985-09/09/2002)	**51**	(0.0005-0.05)	**0.0005**	0	**0.003**	0.007	**236.973**	0.003	**0.011**	0	**0**	23	**45**
Boron	(09/16/1985-09/09/2002)	**72**	(0.74-2.92)	**1.455**	0.07	**1.45**	0.24	**16.38**	1.53	**1.62**	0	**0**	72	**100**
Cadmium	(09/16/1985-09/09/2002)	**72**	(0.0005-0.12)	**0.0025**	0.0015	**0.0067**	0.0156	**234.7339**	0.0030	**0.0250**	1	**1**	12	**17**
Chromium	(09/16/1985-09/09/2002)	**27**	(0.002-0.09)	**0.01**	0.005	**0.016074**	0.017584	**109.3951**	0.025	**0.0299**	0	**0**	10	**37**
Copper	(12/11/1997-09/09/2002)	**19**	(0.0025-0.28)	**0.025**	0.02	**0.042**	0.072	**170.750**	0.025	**0.208**	0	**0**	4	**21**
Iron (total)	(12/17/1992-09/09/2002)	**41**	(0.29-51.7)	**3.11**	1.29	**4.691707**	7.912922	**168.6576**	4.43	**8.9**	0	**0**	34	**83**
Lead	(09/16/1985-09/09/2002)	**48**	(0.0005-0.32)	**0.008**	0.0055	**0.0247**	0.0594	**239.9986**	0.0185	**0.0700**	2	**4**	24	**50**
Manganese	(09/16/1985-09/09/2002)	**72**	(0.019-11.9)	**5.05**	0.55	**5.158319**	1.576917	**30.57037**	5.5625	**6.935**	0	**0**	70	**97**
Mercury	(12/11/1997-03/06/2002)	**17**	(0.00005-0.0005)	**0.0001**	0.00005	**0.00025**	0.00022	**89.50370**	0.00050	**0.00050**	0	**0**	0	**0**
Selenium	(09/16/1985-09/24/2008)	**96**	(0.0005-0.5)	**0.0025**	0.002	**0.021**	0.064	**296.536**	0.014	**0.100**	6	**6**	26	**27**
Zinc	(09/16/1985-03/06/2002)	**49**	(0.0025-2.)	**0.025**	0.0125	**0.104**	0.284	**274.178**	0.125	**0.241**	0	**0**	1	**2**
Chloride	(09/16/1985-09/24/2008)	**95**	(1200.-5400.)	**3910**	750	**3947**	862	**22**	4725	**5100**	95	**100**	95	**100**
Fluoride	(09/16/1985-09/09/2002)	**72**	(0.005-7.5)	**0.85**	0.12	**1.36**	1.39	**102.16**	1.01	**4.60**	9	**13**	9	**13**
Nitrate	(12/13/1990-12/05/1996)	**15**	(0.06-36.4)	**0.23**	0.15	**2.82**	9.31	**329.67**	0.70	**12.49**	1	**7**	2	**13**
Sulfate	(09/16/1985-03/23/2006)	**85**	(500.-5700.)	**4380**	370	**4408**	723	**16**	4900	**5300**	84	**99**	84	**99**
TDS - 180°C	(09/16/1985-09/24/2008)	**94**	(7700.-17200.)	**13000**	1050	**13397**	1513	**11**	14575	**15770**	94	**100**	94	**100**
Radium (pCi/l)	(09/16/1985-12/15/1999)	**28**	(0.2-22.3)	**1.8**	1.85	**4.87**	5.77	**118**	4.375	**19.145**	0	**0**	14	**50**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Alluvial Wells (GM-17, GM-16, QACW-2, and QACW-2B)	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Livestock Criteria Exceedance	
											n	%
pH	(11/16/1974-03/10/1999)	**51**	(6.1-8.39)	**7.7**	0.25	**7.64**	0.45	**5.88**	7.95	**8.17**	1	**2**
Conductivity (umho/cm)	(11/16/1974-03/10/1999)	**44**	(1720.-13200.)	**3695**	360	**4003**	2155	**54**	4043	**4864**	0	**0**
Arsenic	(11/16/1974-03/10/1999)	**36**	(0.0005-0.4)	**0.0005**	0	**0.029**	0.085	**291.402**	0.003	**0.207**	2	**6**
Boron	(11/16/1974-03/10/1999)	**57**	(0.005-1.4)	**0.13**	0.05	**0.21**	0.25	**121.72**	0.20	**0.66**	0	**0**
Cadmium	(11/16/1974-03/10/1999)	**44**	(0.0005-0.02)	**0.0025**	0.0015	**0.0029**	0.0035	**118.7268**	0.0030	**0.0094**	0	**0**
Chromium	(09/19/1990-03/10/1999)	**12**	(0.005-0.12)	**0.0075**	0.0025	**0.016667**	0.032637	**195.82**	0.01	**0.0595**	0	**0**
Copper	(11/16/1974-03/10/1999)	**14**	(0.0005-0.15)	**0.02**	0.01	**0.026**	0.037	**143.773**	0.029	**0.072**	0	**0**
Iron (total)	(09/10/1979-03/10/1999)	**29**	(0.01-41.4)	**0.62**	0.56	**3.67931**	8.874139	**241.1903**	2.12	**19.6**	0	**0**
Lead	(11/16/1974-03/10/1999)	**28**	(0.0005-0.1)	**0.0025**	0.00175	**0.0120**	0.0217	**180.5377**	0.0100	**0.0510**	0	**0**
Manganese	(11/16/1974-03/10/1999)	**59**	(0.005-4.95)	**0.11**	0.105	**0.669542**	1.046685	**156.3285**	0.765	**2.731**	0	**0**
Mercury	(11/16/1974-03/10/1999)	**14**	(0.000043-0.0029)	**0.0005**	0.0003	**0.00080**	0.00078	**97.90787**	0.00100	**0.00232**	0	**0**
Selenium	(11/16/1974-03/10/1999)	**54**	(0.00005-0.25)	**0.0025**	0.0015	**0.010**	0.039	**397.595**	0.003	**0.012**	2	**4**
Zinc	(11/16/1974-03/10/1999)	**36**	(0.0125-21.9)	**0.2915**	0.2665	**1.221**	3.684	**301.785**	0.885	**3.200**	0	**0**
Chloride	(11/16/1974-03/10/1999)	**59**	(0.7-800.)	**124**	23	**137**	132	**96**	145	**268**	2	**3**
Fluoride	(11/16/1974-03/10/1999)	**58**	(0.1-6.2)	**1.38**	0.475	**1.69**	1.21	**71.48**	2.08	**4.12**	15	**26**
Nitrate	(03/27/1975-03/27/1997)	**26**	(0.005-4.56)	**0.505**	0.42	**0.73**	0.98	**133.58**	1.02	**2.28**	0	**0**
Sulfate	(11/16/1974-03/10/1999)	**58**	(740.-9810.)	**1730**	340	**2952**	2916	**99**	2290	**9572**	53	**91**
TDS - 180°C	(11/16/1974-12/08/1998)	**58**	(210.5-16000.)	**3035**	423.5	**5101**	4763	**93**	3920	**15615**	32	**55**
Radium (pCi/l)	(06/18/1987-06/09/1992)	**17**	(0.1-6.8)	**1.2**	1	**1.78**	1.70	**95**	2.6	**4.24**	0	**0**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Alluvial Wells GM-17	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	**%**
pH	(10/14/1975-09/29/1982)	**7**	(6.1-7.4)	**6.9**	0.2	**6.84**	0.42	**6.19**	7.10	**7.31**	1	**14**
Conductivity (umho/cm)	(10/14/1975-05/18/1976)	**2**	(13200.-13200.)	**13200**	0	**13200**	0		13200	**13200**	0	**0**
Arsenic	(10/14/1975-05/18/1976)	**2**	(0.005-0.01)	**0.0075**	0.0025	**0.008**	0.004	**47.140**	0.009	**0.010**	0	**0**
Boron	(10/14/1975-09/29/1982)	**11**	(0.005-0.66)	**0.28**	0.12	**0.27**	0.19	**71.15**	0.31	**0.59**	0	**0**
Cadmium	(10/14/1975-05/18/1976)	**2**	(0.002-0.005)	**0.0035**	0.0015	**0.0035**	0.0021	**60.6092**	0.0043	**0.0049**	0	**0**
Chromium											0	**0**
Copper	(10/14/1975-05/18/1976)	**2**	(0.021-0.025)	**0.023**	0.002	**0.023**	0.003	**12.298**	0.024	**0.025**	0	**0**
Iron (total)	(09/10/1979-09/29/1982)	**9**	(0.05-10.)	**0.62**	0.57	**2.766667**	3.794799	**137.1614**	4.75	**9.08**	0	**0**
Lead	(10/14/1975-05/18/1976)	**2**	(0.006-0.025)	**0.0155**	0.0095	**0.0155**	0.0134	**86.6776**	0.0203	**0.0241**	0	**0**
Manganese	(10/14/1975-09/29/1982)	**11**	(0.005-2.7)	**1.02**	1.015	**1.124091**	1.114656	**99.16071**	2.18	**2.5**	0	**0**
Mercury	(10/14/1975-05/18/1976)	**2**	(0.0002-0.001)	**0.0006**	0.0004	**0.00060**	0.00057	**94.28090**	0.00080	**0.00096**	0	**0**
Selenium	(10/14/1975-09/29/1982)	**11**	(0.00005-0.005)	**0.0004**	0.00035	**0.002**	0.002	**131.698**	0.003	**0.005**	0	**0**
Zinc	(10/14/1975-05/18/1976)	**2**	(0.05-0.11)	**0.08**	0.03	**0.080**	0.042	**53.033**	0.095	**0.107**	0	**0**
Chloride	(10/14/1975-09/29/1982)	**11**	(1.5-430.)	**113**	15	**135**	112	**83**	125	**329**	0	**0**
Fluoride	(10/14/1975-09/29/1982)	**11**	(0.1-0.89)	**0.3**	0.2	**0.35**	0.24	**70.59**	0.45	**0.75**	0	**0**
Nitrate	(10/14/1975-09/29/1982)	**11**	(0.5-4.56)	**1.03**	0.27	**1.23**	1.14	**92.84**	1.14	**2.93**	0	**0**
Sulfate	(10/14/1975-09/29/1982)	**11**	(2453.-9810.)	**9308**	332	**8535**	2221	**26**	9600	**9785**	11	**100**
TDS - 180°C	(10/14/1975-09/29/1982)	**11**	(5629.-16000.)	**15210**	490	**14381**	2957	**21**	15650	**15950**	11	**100**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Alluvial Wells GM-16	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	**%**
pH	(03/27/1975-03/27/1975)	**1**	(7.1-7.1)	**7.1**	0	**7.10**			7.10	**7.10**	0	**0**
Conductivity (umho/cm)	(03/27/1975-03/27/1975)	**1**	(4500.-4500.)	**4500**	0	**4500**			4500	**4500**	0	**0**
Arsenic	(03/27/1975-03/27/1975)	**1**	(0.4-0.4)	**0.4**	0	**0.400**			0.400	**0.400**	1	**100**
Boron	(03/27/1975-03/27/1975)	**1**	(1.2-1.2)	**1.2**	0	**1.20**			1.20	**1.20**	0	**0**
Cadmium	(03/27/1975-03/27/1975)	**1**	(0.01-0.01)	**0.01**	0	**0.0100**			0.0100	**0.0100**	0	**0**
Chromium												
Copper	(03/27/1975-03/27/1975)	**1**	(0.02-0.02)	**0.02**	0	**0.020**			0.020	**0.020**	0	**0**
Iron (total)												
Lead	(03/27/1975-03/27/1975)	**1**	(0.005-0.005)	**0.005**	0	**0.0050**			0.0050	**0.0050**	0	**0**
Manganese	(03/27/1975-03/27/1975)	**1**	(0.23-0.23)	**0.23**	0	**0.23**			0.23	**0.23**	0	**0**
Mercury	(03/27/1975-03/27/1975)	**1**	(0.0029-0.0029)	**0.0029**	0	**0.00290**			0.00290	**0.00290**	0	**0**
Selenium	(03/27/1975-03/27/1975)	**1**	(0.25-0.25)	**0.25**	0	**0.250**			0.250	**0.250**	1	**100**
Zinc	(03/27/1975-03/27/1975)	**1**	(0.062-0.062)	**0.062**	0	**0.062**			0.062	**0.062**	0	**0**
Chloride	(03/27/1975-03/27/1975)	**1**	(650.-650.)	**650**	0	**650**			650	**650**	1	**100**
Fluoride	(03/27/1975-03/27/1975)	**1**	(1.3-1.3)	**1.3**	0	**1.30**			1.30	**1.30**	0	**0**
Nitrate	(03/27/1975-03/27/1975)	**1**	(0.5-0.5)	**0.5**	0	**0.50**			0.50	**0.50**	0	**0**
Sulfate	(03/27/1975-03/27/1975)	**1**	(2300.-2300.)	**2300**	0	**2300**			2300	**2300**	1	**100**
TDS - 180°C	(03/27/1975-03/27/1975)	**1**	(4823.-4823.)	**4823**	0	**4823**			4823	**4823**	1	**100**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Alluvial Wells QACW-2	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	%
pH	(11/16/1974-03/23/1989)	**9**	(7.2-8.3)	**7.9**	0.26	**7.81**	0.35	**4.47**	7.95	**8.26**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/23/1989)	**9**	(1720.-4910.)	**2300**	400	**2692**	991	**37**	3200	**4266**	0	**0**
Arsenic	(11/16/1974-03/23/1989)	**9**	(0.0005-0.25)	**0.002**	0.0015	**0.046**	0.091	**197.166**	0.005	**0.210**	1	**11**
Boron	(11/16/1974-03/23/1989)	**13**	(0.01-1.4)	**0.11**	0.06	**0.25**	0.36	**143.10**	0.23	**0.80**	0	**0**
Cadmium	(11/16/1974-03/23/1989)	**8**	(0.0005-0.005)	**0.00275**	0.00225	**0.0030**	0.0019	**62.9941**	0.0050	**0.0050**	0	**0**
Chromium											0	**0**
Copper	(11/16/1974-03/04/1977)	**4**	(0.005-0.02)	**0.0105**	0.005	**0.012**	0.007	**62.906**	0.016	**0.019**	0	**0**
Iron (total)	(09/10/1979-09/25/1980)	**4**	(0.01-0.25)	**0.03**	0.015	**0.08**	0.114018	**142.5219**	0.0925	**0.2185**	0	**0**
Lead	(11/16/1974-03/04/1977)	**4**	(0.0005-0.065)	**0.013**	0.01225	**0.0229**	0.0303	**132.5532**	0.0350	**0.0590**	0	**0**
Manganese	(11/16/1974-03/23/1989)	**14**	(0.005-4.1)	**0.1**	0.06	**0.471786**	1.073745	**227.5918**	0.305	**2.02**	0	**0**
Mercury	(11/16/1974-03/04/1977)	**4**	(0.000043-0.0006)	**0.000225**	0.000104	**0.00027**	0.00024	**86.00488**	0.00034	**0.00055**	0	**0**
Selenium	(11/16/1974-03/23/1989)	**9**	(0.0005-0.15)	**0.003**	0.002	**0.021**	0.049	**230.439**	0.005	**0.100**	1	**11**
Zinc	(11/16/1974-03/23/1989)	**9**	(0.025-2.43)	**0.025**	0	**0.324**	0.793	**244.798**	0.065	**1.550**	0	**0**
Chloride	(11/16/1974-03/23/1989)	**14**	(0.7-800.)	**28.2**	16.7	**93**	208	**223**	48	**378**	1	**7**
Fluoride	(11/16/1974-03/23/1989)	**14**	(0.76-6.2)	**2.35**	0.71	**2.84**	1.40	**49.16**	3.78	**4.90**	10	**71**
Nitrate	(08/06/1975-09/25/1980)	**7**	(0.005-0.85)	**0.18**	0.16	**0.27**	0.33	**119.95**	0.40	**0.78**	0	**0**
Sulfate	(11/16/1974-03/23/1989)	**14**	(740.-3750.)	**1226.5**	286.5	**1552**	845	**54**	1738	**3068**	9	**64**
TDS - 180°C	(11/16/1974-03/23/1989)	**14**	(210.5-6160.)	**2305**	607.5	**2604**	1449	**56**	2898	**4971**	3	**21**
Radium (pCi/l)	(03/24/1988-03/23/1989)	**5**	(0.2-2.6)	**1.4**	0.7	**1.40**	0.98	**70**	2.1	**2.5**	0	**0**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Cottonwood Alluvial Wells QACW-2B	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	**%**
pH	(06/18/1987-03/10/1999)	**34**	(7.1-8.39)	**7.8**	0.195	**7.78**	0.27	**3.44**	7.98	**8.12**	0	**0**
Conductivity (umho/cm)	(06/18/1987-03/10/1999)	**32**	(2810.-4600.)	**3740**	240	**3782**	418	**11**	4008	**4501**	0	**0**
Arsenic	(06/18/1987-03/10/1999)	**24**	(0.0005-0.192)	**0.0005**	0	**0.009**	0.039	**429.120**	0.003	**0.005**	0	**0**
Boron	(06/18/1987-03/10/1999)	**32**	(0.005-0.68)	**0.13**	0.03	**0.14**	0.11	**83.78**	0.15	**0.24**	0	**0**
Cadmium	(06/18/1987-03/10/1999)	**33**	(0.0005-0.02)	**0.0025**	0.0015	**0.0027**	0.0037	**138.9303**	0.0025	**0.0076**	0	**0**
Chromium	(09/19/1990-03/10/1999)	**12**	(0.005-0.12)	**0.0075**	0.0025	**0.016667**	0.032637	**195.82**	0.01	**0.0595**	0	**0**
Copper	(12/11/1997-03/10/1999)	**7**	(0.0005-0.15)	**0.03**	0.025	**0.036**	0.052	**145.586**	0.030	**0.114**	0	**0**
Iron (total)	(03/28/1995-03/10/1999)	**16**	(0.17-41.4)	**1.04**	0.84	**5.0925**	11.54266	**226.6601**	2.2	**29.85**	0	**0**
Lead	(09/19/1990-03/10/1999)	**21**	(0.0025-0.1)	**0.0025**	0	**0.0099**	0.0213	**214.8081**	0.0100	**0.0250**	0	**0**
Manganese	(06/18/1987-03/10/1999)	**33**	(0.005-4.95)	**0.11**	0.09	**0.615242**	1.015789	**165.1039**	0.7	**2.446**	0	**0**
Mercury	(12/11/1997-03/10/1999)	**7**	(0.0005-0.002)	**0.0005**	0	**0.00086**	0.00056	**64.90734**	0.00100	**0.00170**	0	**0**
Selenium	(06/18/1987-03/10/1999)	**33**	(0.0005-0.005)	**0.0025**	0.0005	**0.002**	0.001	**46.202**	0.003	**0.004**	0	**0**
Zinc	(06/18/1987-03/10/1999)	**24**	(0.0125-21.9)	**0.59**	0.3355	**1.700**	4.439	**261.071**	0.996	**4.908**	0	**0**
Chloride	(06/18/1987-03/10/1999)	**33**	(77.-250.)	**138**	18	**141**	33	**23**	150	**198**	0	**0**
Fluoride	(06/18/1987-03/10/1999)	**32**	(0.92-4.75)	**1.38**	0.115	**1.67**	0.78	**46.99**	1.78	**3.25**	5	**16**
Nitrate	(03/14/1991-03/27/1997)	**7**	(0.07-2.6)	**0.09**	0	**0.44**	0.95	**213.96**	0.09	**1.85**	0	**0**
Sulfate	(06/18/1987-03/10/1999)	**32**	(1150.-2260.)	**1605**	175	**1666**	273	**16**	1835	**2155**	32	**100**
TDS - 180°C	(06/18/1987-12/08/1998)	**32**	(2590.-3800.)	**3015**	330	**3013**	361	**12**	3175	**3725**	17	**53**
Radium (pCi/l)	(06/18/1987-06/09/1992)	**12**	(0.1-6.8)	**1.2**	1	**1.94**	1.94	**100**	3	**5.04**	0	**0**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Pinnabete Alluvial Wells (GM-22, PA-1,	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard	Q3	95th Percentile	Livestock Criteria	
											n	%
pH	(11/16/1974-11/21/2008)	**24**	(7.19-8.2)	**7.5**	0.115	**7.55**	0.26	**3.40**	7.63	**8.07**	0	**0**
Conductivity (umho/cm)	(11/16/1974-06/15/2004)	**6**	(1610.-4040.)	**3420**	485	**3123**	932	**30**	3763	**3973**	0	**0**
Arsenic	(11/16/1974-11/21/2008)	**22**	(0.00025-0.25)	**0.0025**	0.0015	**0.021**	0.060	**284.923**	0.003	**0.144**	1	**5**
Boron	(11/16/1974-11/21/2008)	**22**	(0.1-2.1)	**0.2**	0.015	**0.36**	0.44	**119.56**	0.30	**0.92**	0	**0**
Cadmium	(11/16/1974-11/21/2008)	**22**	(0.000025-0.005)	**0.0005**	0.000475	**0.0007**	0.0014	**203.8603**	0.0005	**0.0048**	0	**0**
Chromium	(09/12/1991-11/21/2008)	**18**	(0.0005-0.03)	**0.005**	0.001	**0.007028**	0.008612	**122.5377**	0.005	**0.03**	0	**0**
Copper	(11/16/1974-11/21/2008)	**22**	(0.003-0.0508)	**0.00865**	0.00365	**0.012**	0.011	**90.903**	0.015	**0.023**	0	**0**
Iron (total)	(03/28/1995-11/21/2008)	**18**	(0.13-63.9)	**3.535**	2.11	**12.85167**	19.45777	**151.4027**	14.163	**54.805**	0	**0**
Lead	(11/16/1974-11/21/2008)	**22**	(0.00005-0.065)	**0.0015**	0.0013	**0.0076**	0.0179	**235.1724**	0.0025	**0.0545**	0	**0**
Manganese	(11/16/1974-11/21/2008)	**22**	(0.003-1.33)	**0.114**	0.076	**0.182486**	0.286864	**157.1974**	0.159	**0.4864**	0	**0**
Mercury	(11/16/1974-11/21/2008)	**22**	(0.000022-0.0005)	**0.0002**	0.0001	**0.00028**	0.00019	**68.76062**	0.00050	**0.00050**	0	**0**
Selenium	(11/16/1974-11/21/2008)	**24**	(0.0007-0.15)	**0.006**	0.0035	**0.014**	0.030	**218.292**	0.012	**0.024**	1	**4**
Zinc	(11/16/1974-11/21/2008)	**22**	(0.002-0.41)	**0.0125**	0.0105	**0.050**	0.092	**185.035**	0.048	**0.178**	0	**0**
Chloride	(11/16/1974-11/21/2008)	**24**	(13.-800.)	**25.5**	9	**61**	158	**261**	37	**63**	1	**4**
Fluoride	(11/16/1974-11/21/2008)	**22**	(1.51-5.7)	**2.48**	0.325	**2.63**	0.82	**31.05**	2.89	**3.29**	19	**86**
Nitrate	(06/27/1975-11/21/2008)	**19**	(0.025-9.)	**0.08**	0.05	**0.85**	2.14	**251.93**	0.49	**4.23**	0	**0**
Sulfate	(11/16/1974-11/21/2008)	**24**	(805.-2400.)	**1552.1**	470	**1488**	508	**34**	1943	**2193**	18	**75**
TDS - 180°C	(11/16/1974-11/21/2008)	**24**	(1500.-4310.)	**2981**	666.5	**2684**	866	**32**	3440	**3681**	11	**46**
Radium (pCi/l)	(12/11/1991-11/21/2008)	**16**	(0.58-29.64)	**1.8**	0.97	**5.32**	7.58	**143**	5.675	**16.8975**	0	**0**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Pinnabete Alluvial Wells GM-22	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	%
pH	(11/16/1974-03/04/1977)	**4**	(7.2-8.2)	**7.75**	0.4	**7.73**	0.50	**6.46**	8.13	**8.19**	0	**0**
Conductivity (umho/cm)	(11/16/1974-03/04/1977)	**4**	(1610.-3770.)	**3420**	335	**3055**	1012	**33**	3748	**3766**	0	**0**
Arsenic	(11/16/1974-03/04/1977)	**4**	(0.005-0.25)	**0.09**	0.0725	**0.109**	0.113	**104.330**	0.175	**0.235**	1	**25**
Boron	(11/16/1974-03/04/1977)	**4**	(0.1-0.93)	**0.34**	0.15	**0.43**	0.36	**83.50**	0.53	**0.85**	0	**0**
Cadmium	(11/16/1974-03/04/1977)	**4**	(0.0005-0.005)	**0.00275**	0.00225	**0.0028**	0.0026	**94.4755**	0.0050	**0.0050**	0	**0**
Chromium												
Copper	(11/16/1974-03/04/1977)	**4**	(0.003-0.015)	**0.009**	0.005	**0.009**	0.006	**65.420**	0.014	**0.015**	0	**0**
Iron (total)												
Lead	(11/16/1974-03/04/1977)	**4**	(0.0005-0.065)	**0.0405**	0.02	**0.0366**	0.0296	**80.6992**	0.0583	**0.0637**	0	**0**
Manganese	(11/16/1974-03/04/1977)	**4**	(0.003-0.165)	**0.038**	0.0215	**0.061**	0.071568	**117.3248**	0.0758	**0.14715**	0	**0**
Mercury	(11/16/1974-03/04/1977)	**4**	(0.000022-0.0005)	**0.000225**	0.000114	**0.00024**	0.00020	**81.19555**	0.00031	**0.00046**	0	**0**
Selenium	(11/16/1974-03/04/1977)	**4**	(0.005-0.15)	**0.015**	0.01	**0.046**	0.070	**150.932**	0.056	**0.131**	1	**25**
Zinc	(11/16/1974-03/04/1977)	**4**	(0.031-0.41)	**0.095**	0.0545	**0.158**	0.175	**110.781**	0.208	**0.370**	0	**0**
Chloride	(11/16/1974-03/04/1977)	**4**	(13.-800.)	**21.5**	6.5	**214**	391	**183**	220	**684**	1	**25**
Fluoride	(11/16/1974-03/04/1977)	**4**	(1.51-5.7)	**1.9**	0.245	**2.75**	1.98	**71.76**	2.93	**5.15**	1	**25**
Nitrate	(06/27/1975-03/04/1977)	**3**	(0.8-9.)	**3.7**	2.9	**4.50**	4.16	**92.40**	6.35	**8.47**	0	**0**
Sulfate	(11/16/1974-03/04/1977)	**4**	(1153.-2000.)	**1667.1**	222.9	**1622**	362	**22**	1835	**1967**	4	**100**
TDS - 180°C	(11/16/1974-03/04/1977)	**4**	(1952.-3695.)	**3124**	361.5	**2974**	743	**25**	3381	**3632**	2	**50**
Radium (pCi/l)												

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Pinnabete Alluvial Wells PA-1	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	**%**
pH	(11/16/1974-11/21/2008)	**10**	(7.48-7.78)	**7.57**	0.07	**7.59**	0.10	**1.31**	7.66	**7.74**	0	**0**
Conductivity (umho/cm)	(11/16/1974-06/15/2004)	**1**	(2480.-2480.)	**2480**	0	**2480**			2480	**2480**	0	**0**
Arsenic	(11/16/1974-11/21/2008)	**9**	(0.00025-0.0025)	**0.0008**	0.00055	**0.001**	0.001	**73.284**	0.003	**0.003**	0	**0**
Boron	(11/16/1974-11/21/2008)	**9**	(0.17-0.787)	**0.2**	0	**0.26**	0.20	**74.40**	0.20	**0.56**	0	**0**
Cadmium	(11/16/1974-11/21/2008)	**9**	(0.000025-0.0005)	**0.000025**	0	**0.0002**	0.0003	**106.0293**	0.0005	**0.0005**	0	**0**
Chromium	(09/12/1991-11/21/2008)	**9**	(0.0005-0.03)	**0.005**	0.001	**0.006556**	0.008984	**137.0466**	0.005	**0.02**	0	**0**
Copper	(11/16/1974-11/21/2008)	**9**	(0.005-0.0151)	**0.0079**	0.0029	**0.008**	0.004	**43.402**	0.010	**0.013**	0	**0**
Iron (total)	(03/28/1995-11/21/2008)	**9**	(0.25-53.2)	**4.43**	4.18	**15.81333**	19.25661	**121.7745**	17.5	**48.68**	0	**0**
Lead	(11/16/1974-11/21/2008)	**9**	(0.00005-0.0025)	**0.0003**	0.00025	**0.0012**	0.0012	**102.9723**	0.0025	**0.0025**	0	**0**
Manganese	(11/16/1974-11/21/2008)	**9**	(0.005-0.488)	**0.087**	0.07	**0.125889**	0.152955	**121.4997**	0.138	**0.38**	0	**0**
Mercury	(11/16/1974-11/21/2008)	**9**	(0.0001-0.0005)	**0.0002**	0.0001	**0.00029**	0.00020	**70.18572**	0.00050	**0.00050**	0	**0**
Selenium	(11/16/1974-11/21/2008)	**10**	(0.0025-0.014)	**0.005**	0.001	**0.005**	0.003	**61.698**	0.006	**0.010**	0	**0**
Zinc	(11/16/1974-11/21/2008)	**9**	(0.002-0.053)	**0.007**	0.005	**0.018**	0.020	**109.606**	0.037	**0.049**	0	**0**
Chloride	(11/16/1974-11/21/2008)	**10**	(14.-36.)	**20**	5	**22**	7	**33**	25	**33**	0	**0**
Fluoride	(11/16/1974-11/21/2008)	**9**	(2.1-3.)	**2.36**	0.16	**2.39**	0.27	**11.43**	2.49	**2.81**	9	**100**
Nitrate	(06/27/1975-11/21/2008)	**8**	(0.025-0.72)	**0.05**	0.0225	**0.21**	0.30	**142.30**	0.24	**0.70**	0	**0**
Sulfate	(11/16/1974-11/21/2008)	**10**	(805.-1280.)	**950**	100	**983**	149	**15**	1055	**1217**	4	**40**
TDS - 180°C	(11/16/1974-11/21/2008)	**10**	(1500.-4310.)	**1705**	80	**1986**	832	**42**	1900	**3284**	1	**10**
Radium (pCi/l)	(12/11/1991-11/21/2008)	**8**	(0.58-12.65)	**2.0975**	1.2975	**4.44**	4.88	**110**	6.1875	**12.265**	0	**0**

Appendix F: Groundwater Data Summary

Alluvial Quality Data (all Values are dissolved (mg/L) unless otherwise indicated)

Pinnabete Alluvial Wells PA-2	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Livestock Criteria Exceedance**	
											n	**%**
pH	(03/30/1998-11/20/2008)	**10**	(7.19-7.9)	**7.405**	0.1	**7.43**	0.21	**2.85**	7.50	**7.77**	0	**0**
Conductivity (umho/cm)	(06/15/2004-06/15/2004)	**1**	(4040.-4040.)	**4040**	0	**4040**			4040	**4040**	0	**0**
Arsenic	(03/30/1998-11/20/2008)	**9**	(0.0007-0.0027)	**0.0025**	0.0002	**0.002**	0.001	**42.303**	0.003	**0.003**	0	**0**
Boron	(03/30/1998-11/20/2008)	**9**	(0.19-2.1)	**0.2**	0.01	**0.44**	0.63	**143.68**	0.30	**1.38**	0	**0**
Cadmium	(03/30/1998-11/20/2008)	**9**	(0.000025-0.0005)	**0.000025**	0	**0.0002**	0.0003	**106.0293**	0.0005	**0.0005**	0	**0**
Chromium	(03/30/1998-11/20/2008)	**9**	(0.0005-0.03)	**0.005**	0.001	**0.0075**	0.008739	**116.5237**	0.006	**0.0216**	0	**0**
Copper	(03/30/1998-11/20/2008)	**9**	(0.005-0.0508)	**0.0116**	0.0066	**0.017**	0.015	**91.121**	0.023	**0.040**	0	**0**
Iron (total)	(03/30/1998-11/20/2008)	**9**	(0.13-63.9)	**3.03**	1.17	**9.89**	20.34657	**205.7287**	5.61	**40.96**	0	**0**
Lead	(03/30/1998-11/20/2008)	**9**	(0.00005-0.0025)	**0.0002**	0.00015	**0.0012**	0.0013	**108.4845**	0.0025	**0.0025**	0	**0**
Manganese	(03/30/1998-11/20/2008)	**9**	(0.0277-1.33)	**0.135**	0.045	**0.293078**	0.407376	**138.9993**	0.22	**0.9804**	0	**0**
Mercury	(03/30/1998-11/20/2008)	**9**	(0.0001-0.0005)	**0.0002**	0.0001	**0.00029**	0.00020	**70.18572**	0.00050	**0.00050**	0	**0**
Selenium	(03/30/1998-11/20/2008)	**10**	(0.0007-0.018)	**0.0095**	0.004	**0.009**	0.006	**65.054**	0.012	**0.016**	0	**0**
Zinc	(03/30/1998-11/20/2008)	**9**	(0.003-0.18)	**0.009**	0.005	**0.033**	0.057	**170.686**	0.025	**0.128**	0	**0**
Chloride	(03/30/1998-11/20/2008)	**10**	(22.-65.)	**36.5**	7.5	**38**	13	**35**	44	**59**	0	**0**
Fluoride	(03/30/1998-11/20/2008)	**9**	(2.4-3.3)	**2.81**	0.29	**2.82**	0.31	**11.06**	3.06	**3.22**	9	**100**
Nitrate	(03/30/1998-11/20/2008)	**8**	(0.025-0.32)	**0.08**	0.03	**0.12**	0.11	**87.64**	0.15	**0.30**	0	**0**
Sulfate	(03/30/1998-11/20/2008)	**10**	(1550.-2400.)	**1945**	230	**1941**	273	**14**	2138	**2310**	10	**100**
TDS - 180°C	(03/30/1998-11/20/2008)	**10**	(2780.-3600.)	**3285**	255	**3266**	295	**9**	3530	**3591**	8	**80**
Radium (pCi/l)	(03/30/1998-11/20/2008)	**8**	(0.64-29.64)	**1.8**	0.835	**6.19**	9.88	**160**	4.6625	**22.591**	0	**0**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals Combined	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(07/08/1984-07/10/1984)	203	(7.03-8.06)	7.8	0.27	7.9	0.7	9	8.1	8.7	8	4
Conductivity (umho/cm)	(07/08/1984-07/10/1984)	180	(5300.-46500.)	12150	3950	12342	5805	47	15925	23300		
Boron	(07/08/1984-07/10/1984)	193	(1.23-1.57)	0.53	0.14	0.55	0.22	40	0.68	0.84		
Iron (total)		143		0.77	0.67	6.05	30.76	508	4.02	15.28		
Manganese	(07/08/1984-07/10/1984)	194	(0.11-2.93)	0.1	0.088	0.532	2.589	487	0.318	1.587		
Selenium	(07/08/1984-07/10/1984)	194	(0.0005-0.0005)	0.0025	0	0.003	0.007	223	0.003	0.008		
Chloride	(07/08/1984-07/10/1984)	194	(2210.-28200.)	3670	1310	3482	2372	68	4593	7937	165	85
Fluoride	(07/08/1984-07/10/1984)	193	(0.92-1.08)	1.4	0.48	1.37	0.67	49	1.78	2.50	31	16
Sulfate	(07/08/1984-07/10/1984)	194	(5.-5.)	15.75	13.25	294	677	230	88	2267	22	11
TDS - 180°C	(07/08/1984-07/10/1984)	194	(7370.-50810.)	7260	2055	7161	3212	45	8575	13400	170	88

Baseline Fruitland Coals KF2007-01	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(08/16/2007-11/20/2008)	5	(8.12-9.56)	8.75	0.34	8.8	0.5	6	9.1	9.5	2	40
Conductivity (umho/cm)												
Boron	(08/16/2007-11/20/2008)	5	(0.2-0.4)	0.329	0.071	0.33	0.08	25	0.40	0.40		
Iron (total)	(08/16/2007-11/20/2008)	5	(0.025-1.2)	0.29	0.205	0.39	0.47	123	0.33	1.03		0
Manganese	(08/16/2007-11/20/2008)	5	(0.0025-0.013)	0.0075	5E-04	0.008	0.004	49	0.008	0.012		
Selenium	(08/16/2007-11/20/2008)	5	(0.004-0.006)	0.005	0.001	0.005	0.001	17	0.005	0.006		
Chloride	(08/16/2007-11/20/2008)	5	(278.-364.)	338	24	332	35	11	362	364		
Fluoride	(08/16/2007-11/20/2008)	5	(2.6-3.3)	2.7	0.1	2.86	0.32	11	3.10	3.26	5	100
Sulfate	(08/16/2007-11/20/2008)	5	(315.-2050.)	740	425	1021	694	68	1380	1916	2	40
TDS - 180°C	(08/16/2007-11/20/2008)	5	(2750.-5160.)	3460	670	3750	931	25	4130	4954	4	80

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals KF98-02	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(03/29/1998-11/20/2008)	**8**	(7.53-12.6)	**8.06**	0.4	**9.2**	2.0	**22**	10.2	**12.4**	3	**38**
Conductivity (umho/cm)												
Boron	(03/29/1998-11/20/2008)	**8**	(0.09-1.47)	**0.4**	0.1	**0.49**	0.42	**85**	0.46	**1.13**		
Iron (total)	(03/29/1998-11/20/2008)	**8**	(0.14-1.01)	**0.485**	0.075	**0.55**	0.28	**51**	0.62	**0.97**		**0**
Manganese	(03/29/1998-11/20/2008)	**8**	(0.0025-0.045)	**0.008**	0.006	**0.017**	0.018	**107**	0.030	**0.045**		**0**
Selenium	(03/29/1998-11/20/2008)	**8**	(0.005-0.0333)	**0.008**	0.001	**0.011**	0.009	**88**	0.008	**0.025**		
Chloride	(03/29/1998-11/20/2008)	**8**	(170.-1280.)	**925**	280	**814**	383	**47**	1015	**1256**	6	**75**
Fluoride	(03/29/1998-11/20/2008)	**8**	(0.2-2.31)	**1.65**	0.2	**1.51**	0.61	**41**	1.80	**2.13**	1	**13**
Sulfate	(03/29/1998-11/20/2008)	**8**	(36.-796.)	**119**	39	**202**	248	**123**	165	**605**		
TDS - 180°C	(03/29/1998-11/20/2008)	**8**	(2220.-4100.)	**3160**	355	**3321**	623	**19**	3830	**4079**	7	**88**

Baseline Fruitland Coals KF84-21A	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(07/09/1984-09/12/2001)	**32**	(6.8-8.3)	**7.9**	0.1	**7.9**	0.3	**3**	8.1	**8.2**		
Conductivity (umho/cm)	(07/09/1984-09/12/2001)	**31**	(6610.-16800.)	**14200**	1200	**13755**	2272	**17**	14750	**16600**		
Boron	(07/09/1984-09/12/2001)	**31**	(0.36-1.12)	**0.6**	0.05	**0.63**	0.14	**23**	0.65	**0.90**		
Iron (total)	(09/08/1993-09/12/2001)	**22**	(0.01-1.36)	**0.1**	0.075	**0.22**	0.30	**135**	0.24	**0.50**		**0**
Manganese	(07/09/1984-09/12/2001)	**31**	(0.0025-0.1)	**0.025**	0.015	**0.045**	0.039	**86**	0.099	**0.100**		**0**
Selenium	(07/09/1984-09/12/2001)	**31**	(0.0005-0.05)	**0.0025**	0	**0.005**	0.012	**245**	0.003	**0.027**		
Chloride	(07/09/1984-09/12/2001)	**31**	(2860.-5960.)	**4440**	130	**4394**	429	**10**	4495	**4675**	31	**100**
Fluoride	(07/09/1984-09/12/2001)	**31**	(0.94-2.38)	**1.54**	0.09	**1.62**	0.27	**17**	1.75	**2.13**	2	**6**
Sulfate	(07/09/1984-09/12/2001)	**31**	(5.-316.)	**64**	21	**74**	71	**95**	82	**223**		
TDS - 180°C	(07/09/1984-09/12/2001)	**31**	(5730.-9800.)	**8380**	140	**8291**	615	**7**	8515	**8780**	31	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals Kf84-21c	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(07/09/1984-07/09/1984)	**1**	(8.08-8.08)	**8.08**	0	**8.1**			8.1	**8.1**		
Conductivity (umho/cm)	(07/09/1984-07/09/1984)	**1**	(12600.-12600.)	**12600**	0	**12600**			12600	**12600**		
Boron	(07/09/1984-07/09/1984)	**1**	(0.63-0.63)	**0.63**	0	**0.63**			0.63	**0.63**		
Iron (total)		**1**										
Manganese	(07/09/1984-07/09/1984)	**1**	(0.38-0.38)	**0.38**	0	**0.380**			0.380	**0.380**		**0**
Selenium	(07/09/1984-07/09/1984)	**1**	(0.0005-0.0005)	**0.0005**	0	**0.001**			0.001	**0.001**		
Chloride	(07/09/1984-07/09/1984)	**1**	(3980.-3980.)	**3980**	0	**3980**			3980	**3980**	1	**100**
Fluoride	(07/09/1984-07/09/1984)	**1**	(1.79-1.79)	**1.79**	0	**1.79**			1.79	**1.79**		
Sulfate	(07/09/1984-07/09/1984)	**1**	(184.-184.)	**184**	0	**184**			184	**184**		
TDS - 180°C	(07/09/1984-07/09/1984)	**1**	(8505.-8505.)	**8505**	0	**8505**			8505	**8505**	1	**100**

Baseline Fruitland Coals KF84-22A	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(09/12/1991-09/18/2001)	**23**	(7.44-9.3)	**8**	0.05	**8.1**	0.3	**4**	8.1	**8.2**	1	**4**
Conductivity (umho/cm)	(09/12/1991-09/18/2001)	**21**	(4900.-14500.)	**6560**	390	**7070**	2059	**29**	14750	**16600**		
Boron	(09/12/1991-09/18/2001)	**21**	(0.15-0.58)	**0.26**	0.03	**0.29**	0.11	**37**	0.65	**0.90**		
Iron (total)	(09/08/1993-09/18/2001)	**19**	(0.06-8.02)	**0.42**	0.31	**0.98**	1.86	**190**	0.24	**0.50**		**0**
Manganese	(09/12/1991-09/18/2001)	**21**	(0.005-0.1)	**0.0125**	0.004	**0.030**	0.035	**116**	0.099	**0.100**		**0**
Selenium	(09/12/1991-09/18/2001)	**21**	(0.0005-0.05)	**0.0025**	0	**0.005**	0.011	**224**	0.003	**0.027**		
Chloride	(09/12/1991-09/18/2001)	**21**	(167.-4250.)	**290**	53	**601**	1064	**177**	4495	**4675**	2	**10**
Fluoride	(09/12/1991-09/18/2001)	**21**	(0.8-3.52)	**2.19**	0.08	**2.29**	0.56	**24**	1.75	**2.13**	19	**90**
Sulfate	(09/12/1991-09/18/2001)	**21**	(5.-2600.)	**2230**	210	**1934**	700	**36**	82	**223**	19	**90**
TDS - 180°C	(09/12/1991-09/18/2001)	**21**	(4080.-8540.)	**4680**	220	**4861**	944	**19**	8515	**8780**	21	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals KF84-22B	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(07/10/1984-09/18/2001)	**27**	(6.8-8.05)	**7.4**	0.1	**7.5**	0.3	**3**	7.5	**8.0**		
Conductivity (umho/cm)	(07/10/1984-09/18/2001)	**25**	(4010.-38000.)	**10900**	400	**11616**	5736	**49**	11300	**12460**		
Boron	(07/10/1984-09/18/2001)	**25**	(0.28-0.54)	**0.39**	0.02	**0.39**	0.06	**14**	0.41	**0.50**		
Iron (total)	(09/08/1993-09/18/2001)	**23**	(0.025-4.93)	**1.13**	0.97	**1.98**	1.75	**88**	3.90	**4.76**		
Manganese	(07/10/1984-09/18/2001)	**26**	(0.01-0.67)	**0.3**	0.105	**0.275**	0.167	**61**	0.378	**0.605**		
Selenium	(07/10/1984-09/18/2001)	**26**	(0.0005-0.05)	**0.0025**	0	**0.005**	0.010	**214**	0.003	**0.019**		
Chloride	(07/10/1984-09/18/2001)	**26**	(0.25-3364.)	**3210**	80	**2953**	788	**27**	3260	**3353**	25	**96**
Fluoride	(07/10/1984-09/18/2001)	**25**	(0.67-1.7)	**0.89**	0.09	**0.93**	0.21	**23**	0.99	**1.24**		
Sulfate	(07/10/1984-09/18/2001)	**26**	(0.5-115.)	**5**	2.5	**12**	24	**195**	7	**46**		
TDS - 180°C	(07/10/1984-09/18/2001)	**26**	(18.-6370.)	**6115**	145	**5671**	1366	**24**	6188	**6350**	24	**92**

Baseline Fruitland Coals Kf84-22d	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(07/09/1984-07/09/1984)	**1**	(7.94-7.94)	**7.94**	0	**7.9**			7.9	**7.9**		
Conductivity (umho/cm)	(07/09/1984-07/09/1984)	**1**	(13000.-13000.)	**13000**	0	**13000**			13000	**13000**		
Boron	(07/09/1984-07/09/1984)	**1**	(0.5-0.5)	**0.5**	0	**0.50**			0.50	**0.50**		
Iron (total)												
Manganese	(07/09/1984-07/09/1984)	**1**	(0.016-0.016)	**0.016**	0	**0.016**			0.016	**0.016**		**0**
Selenium	(07/09/1984-07/09/1984)	**1**	(0.0005-0.0005)	**0.0005**	0	**0.001**			0.001	**0.001**		
Chloride	(07/09/1984-07/09/1984)	**1**	(3420.-3420.)	**3420**	0	**3420**			3420	**3420**	25	**100**
Fluoride	(07/09/1984-07/09/1984)	**1**	(1.28-1.28)	**1.28**	0	**1.28**			1.28	**1.28**		
Sulfate	(07/09/1984-07/09/1984)	**1**	(5.-5.)	**5**	0	**5**			5	**5**		
TDS - 180°C	(07/09/1984-07/09/1984)	**1**	(8610.-8610.)	**8610**	0	**8610**			8610	**8610**	24	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals Kf84-22d	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(07/09/1984-07/09/1984)	**1**	(7.94-7.94)	**7.94**	0	**7.9**			7.9	**7.9**		
Conductivity (umho/cm)	(07/09/1984-07/09/1984)	**1**	(13000.-13000.)	**13000**	0	**13000**			13000	**13000**		
Boron	(07/09/1984-07/09/1984)	**1**	(0.5-0.5)	**0.5**	0	**0.50**			0.50	**0.50**		
Iron (total)												
Manganese	(07/09/1984-07/09/1984)	**1**	(0.016-0.016)	**0.016**	0	**0.016**			0.016	**0.016**		**0**
Selenium	(07/09/1984-07/09/1984)	**1**	(0.0005-0.0005)	**0.0005**	0	**0.001**			0.001	**0.001**		
Chloride	(07/09/1984-07/09/1984)	**1**	(3420.-3420.)	**3420**	0	**3420**			3420	**3420**	25	**100**
Fluoride	(07/09/1984-07/09/1984)	**1**	(1.28-1.28)	**1.28**	0	**1.28**			1.28	**1.28**		
Sulfate	(07/09/1984-07/09/1984)	**1**	(5.-5.)	**5**	0	**5**			5	**5**		
TDS - 180°C	(07/09/1984-07/09/1984)	**1**	(8610.-8610.)	**8610**	0	**8610**			8610	**8610**	24	**100**

Baseline Fruitland Coals Kf84-22e	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(07/09/1984-07/09/1984)	**2**	(7.86-8.1)	**7.98**	0.12	**8.0**	0.2	**2**	8.0	**8.1**		
Conductivity (umho/cm)	(07/09/1984-07/09/1984)	**2**	(12000.-12800.)	**12400**	400	**12400**	566	**5**	12600	**12760**		
Boron	(07/09/1984-07/09/1984)		(0.46-0.56)	**0.51**	0.05	**0.51**	0.07	**14**	0.54	**0.56**		
Iron (total)		**2**										
Manganese	(07/09/1984-07/09/1984)	**2**	(0.13-0.14)	**0.135**	0.005	**0.135**	0.007	**5**	0.138	**0.140**		**0**
Selenium	(07/09/1984-07/09/1984)	**2**	(0.0005-0.0005)	**0.0005**	0	**0.001**	0.000		0.001	**0.001**		
Chloride	(07/09/1984-07/09/1984)	**2**	(4070.-4300.)	**4185**	115	**4185**	163	**4**	4243	**4289**	2	**100**
Fluoride	(07/09/1984-07/09/1984)	**2**	(1.03-1.43)	**1.23**	0.2	**1.23**	0.28	**23**	1.33	**1.41**		
Sulfate	(07/09/1984-07/09/1984)	**2**	(5.-44.)	**24.5**	19.5	**25**	28	**113**	34	**42**		
TDS - 180°C	(07/09/1984-07/09/1984)	**2**	(8035.-8275.)	**8155**	120	**8155**	170	**2**	8215	**8263**	2	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals KF84-20A	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(07/10/1984-12/18/2001)	27	(7.6-10.05)	7.85	0.15	8.2	0.6	8	8.4	9.5	2	7
Conductivity (umho/cm)	(07/10/1984-12/18/2001)	26	(4240.-16100.)	12525	725	11692	2388	20	13100	13475		
Boron	(07/10/1984-12/18/2001)	26	(0.42-1.28)	0.545	0.05	0.57	0.16	28	0.58	0.71		
Iron (total)	(09/08/1993-12/18/2001)	17	(0.1-15.1)	2.73	2.3	4.39	4.42	101	6.80	11.90		0
Manganese	(07/10/1984-12/18/2001)	26	(0.007-0.22)	0.1	0.011	0.093	0.044	47	0.108	0.148		0
Selenium	(07/10/1984-12/18/2001)	26	(0.0005-0.0025)	0.00175	8E-04	0.002	0.001	66	0.003	0.003		
Chloride	(07/10/1984-12/18/2001)	26	(700.-4400.)	3715	253	3532	730	21	3942	4130	26	100
Fluoride	(07/10/1984-12/18/2001)	26	(1.13-2.3)	1.39	0.13	1.47	0.27	18	1.62	1.91	1	4
Sulfate	(07/10/1984-12/18/2001)	26	(0.5-823.)	5	2.5	46	161	348	18	123		
TDS - 180°C	(07/10/1984-12/18/2001)	26	(2775.-7670.)	7260	210	6752	1284	19	7425	7658	25	96

Baseline Fruitland Coals KF84-20C	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(09/16/1985-12/26/2001)	24	(7.6-8.65)	7.865	0.165	8.0	0.3	4	8.0	8.5		
Conductivity (umho/cm)	(09/16/1985-12/26/2001)	23	(3650.-6140.)	4370	180	4355	477	11	4690	4792		
Boron	(09/16/1985-12/26/2001)	23	(0.025-0.67)	0.42	0.05	0.42	0.11	27	0.05	0.52		
Iron (total)	(09/08/1993-12/26/2001)	16	(0.18-13.5)	0.64	0.295	2.24	4.09	183	3.10	12.00		0
Manganese	(09/16/1985-12/26/2001)	23	(0.03-0.305)	0.082	0.032	0.096	0.076	79		0.290		0
Selenium	(09/16/1985-12/26/2001)	23	(0.0005-0.008)	0.0025	0.002	0.002	0.002	91	0.009	0.003		
Chloride	(09/16/1985-12/26/2001)	23	(8.4-1090.)	715	28	686	197	29	750	821	21	91
Fluoride	(09/16/1985-12/26/2001)	23	(0.53-2.44)	1.74	0.14	1.73	0.37	22	1.80	2.14	3	13
Sulfate	(09/16/1985-12/26/2001)	23	(2.5-2600.)	7	4.5	162	552	340	5	666	1	4
TDS - 180°C	(09/16/1985-12/26/2001)	23	(2570.-5300.)	2770	140	2974	695	23	2665	4723	4	17

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Baseline Fruitland Coals KF84-18B	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(07/10/1984-09/26/2000)	**26**	(6.8-8.05)	**7.1**	0.25	**7.3**	0.4	**6**	7.7	**7.9**		
Conductivity (umho/cm)	(07/10/1984-09/26/2000)	**25**	(10000.-18600.)	**15900**	1100	**14935**	2385	**16**	16500	**18200**		
Boron	(07/10/1984-09/26/2000)	**25**	(0.49-1.2)	**0.73**	0.05	**0.74**	0.13	**18**	0.77	**0.90**		
Iron (total)	(09/08/1993-09/26/2000)	**16**	(0.3-362.)	**11.55**	4.515	**35.84**	88.16	**246**	16.88	**135.50**		**0**
Manganese	(07/10/1984-09/26/2000)	**25**	(0.1-6.)	**0.38**	0.12	**0.845**	1.498	**177**	0.500	**4.620**		**0**
Selenium	(07/10/1984-09/26/2000)	**25**	(0.0005-0.0025)	**0.0025**	0	**0.002**	0.001	**61**	0.003	**0.003**		
Chloride	(07/10/1984-09/26/2000)	**25**	(3560.-6050.)	**4900**	300	**4907**	512	**10**	5210	**5488**	25	**100**
Fluoride	(07/10/1984-09/26/2000)	**25**	(0.34-1.66)	**0.44**	0.06	**0.55**	0.29	**53**	0.61	**1.02**		
Sulfate	(07/10/1984-09/26/2000)	**25**	(2.-156.)	**5**	2.5	**24**	42	**178**	17	**135**		
TDS - 180°C	(07/10/1984-09/26/2000)	**25**	(7100.-12410.)	**9300**	250	**9128**	972	**11**	9460	**9924**	25	**100**

Baseline Fruitland Coals KF84-18A	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Livestock Criteria**	
											n	%
pH	(09/16/1985-12/19/2001)	**6**	(7.2-8.05)	**7.45**	0.21	**7.5**	0.3	**3**	7.7	**8.0**		
Conductivity (umho/cm)	(09/16/1985-12/19/2001)	**6**	(2380.-25300.)	**22900**	1700	**21131**	4481	**21**	23300	**24600**		
Boron	(09/16/1985-12/19/2001)	**1**	(0.64-1.32)	**0.72**	0.05	**0.77**	0.15	**19**	0.79	**1.00**		
Iron (total)	(09/08/1993-12/19/2001)	**1**	(0.1-21.1)	**3.8**	1.51	**6.23**	5.94	**95**	5.70	**17.26**		**0**
Manganese	(09/16/1985-12/19/2001)	**1**	(0.2-35.)	**1.33**	0.18	**2.694**	6.746	**250**	1.600	**2.184**		**0**
Selenium	(09/16/1985-12/19/2001)	**6**	(0.0005-0.005)	**0.0025**	0	**0.002**	0.001	**66**	0.003	**0.003**		
Chloride	(09/16/1985-12/19/2001)	**6**	(6680.-8370.)	**7900**	185	**7825**	395	**5**	8060	**8340**	25	**100**
Fluoride	(09/16/1985-12/19/2001)	**1**	(0.57-1.5)	**0.67**	0.08	**0.77**	0.23	**29**	0.92	**1.05**		
Sulfate	(09/16/1985-12/19/2001)	**3**	(2.5-729.)	**5**	2.5	**52**	148	**282**	17	**161**		
TDS - 180°C	(09/16/1985-12/19/2001)	**6**	(11400.-14100.)	**13400**	100	**13270**	544	**4**	13500	**13800**	25	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland Combined	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(12/12/1983-12/20/2010)	**171**	(7.06-8.68)	**7.74**	0.24	**7.8**	0.3	**4**	8.0	**8.3**			12	**7**
Conductivity (umho/cm)	(12/12/1983-12/20/2010)	**168**	(2030.-26900.)	**11000**	2000	**11815**	4056	**34**	13800	**18550**			7	**4**
Boron	(12/12/1983-12/20/2010)	**149**	(0.03-5.)	**1.07**	0.14	**1.09**	0.45	**41**	1.23	**1.50**			137	**92**
Iron (total)	(09/08/1993-12/20/2010)	**124**	-(0.3-76.2)	**0.275**	0.205	**2.24**	8.71	**388**	0.76	**8.92**			11	**9**
Manganese	(12/12/1983-12/20/2010)	**147**	-(0.2-1.5)	**0.025**		**0.068**	0.152	**224**	0.100	**0.228**			7	**5**
Selenium	(12/12/1983-12/20/2010)	**167**	-(0.005-0.093)	**0.0025**	5E-04	**0.006**	0.012	**209**	0.003	**0.034**	1	**1**	32	**19**
Chloride	(12/12/1983-12/20/2010)	**168**	(26.-8400.)	**2257.5**	1240	**2272**	1734	**76**	3340	**4905**	131	**78**	3	**2**
Fluoride	(12/12/1983-12/20/2010)	**149**	(0.005-5.3)	**1.1**	0.4	**1.38**	0.80	**58**	1.70	**2.80**	25	**17**	20	**13**
Sulfate	(12/12/1983-12/20/2010)	**159**	(0.5-5400.)	**264**	259	**939**	1450	**154**	1000	**4342**	39	**25**	102	**64**
TDS - 180°C	(12/12/1983-12/20/2010)	**164**	(1450.-14100.)	**7330**	1300	**7432**	2028	**27**	8323	**10200**	160	**98**	4	**2**

Non-Baseline Fruitland Bitsui 2	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(03/02/1995-12/20/2010)	**27**	(7.5-8.5)	**8**	0.1	**8.0**	0.2	**2**	8.1	**8.3**			2	**7**
Conductivity (umho/cm)	(03/02/1995-12/20/2010)	**26**	(2030.-12100.)	**8095**	595	**8476**	1713	**20**	9463	**10475**				
Boron	(03/02/1995-12/20/2010)	**26**	(0.27-1.1)	**0.985**	0.05	**0.94**	0.15	**16**	1.01	**1.06**			25	**96**
Iron (total)	(03/02/1995-12/20/2010)	**26**	(0.025-0.7)	**0.105**	0.045	**0.18**	0.18	**99**	0.19	**0.54**				
Manganese	(03/02/1995-12/20/2010)	**26**	(0.0025-0.025)	**0.0058**	0.003	**0.008**	0.006	**76**	0.010	**0.024**				
Selenium	(03/02/1995-12/20/2010)	**26**	(0.0005-0.041)	**0.0025**	0	**0.006**	0.009	**149**	0.004	**0.022**			7	**27**
Chloride	(03/02/1995-12/20/2010)	**26**	(130.-1270.)	**1160**	60	**1076**	243	**23**	1215	**1258**	25	**96**		
Fluoride	(03/02/1995-12/20/2010)	**26**	(0.79-2.66)	**1.7**	0.1	**1.66**	0.34	**21**	1.77	**1.97**	1	**4**	1	**4**
Sulfate	(03/02/1995-12/20/2010)	**26**	(4.5-1700.)	**165**	153	**535**	605	**113**	1150	**1450**	7	**27**	19	**73**
TDS - 180°C	(03/02/1995-12/20/2010)	**26**	(1450.-6500.)	**5145**	185	**5375**	975	**18**	6128	**6400**	25	**96**		

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland Bitsui 3	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(03/02/1995-12/21/2009)	**22**	(7.3-7.83)	**7.535**	0.065	**7.5**	0.1	**2**	7.6	**7.8**				
Conductivity (umho/cm)	(03/02/1995-12/21/2009)	**21**	(11900.-15000.)	**12900**	400	**13133**	867	**7**	13800	**14600**				
Boron	(03/02/1995-12/21/2009)	**21**	(0.9-1.22)	**1.07**	0.04	**1.07**	0.09	**8**	1.10	**1.20**			21	**100**
Iron (total)	(03/02/1995-12/21/2009)	**21**	(0.12-1.18)	**0.35**	0.17	**0.44**	0.29	**67**	0.60	**0.87**				
Manganese	(03/02/1995-12/21/2009)	**21**	(0.0025-0.025)	**0.005**	0.003	**0.009**	0.007	**86**	0.010	**0.025**				
Selenium	(03/02/1995-12/21/2009)	**21**	(0.0005-0.036)	**0.0025**	0	**0.006**	0.010	**162**	0.003	**0.035**			5	**24**
Chloride	(03/02/1995-12/21/2009)	**21**	(2420.-3600.)	**2820**	220	**2892**	331	**11**	3070	**3540**	21	**100**		
Fluoride	(03/02/1995-12/21/2009)	**21**	(0.005-1.3)	**1.01**	0.09	**0.97**	0.27	**28**	1.10	**1.27**				
Sulfate	(03/02/1995-12/21/2009)	**21**	(5.-640.)	**317**	213	**288**	235	**82**	509	**604**			14	**67**
TDS - 180°C	(03/02/1995-12/21/2009)	**17**	(7360.-8240.)	**7960**	180	**7866**	276	**4**	8100	**8224**	17	**100**		

Non-Baseline Fruitland Kf83-1	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(12/12/1983-09/26/2002)	**41**	(7.245-8.68)	**7.7**	0.1	**7.8**	0.3	**4**	8.0	**8.5**			4	**10**
Conductivity (umho/cm)	(12/12/1983-09/26/2002)	**41**	(9000.-13300.)	**10800**	900	**10663**	1048	**10**	11600	**11900**				
Boron	(12/12/1983-09/26/2002)	**41**	(0.1-5.)	**1.01**	0.08	**1.09**	0.67	**62**	1.08	**1.23**			38	**93**
Iron (total)	(09/08/1993-09/26/2002)	**32**	-(0.3-1.06)	**0.155**	0.11	**0.23**	0.29	**126**	0.28	**0.85**				
Manganese	(12/12/1983-09/26/2002)	**41**	-(0.2-0.21)	**0.02**	0.01	**0.030**	0.057	**188**	0.030	**0.100**				
Selenium	(12/12/1983-09/26/2002)	**41**	-(0.005-0.05)	**0.0025**	0	**0.003**	0.009	**329**	0.003	**0.003**			2	**5**
Chloride	(12/12/1983-09/26/2002)	**41**	(46.-2760.)	**2255**	355	**2008**	687	**34**	2485	**2680**	39	**95**		
Fluoride	(12/12/1983-09/26/2002)	**41**	(0.83-1.57)	**1.07**	0.14	**1.15**	0.22	**19**	1.30	**1.57**				
Sulfate	(12/12/1983-09/26/2002)	**41**	(5.-1260.)	**340**	209	**372**	329	**88**	411	**1000**	2	**5**	36	**88**
TDS - 180°C	(12/12/1983-09/26/2002)	**41**	(5670.-7750.)	**7100**	240	**6883**	611	**9**	7330	**7460**	41	**100**		

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland KF84	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/17/1986-09/30/2001)	**25**	(7.605-8.56)	**7.8**	0.1	**7.9**	0.3	**3**	8.2	**8.3**			2	**8**
Conductivity (umho/cm)	(09/17/1986-09/30/2001)	**24**	(6400.-22000.)	**10000**	515	**10415**	2845	**27**	10425	**21805**			1	**4**
Boron	(09/17/1986-09/30/2001)	**24**	(0.03-1.66)	**1.3**	0.075	**1.26**	0.30	**24**	1.38	**1.64**			23	**96**
Iron (total)	(09/08/1993-09/30/2001)	**18**	(0.41-76.2)	**1.675**	1.105	**11.68**	19.81	**170**	13.94	**1.56**			8	**44**
Manganese	(09/17/1986-09/30/2001)	**24**	(0.03-1.5)	**0.134**	0.044	**0.237**	0.303	**128**	0.252	**0.195**			6	**25**
Selenium	(09/17/1986-09/30/2001)	**24**	(0.0005-0.016)	**0.0025**	0	**0.002**	0.003	**131**	0.003	**0.004**			1	**4**
Chloride	(09/17/1986-09/30/2001)	**24**	(181.-503.)	**326.5**	44	**326**	72	**22**	366	**5004**				
Fluoride	(09/17/1986-09/30/2001)	**24**	(0.45-5.3)	**2.7**	0.195	**2.75**	0.86	**31**	2.89	**0.91**	23	**96**	19	**79**
Sulfate	(09/17/1986-09/30/2001)	**24**	(2500.-5400.)	**3955**	492.5	**4014**	688	**17**	4490	**115**	24	**100**	24	**100**
TDS - 180°C	(09/17/1986-09/30/2001)	**24**	(6060.-9390.)	**7760**	425	**7788**	784	**10**	8190	**10445**	24	**100**		

Non-Baseline Fruitland KF84-16	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(07/10/1984-09/24/2002)	**32**	(7.3-8.65)	**7.55**	0.18	**7.6**	0.3	**4**	7.7	**8.3**			2	**6**
Conductivity (umho/cm)	(07/10/1984-09/24/2002)	**32**	(13000.-23500.)	**16455**	1300	**16575**	2487	**15**	17125	**21805**			3	**9**
Boron	(07/10/1984-09/24/2002)	**32**	(0.3-1.88)	**1.26**	0.075	**1.25**	0.29	**23**	1.35	**1.64**			29	**91**
Iron (total)	(09/08/1993-09/24/2002)	**23**	(0.025-2.76)	**0.37**	0.24	**0.57**	0.62	**109**	0.70	**1.56**			1	**4**
Manganese	(07/10/1984-09/24/2002)	**32**	(0.008-0.42)	**0.05**	0.03	**0.076**	0.079	**105**	0.100	**0.195**			1	**3**
Selenium	(07/10/1984-09/24/2002)	**31**	(0.0005-0.01)	**0.0025**	0	**0.002**	0.002	**82**	0.003	**0.004**			2	**6**
Chloride	(07/10/1984-09/24/2002)	**32**	(3510.-5300.)	**4551**	160	**4524**	346	**8**	4705	**5004**	32	**100**		
Fluoride	(07/10/1984-09/24/2002)	**32**	(0.4-0.95)	**0.69**	0.06	**0.70**	0.12	**18**	0.75	**0.91**				
Sulfate	(07/10/1984-09/24/2002)	**32**	(0.5-599.)	**15.5**	10.5	**40**	106	**264**	22	**115**			3	**9**
TDS - 180°C	(07/10/1984-09/24/2002)	**32**	(9400.-11400.)	**9955**	145	**10033**	351	**3**	10125	**10445**	32	**100**	1	**3**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland SJKF84 #5	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(07/10/1984-07/10/1984)	**1**	(8.12-8.12)	**8.12**	0	**8.1**			8.1	**8.1**				
Conductivity (umho/cm)	(07/10/1984-07/10/1984)	**1**	(5900.-5900.)	**5900**	0	**5900**			5900	**5900**				
Boron	(07/10/1984-07/10/1984)	**1**	(1.23-1.23)	**1.23**	0	**1.23**			1.23	**1.23**			1	**100**
Iron (total)														
Manganese	(07/10/1984-07/10/1984)	**1**	(0.17-0.17)	**0.17**	0	**0.170**			0.170	**0.170**				
Selenium	(07/10/1984-07/10/1984)	**1**	(0.0005-0.0005)	**0.0005**	0	**0.001**			0.001	**0.001**				
Chloride	(07/10/1984-07/10/1984)	**1**	(360.-360.)	**360**	0	**360**			360	**360**				
Fluoride	(07/10/1984-07/10/1984)	**1**	(2.07-2.07)	**2.07**	0	**2.07**			2.07	**2.07**	1	**100**		
Sulfate	(07/10/1984-07/10/1984)	**1**	(5.-5.)	**5**	0	**5**			5	**5**				
TDS - 180°C	(07/10/1984-07/10/1984)	**1**	(4470.-4470.)	**4470**	0	**4470**			4470	**4470**	1	**100**		

Non-Baseline Fruitland KF84-18A	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/28/2005-09/30/2008)	**3**	(7.27-7.34)	**7.29**	0.02	**7.3**	0.0	**0**	7.3	**7.3**				
Conductivity (umho/cm)	(09/28/2005-09/30/2008)	**3**	(26300.-26900.)	**26500**	200	**26567**	306	**1**	26700	**26860**			3	**100**
Boron														
Iron (total)														
Manganese														
Selenium	(09/28/2005-09/30/2008)	**3**	(0.046-0.093)	**0.047**	0.001	**0.062**	0.027	**43**	0.070	**0.088**	1	**33**	3	**100**
Chloride	(09/28/2005-09/30/2008)	**3**	(7800.-8400.)	**8300**	100	**8167**	321	**4**	8350	**8390**	3	**100**	3	**100**
Fluoride														
Sulfate	(09/28/2005-09/28/2005)	**1**	(5.-5.)	**5**	0	**5**			5	**5**				
TDS - 180°C	(09/28/2005-09/30/2008)	**3**	(13800.-14100.)	**13800**	0	**13900**	173	**1**	13950	**14070**	3	**100**	3	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland KF84-18B	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/27/2002-09/24/2003)	**2**	(7.06-7.2)	**7.13**	0.07	**7.1**	0.1	**1**	7.2	**7.2**			2	**100**
Conductivity (umho/cm)	(09/27/2002-09/24/2003)	**2**	(17200.-17900.)	**17550**	350	**17550**	495	**3**	17725	**17865**				
Boron	(09/27/2002-09/27/2002)	**1**	(0.1-0.1)	**0.1**	0	**0.10**			0.10	**0.10**				
Iron (total)	(09/27/2002-09/27/2002)	**1**	(28.-28.)	**28**	0	**28.00**			28.00	**28.00**			1	**100**
Manganese														
Selenium	(09/27/2002-09/24/2003)	**2**	(0.0005-0.001)	**0.00075**	3E-04	**0.001**	0.000	**47**	0.001	**0.001**				
Chloride	(09/27/2002-09/24/2003)	**2**	(4950.-4960.)	**4955**	5	**4955**	7	**0**	4958	**4960**	2	**100**		
Fluoride	(09/27/2002-09/27/2002)	**1**	(0.4-0.4)	**0.4**	0	**0.40**			0.40	**0.40**				
Sulfate	(09/27/2002-09/24/2003)	**2**	(5.-5.)	**5**	0	**5**	0		5	**5**				
TDS - 180°C	(09/27/2002-09/24/2003)	**2**	(9130.-9200.)	**9165**	35	**9165**	49	**1**	9183	**9197**	2	**100**		

Non-Baseline Fruitland KF84-20C	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/26/2002-09/29/2008)	**3**	(7.81-7.96)	**7.94**	0.02	**7.9**	0.1	**1**	8.0	**8.0**				
Conductivity (umho/cm)	(09/26/2002-09/29/2008)	**3**	(4470.-4870.)	**4510**	40	**4617**	220	**5**	4690	**4834**				
Boron	(09/26/2002-09/26/2002)	**1**	(0.05-0.05)	**0.05**	0	**0.05**			0.05	**0.05**				
Iron (total)	(09/26/2002-09/26/2002)	**1**	(3.1-3.1)	**3.1**	0	**3.10**			3.10	**3.10**			1	**100**
Manganese														
Selenium	(09/26/2002-09/29/2008)	**3**	(0.001-0.011)	**0.007**	0.004	**0.006**	0.005	**79**	0.009	**0.011**			2	**67**
Chloride	(09/26/2002-09/29/2008)	**3**	(720.-770.)	**730**	10	**740**	26	**4**	750	**766**	3	**100**		
Fluoride	(09/26/2002-09/26/2002)	**1**	(1.8-1.8)	**1.8**	0	**1.80**			1.80	**1.80**				
Sulfate	(09/26/2002-09/28/2005)	**2**	(5.-5.)	**5**	0	**5**	0		5	**5**				
TDS - 180°C	(09/26/2002-09/29/2008)	**3**	(2620.-2690.)	**2640**	20	**2650**	36	**1**	2665	**2685**				

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Non-Baseline Fruitland KF84-22A	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/24/2002-09/24/2008)	**9**	(7.97-8.19)	**8.09**		**8.1**	0.1	**1**	8.2	**8.2**				
Conductivity (umho/cm)	(09/24/2002-09/24/2008)	**9**	(7120.-8030.)	**7430**		**7424**	266	**4**	7480	**7810**				
Boron	(09/23/2002-09/23/2002)	**1**	(0.05-0.05)	**0.05**		**0.05**			0.05	**0.05**				
Iron (total)	(09/23/2002-09/23/2002)	**1**	(0.8-0.8)	**0.8**		**0.80**			0.80	**0.80**				
Manganese	(09/23/2002-09/23/2002)	**1**	(0.025-0.025)	**0.025**		**0.025**			0.025	**0.025**				
Selenium	(09/23/2002-09/24/2008)	**9**	(0.0005-0.047)	**0.012**		**0.015**	0.016	**107**	0.017	**0.041**			6	**67**
Chloride	(09/24/2002-09/24/2008)	**9**	(26.-230.)	**216**		**188**	65	**34**	220	**228**				
Fluoride	(09/24/2002-09/24/2002)	**1**	(1.1-1.1)	**1.1**		**1.10**			1.10	**1.10**				
Sulfate	(09/24/2002-09/29/2006)	**6**	(2300.-3050.)	**2800**		**2725**	252	**9**	2800	**2988**	6	**100**	6	**100**
TDS - 180°C	(09/24/2002-09/24/2008)	**9**	(4870.-5540.)	**5100**		**5180**	212	**4**	5330	**5456**	9	**100**		

Non-Baseline Fruitland KF84-22B	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(09/24/2002-09/24/2008)	**6**	(7.42-7.9)	**7.52**	0.07	**7.6**	0.2	**2**	7.6	**7.8**				
Conductivity (umho/cm)	(09/24/2002-09/24/2008)	**6**	(11400.-11900.)	**11650**	200	**11633**	225	**2**	11800	**11875**				
Boron	(09/24/2002-09/24/2002)	**1**	(0.05-0.05)	**0.05**	0	**0.05**			0.05	**0.05**				
Iron (total)	(09/24/2002-09/24/2002)	**1**	(1.5-1.5)	**1.5**	0	**1.50**			1.50	**1.50**				
Manganese	(09/24/2002-09/24/2002)	**1**	(0.025-0.025)	**0.025**	0	**0.025**			0.025	**0.025**				
Selenium	(09/24/2002-09/24/2008)	**6**	(0.0005-0.038)	**0.0195**	0.013	**0.018**	0.015	**85**	0.026	**0.035**			4	**67**
Chloride	(09/24/2002-09/24/2008)	**6**	(3000.-3340.)	**3280**	60	**3220**	149	**5**	3340	**3340**	6	**100**		
Fluoride	(09/24/2002-09/24/2002)	**1**	(0.8-0.8)	**0.8**	0	**0.80**			0.80	**0.80**				
Sulfate	(09/24/2002-09/27/2005)	**3**	(5.-5.)	**5**	0	**5**	0		5	**5**				
TDS - 180°C	(09/24/2002-09/24/2008)	**6**	(5840.-6210.)	**6030**	125	**6013**	143	**2**	6090	**6185**	6	**100**		

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Spoils Wells Combined	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(01/26/1996-12/21/2010)	**64**	(6.5-8.4)	**6.975**	0.275	**7.1**	0.4	**6**	7.4	**7.7**			41	**64**
Conductivity (umho/cm)	(01/26/1996-12/21/2010)	**63**	(430.-24600.)	**17200**	1200	**16872**	3590	**21**	18400	**21290**			5	**8**
Boron	(01/26/1996-12/21/2010)	**63**	(0.11-4.7)	**1.54**	0.34	**1.67**	0.69	**42**	1.90	**2.61**			62	**98**
Iron (total)	(01/26/1996-12/21/2010)	**63**	(0.06-20.)	**1.09**	0.75	**2.50**	4.16	**166**	2.20	**11.43**		**0**	17	**27**
Manganese	(01/26/1996-12/21/2010)	**63**	(0.0025-7.05)	**2.99**	2.61	**2.717**	2.321	**85**	4.558	**6.081**		**0**	40	**63**
Selenium	(01/26/1996-12/21/2010)	**63**	(0.0005-0.2)	**0.0025**	0.002	**0.013**	0.035	**270**	0.013	**0.027**	2	**3**	21	**33**
Chloride	(01/26/1996-12/21/2010)	**63**	(45.7-1330.)	**530**	166	**658**	327	**50**	980	**1221**	28	**44**		
Fluoride	(01/26/1996-12/21/2010)	**63**	(0.2-1.34)	**0.3**	0.04	**0.56**	0.36	**65**	1.00	**1.12**				
Sulfate	(01/26/1996-12/21/2010)	**63**	(3550.-15500.)	**7920**	1920	**7779**	2502	**32**	9293	**11380**	63	**100**	63	**100**
TDS - 180°C	(01/26/1996-12/21/2010)	**61**	(1160.-18000.)	**14600**	1600	**13880**	2530	**18**	15300	**16700**	60	**98**	57	**93**

Spoils Wells Bitsui 4	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(01/26/1996-12/21/2010)	**21**	(6.62-7.7)	**6.8**	0.1	**6.9**	0.3	**4**	7.0	**7.7**			19	**90**
Conductivity (umho/cm)	(01/26/1996-12/21/2010)	**20**	(14400.-24600.)	**18100**	950	**18395**	2205	**12**	18975	**21845**			3	**15**
Boron	(01/26/1996-12/21/2010)	**20**	(1.3-2.5)	**1.685**	0.19	**1.73**	0.34	**19**	1.76	**2.31**			20	**100**
Iron (total)	(01/26/1996-12/21/2010)	**20**	(0.67-18.6)	**2.76**	1.92	**4.78**	5.23	**109**	5.98	**16.70**			13	**65**
Manganese	(01/26/1996-12/21/2010)	**20**	(2.08-7.05)	**3.65**	1.033	**3.869**	1.393	**36**	4.754	**5.920**			20	**100**
Selenium	(01/26/1996-12/21/2010)	**20**	(0.0005-0.2)	**0.0025**	0.002	**0.016**	0.044	**273**	0.013	**0.029**	1	**5**	7	**35**
Chloride	(01/26/1996-12/21/2010)	**20**	(45.7-696.)	**504**	63.5	**491**	145	**30**	563	**661**	5	**25**		
Fluoride	(01/26/1996-12/21/2010)	**20**	(0.2-0.34)	**0.3**	0	**0.30**	0.03	**10**	0.31	**0.33**				
Sulfate	(01/26/1996-12/21/2010)	**20**	(6680.-13500.)	**8900**	520	**9286**	1491	**16**	9595	**11505**	20	**100**	20	**100**
TDS - 180°C	(01/26/1996-12/21/2010)	**20**	(13100.-17500.)	**15150**	450	**15335**	995	**6**	15875	**16740**	20	**100**	20	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

Spoils Wells Bitsui 5	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(02/13/1996-12/20/2010)	**23**	(7.25-8.4)	**7.45**	0.1	**7.6**	0.3	**4**	7.6	**8.2**			2	**9**
Conductivity (umho/cm)	(02/13/1996-12/20/2010)	**23**	(13000.-19300.)	**16200**	1000	**16070**	1494	**9**	16850	**19090**				
Boron	(02/13/1996-12/20/2010)	**23**	(0.11-1.7)	**1.11**	0.09	**1.12**	0.27	**24**	1.20	**1.33**			22	**96**
Iron (total)	(02/13/1996-12/20/2010)	**23**	(0.06-2.05)	**0.31**	0.12	**0.42**	0.50	**119**	0.40	**1.70**				
Manganese	(02/13/1996-12/20/2010)	**23**	(0.0025-0.41)	**0.108**	0.025	**0.115**	0.077	**67**	0.132	**0.169**			1	**4**
Selenium	(02/13/1996-12/20/2010)	**23**	(0.0005-0.2)	**0.0025**	0.002	**0.015**	0.041	**280**	0.011	**0.027**	1	**4**	7	**30**
Chloride	(02/13/1996-12/20/2010)	**23**	(650.-1330.)	**1020**	115	**1041**	174	**17**	1205	**1314**	23	**100**		
Fluoride	(02/13/1996-12/20/2010)	**23**	(0.8-1.22)	**1**	0.04	**1.00**	0.09	**9**	1.03	**1.12**				
Sulfate	(02/13/1996-12/20/2010)	**23**	(3550.-6200.)	**5030**	570	**5173**	750	**14**	5800	**6190**	23	**100**	23	**100**
TDS - 180°C	(02/13/1996-12/20/2010)	**21**	(1160.-12700.)	**11800**	400	**11298**	2397	**21**	12200	**12500**	20	**95**	17	**81**

Spoils Wells Bitsui 6	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(02/12/1996-12/02/2010)	**20**	(6.5-7.25)	**6.8**	0.1	**6.8**	0.2	**3**	6.9	**7.1**			20	**100**
Conductivity (umho/cm)	(02/12/1996-12/02/2010)	**20**	(430.-23200.)	**17600**	1400	**16271**	5569	**34**	18525	**21395**			2	**10**
Boron	(02/12/1996-12/02/2010)	**20**	(1.38-4.7)	**2.07**	0.47	**2.24**	0.81	**36**	2.46	**3.47**			20	**100**
Iron (total)	(02/12/1996-12/02/2010)	**20**	(0.41-20.)	**1.33**	0.31	**2.63**	4.26	**162**	1.86	**5.37**			4	**20**
Manganese	(02/12/1996-12/02/2010)	**20**	(0.13-7.05)	**4.55795**	1.042	**4.558**	1.573	**35**	5.600	**6.623**			19	**95**
Selenium	(02/12/1996-12/02/2010)	**20**	(0.0005-0.042)	**0.0025**	0.002	**0.008**	0.010	**129**	0.013	**0.021**			7	**35**
Chloride	(02/12/1996-12/02/2010)	**20**	(56.9-490.)	**396**	37	**384**	91	**24**	433	**471**				
Fluoride	(02/12/1996-12/02/2010)	**20**	(0.2-1.34)	**0.285**	0.02	**0.32**	0.24	**77**	0.30	**0.38**				
Sulfate	(02/12/1996-12/02/2010)	**20**	(4700.-15500.)	**8850**	1040	**9268**	2145	**23**	10010	**11795**	20	**100**	20	**100**
TDS - 180°C	(02/12/1996-12/02/2010)	**20**	(12200.-18000.)	**14850**	900	**15135**	1385	**9**	16200	**16860**	20	**100**	20	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

CCB Wells Combined	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(03/01/1995-12/02/2010)	**43**	(4.7-10.1)	**8.7**	0.2	**8.4**	0.9	**11**	8.8	**9.9**	7	**16**	30	**70**
Conductivity (umho/cm)	(03/01/1995-12/02/2010)	**40**	(868.-25900.)	**15550**	7450	**12679**	8558	**67**	19225	**24235**			8	**20**
Boron	(03/01/1995-12/02/2010)	**38**	(0.96-23.2)	**10.25**	3.36	**10.60**	6.00	**57**	15.53	**18.81**	31	**82**	38	**100**
Iron (total)	(03/01/1995-12/02/2010)	**40**	(0.12-216.)	**1.16**	0.75	**12.41**	36.49	**294**	7.18	**48.00**			16	**40**
Manganese	(03/01/1995-12/02/2010)	**39**	(0.001-2.68)	**0.11**	0.09	**0.409**	0.725	**177**	0.265	**2.377**			10	**26**
Selenium	(03/01/1995-12/02/2010)	**39**	(0.0005-0.141)	**0.009**	0.007	**0.027**	0.037	**137**	0.029	**0.100**	8	**21**	32	**82**
Chloride	(03/01/1995-12/02/2010)	**40**	(5.-2310.)	**900**	856.6	**1056**	845	**80**	1840	**2051**	26	**65**		
Fluoride	(03/01/1995-12/02/2010)	**40**	(0.58-5.1)	**2.61**	0.96	**2.79**	1.33	**48**	3.83	**4.92**	30	**75**	25	**63**
Sulfate	(03/01/1995-12/02/2010)	**40**	(261.-14000.)	**6325**	1615	**4835**	3307	**68**	7055	**8315**	31	**78**	40	**100**
TDS - 180°C	(03/01/1995-12/02/2010)	**34**	(1500.-18700.)	**14200**	2100	**10996**	5403	**49**	15150	**16360**	30	**88**	20	**59**

CCB Wells Bitsui 1	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(03/01/1995-12/02/2010)	**28**	(7.23-8.9)	**8.7**	0.1	**8.5**	0.5	**6**	8.8	**8.9**			23	**82**
Conductivity (umho/cm)	(03/01/1995-12/02/2010)	**26**	(868.-25900.)	**18200**	2950	**17987**	5447	**30**	22200	**24725**			26	**100**
Boron	(03/01/1995-12/02/2010)	**25**	(6.98-23.2)	**10.5**	1.75	**11.86**	4.07	**34**	13.70	**18.34**	25	**100**	22	**88**
Iron (total)	(03/01/1995-12/02/2010)	**26**	(0.12-21.4)	**0.66**	0.33	**2.62**	4.83	**185**	1.61	**12.19**			26	**100**
Manganese	(03/01/1995-12/02/2010)	**26**	(0.02-2.68)	**0.2**	0.1	**0.602**	0.826	**137**	0.579	**2.415**			26	**100**
Selenium	(03/01/1995-12/02/2010)	**26**	(0.0005-0.09)	**0.006**	0.004	**0.010**	0.017	**169**	0.011	**0.027**	1	**4**	26	**100**
Chloride	(03/01/1995-12/02/2010)	**26**	(5.-2310.)	**1830**	150	**1529**	653	**43**	1965	**2065**	24	**92**	26	**100**
Fluoride	(03/01/1995-12/02/2010)	**26**	(0.58-4.39)	**2.25**	0.425	**2.11**	0.87	**41**	2.62	**3.03**	17	**65**	26	**100**
Sulfate	(03/01/1995-12/02/2010)	**26**	(261.-14000.)	**6995**	569	**6838**	2201	**32**	7556	**8525**	25	**96**	26	**100**
TDS - 180°C	(03/01/1995-12/02/2010)	**25**	(8430.-18700.)	**14600**	700	**13906**	2536	**18**	15300	**17080**	25	**100**	25	**100**

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

CCB Wells Watson-4	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(03/02/1995-10/10/1996)	**6**	(9.145-10.1)	**9.8**	0.2	**9.7**	0.3	**4**	9.9	**10.1**	6	**100**	6	**100**
Conductivity (umho/cm)	(03/02/1995-10/10/1996)	**6**	(2610.-5480.)	**4195**	665	**4042**	1021	**25**	4520	**5248**			6	**100**
Boron	(03/02/1995-10/10/1996)	**6**	(8.9-20.)	**17.4**	1.45	**16.33**	3.92	**24**	18.43	**19.65**	6	**100**	6	**100**
Iron (total)	(03/02/1995-10/10/1996)	**6**	(11.-216.)	**34.85**	21.55	**66.38**	78.30	**118**	76.00	**183.50**			6	**100**
Manganese	(03/02/1995-10/10/1996)	**6**	(0.001-0.01)	**0.01**	0	**0.008**	0.004	**50**	0.010	**0.010**			6	**100**
Selenium	(03/02/1995-10/10/1996)	**6**	(0.006-0.05)	**0.017**	0.01	**0.021**	0.016	**77**	0.027	**0.045**			6	**100**
Chloride	(03/02/1995-10/10/1996)	**6**	(123.-647.)	**248**	101.5	**341**	228	**67**	522	**638**	2	**33**	6	**100**
Fluoride	(03/02/1995-10/10/1996)	**6**	(3.17-4.46)	**3.625**	0.29	**3.75**	0.47	**12**	4.02	**4.37**	6	**100**	6	**100**
Sulfate	(03/02/1995-10/10/1996)	**6**	(1620.-2100.)	**2020**	65	**1940**	189	**10**	2068	**2093**	6	**100**	6	**100**
TDS - 180°C	(03/02/1995-10/10/1996)	**6**	(2900.-4160.)	**3620**	240	**3617**	435	**12**	3875	**4105**	5	**83**	6	**100**

CCB Wells Custer-2	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Criteria			
											Livestock		Baseline Fruitland	
											n	%	n	%
pH	(07/18/1997-07/18/1997)	**1**	(7.9-7.9)	**7.9**	0	**7.9**			7.9	**7.9**				
Conductivity (umho/cm)	(07/18/1997-07/18/1997)	**1**	(1110.-1110.)	**1110**	0	**1110**			1110	**1110**			1	**100**
Boron														
Iron (total)	(07/18/1997-07/18/1997)	**1**	(1.11-1.11)	**1.11**	0	**1.11**			1.11	**1.11**			1	**100**
Manganese														
Selenium														
Chloride	(07/18/1997-07/18/1997)	**1**	(36.-36.)	**36**	0	**36**			36	**36**			1	**100**
Fluoride	(07/18/1997-07/18/1997)	**1**	(0.98-0.98)	**0.98**	0	**0.98**			0.98	**0.98**			1	**100**
Sulfate	(07/18/1997-07/18/1997)	**1**	(440.-440.)	**440**	0	**440**			440	**440**			1	**100**
TDS - 180°C														

Appendix F - Groundwater Data Summary

Fruitland Formation, Spoil, and CCB Well Tables (all Values are dissolved (mg/L) unless otherwise indicated)

CCB Wells Doby-2	Dates	**n**	Range	**Median**	MAD	**Average**	Standard Deviation	**Percent Relative Standard Deviation**	Q3	**95th Percentile**	**Exceedance of Criteria**			
											Livestock		**Baseline Fruitland**	
											n	**%**	n	**%**
pH	(01/21/1997-06/14/1999)	**8**	(4.7-7.7)	**7.5**	0.1	**7.2**	1.0	**14**	7.6	**7.7**	1	**13**	1	**13**
Conductivity (umho/cm)	(01/21/1997-06/14/1999)	**7**	(1780.-2110.)	**2070**	40	**2020**	118	**6**	2100	**2107**			7	**100**
Boron	(01/21/1997-06/14/1999)	**7**	(0.96-1.56)	**1.14**	0.06	**1.19**	0.18	**16**	1.22	**1.46**			7	**100**
Iron (total)	(01/21/1997-06/14/1999)	**7**	(0.58-10.4)	**2.3**	1.64	**4.14**	4.32	**104**	6.85	**10.34**			7	**100**
Manganese	(01/21/1997-06/14/1999)	**7**	(0.01-0.07)	**0.027**	0.006	**0.035**	0.022	**63**	0.045	**0.067**			7	**100**
Selenium	(01/21/1997-06/14/1999)	**7**	(0.057-0.141)	**0.09**	0.016	**0.093**	0.028	**30**	0.107	**0.133**	7	**100**	7	**100**
Chloride	(01/21/1997-06/14/1999)	**7**	(41.2-78.)	**50**	8.8	**55**	15	**26**	66	**75**			7	**100**
Fluoride	(01/21/1997-06/14/1999)	**7**	(4.42-5.1)	**4.9**	0.2	**4.76**	0.26	**6**	4.92	**5.05**	7	**100**	7	**100**
Sulfate	(01/21/1997-06/14/1999)	**7**	(365.-610.)	**488**	112	**504**	103	**20**	601	**607**			7	**100**
TDS - 180°C	(01/21/1997-03/12/1997)	**3**	(1500.-1530.)	**1510**	10	**1513**	15	**1**	1520	**1528**			3	**100**

Appendix F - Groundwater Data Summary

PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline Combined	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(11/16/1974-	**52**	(11.8-7.)	**8**	0.4	**8.3**	1.0	**12**	8.6	**10.1**	10	**19**
Conductivity (umho/cm)	(11/16/1974- 03/04/1977)	**20**	(20500.-3620.)	**9590**	2740	**9893**	4297	**43**	11950	**16700**		
Boron	(11/16/1974-	**51**	(37.-0.05)	**0.7**	0.28	**1.51**	5.09	**338**	1.00	**2.02**	1	**2**
Iron (total)	(11/16/1974-	**18**	(533.-0.01)	**0.805**	0.77	**32.37**	125.13	**386**	2.32	**105.02**		
Manganese	(11/16/1974-	**45**	(0.34-0.001)	**0.06**	0.03	**0.077**	0.075	**97**	0.088	**0.242**		
Selenium	(11/16/1974-	**51**	(0.25-0.001)	**0.005**	0	**0.032**	0.073	**232**	0.007	**0.250**	6	**12**
Chloride	(11/16/1974-	**51**	(9000.-39.)	**970**	650	**1755**	2279	**130**	1450	**7080**	31	**61**
Fluoride	(11/16/1974-	**43**	(4.9-0.2)	**1.5**	0.45	**1.72**	0.92	**54**	2.00	**3.29**	10	**23**
Sulfate	(11/16/1974-	**51**	(4535.-0.5)	**2500**	800	**2359**	1198	**51**	3325	**3950**	42	**82**
TDS - 180°C	(11/16/1974-	**51**	(18746.-800.)	**6140**	790	**7214**	3262	**45**	7440	**14418**	50	**98**

PCS Baseline GM-11	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/25/1975-	**4**	(8.05-7.5)	**7.6**	0.05	**7.7**	0.2	**3**	7.7	**8.0**		
Conductivity (umho/cm)	(03/25/1975- 03/04/1977)	**4**	(16500.-11700.)	**14715**	1750	**14408**	2435	**17**	16448	**16490**		
Boron	(03/25/1975-	**4**	(1.2-0.2)	**0.99**	0.11	**0.85**	0.44	**52**	1.05	**1.17**		
Iron (total)												
Manganese	(03/25/1975-	**4**	(0.34-0.08)	**0.18**	0.075	**0.195**	0.115	**59**	0.258	**0.324**		
Selenium	(03/25/1975-	**4**	(0.25-0.005)	**0.0375**	0.0325	**0.083**	0.116	**140**	0.115	**0.223**	2	**50**
Chloride	(03/25/1975-	**4**	(9000.-6420.)	**7267.5**	677.5	**7489**	1160	**15**	8081	**8816**	4	**100**
Fluoride	(03/25/1975-	**4**	(1.6-0.8)	**1.07**	0.2	**1.14**	0.35	**31**	1.30	**1.54**		
Sulfate	(03/25/1975-	**4**	(3065.-375.)	**2450**	432.5	**2085**	1194	**57**	2791	**3010**	3	**75**
TDS - 180°C	(03/25/1975-	**4**	(18746.-13870.)	**15963**	1545	**16136**	2160	**13**	17407	**18478**	4	**100**

Appendix F - Groundwater Data Summary

PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline GM-14	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/25/1975-	**2**	(8.-7.7)	**7.85**	0.15	**7.9**	0.2	**3**	7.9	**8.0**		
Conductivity (umho/cm)	(03/25/1975- 05/20/1976)	**2**	(9350.-6100.)	**7725**	1625	**7725**	2298	**30**	8538	**9188**		
Boron	(03/25/1975-	**2**	(0.97-0.61)	**0.79**	0.18	**0.79**	0.25	**32**	0.88	**0.95**		
Iron (total)												
Manganese	(03/25/1975-	**2**	(0.059-0.026)	**0.0425**	0.0165	**0.043**	0.023	**55**	0.051	**0.057**		
Selenium	(03/25/1975-	**2**	(0.25-0.005)	**0.1275**	0.1225	**0.128**	0.173	**136**	0.189	**0.238**	1	**50**
Chloride	(03/25/1975-	**2**	(3400.-2430.)	**2915**	485	**2915**	686	**24**	3158	**3352**	2	**100**
Fluoride	(03/25/1975-	**2**	(1.2-1.19)	**1.195**	0.005	**1.20**	0.01	**1**	1.20	**1.20**		
Sulfate	(03/25/1975-	**2**	(0.91-0.5)	**0.705**	0.205	**1**	0	**41**	1	**1**		
TDS - 180°C	(03/25/1975-	**2**	(6732.-5078.)	**5905**	827	**5905**	1170	**20**	6319	**6649**	2	**100**

PCS Baseline GM-15	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/27/1975-	**2**	(9.2-8.92)	**9.06**	0.14	**9.1**	0.2	**2**	9.1	**9.2**	1	**50**
Conductivity (umho/cm)	(03/27/1975- 05/20/1976)	**2**	(12700.-9880.)	**11290**	1410	**11290**	1994	**18**	11995	**12559**		
Boron	(03/27/1975-	**2**	(0.83-0.81)	**0.82**	0.01	**0.82**	0.01	**2**	0.83	**0.83**		
Iron (total)												
Manganese	(03/27/1975-	**2**	(0.079-0.014)	**0.0465**	0.0325	**0.047**	0.046	**99**	0.063	**0.076**		
Selenium	(03/27/1975-	**2**	(0.25-0.005)	**0.1275**	0.1225	**0.128**	0.173	**136**	0.189	**0.238**	1	**50**
Chloride	(03/27/1975-	**2**	(7400.-3910.)	**5655**	1745	**5655**	2468	**44**	6528	**7226**	2	**100**
Fluoride	(03/27/1975-	**2**	(2.26-2.)	**2.13**	0.13	**2.13**	0.18	**9**	2.20	**2.25**	1	**50**
Sulfate	(03/27/1975-	**2**	(386.-330.)	**358**	28	**358**	40	**11**	372	**383**		
TDS - 180°C	(03/27/1975-	**2**	(10879.-8101.)	**9490**	1389	**9490**	1964	**21**	10185	**10740**	2	**100**

Appendix F - Groundwater Data Summary

PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline GM-19	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(11/16/1974-	**4**	(8.1-7.5)	**7.865**	0.135	**7.8**	0.2	**3**	8.0	**8.1**		
Conductivity (umho/cm)												
Boron	(11/16/1974-	**4**	(1.03-0.3)	**0.94**	0.075	**0.80**	0.34	**43**	1.01	**1.03**		
Iron (total)	(11/16/1974-	**1**	(0.01-0.01)	**0.01**	0	**0.01**			0.01	**0.01**		
Manganese	(11/16/1974-	**4**	(0.245-0.06)	**0.099**	0.025	**0.126**	0.082	**65**	0.144	**0.225**		
Selenium	(11/16/1974-	**4**	(0.025-0.002)	**0.005**	0.0015	**0.009**	0.011	**115**	0.010	**0.022**		
Chloride	(11/16/1974-	**4**	(1077.-534.8)	**844**	204.5	**825**	265	**32**	1034	**1068**	3	**75**
Fluoride	(11/16/1974-	**4**	(1.7-0.76)	**1.195**	0.365	**1.21**	0.45	**37**	1.54	**1.67**		
Sulfate	(11/16/1974-	**4**	(4535.-3685.)	**4025**	182.5	**4068**	351	**9**	4171	**4462**	4	**100**
TDS - 180°C	(11/16/1974-	**4**	(9270.-7810.)	**8804.5**	416.5	**8672**	685	**8**	9197	**9255**	4	**100**

PCS Baseline GM-20	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(11/16/1974-	**8**	(11.8-7.)	**8.65**	1	**9.0**	1.6	**18**	9.7	**11.5**	3	**38**
Conductivity (umho/cm)	(06/27/1975-06/27/1975)	**1**	(8755.-8755.)	**8755**	0	**8755**			8755	**8755**		
Boron	(11/16/1974-	**7**	(2.24-0.2)	**0.88**	0.32	**0.90**	0.70	**77**	1.05	**1.93**		
Iron (total)	(11/16/1974-	**1**	(0.03-0.03)	**0.03**	0	**0.03**			0.03	**0.03**		
Manganese	(11/16/1974-	**6**	(0.29-0.008)	**0.0305**	0.0225	**0.088**	0.114	**130**	0.129	**0.258**		
Selenium	(11/16/1974-	**7**	(0.025-0.001)	**0.005**	0	**0.007**	0.008	**109**	0.005	**0.019**		
Chloride	(11/16/1974-	**7**	(2118.-757.)	**1280**	250	**1243**	462	**37**	1355	**1912**	7	**100**
Fluoride	(11/16/1974-	**3**	(2.-1.8)	**1.95**	0.05	**1.92**	0.10	**5**	1.98	**2.00**		
Sulfate	(11/16/1974-	**7**	(2380.-1725.)	**1880**	155	**1992**	244	**12**	2150	**2341**	7	**100**
TDS - 180°C	(11/16/1974-	**7**	(5880.-5033.)	**5711**	169	**5511**	382	**7**	5822	**5863**	7	**100**

Appendix F - Groundwater Data Summary

PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline GM-21	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(11/16/1974-	**4**	(7.9-7.)	**7.25**	0.15	**7.4**	0.4	**5**	7.5	**7.8**		
Conductivity (umho/cm)												
Boron	(11/16/1974-	**4**	(1.1-0.7)	**0.94**	0.11	**0.92**	0.17	**19**	1.03	**1.09**		
Iron (total)	(11/16/1974-	**1**	(0.41-0.41)	**0.41**	0	**0.41**			0.41	**0.41**		
Manganese	(11/16/1974-	**3**	(0.07-0.03)	**0.05**	0.02	**0.050**	0.020	**40**	0.060	**0.068**		
Selenium	(11/16/1974-	**4**	(0.025-0.001)	**0.005**	0.002	**0.009**	0.011	**120**	0.010	**0.022**		
Chloride	(11/16/1974-	**4**	(780.-118.)	**398**	264	**424**	339	**80**	680	**760**	2	**50**
Fluoride	(11/16/1974-	**2**	(0.4-0.2)	**0.3**	0.1	**0.30**	0.14	**47**	0.35	**0.39**		
Sulfate	(11/16/1974-	**4**	(3740.-2502.)	**3112.5**	549	**3117**	643	**21**	3635	**3719**	4	**100**
TDS - 180°C	(11/16/1974-	**4**	(6923.-6140.)	**6497**	242	**6514**	337	**5**	6699	**6878**	4	**100**

PCS Baseline GM-28	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(11/16/1974-	**2**	(8.85-8.1)	**8.475**	0.375	**8.5**	0.5	**6**	8.7	**8.8**		
Conductivity (umho/cm)	(11/16/1974- 08/04/1976)	**2**	(10100.-9830.)	**9965**	135	**9965**	191	**2**	10033	**10087**		
Boron	(11/16/1974-	**2**	(0.5-0.05)	**0.275**	0.225	**0.28**	0.32	**116**	0.39	**0.48**		
Iron (total)												
Manganese	(11/16/1974-	**2**	(0.16-0.001)	**0.0805**	0.0795	**0.081**	0.112	**140**	0.120	**0.152**		
Selenium	(11/16/1974-	**2**	(0.025-0.005)	**0.015**	0.01	**0.015**	0.014	**94**	0.020	**0.024**		
Chloride	(11/16/1974-	**2**	(4560.-240.)	**2400**	2160	**2400**	3055	**127**	3480	**4344**	1	**50**
Fluoride	(11/16/1974-	**2**	(1.1-0.8)	**0.95**	0.15	**0.95**	0.21	**22**	1.03	**1.09**		
Sulfate	(11/16/1974-	**2**	(754.-630.)	**692**	62	**692**	88	**13**	723	**748**		
TDS - 180°C	(11/16/1974-	**2**	(4659.-4334.)	**4496.5**	162.5	**4497**	230	**5**	4578	**4643**	2	**100**

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PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline GM-30A	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	29108	**3**	(7.6-7.5)	**7.5**	0	**7.5**	0.1	**1**	7.6	**7.6**		
Conductivity (umho/cm)												
Boron	29108	**3**	(0.96-0.46)	**0.6**	0.14	**0.67**	0.26	**38**	0.78	**0.92**		
Iron (total)	29108	**1**	(0.02-0.02)	**0.02**	0	**0.02**			0.02	**0.02**		
Manganese	29108	**2**	(0.07-0.04)	**0.055**	0.015	**0.055**	0.021	**39**	0.063	**0.069**		
Selenium	29108	**3**	(0.005-0.002)	**0.005**	0	**0.004**	0.002	**43**	0.005	**0.005**	4	**133**
Chloride	29108	**3**	(1215.-1120.)	**1203**	12	**1179**	52	**4**	1209	**1214**	22	**733**
Fluoride	29108	**1**	(0.95-0.95)	**0.95**	0	**0.95**			0.95	**0.95**	1	**100**
Sulfate	29108	**3**	(3105.-422.)	**3100**	5	**2209**	1548	**70**	3103	**3105**	18	**600**
TDS - 180°C	29108	**3**	(7070.-6573.)	**6930**	140	**6858**	256	**4**	7000	**7056**	26	**867**

PCS Baseline GM-5	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/24/1975-	**3**	(9.1-8.)	**8.3**	0.3	**8.5**	0.6	**7**	8.7	**9.0**	1	**33**
Conductivity (umho/cm)	(03/24/1975- 03/03/1977)	**3**	(10200.-3620.)	**6900**	3280	**6907**	3290	**48**	8550	**9870**		
Boron	(03/24/1975-	**3**	(2.4-0.5)	**1.3**	0.8	**1.40**	0.95	**68**	1.85	**2.29**		
Iron (total)												
Manganese	(03/24/1975-	**3**	(0.092-0.012)	**0.09**	0.002	**0.065**	0.046	**71**	0.091	**0.092**		
Selenium	(03/24/1975-	**3**	(0.25-0.005)	**0.005**	0	**0.087**	0.141	**163**	0.128	**0.226**	1	**33**
Chloride	(03/24/1975-	**3**	(5174.-1100.)	**5000**	174	**3758**	2304	**61**	5087	**5157**	3	**100**
Fluoride	(03/24/1975-	**3**	(3.7-1.05)	**2.4**	1.3	**2.38**	1.33	**56**	3.05	**3.57**	2	**67**
Sulfate	(03/24/1975-	**3**	(3541.-2452.)	**3400**	141	**3131**	592	**19**	3471	**3527**	3	**100**
TDS - 180°C	(03/24/1975-	**3**	(12982.-7894.)	**11156**	1826	**10677**	2578	**24**	12069	**12799**	3	**100**

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PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline GM-6	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(08/03/1976-	**2**	(8.2-7.8)	**8**	0.2	**8.0**	0.3	**4**	8.1	**8.2**		
Conductivity (umho/cm)	(08/03/1976-03/04/1977)	**2**	(20500.-4100.)	**12300**	8200	**12300**	11597	**94**	16400	**19680**		
Boron	(08/03/1976-	**2**	(1.8-0.05)	**0.925**	0.875	**0.93**	1.24	**134**	1.36	**1.71**		
Iron (total)												
Manganese	(08/03/1976-	**2**	(0.069-0.021)	**0.045**	0.024	**0.045**	0.034	**75**	0.057	**0.067**		
Selenium	(08/03/1976-	**2**	(0.005-0.005)	**0.005**	0	**0.005**	0.000		0.005	**0.005**		
Chloride	(08/03/1976-	**2**	(323.6-320.)	**321.8**	1.8	**322**	3	**1**	323	**323**		
Fluoride	(08/03/1976-	**2**	(4.9-2.74)	**3.82**	1.08	**3.82**	1.53	**40**	4.36	**4.79**	2	**100**
Sulfate	(08/03/1976-	**2**	(3541.-2193.)	**2867**	674	**2867**	953	**33**	3204	**3474**	2	**100**
TDS - 180°C	(08/03/1976-	**2**	(6487.-4970.)	**5728.5**	758.5	**5729**	1073	**19**	6108	**6411**	2	**100**

PCS Baseline GM-8	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/24/1975-	**4**	(8.2-7.9)	**8.045**		**8.0**	0.1	**2**	8.1	**8.2**		
Conductivity (umho/cm)	(03/24/1975-10/06/1976)	**4**	(7800.-6800.)	**6930**	130	**7177**	544	**8**	7148	**7670**		
Boron	(03/24/1975-	**4**	(37.-1.)	**1.1**	0.1	**13.03**	20.76	**159**	10.38	**31.68**	1	**25**
Iron (total)												
Manganese	(03/24/1975-	**3**	(0.11-0.008)	**0.059**	0.051	**0.059**	0.072	**122**	0.089	**0.106**		
Selenium	(03/24/1975-	**4**	(0.005-0.005)	**0.005**	0	**0.005**	0.000		0.066	**0.213**	1	**25**
Chloride	(03/24/1975-	**4**	(1470.-970.)	**1010**	40	**1150**	278	**24**	1193	**1415**	4	**100**
Fluoride	(03/24/1975-	**4**	(3.2-2.87)	**3.1**	0.1	**3.06**	0.17	**6**	3.23	**3.29**	4	**100**
Sulfate	(03/24/1975-	**4**	(2203.-1100.)	**1670**	533	**1658**	552	**33**	1803	**2123**	4	**100**
TDS - 180°C	(03/24/1975-	**4**	(5764.-5220.)	**5506**	258	**5497**	272	**5**	5571	**5725**	4	**100**

Appendix F - Groundwater Data Summary

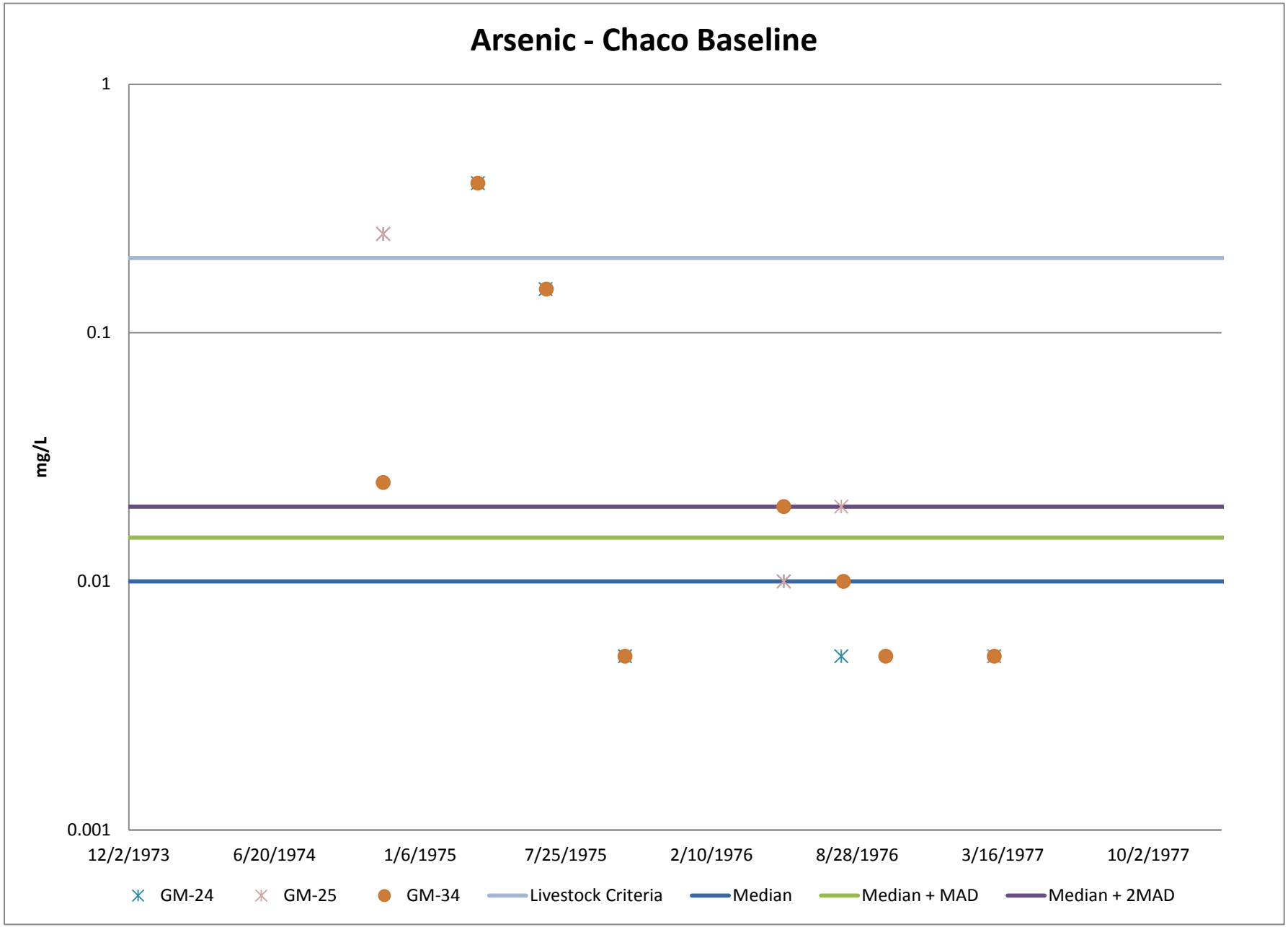
PCS Summary Tables (all Values are dissolved (mg/L) unless otherwise indicated)

PCS Baseline KPC-2007-01	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(08/16/2007-	**6**	(10.3-8.19)	**9.48**	0.595	**9.3**	0.9	**9**	9.8	**10.2**	4	**67**
Conductivity (umho/cm)												
Boron	(08/16/2007-	**6**	(0.6-0.3)	**0.4645**	0.05	**0.45**	0.10	**23**	0.50	**0.58**		
Iron (total)	(08/16/2007-	**6**	(533.-0.0892)	**1.02**	0.7	**89.48**	217.28	**243**	1.46	**400.14**		
Manganese	(08/16/2007-	**4**	(0.0785-0.022)	**0.0292**	0.006	**0.040**	0.026	**66**	0.045	**0.072**		
Selenium	(08/16/2007-	**6**	(0.008-0.003)	**0.005**	0.0015	**0.006**	0.002	**39**	0.008	**0.008**		
Chloride	(08/16/2007-	**6**	(580.-292.)	**342.5**	35	**373**	107	**29**	372	**529**		
Fluoride	(08/16/2007-	**6**	(1.8-1.5)	**1.6**	0.1	**1.62**	0.12	**7**	1.68	**1.78**		
Sulfate	(08/16/2007-	**6**	(2900.-2000.)	**2625**	225	**2550**	338	**13**	2788	**2875**	6	**100**
TDS - 180°C	(08/16/2007-	**6**	(6790.-5640.)	**5820**	175	**6000**	452	**8**	6165	**6663**	6	**100**

PCS Baseline KPC-98-01	Dates	n	Range	Median	MAD	Average	Standard Deviation	Percent Relative Standard Deviation	Q3	95th Percentile	Exceedance of Livestock Criteria	
											n	%
pH	(03/29/1998-	**8**	(9.1-7.7)	**7.785**	0.07	**8.0**	0.5	**6**	7.9	**8.7**	1	**13**
Conductivity (umho/cm)												
Boron	(03/29/1998-	**8**	(1.11-0.12)	**0.655**	0.05	**0.64**	0.27	**42**	0.70	**0.97**		
Iron (total)	(03/29/1998-	**8**	(29.5-0.16)	**2.125**	1.53	**5.68**	9.91	**175**	3.93	**21.84**		
Manganese	(03/29/1998-	**8**	(0.08-0.013)	**0.0545**	0.0142	**0.051**	0.021	**41**	0.064	**0.076**		
Selenium	(03/29/1998-	**8**	(0.011-0.0025)	**0.005**	0.0013	**0.005**	0.003	**54**	0.005	**0.009**		
Chloride	(03/29/1998-	**8**	(310.-39.)	**227**	16	**209**	78	**37**	238	**287**		
Fluoride	(03/29/1998-	**8**	(2.29-1.13)	**1.4**	0.1	**1.48**	0.35	**24**	1.50	**2.01**	1	**13**
Sulfate	(03/29/1998-	**8**	(3900.-350.)	**3325**	275	**3010**	1136	**38**	3500	**3865**	7	**88**
TDS - 180°C	(03/29/1998-	**8**	(6640.-800.)	**5975**	270	**5308**	1896	**36**	6135	**6542**	7	**88**

Appendix F - Groundwater Data Summary

Chaco Alluvial Graphs



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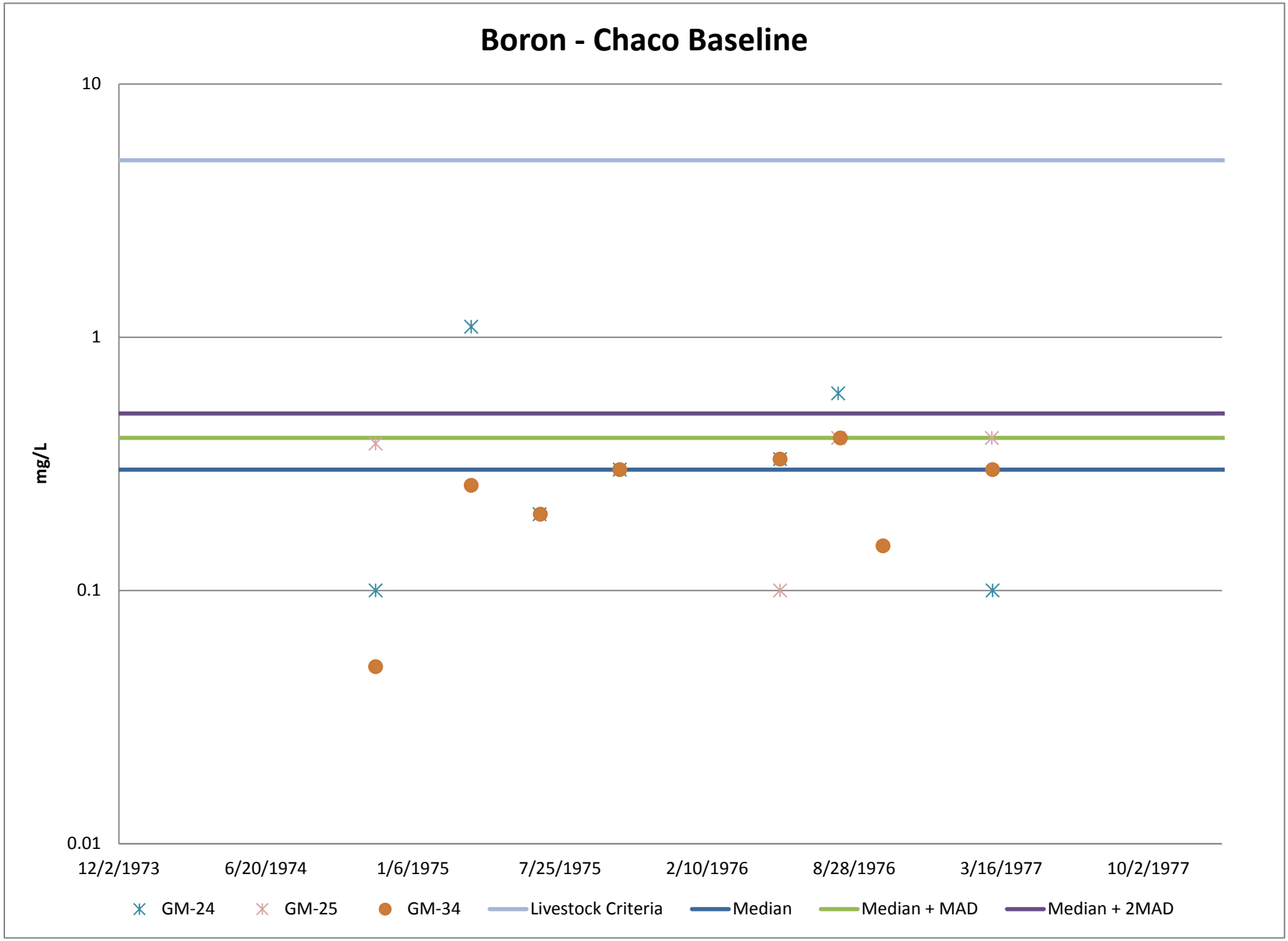
Chaco Alluvial Graphs



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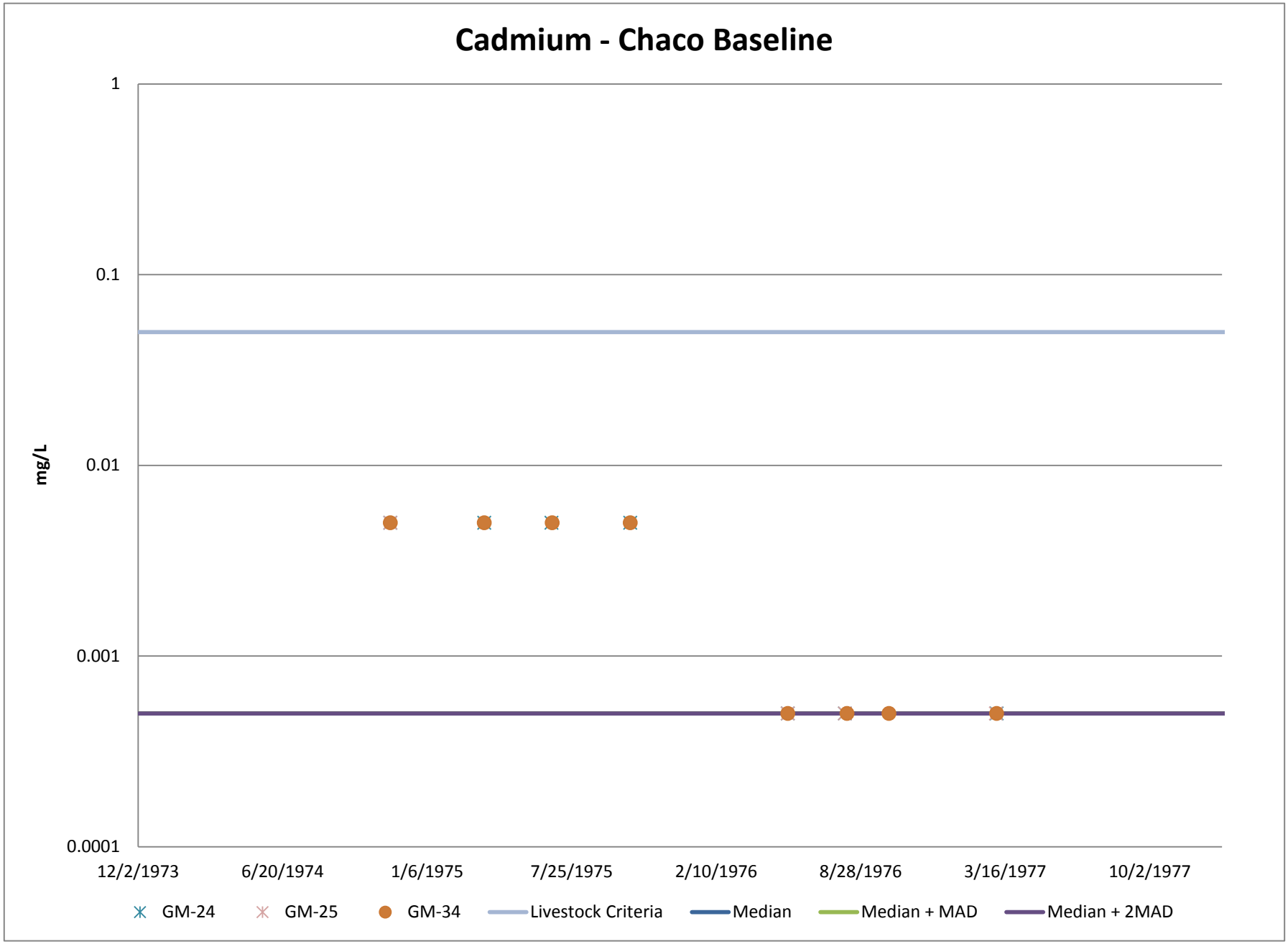
Chaco Alluvial Graphs



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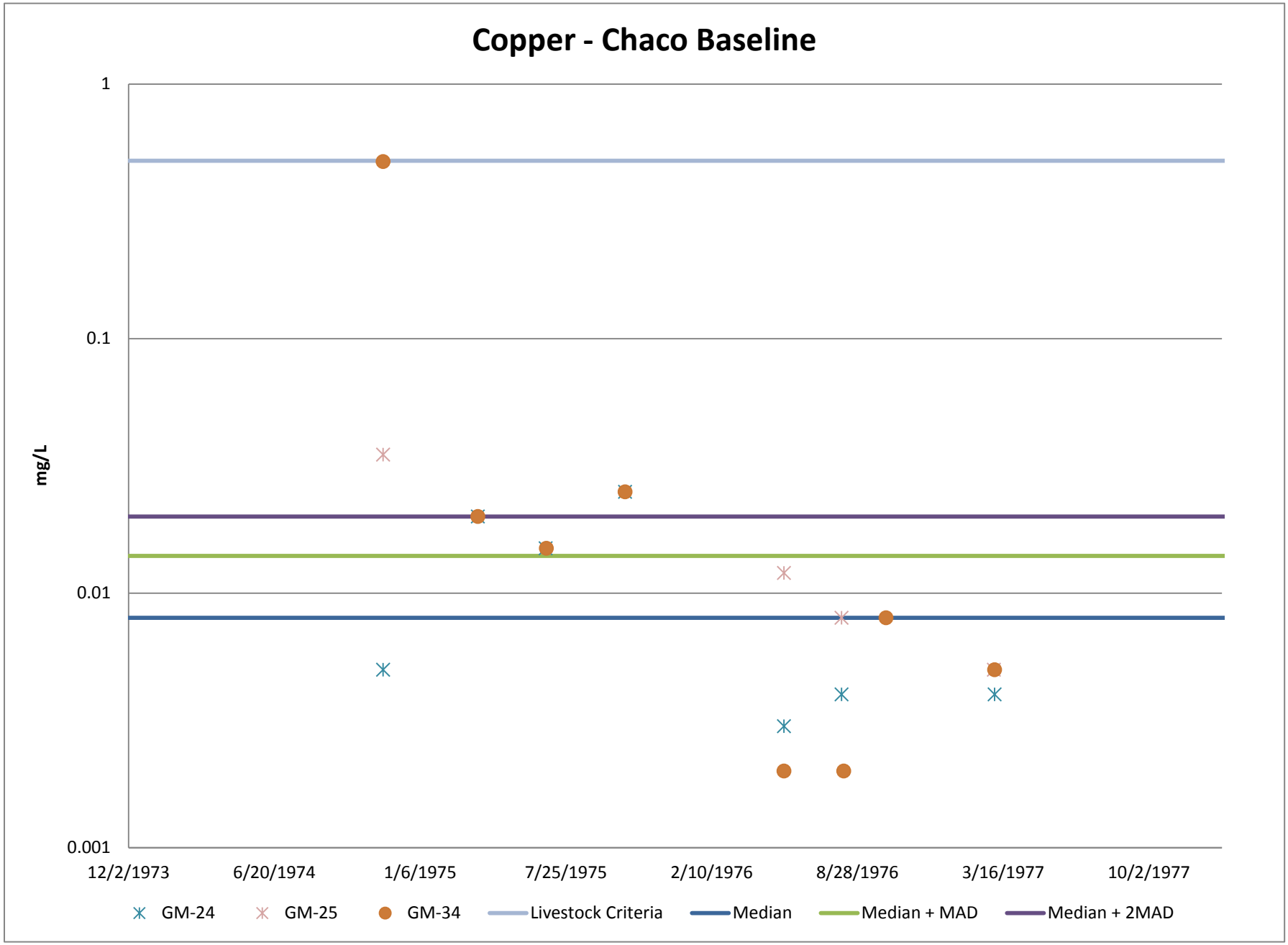
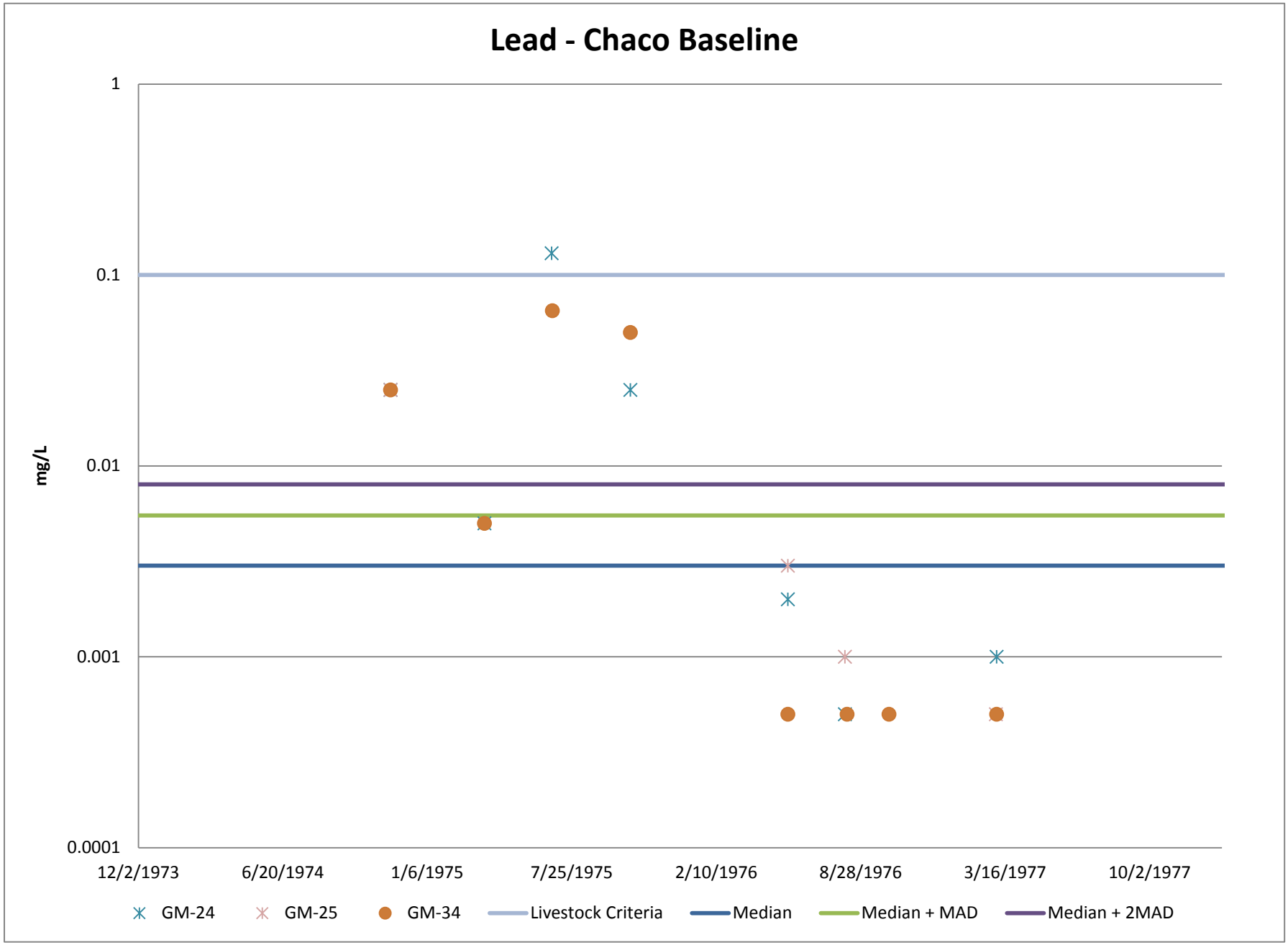
Chaco Alluvial Graphs



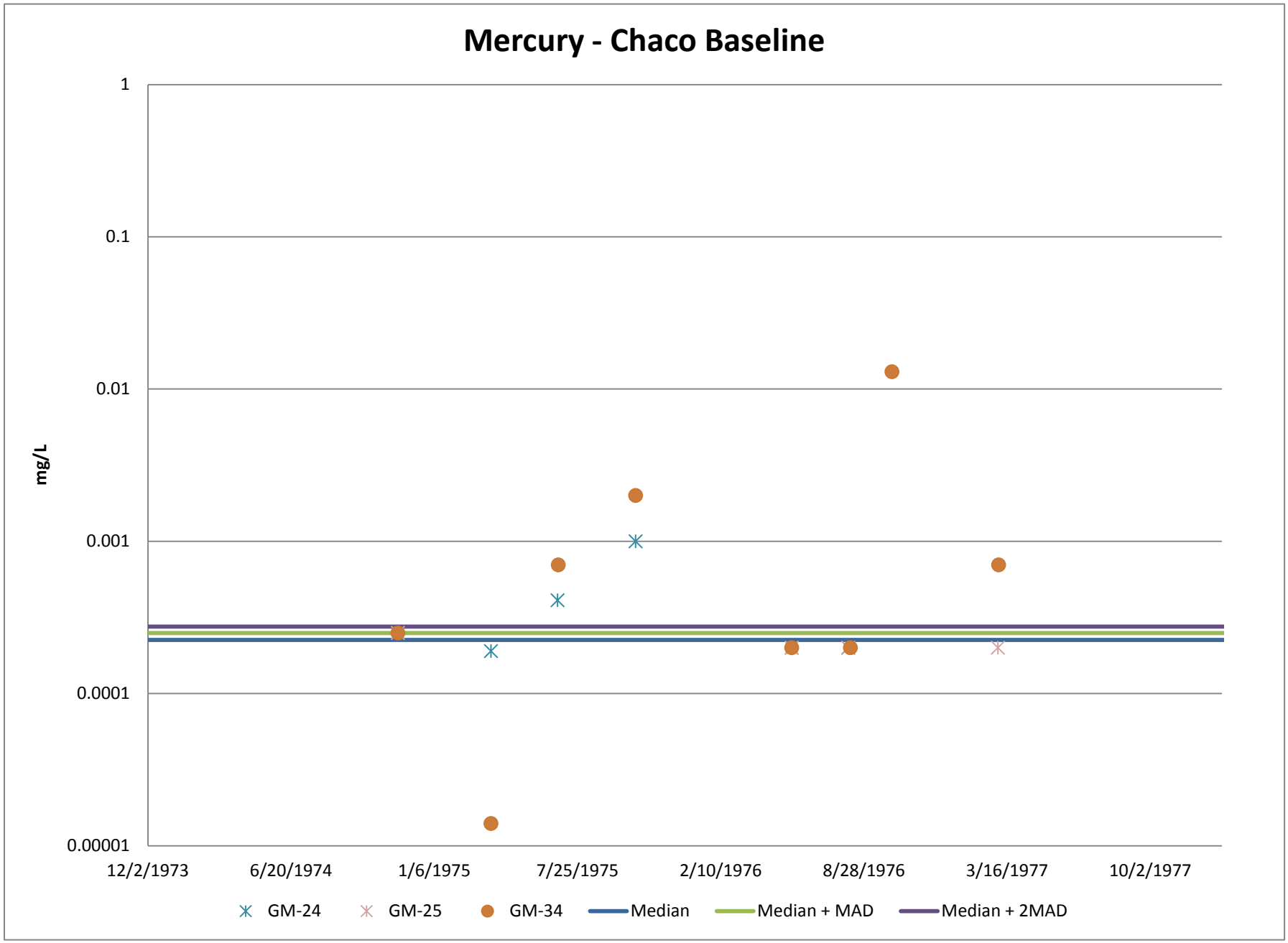
Appendix F - Groundwater Data Summary

Chaco Alluvial Graphs



Appendix F - Groundwater Data Summary

Chaco Alluvial Graphs



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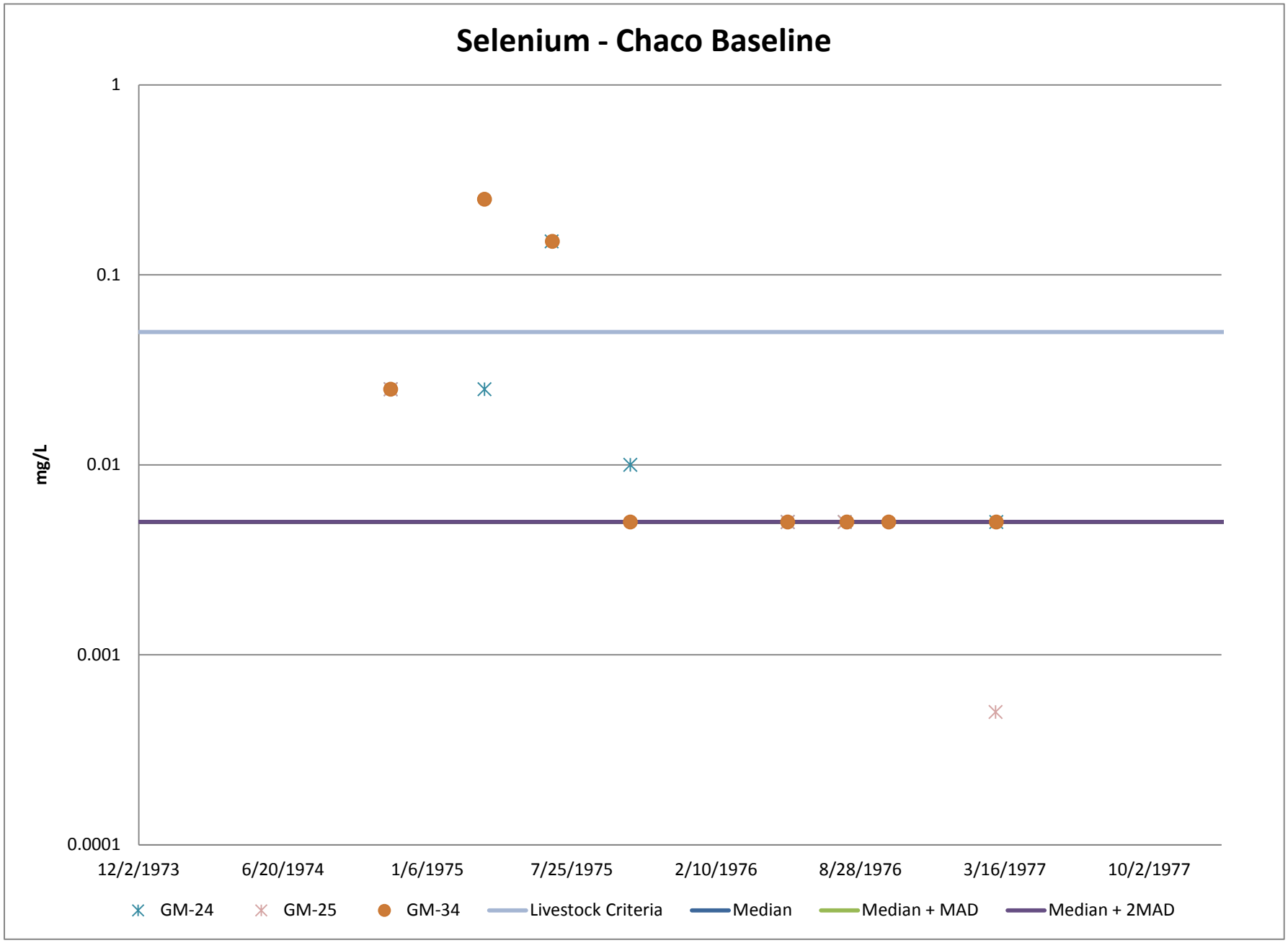
Chaco Alluvial Graphs



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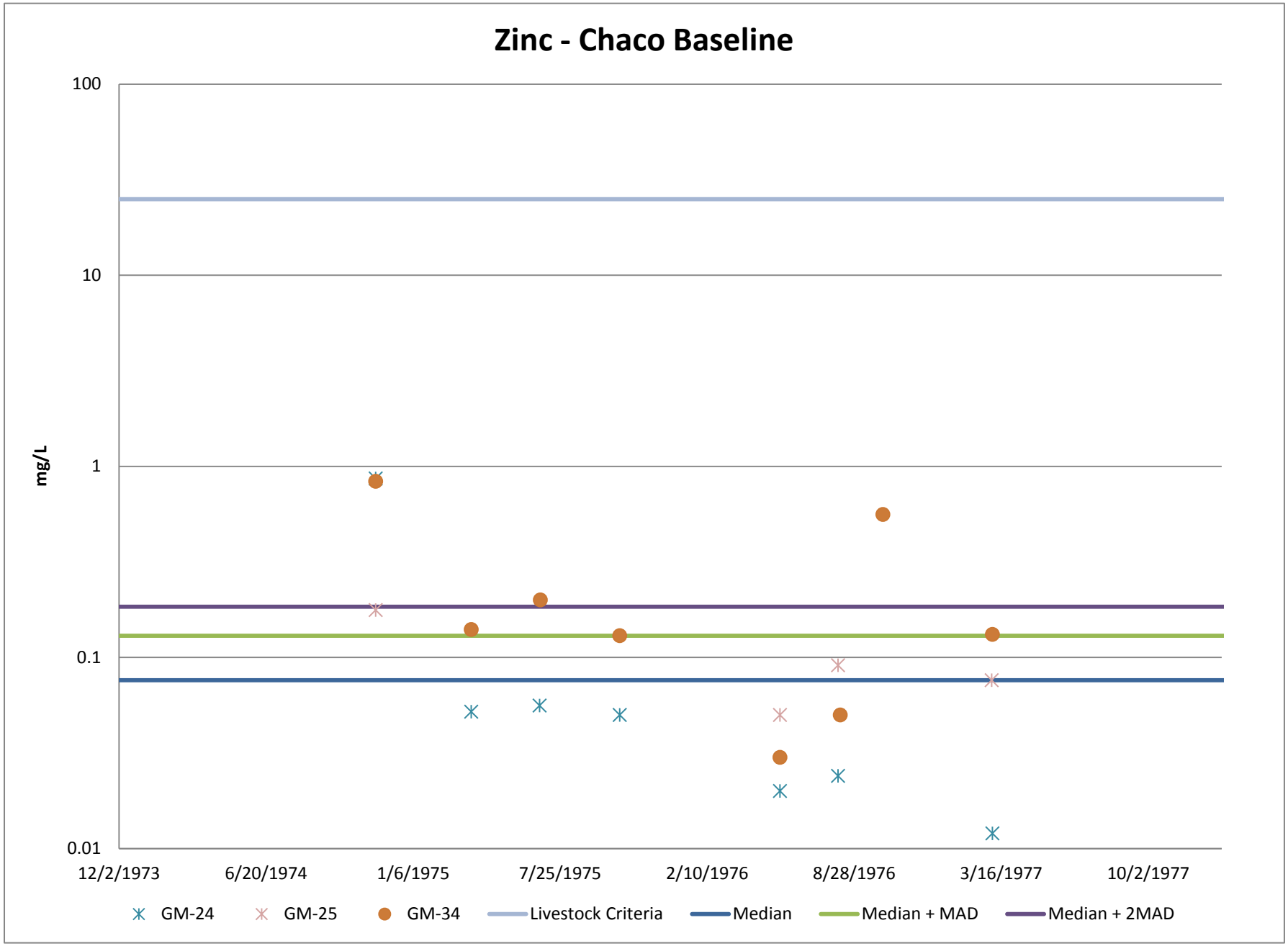
Chaco Alluvial Graphs



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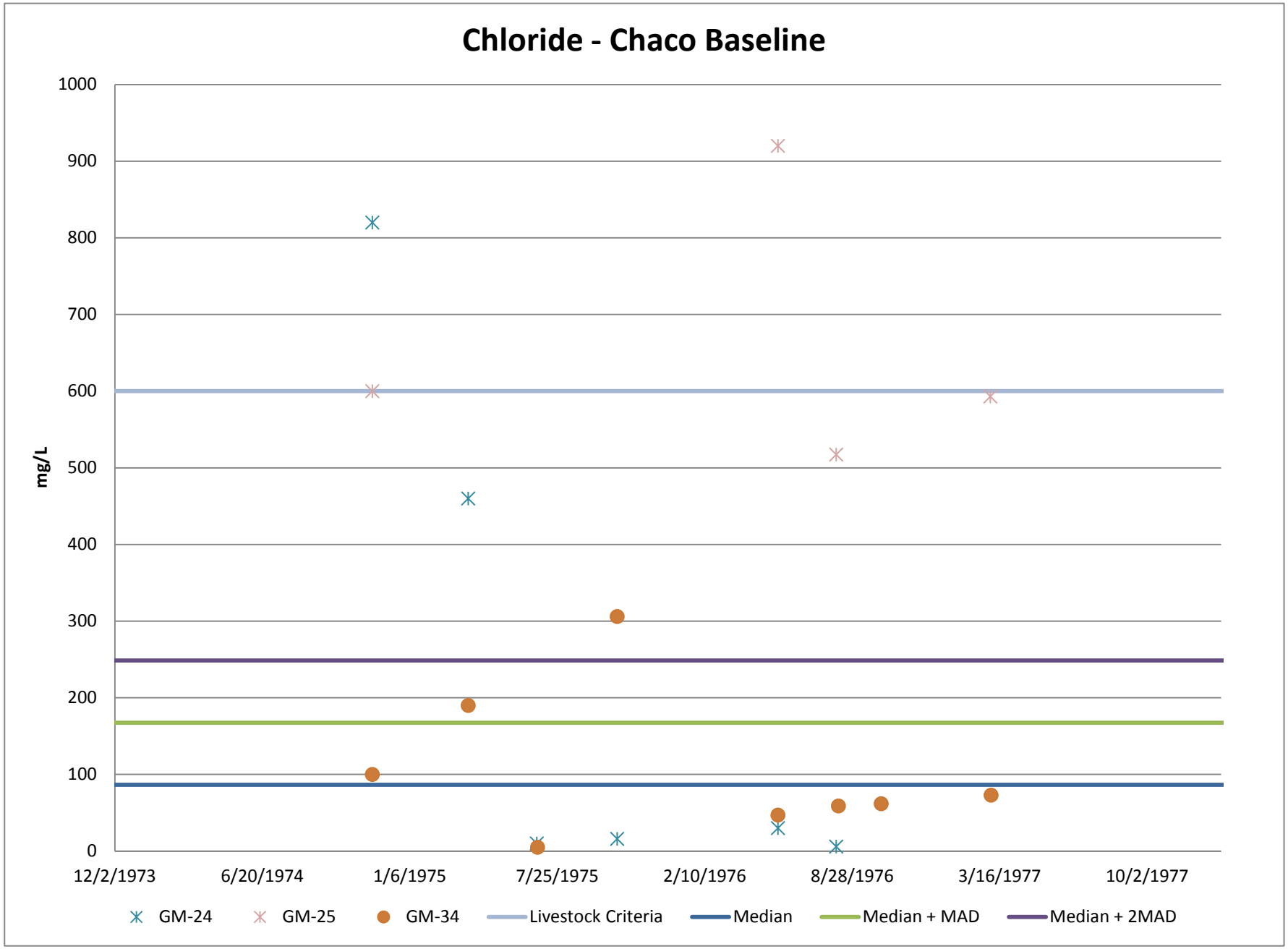
Chaco Alluvial Graphs



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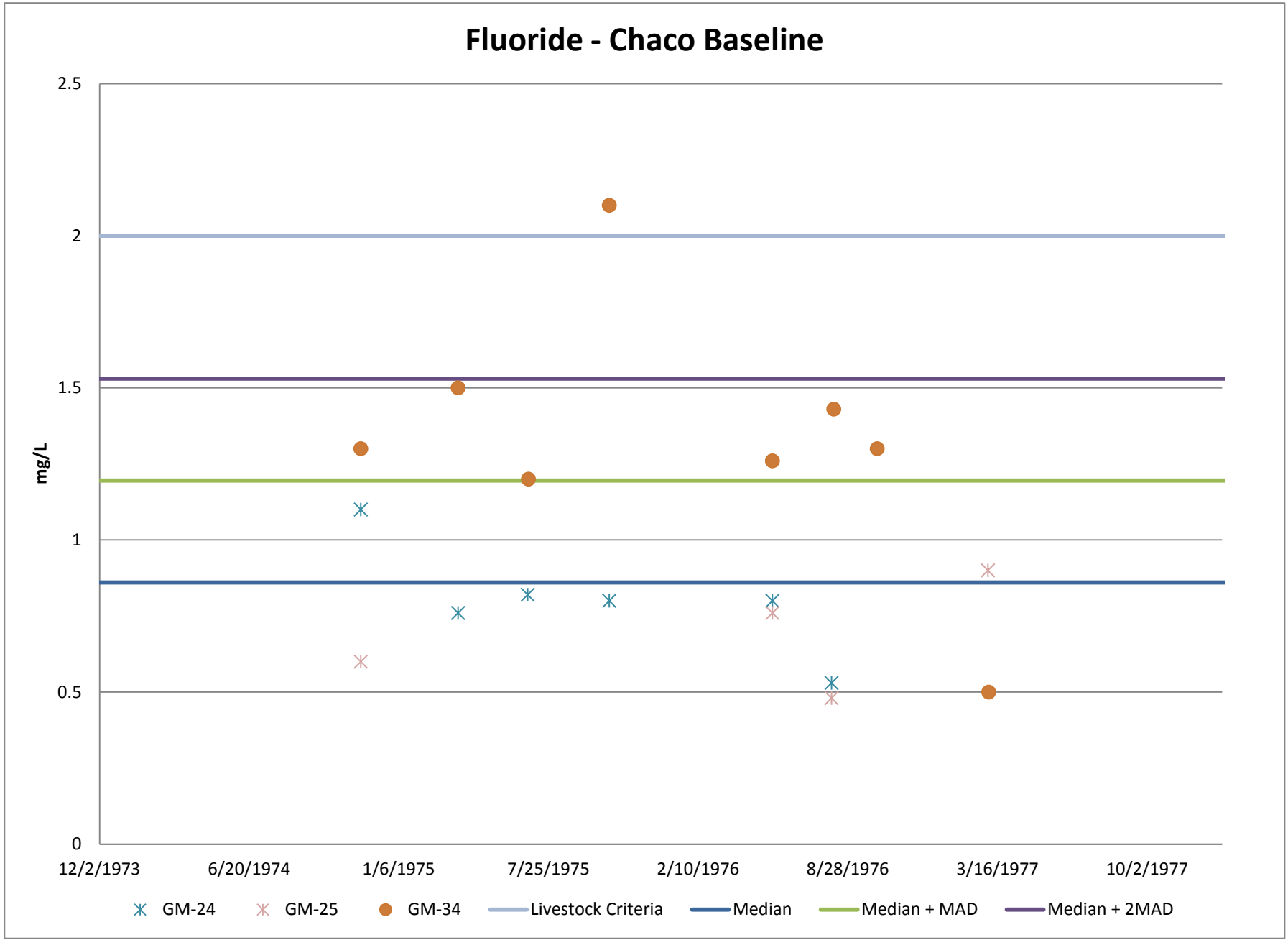
Chaco Alluvial Graphs



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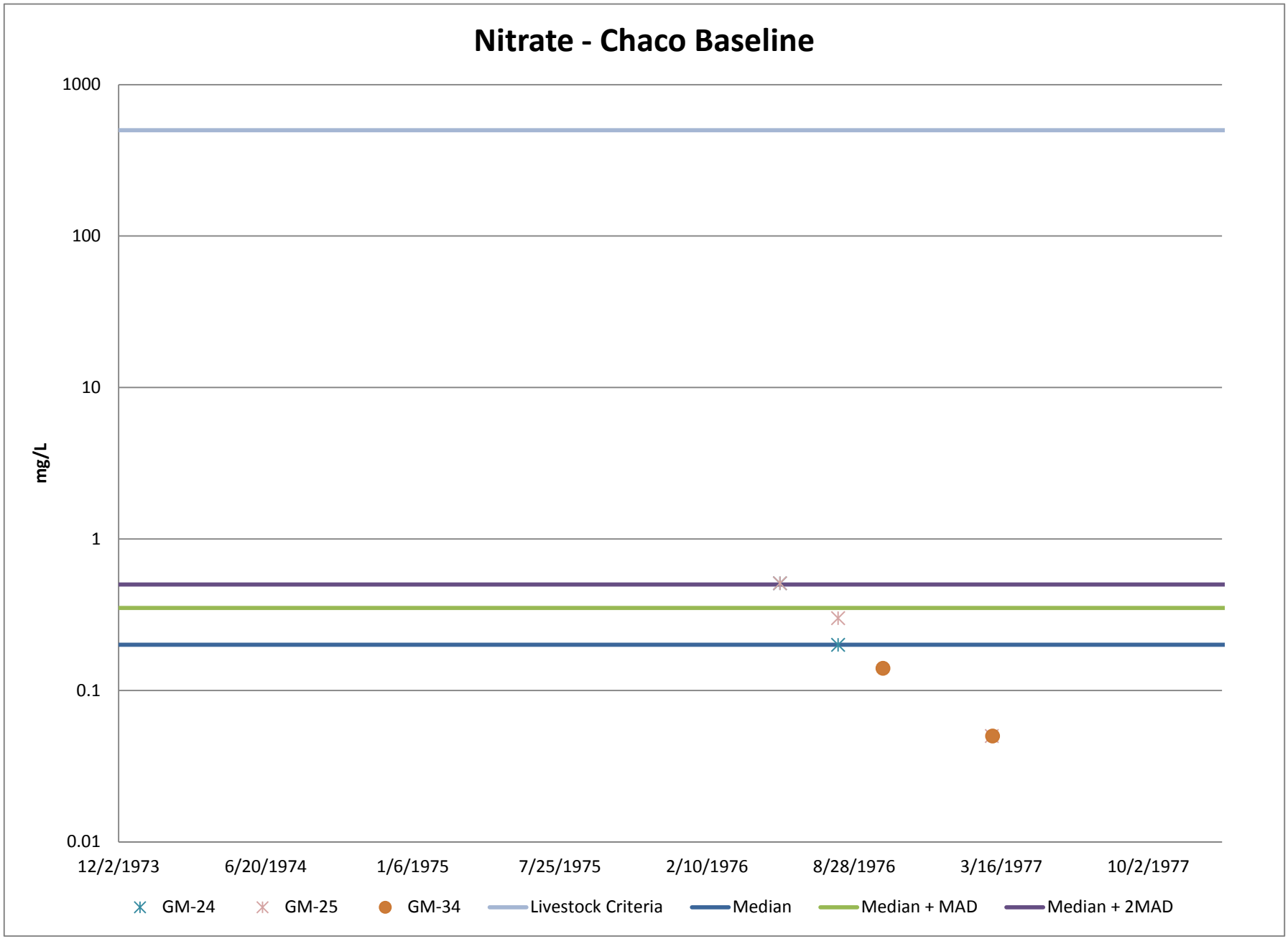
Chaco Alluvial Graphs



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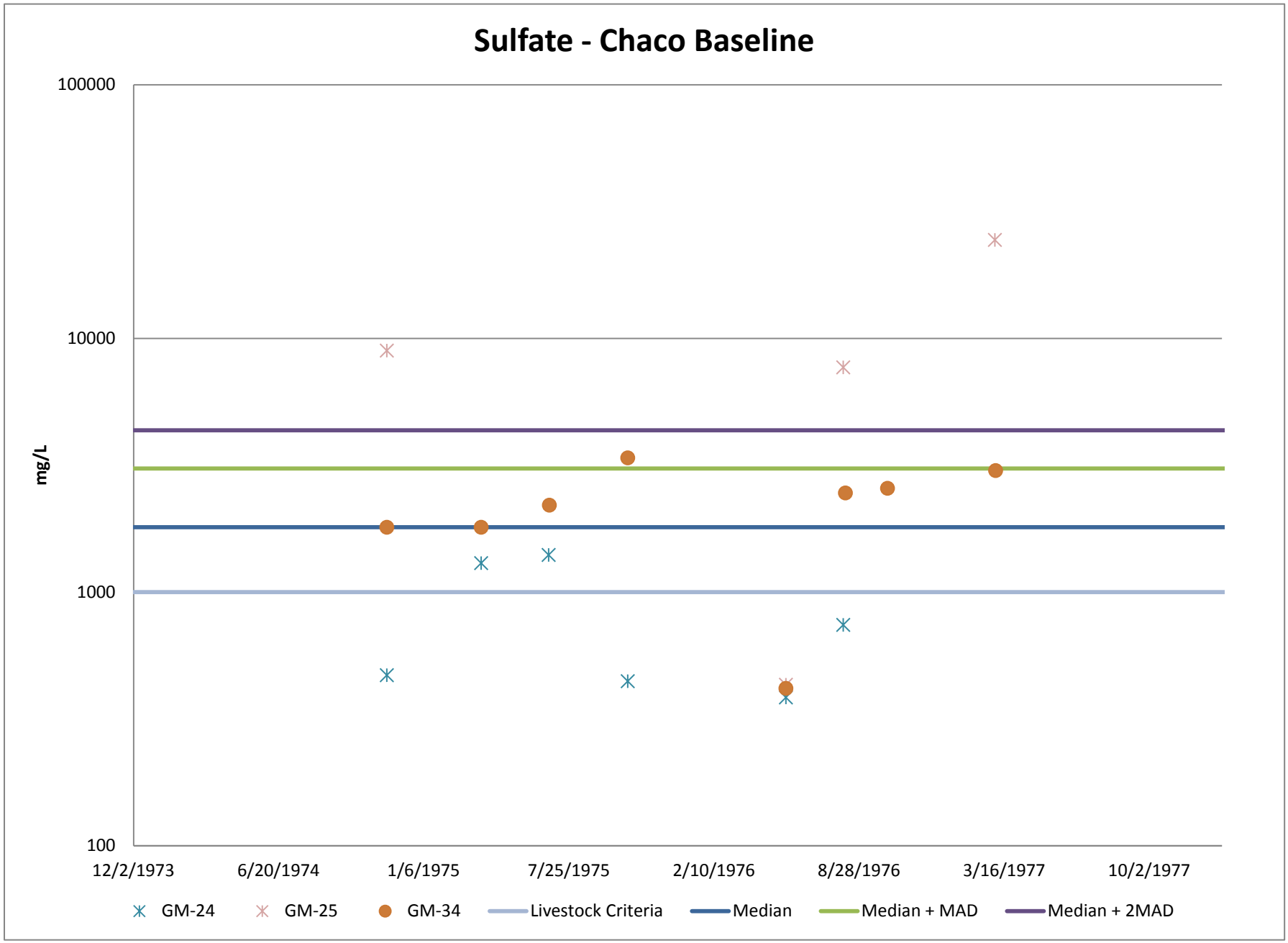
Chaco Alluvial Graphs



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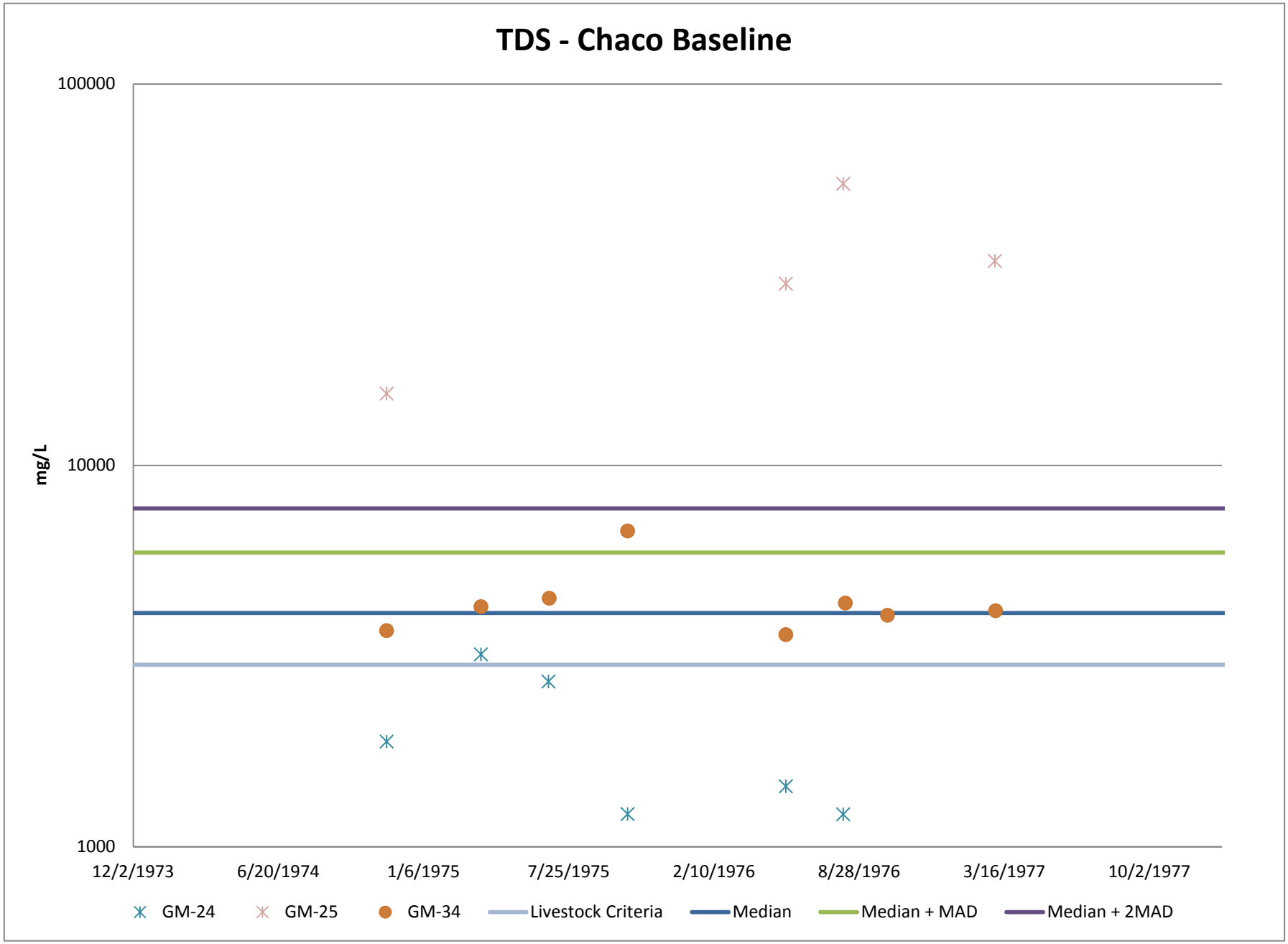
Chaco Alluvial Graphs



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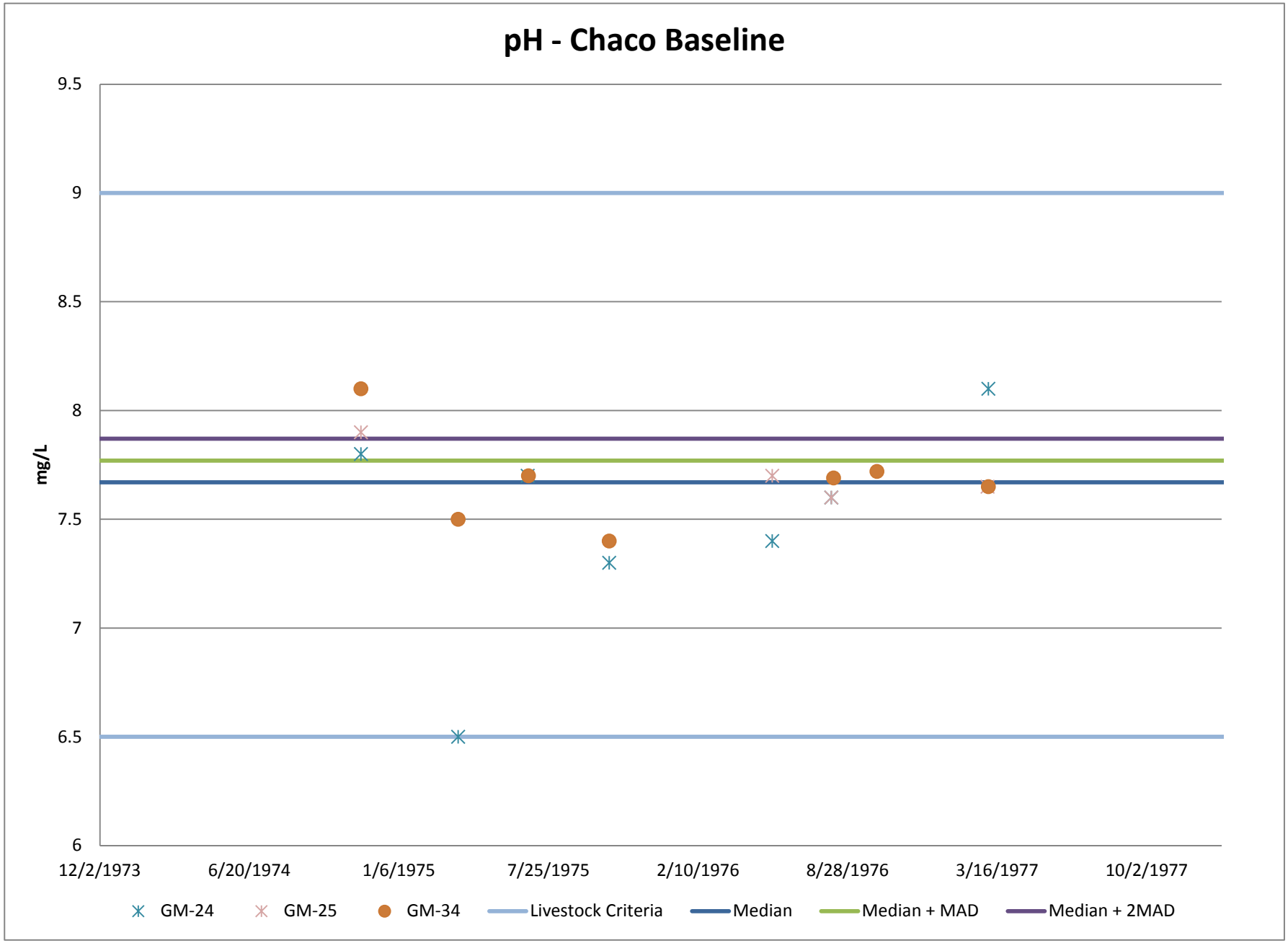
Chaco Alluvial Graphs



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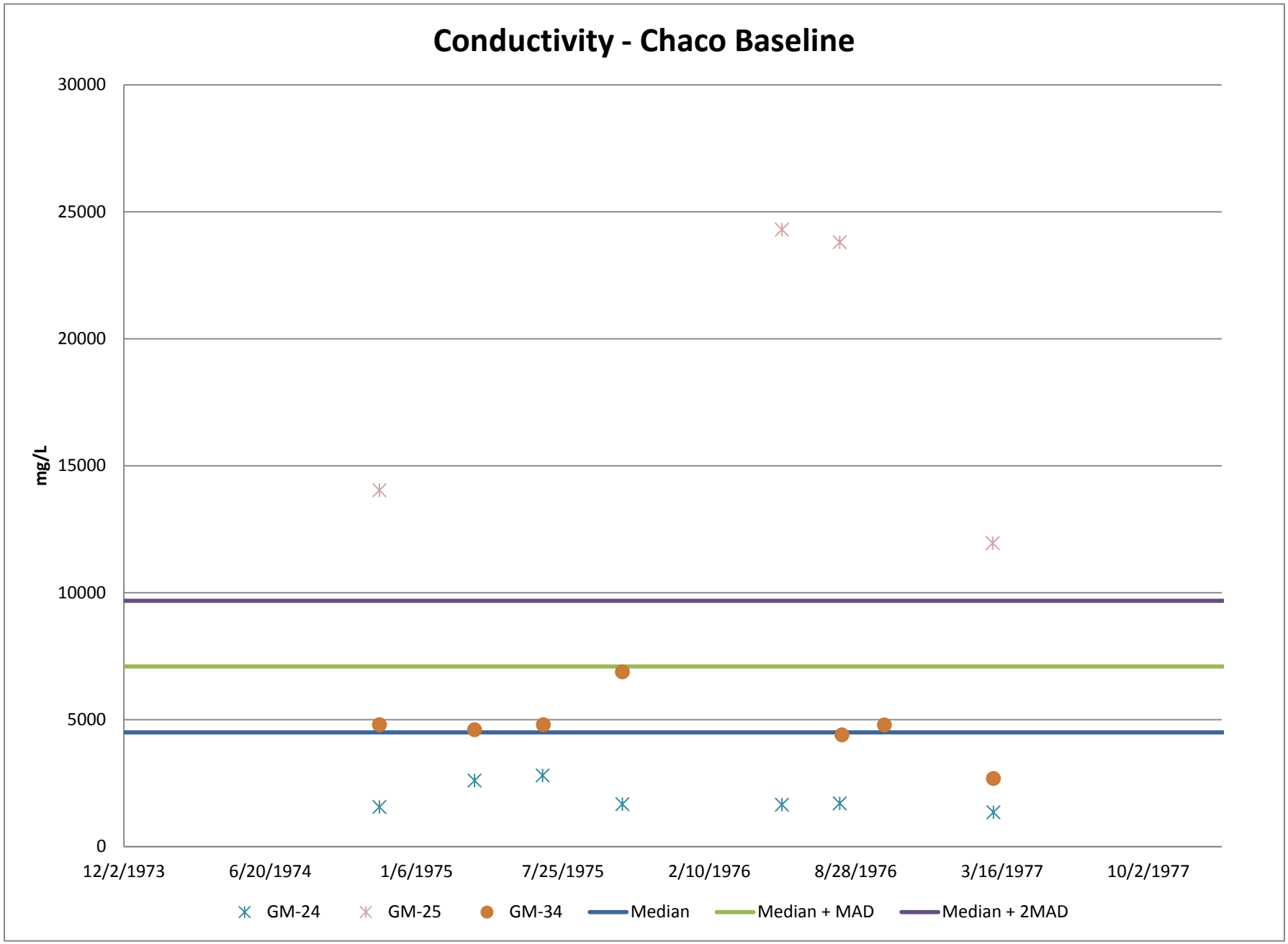
Chaco Alluvial Graphs



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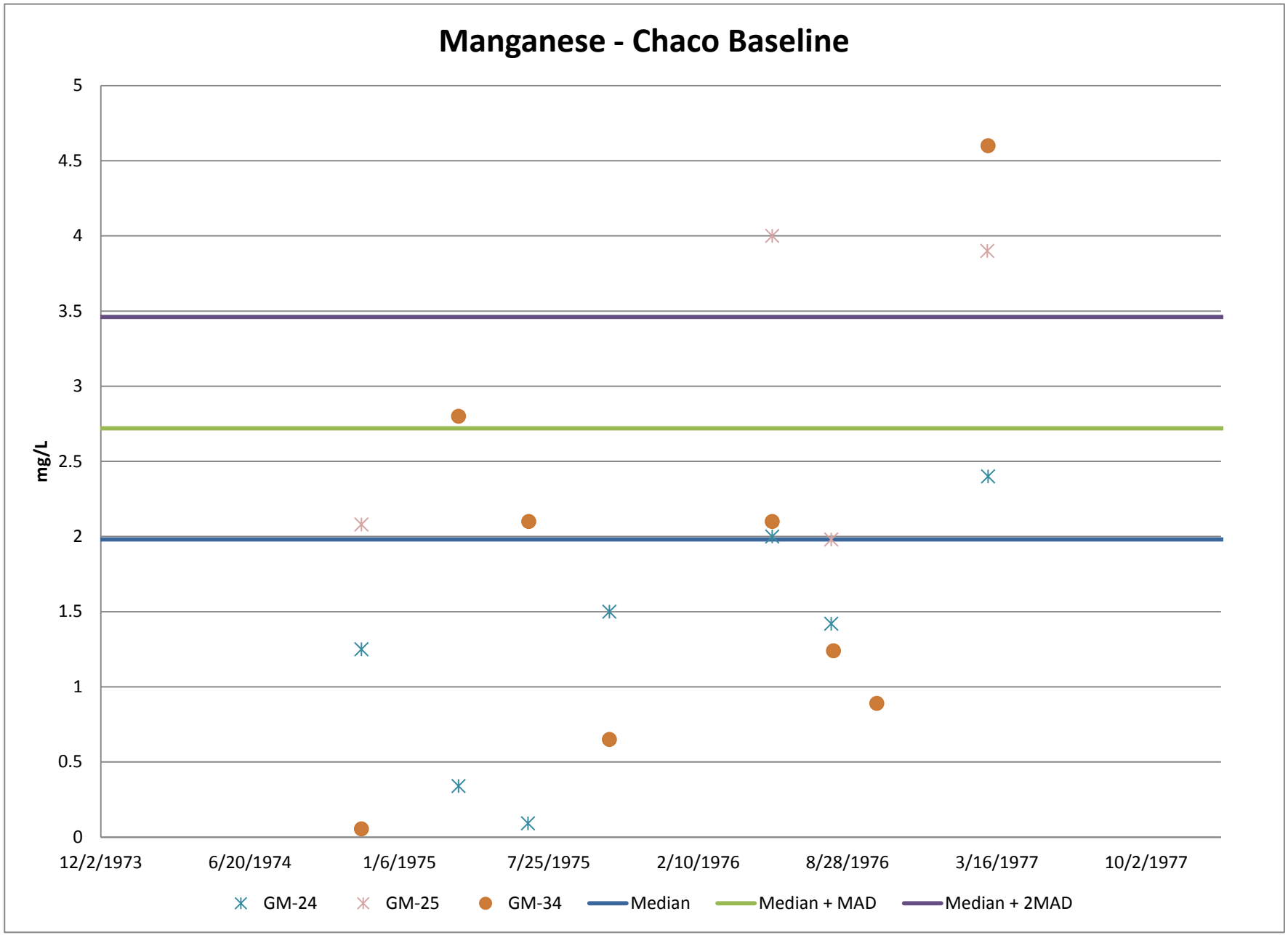
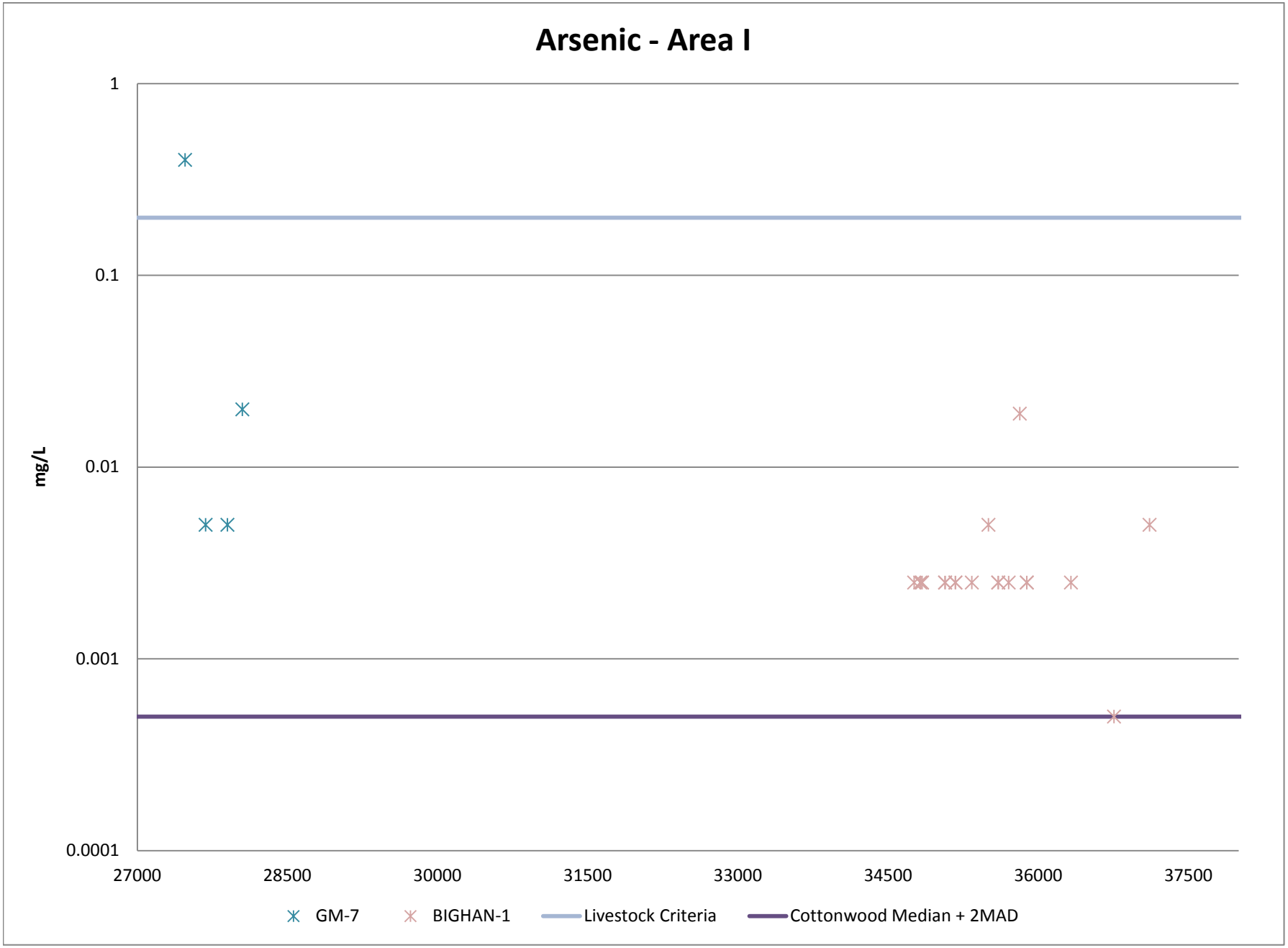
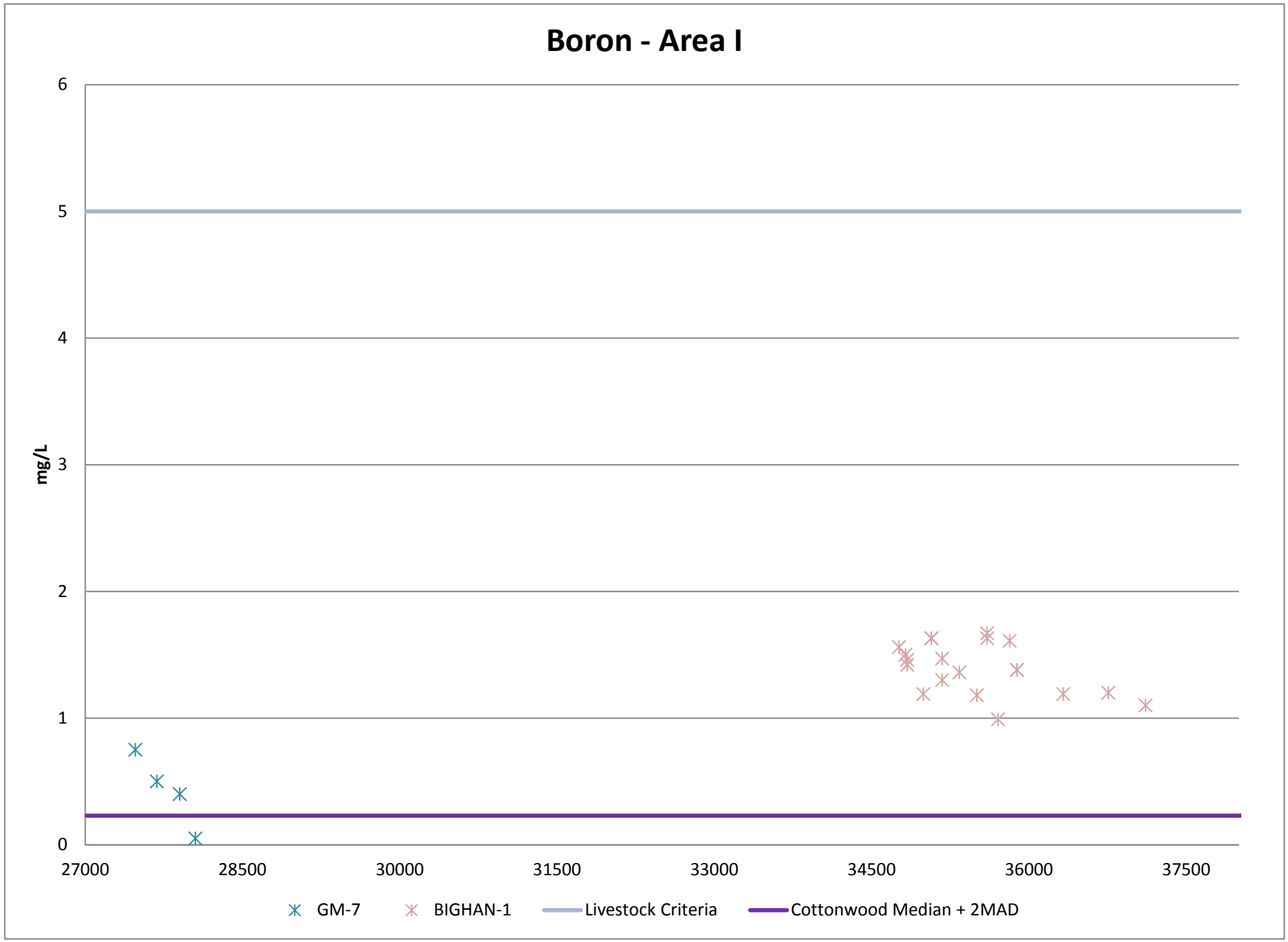
Chaco Alluvial Graphs

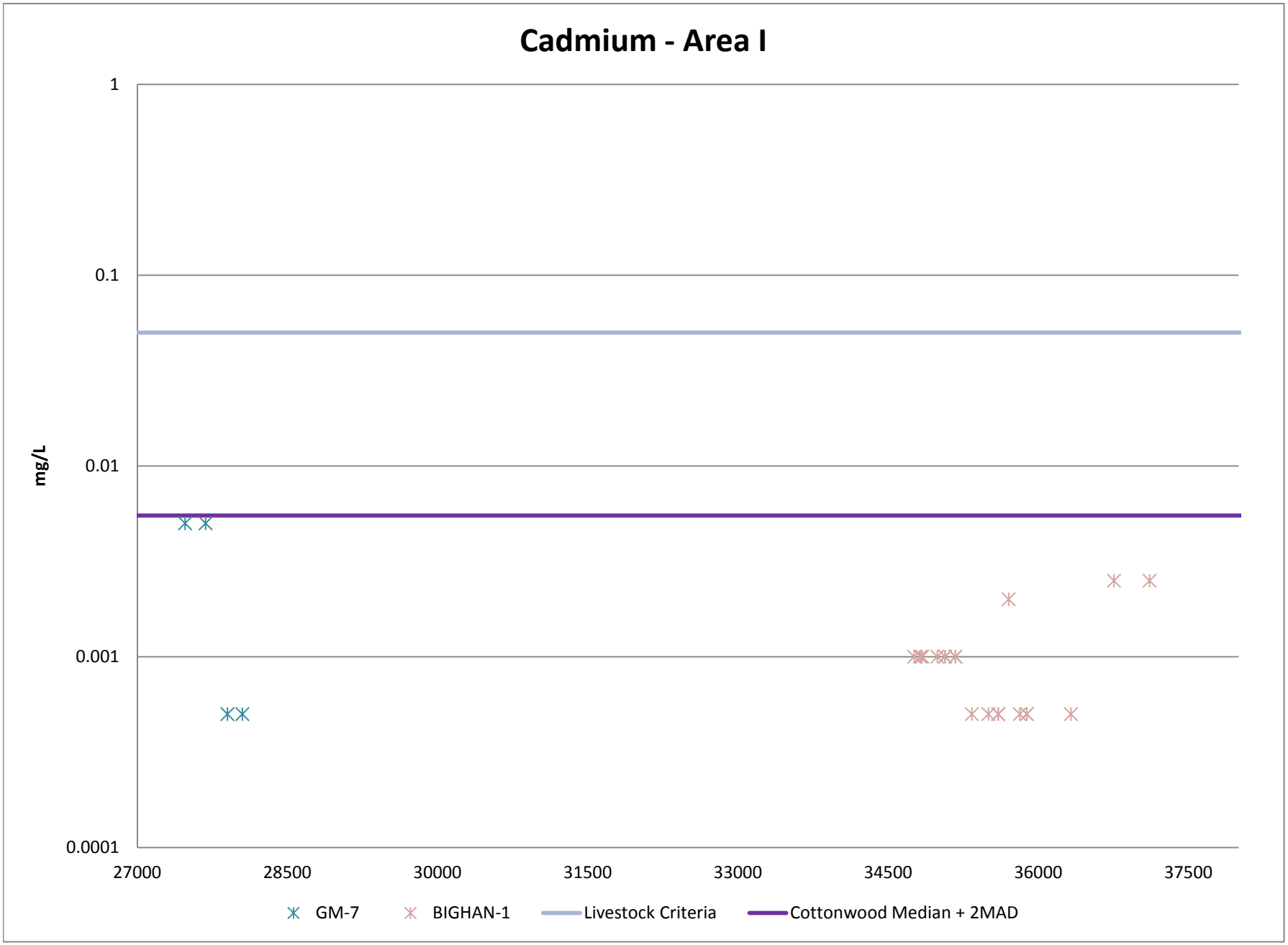


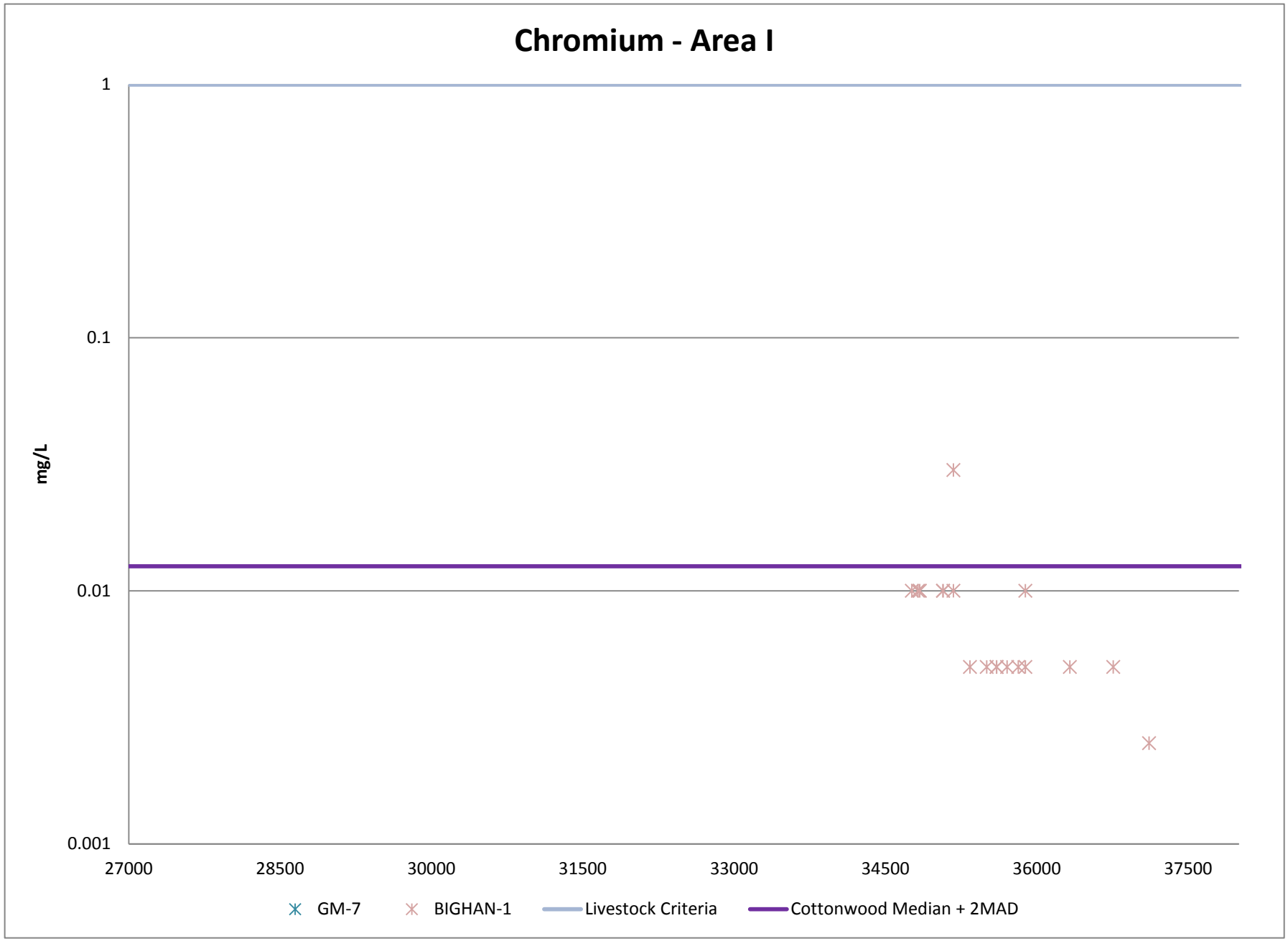
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs

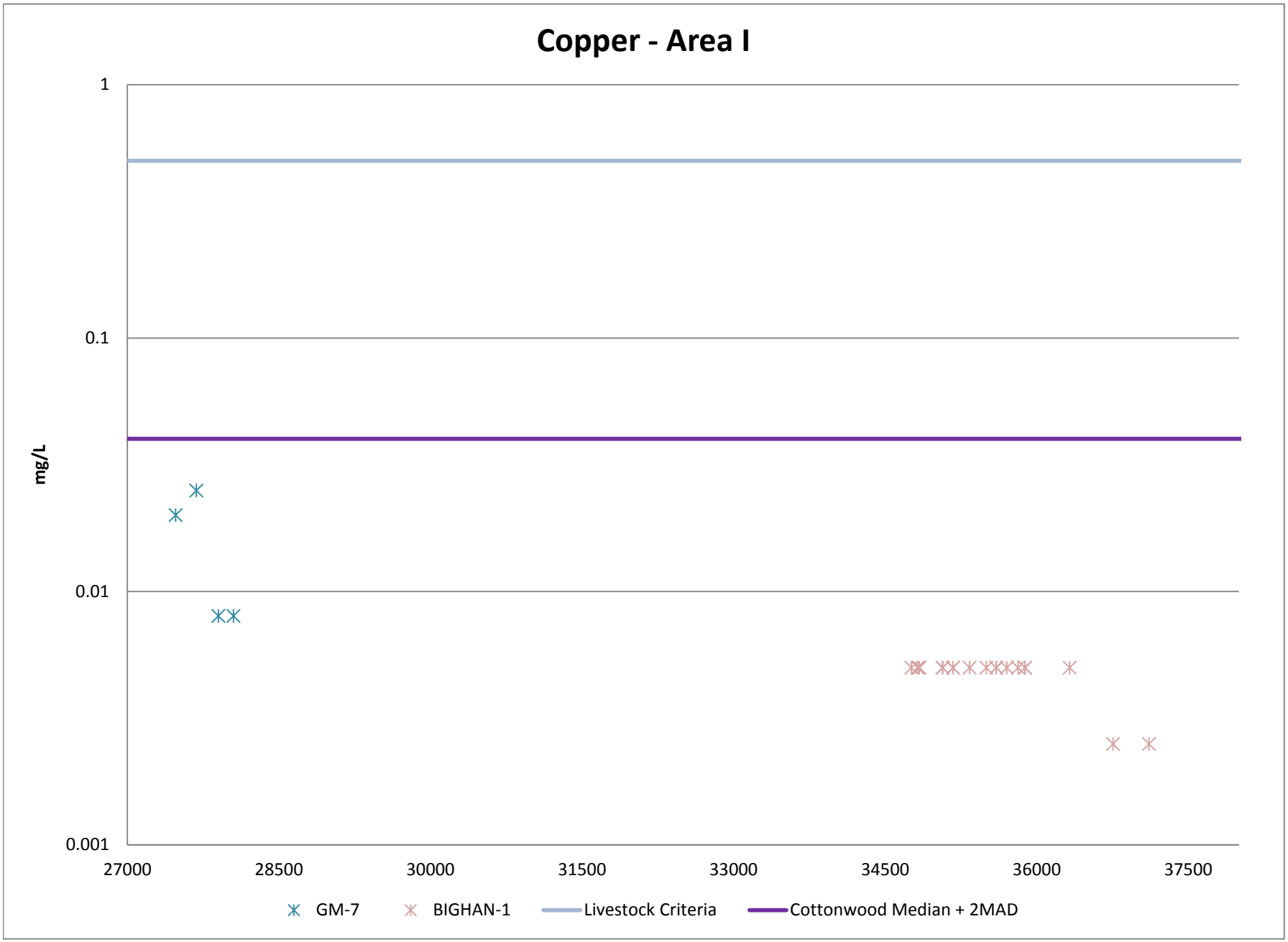



Boron - Area I
mg/L
6
5
4
3
2
1
0
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

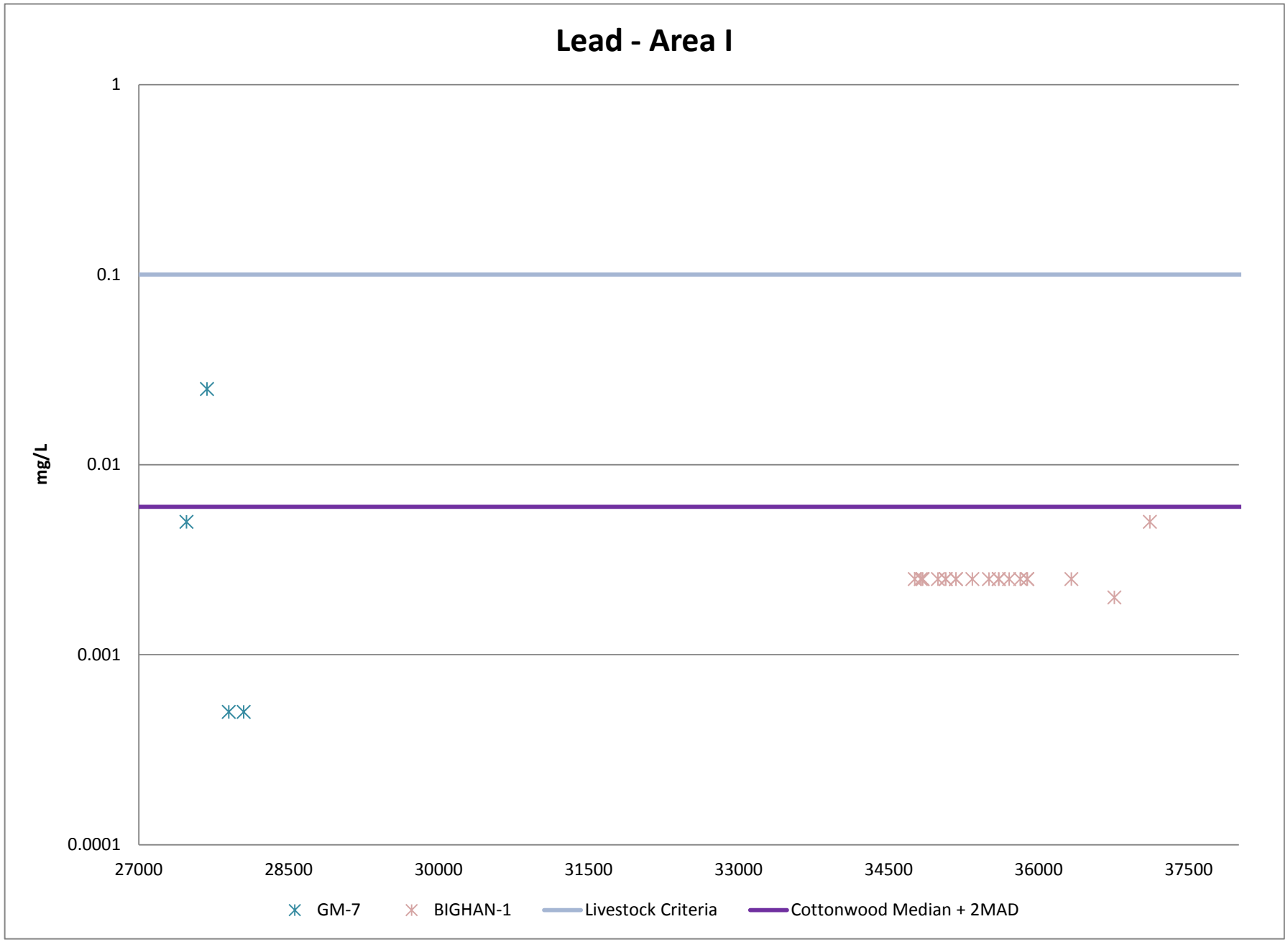
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs

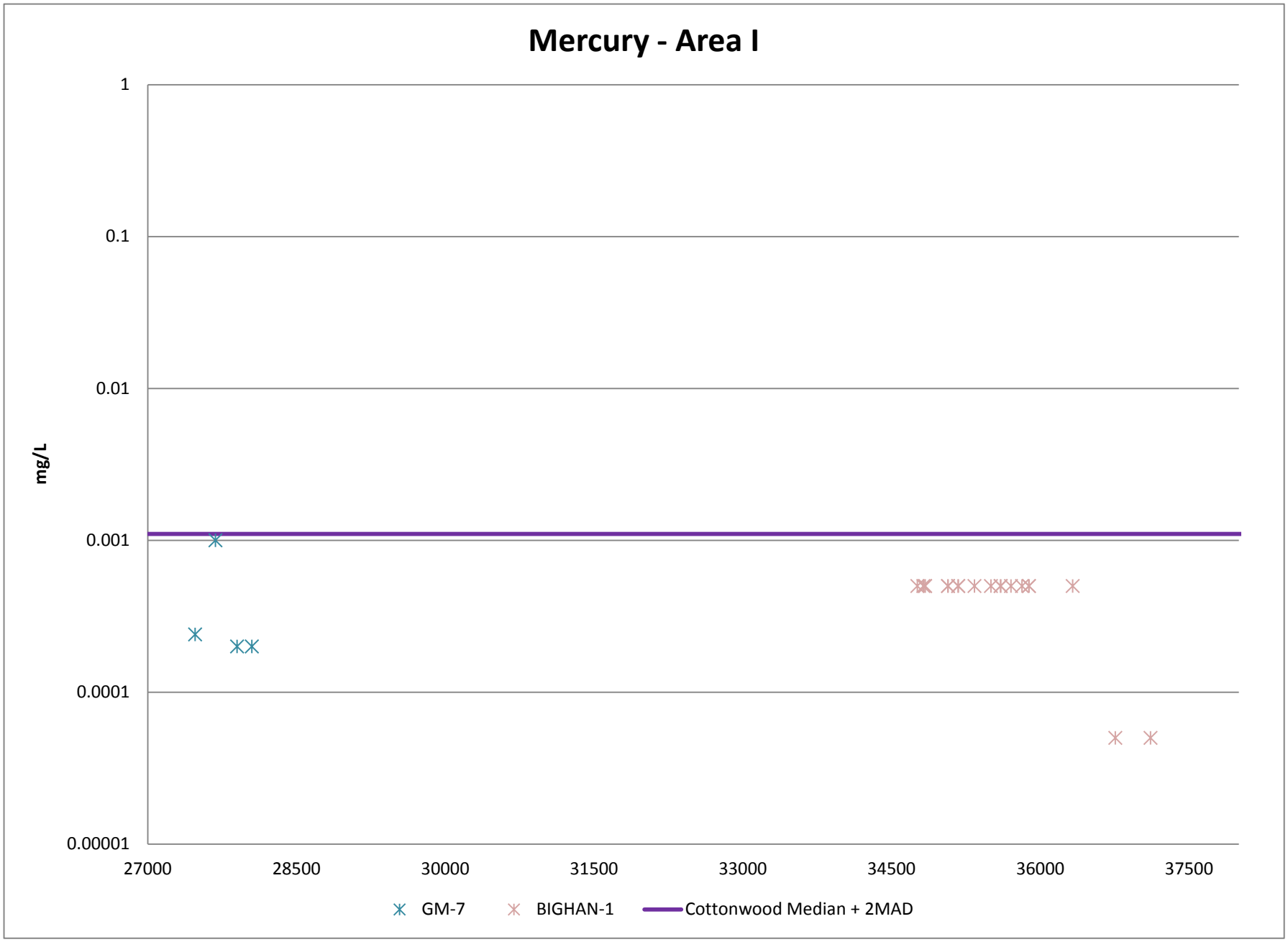


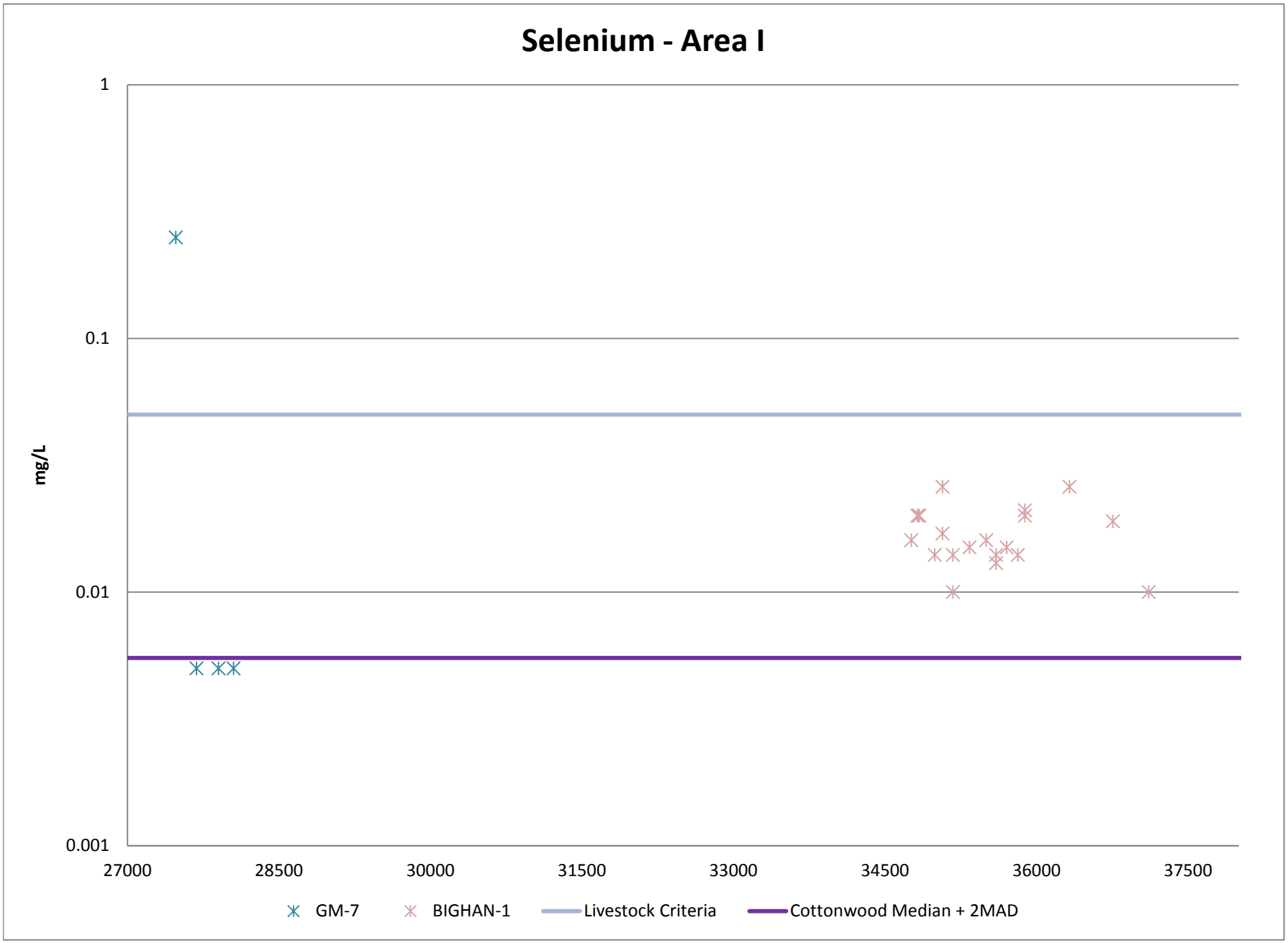

Chromium - Area I
mg/L
1
0.1
0.01
0.001
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

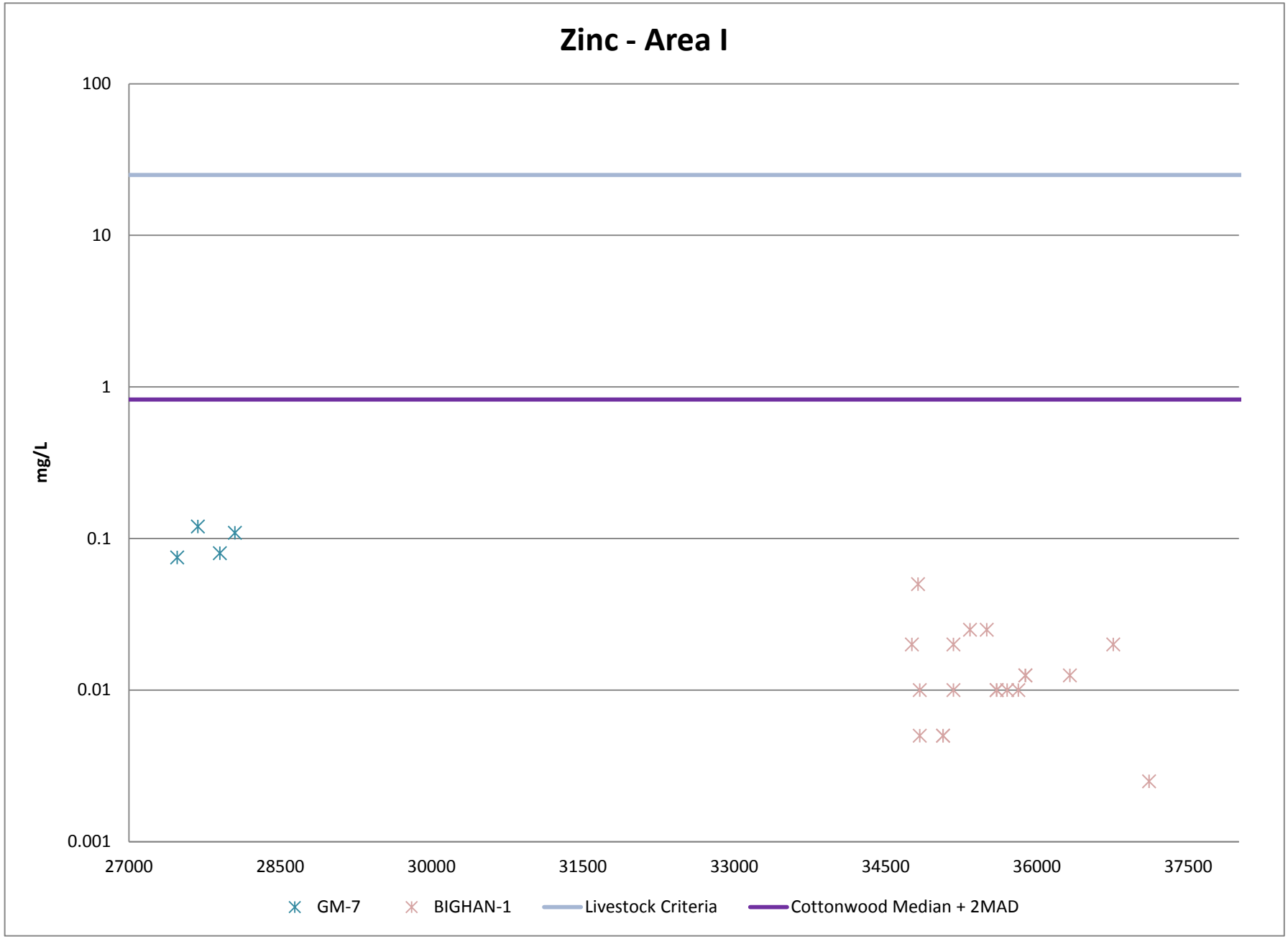

Copper - Area I
1
0.1
0.01
0.001
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

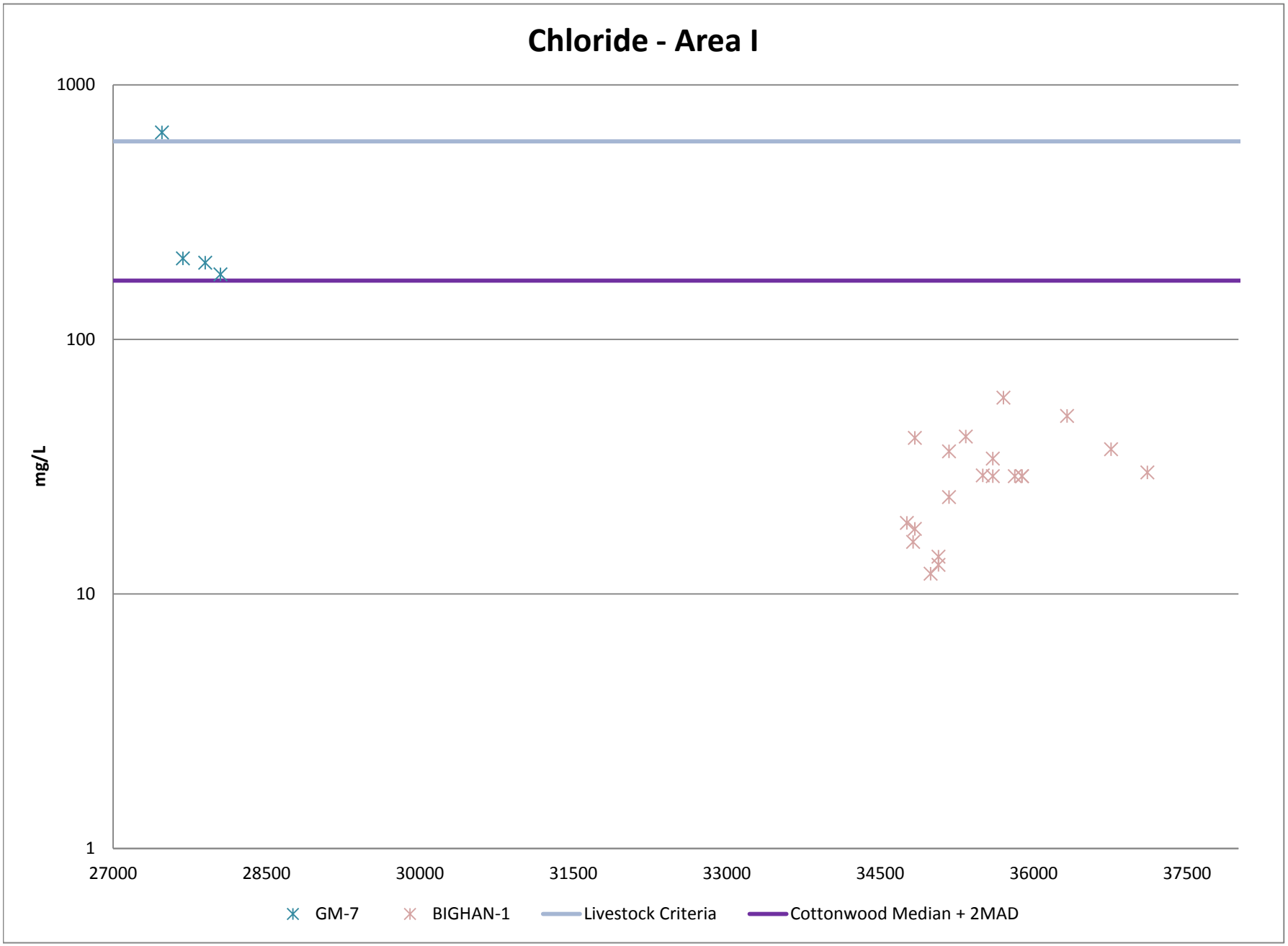
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs

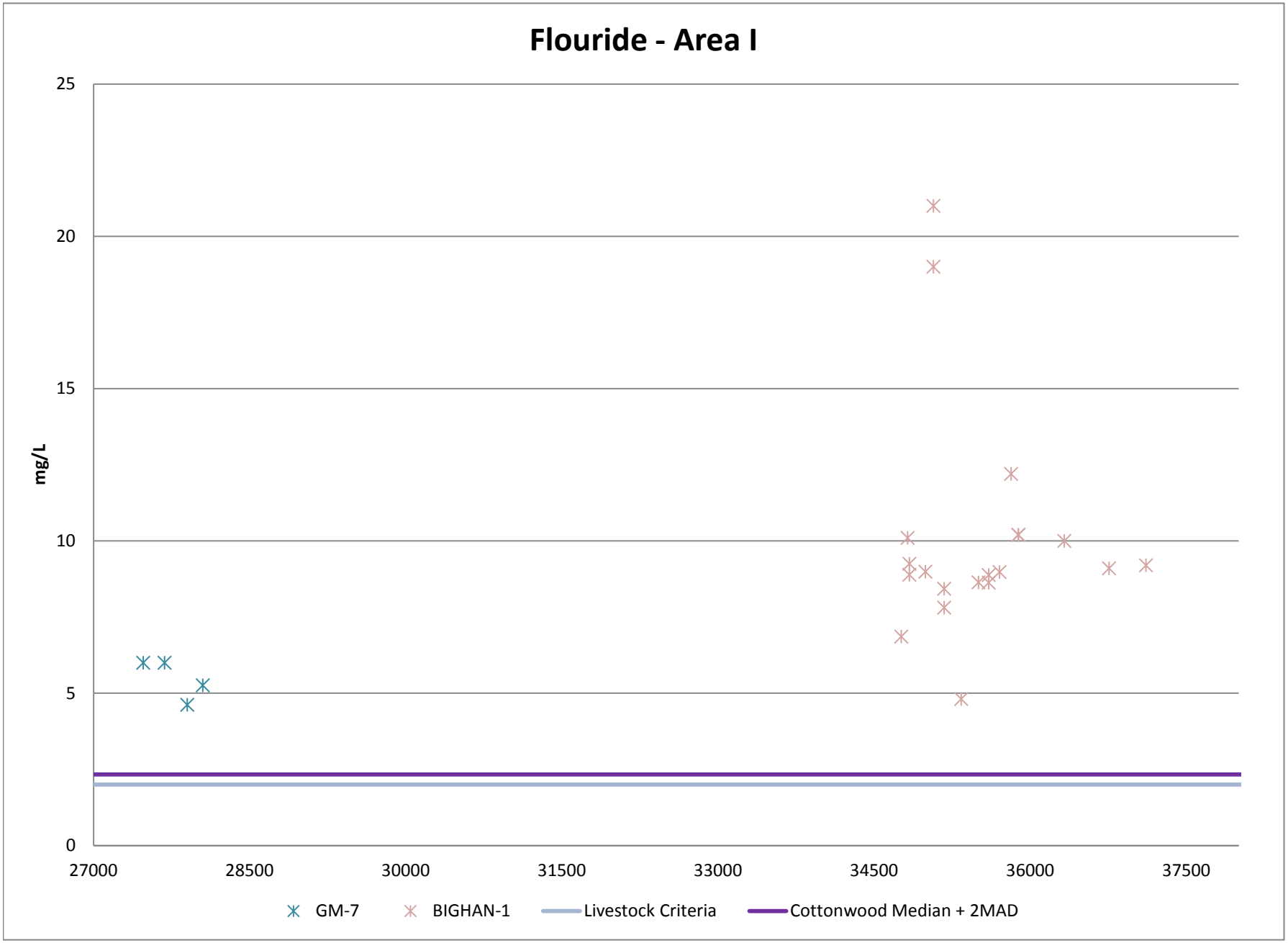


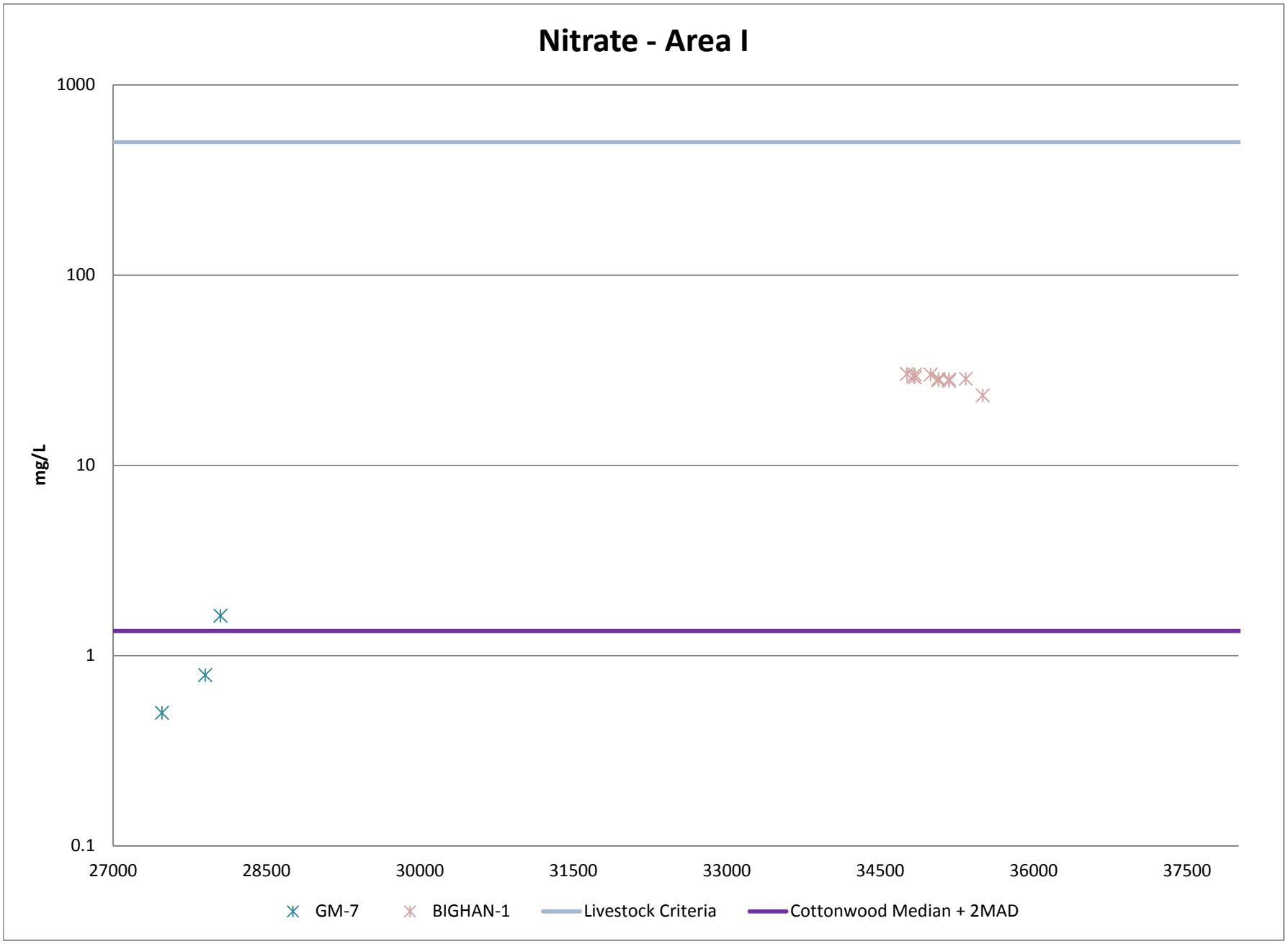

Mercury - Area I
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Cottonwood Median + 2MAD

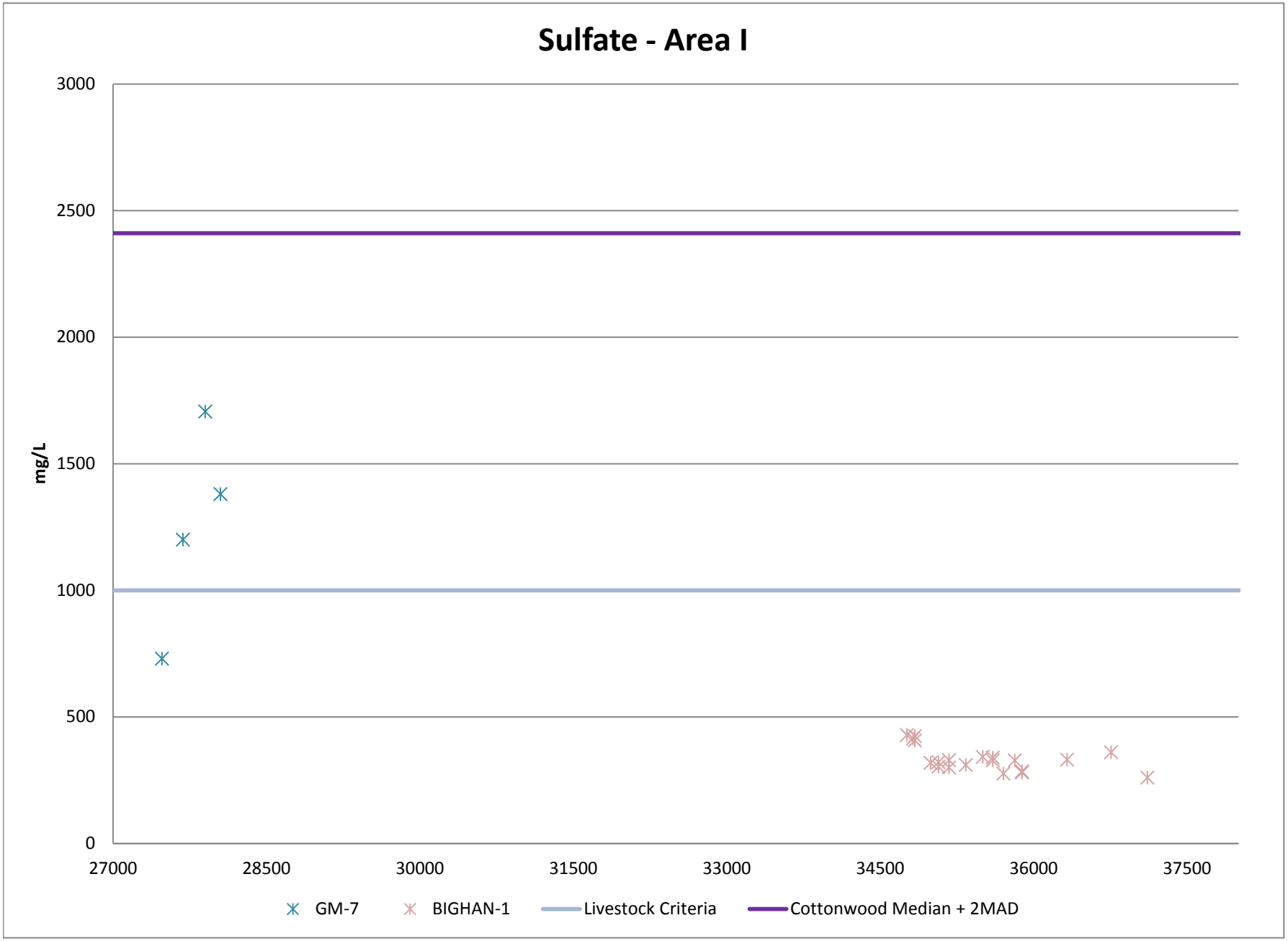

Selenium - Area I
1
0.1
0.01
0.001
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD


Zinc - Area I
100
10
1
0.1
0.01
0.001
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

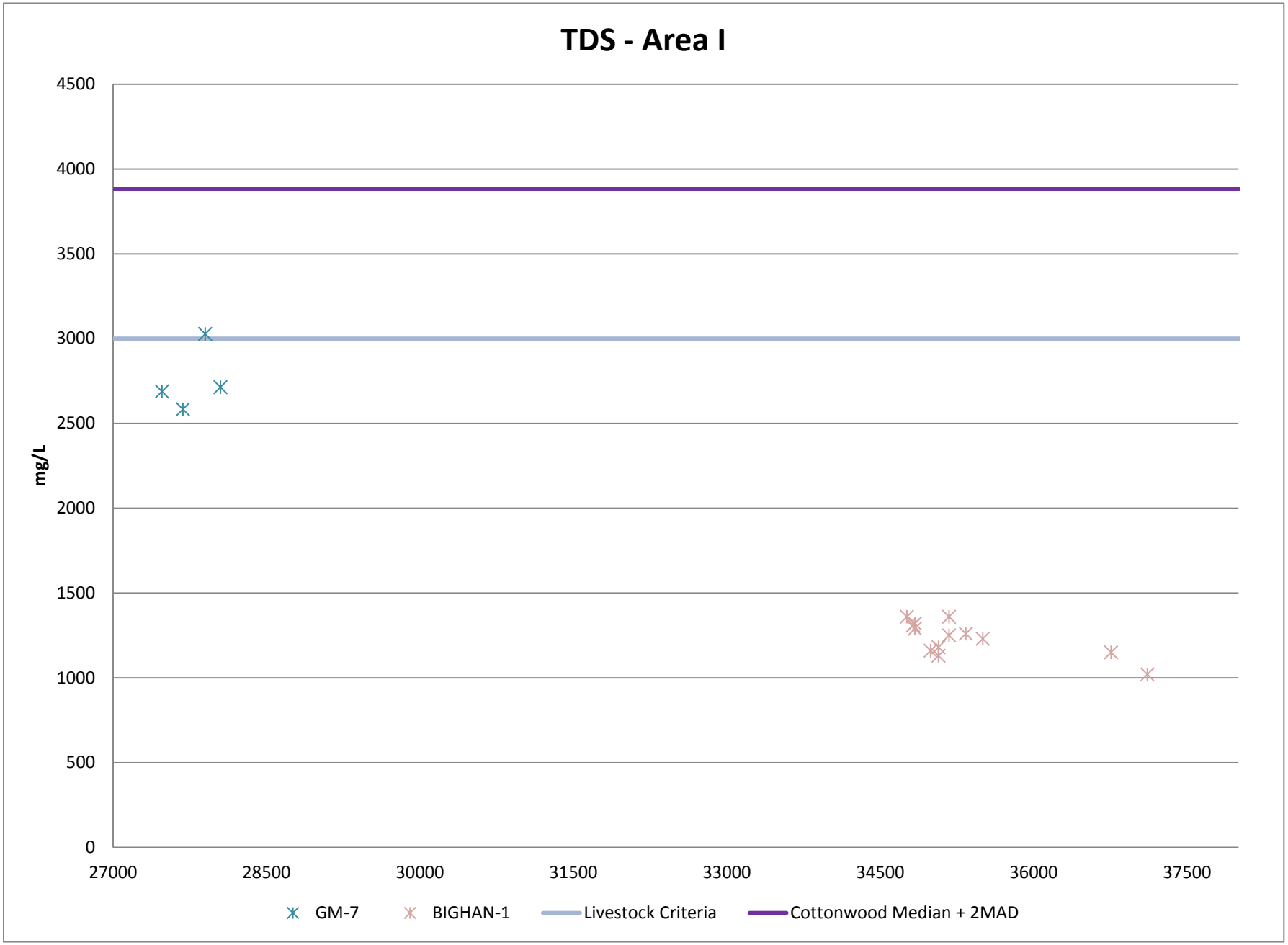

Chloride - Area I
1000
100
10
1
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

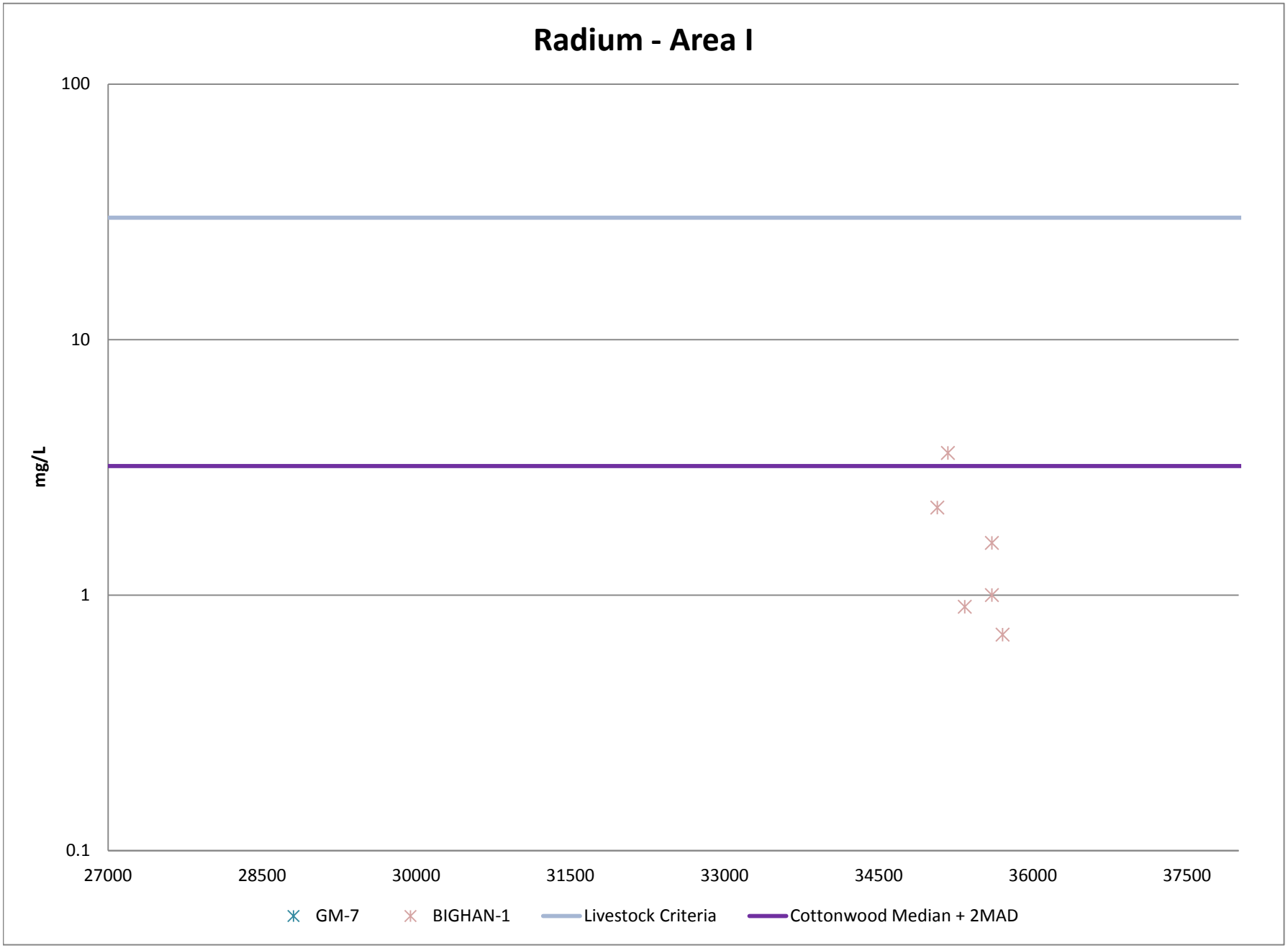

Flouride - Area I
mg/L
25
20
15
10
5
0
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD


Nitrate - Area I
1000
100
10
1
0.1
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

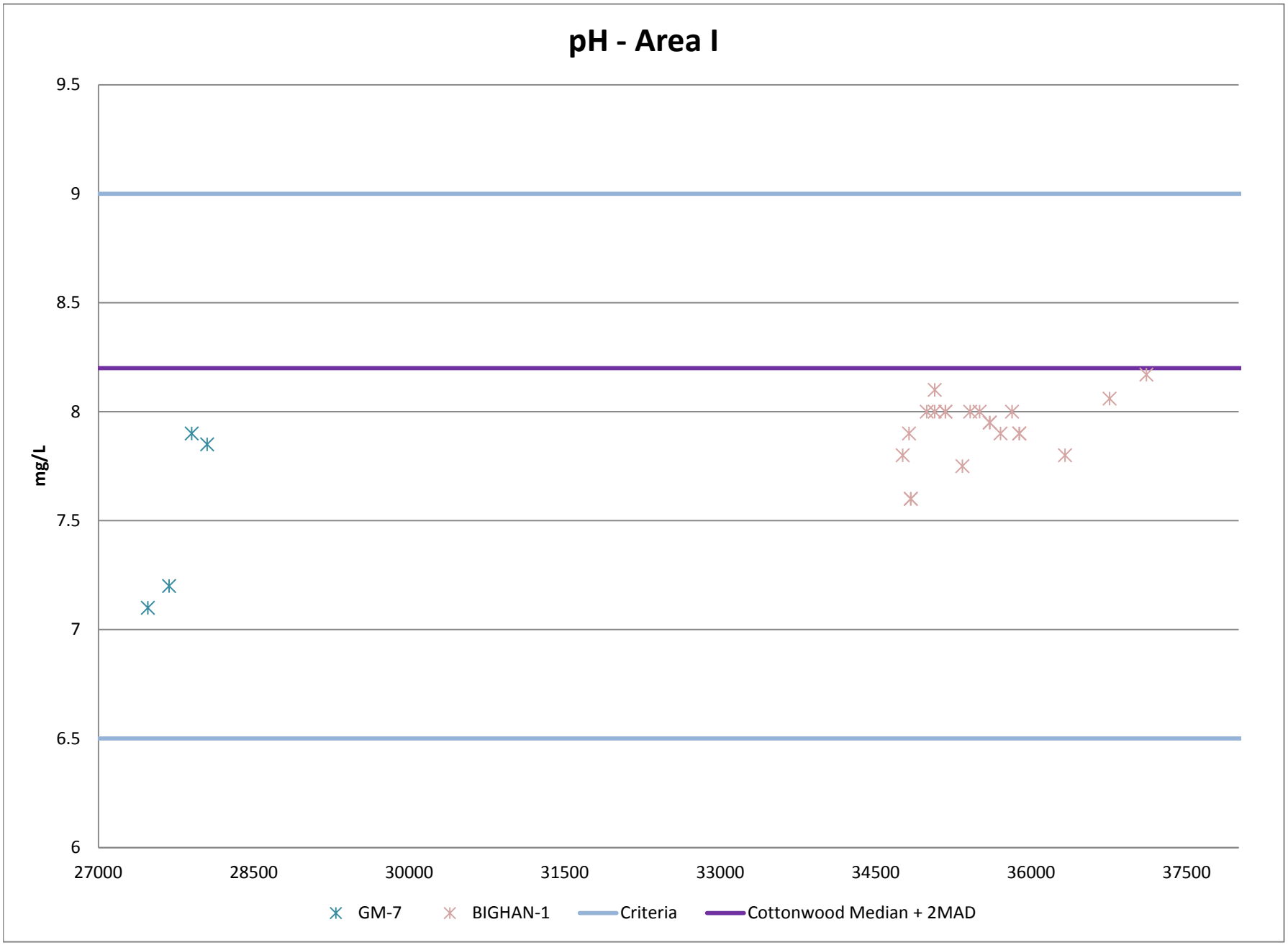

Sulfate - Area I
mg/L
3000
2500
2000
1500
1000
500
0
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

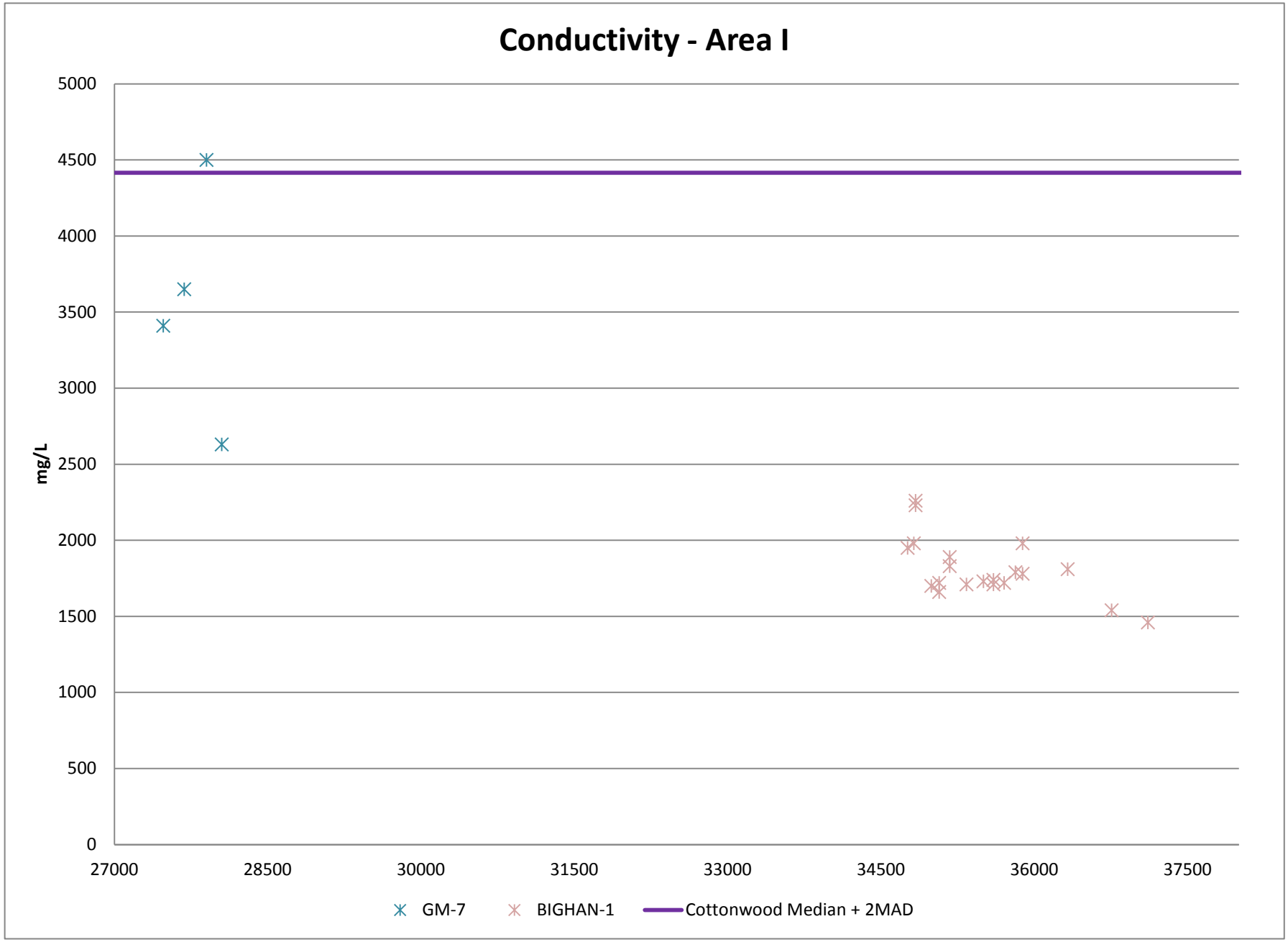
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs



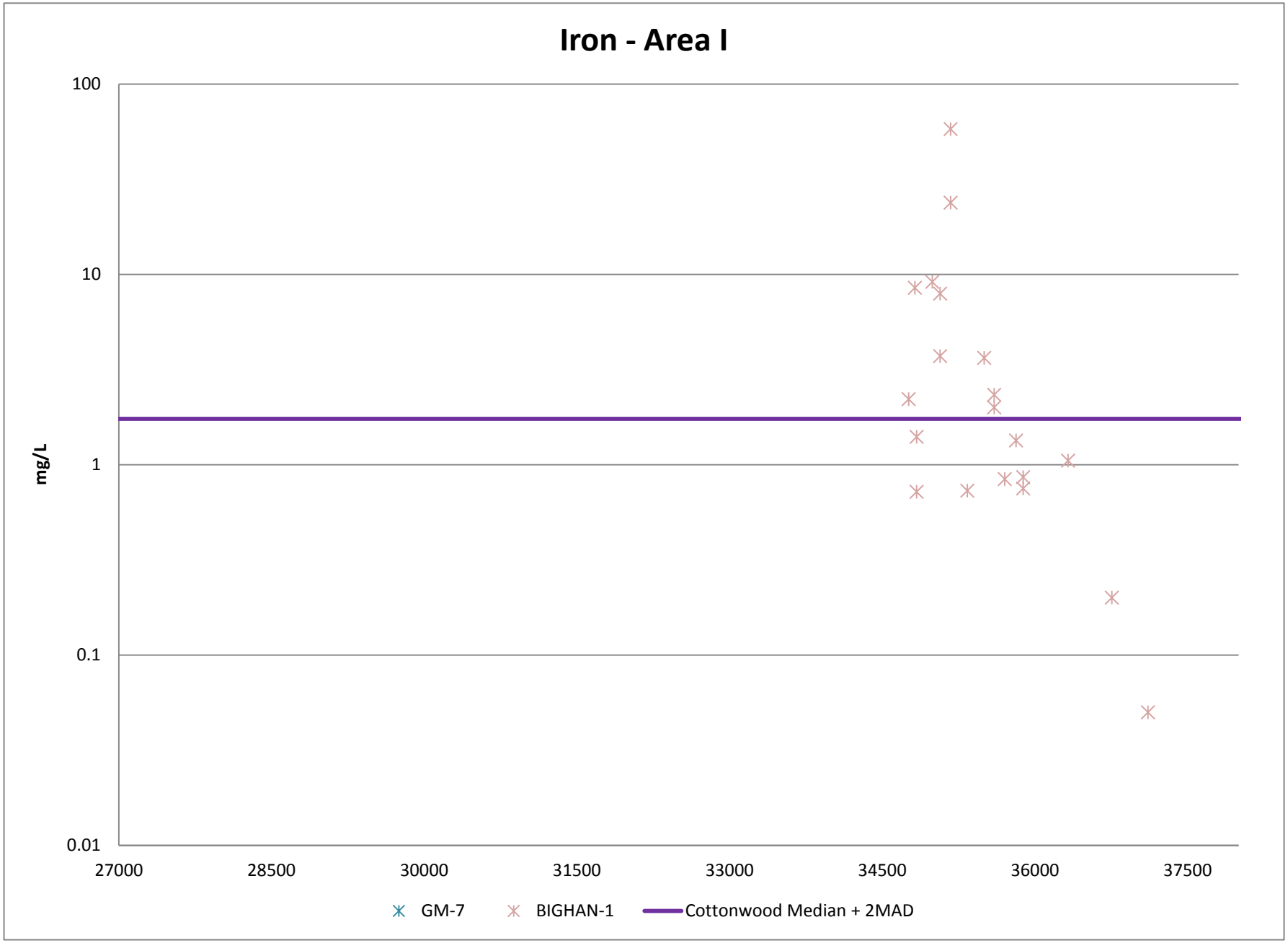

Radium - Area I
100
10
1
0.1
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Livestock Criteria
Cottonwood Median + 2MAD

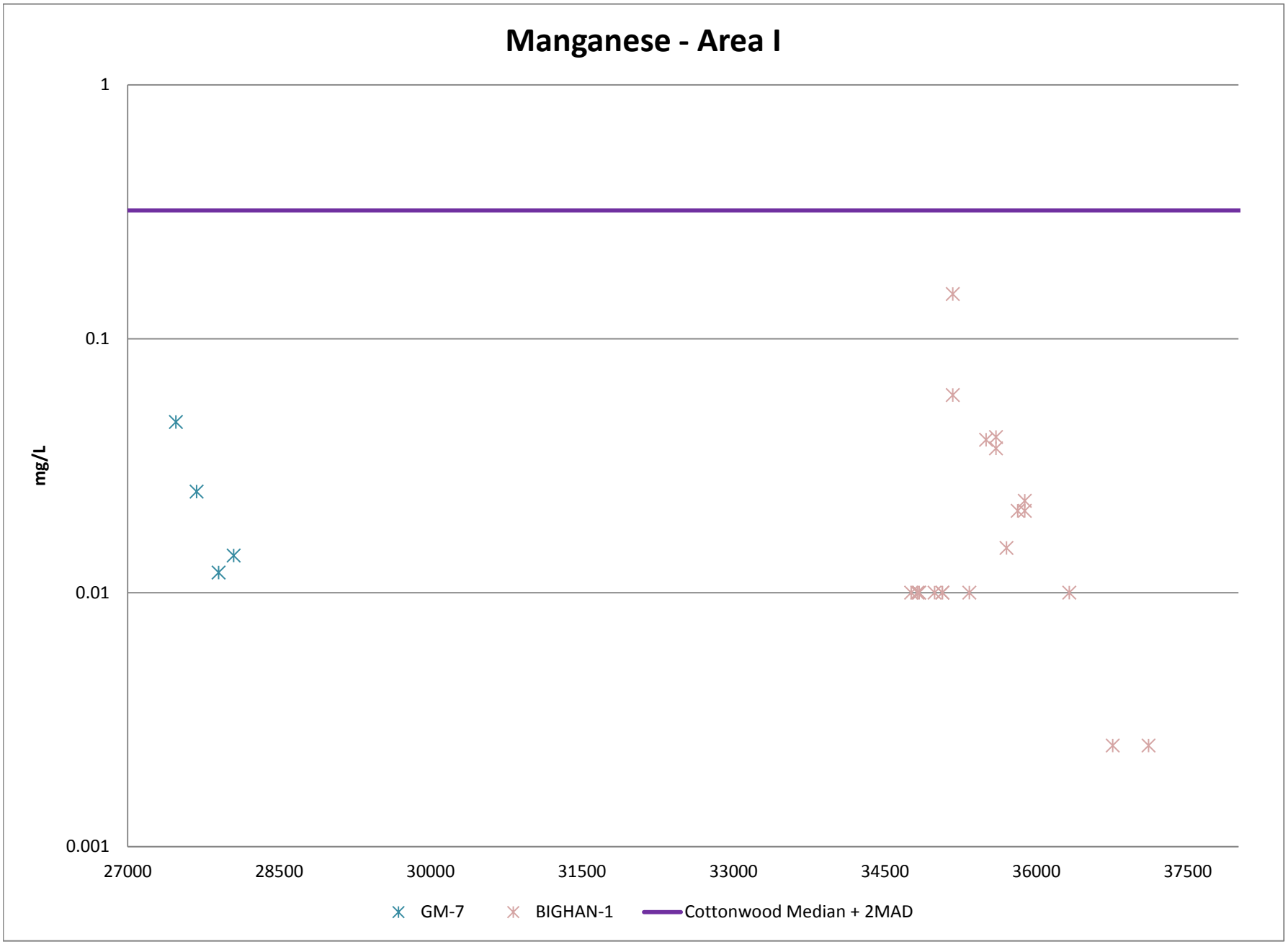
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs

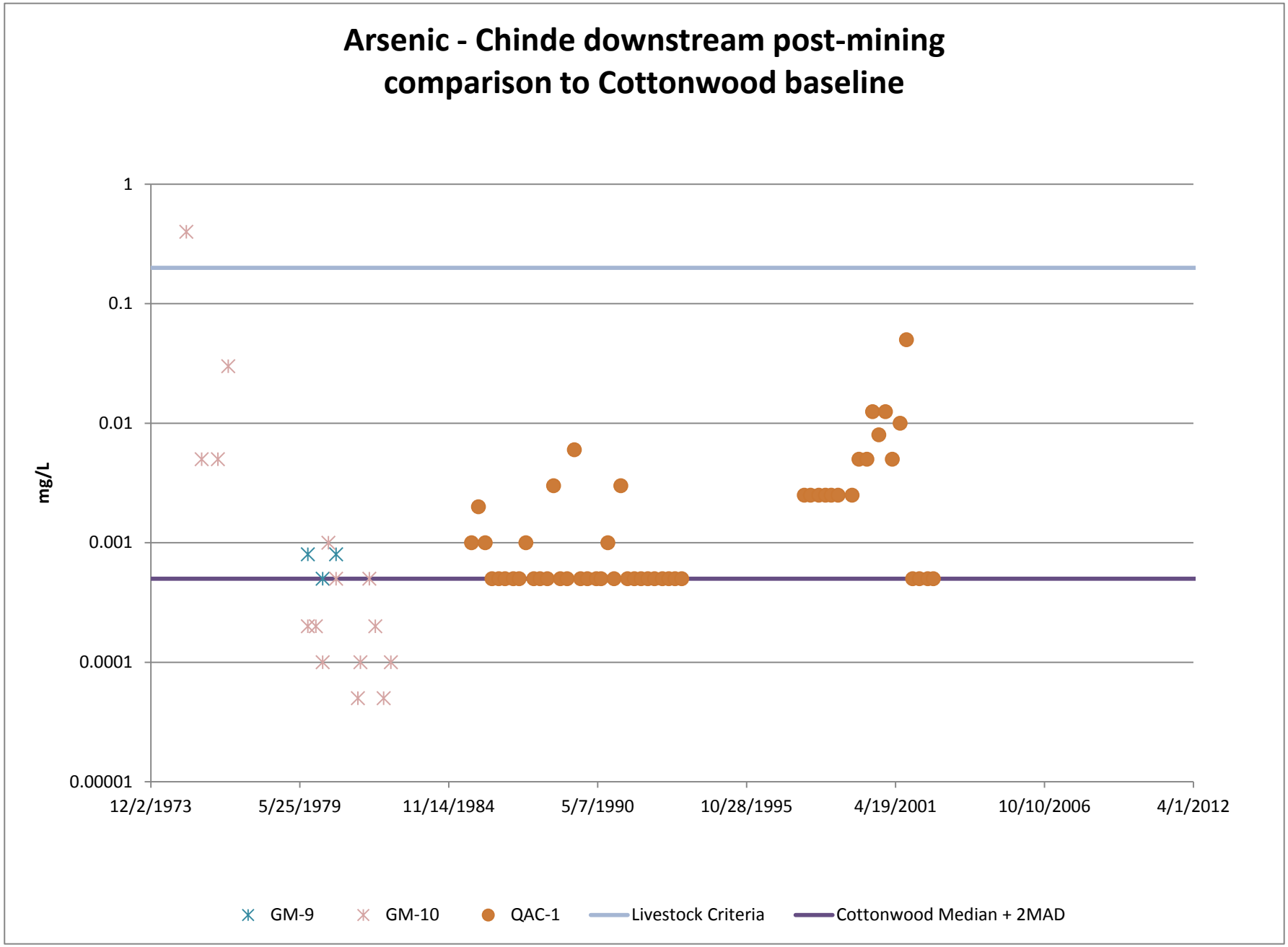


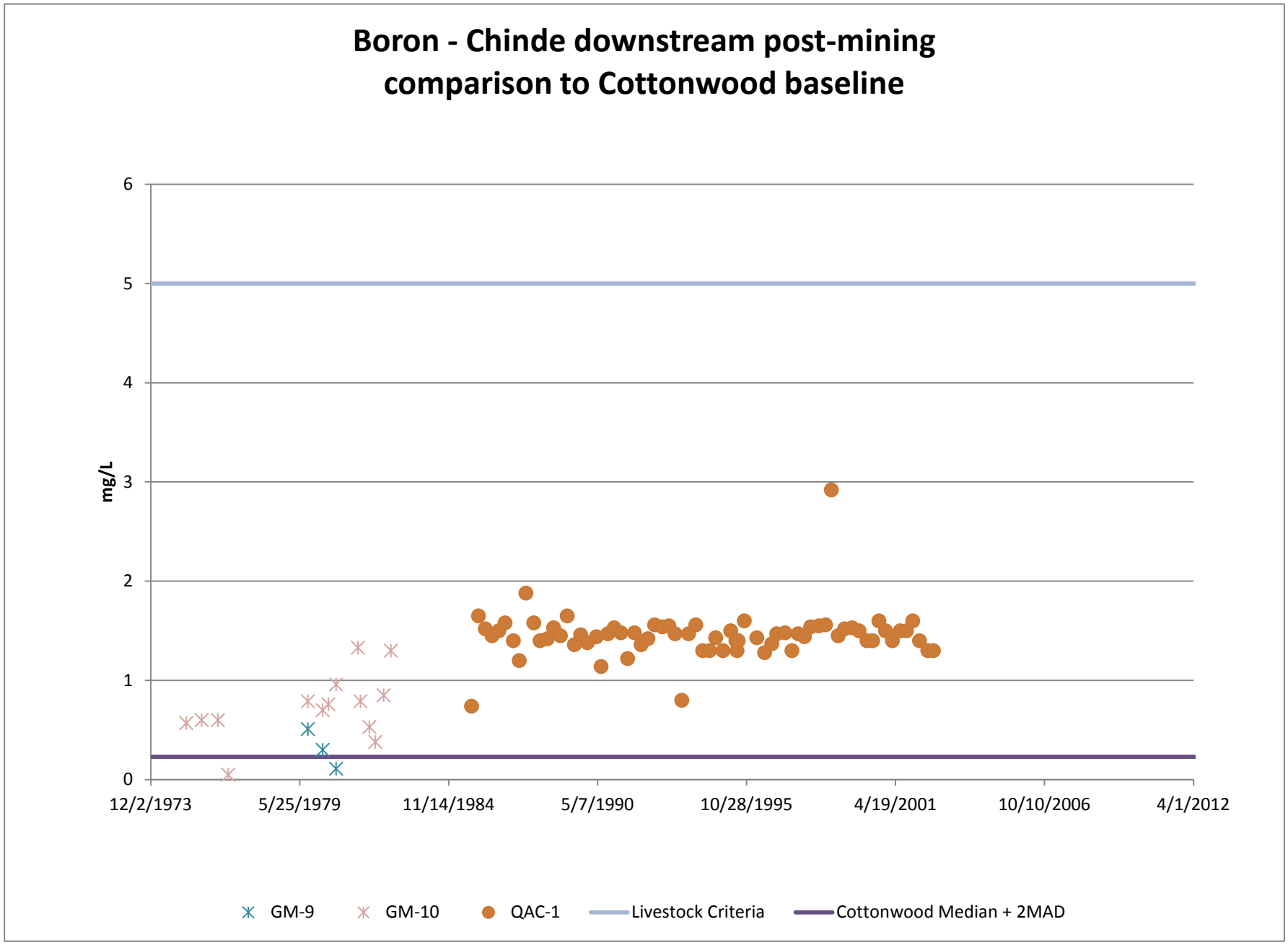

Conductivity - Area I
mg/L
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Cottonwood Median + 2MAD

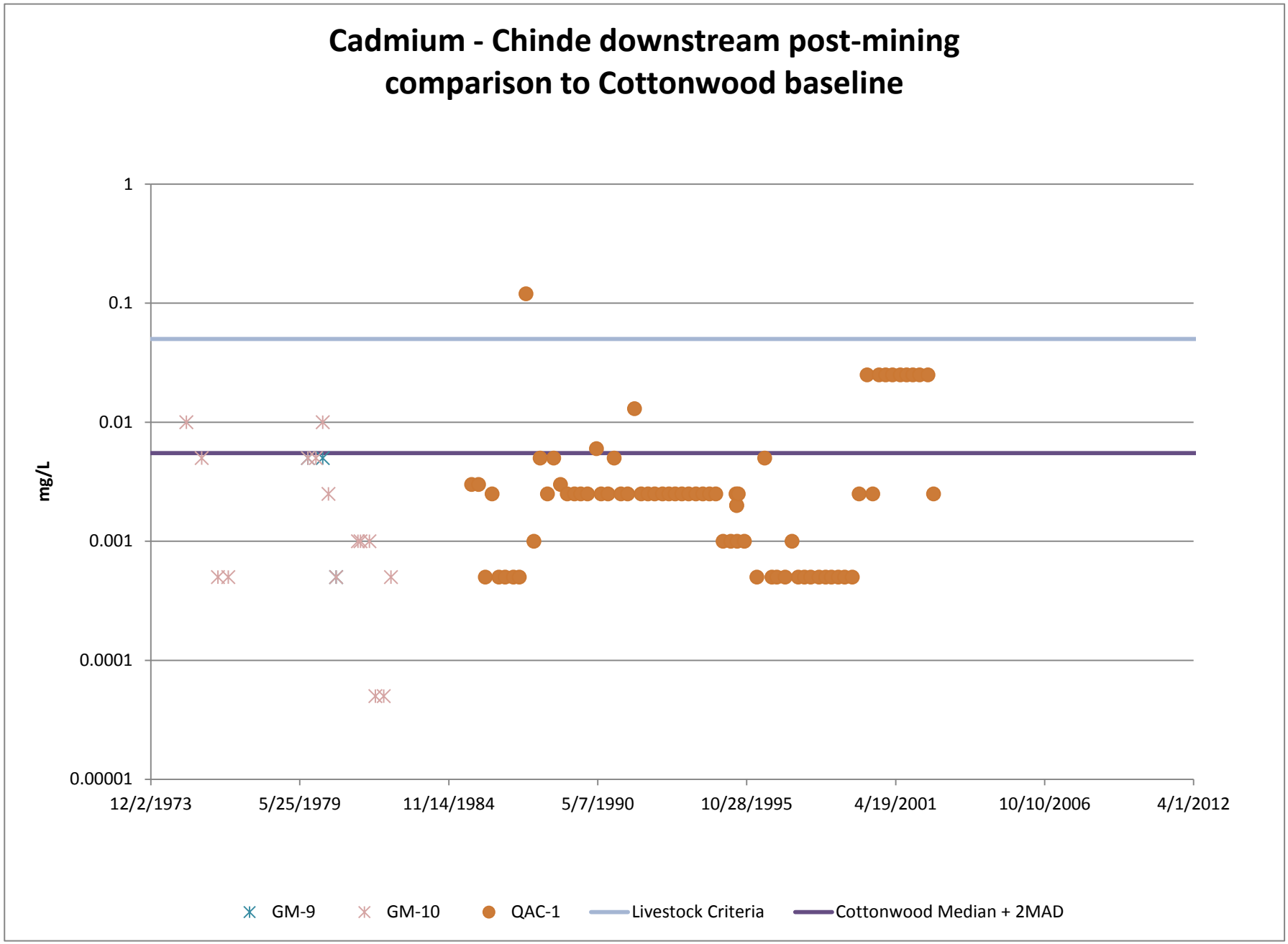
Appendix F - Groundwater Data Summary
Area I Alluvial Graphs

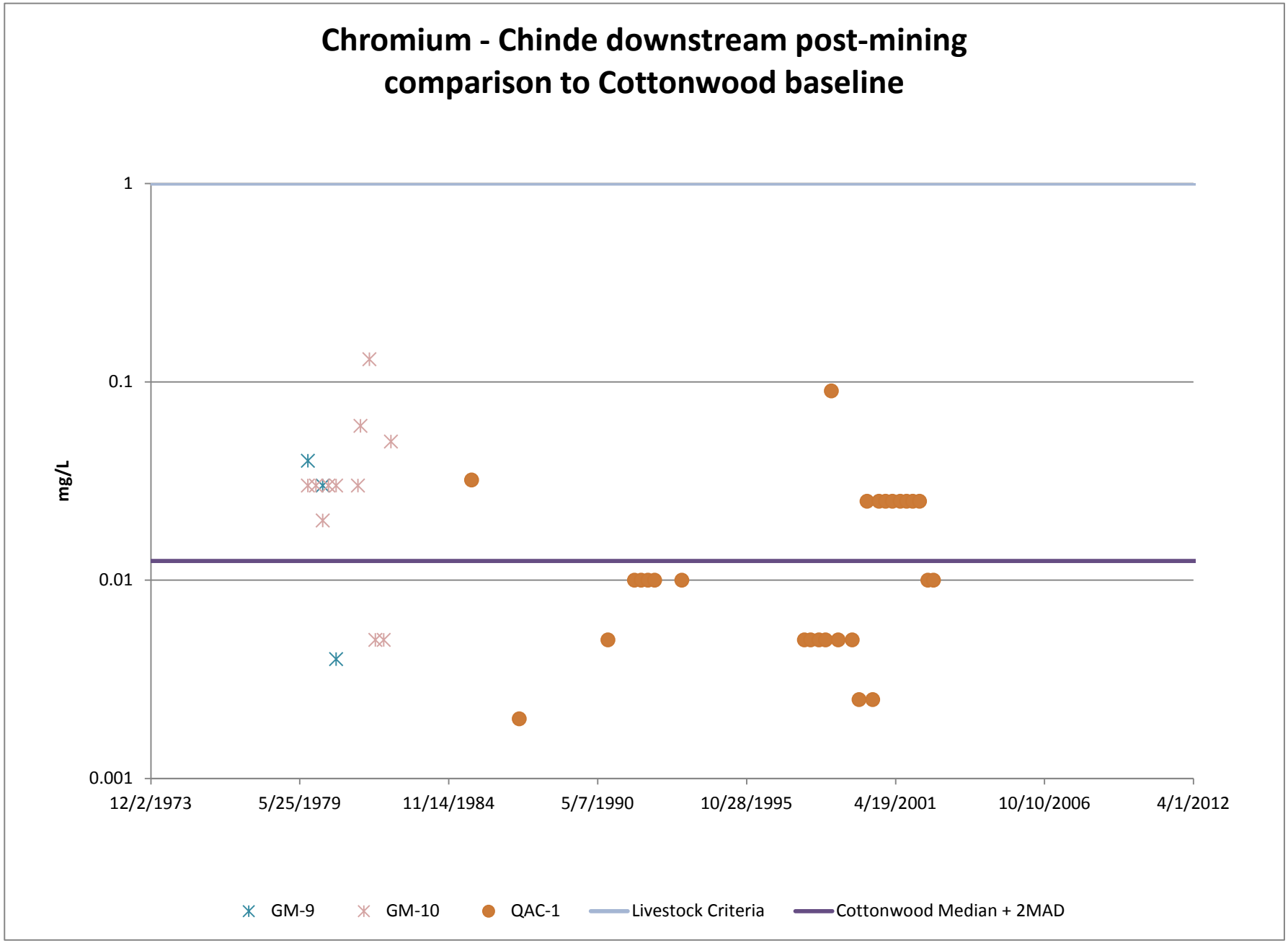


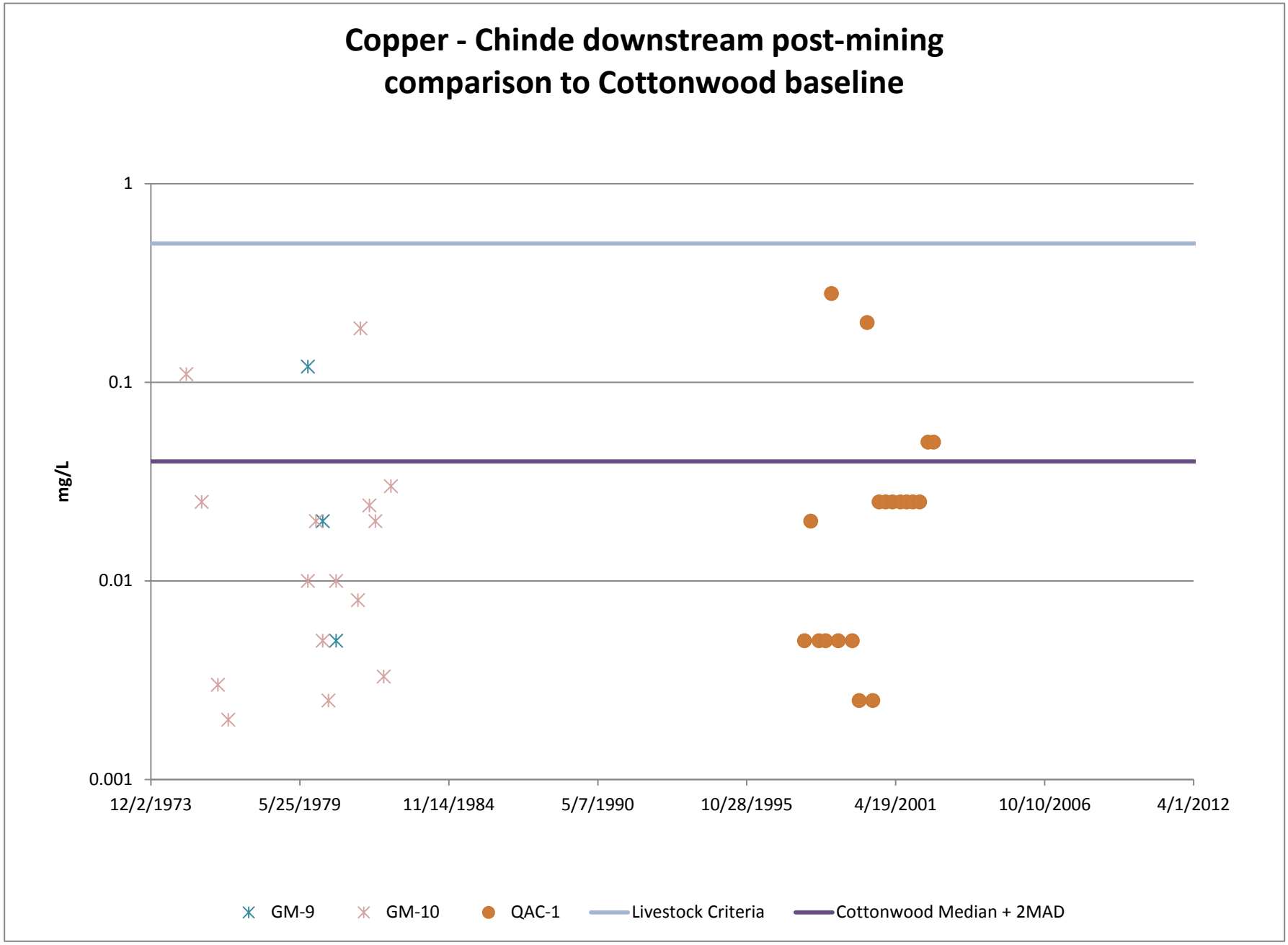

Manganese - Area I
1
0.1
0.01
0.001
mg/L
27000
28500
30000
31500
33000
34500
36000
37500
GM-7
BIGHAN-1
Cottonwood Median + 2MAD

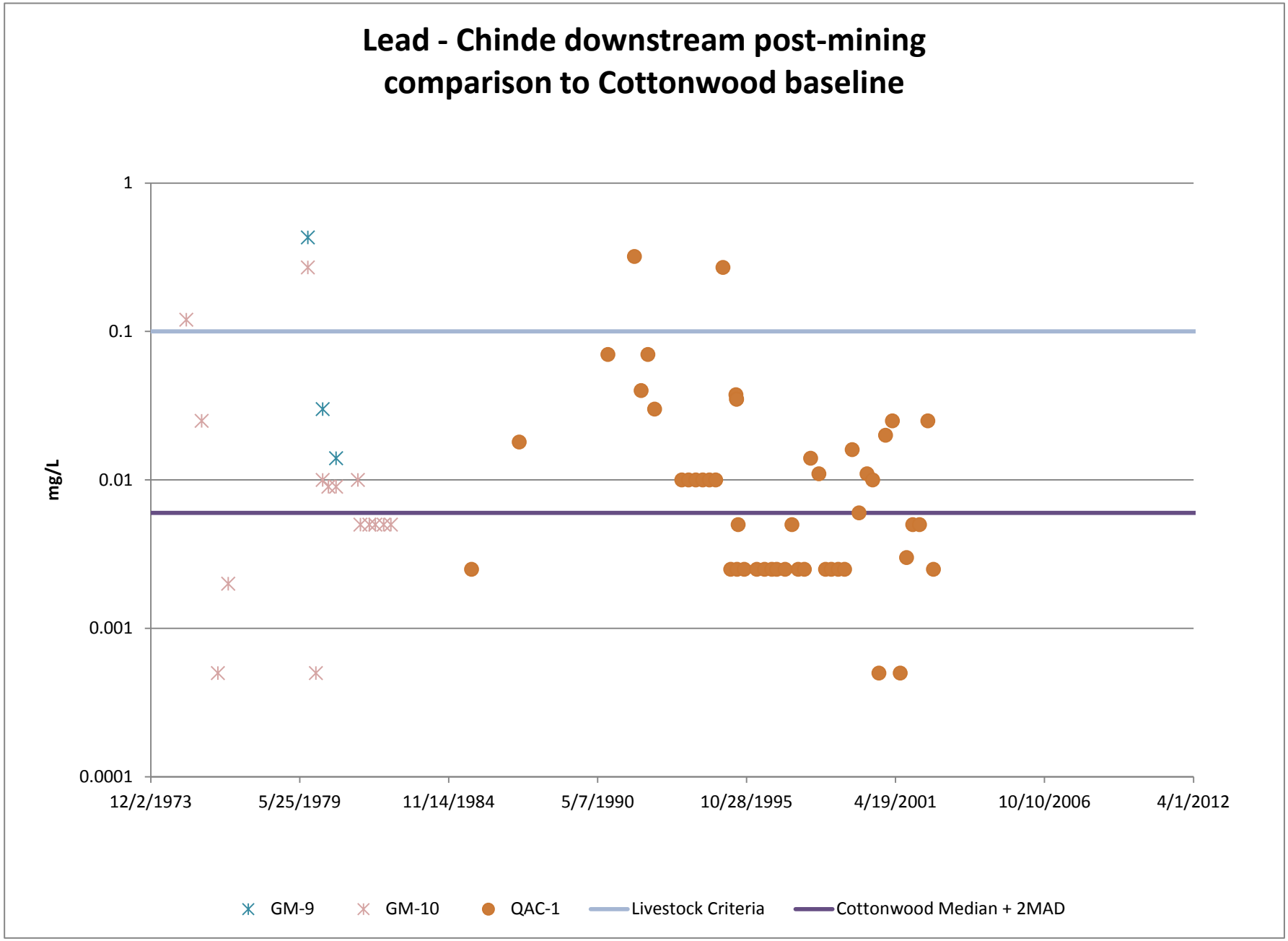

Arsenic - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

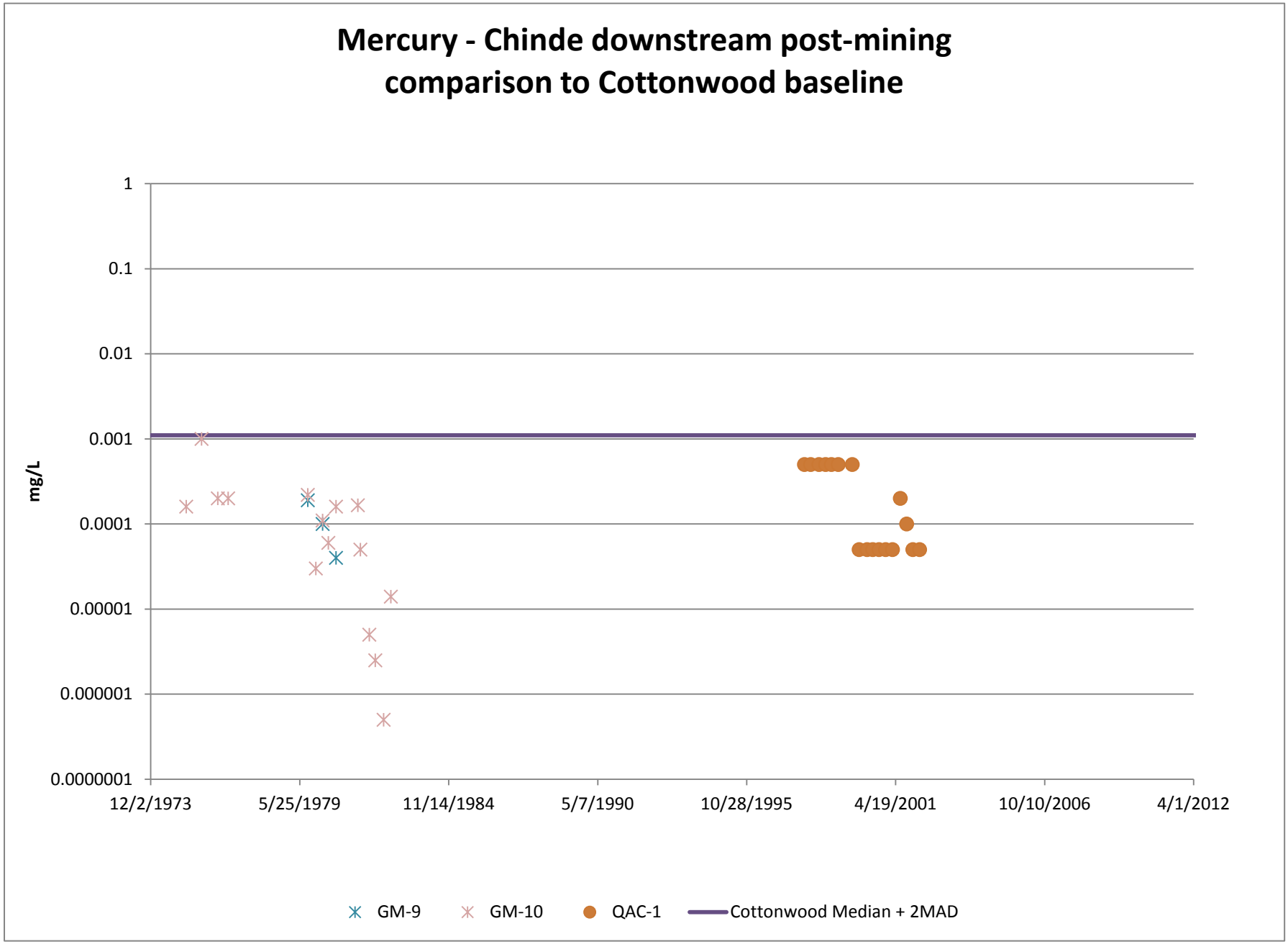

Boron - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
6
5
4
3
2
1
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

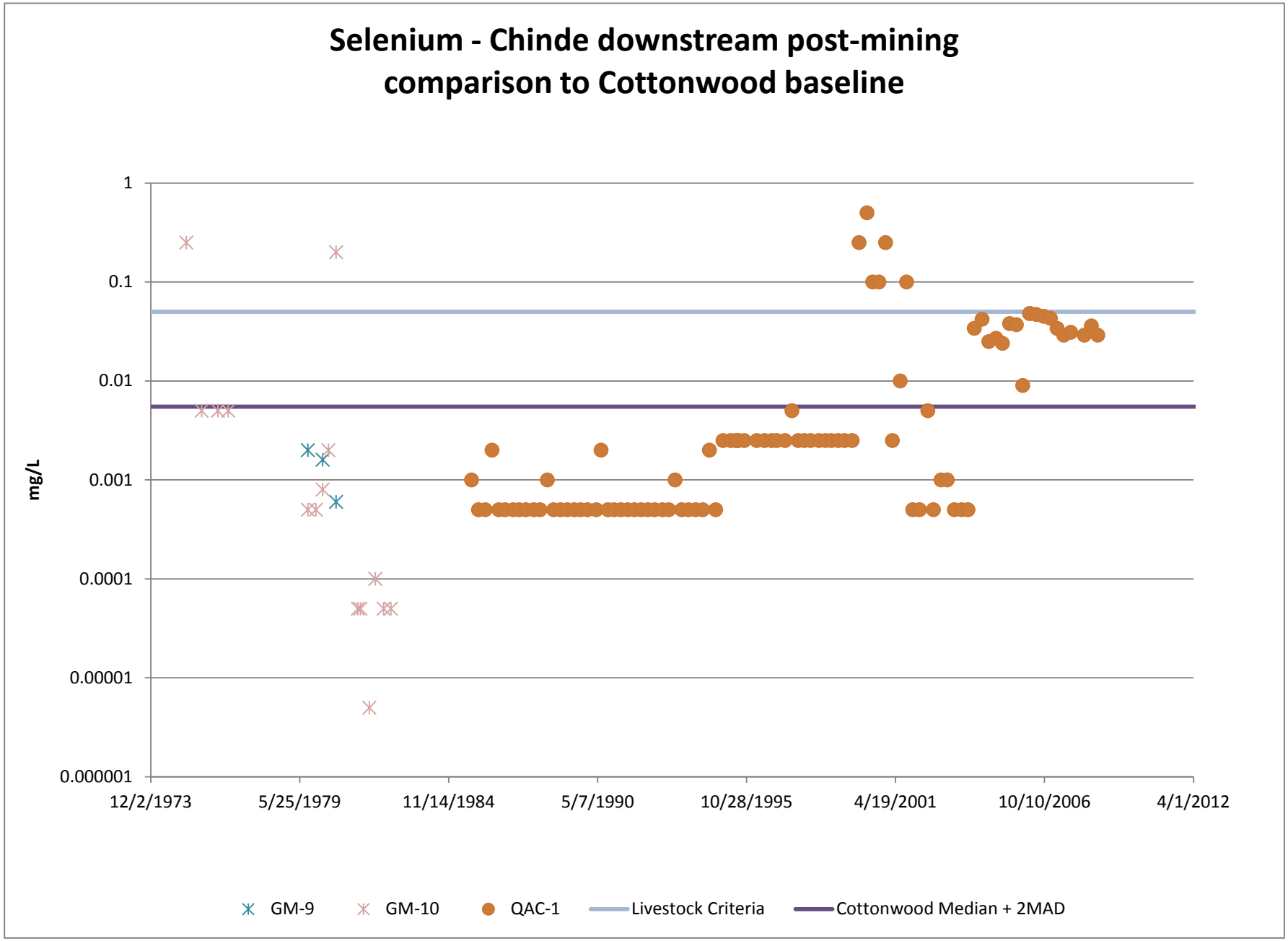

Cadmium - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

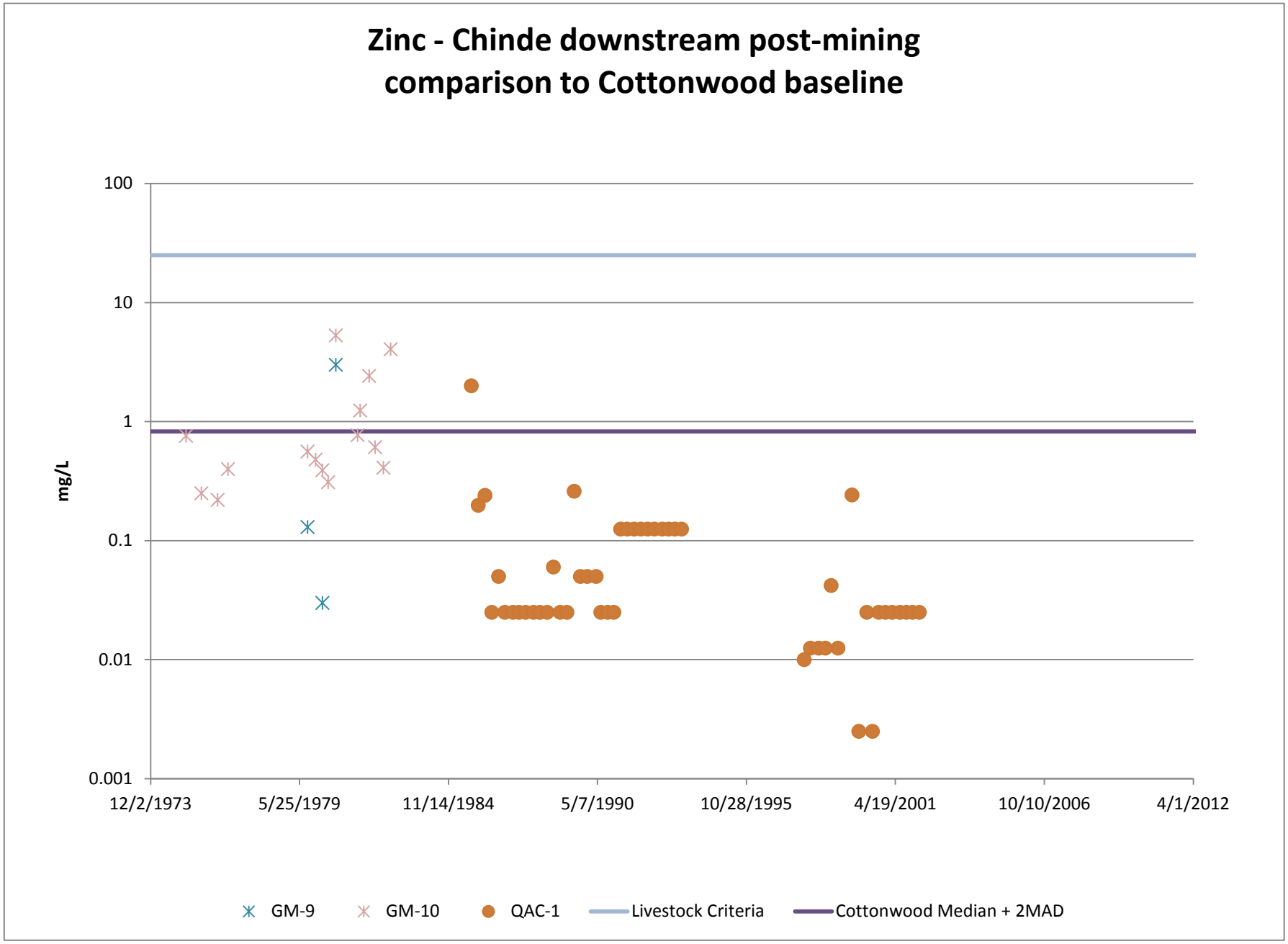

Chromium - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

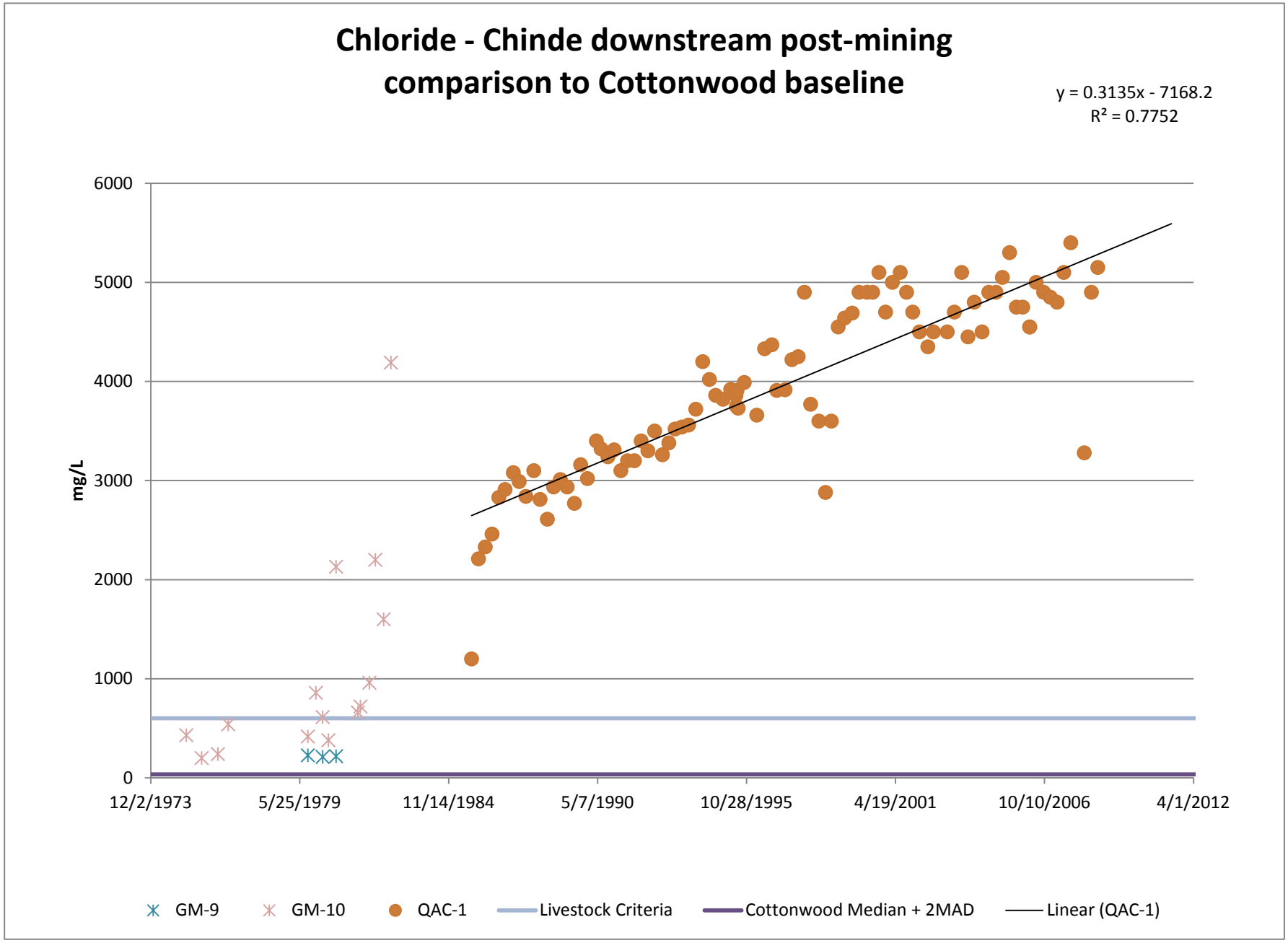

Copper - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

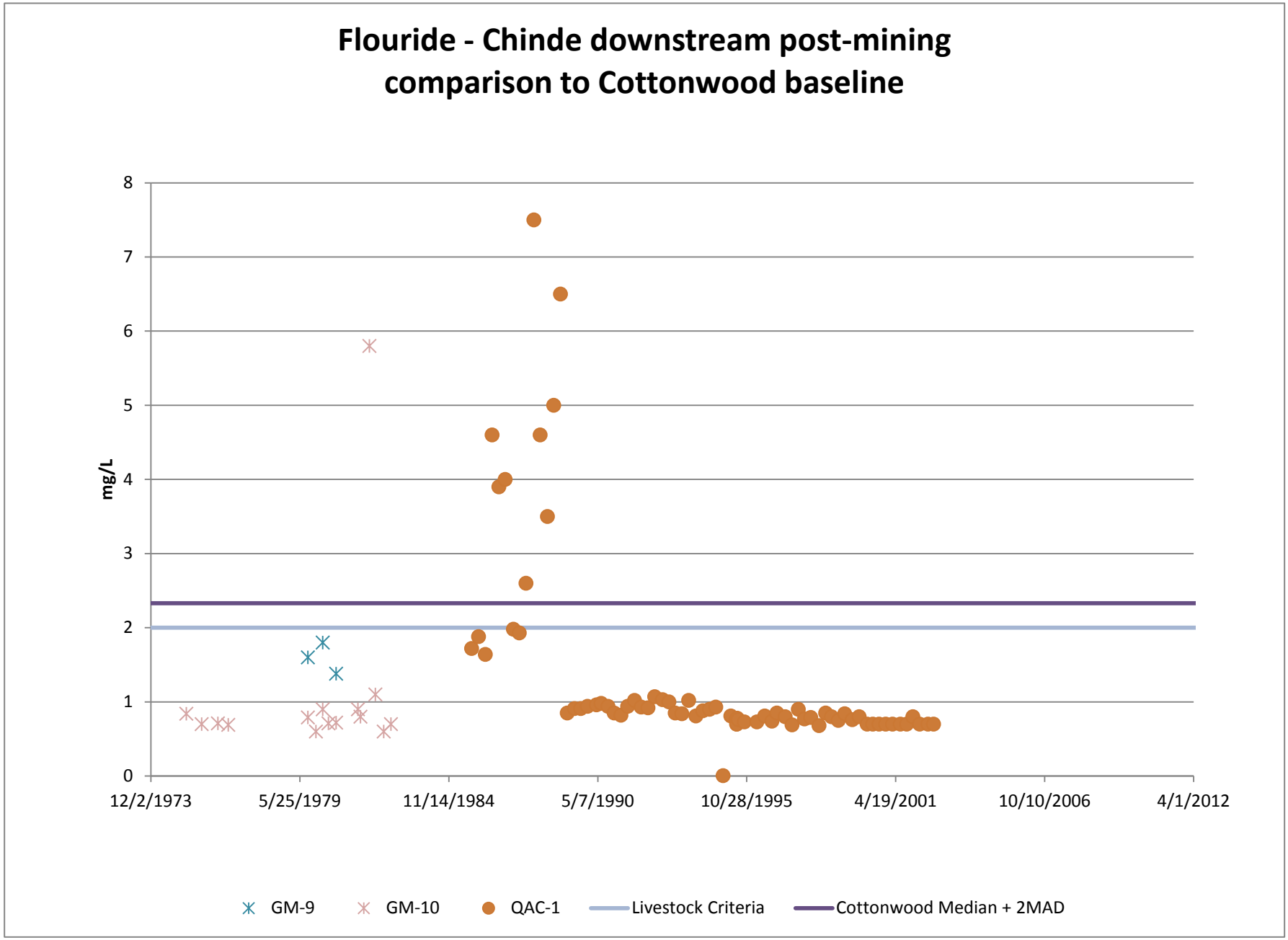

Lead - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
0.0001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

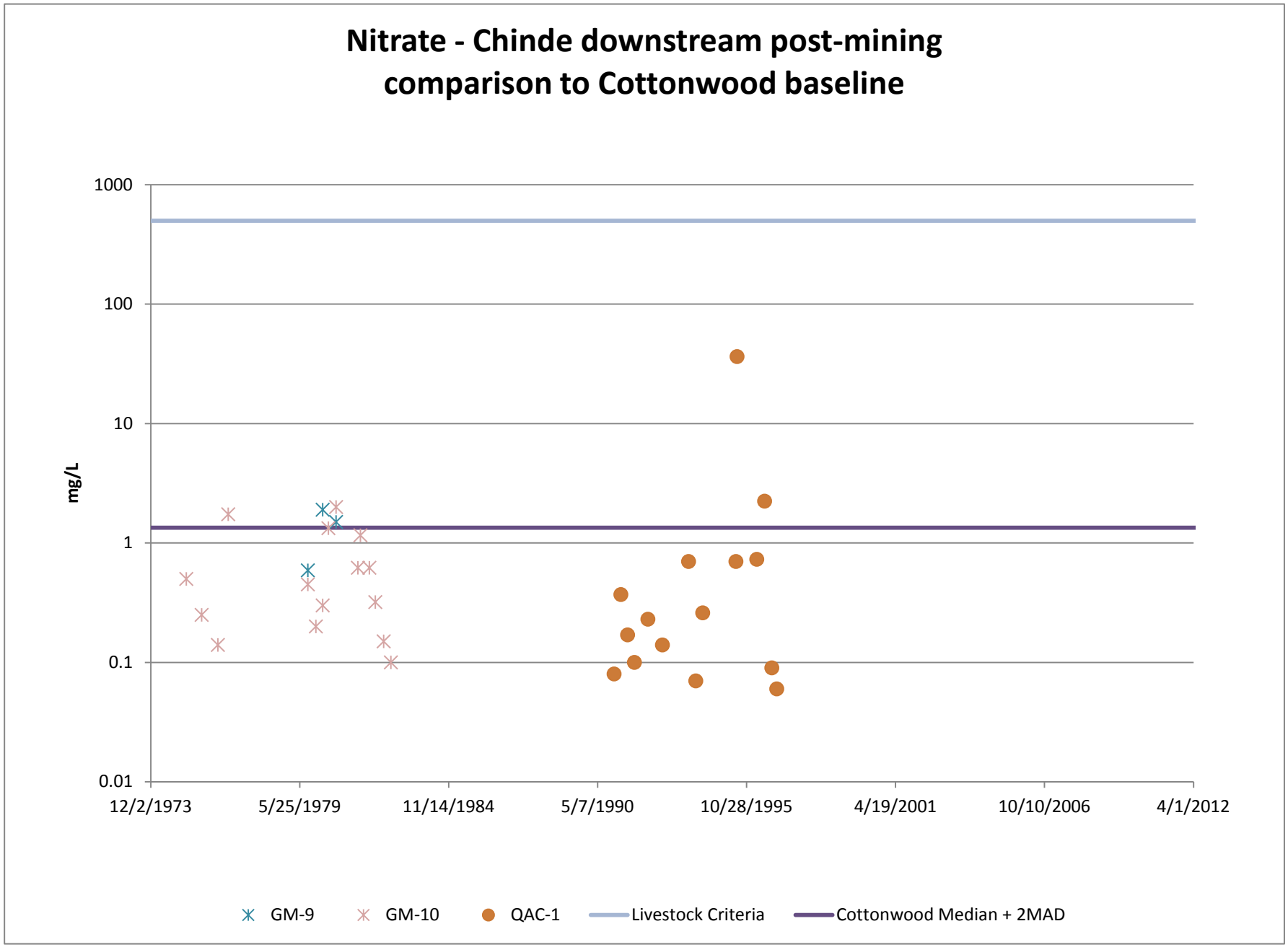

Mercury - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
0.0000001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Cottonwood Median + 2MAD

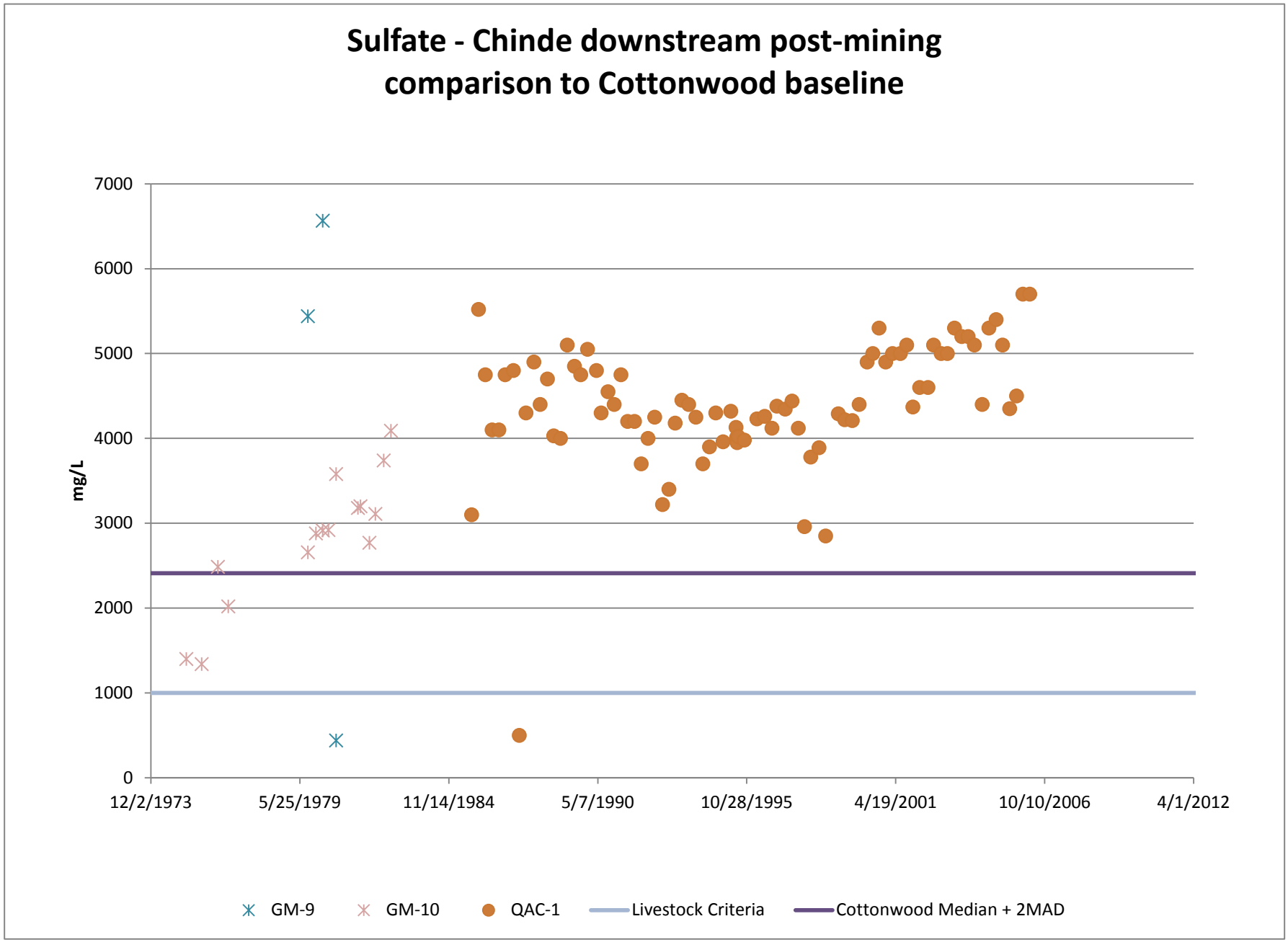

Selenium - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

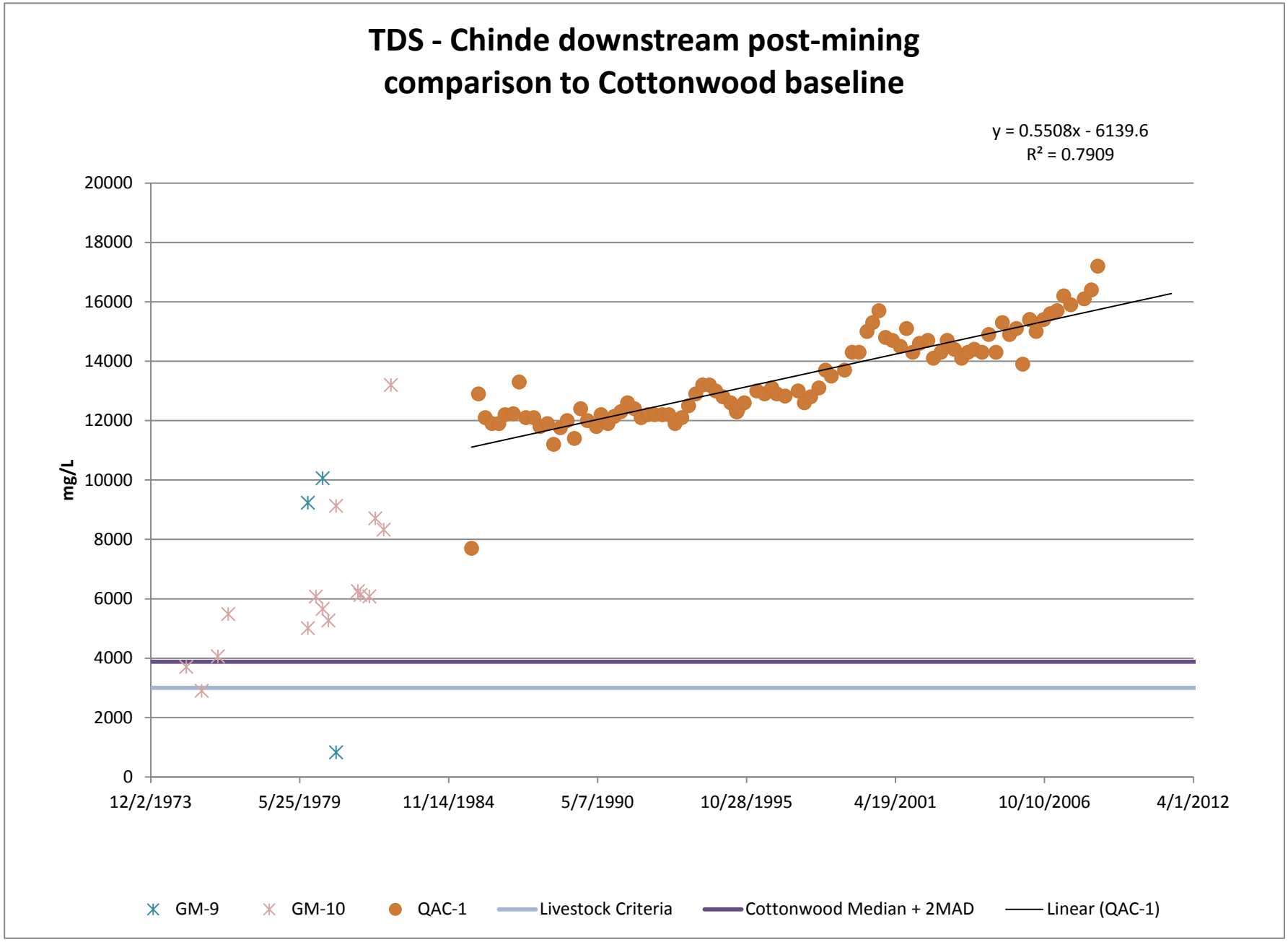

Zinc - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
100
10
1
0.1
0.01
0.001
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

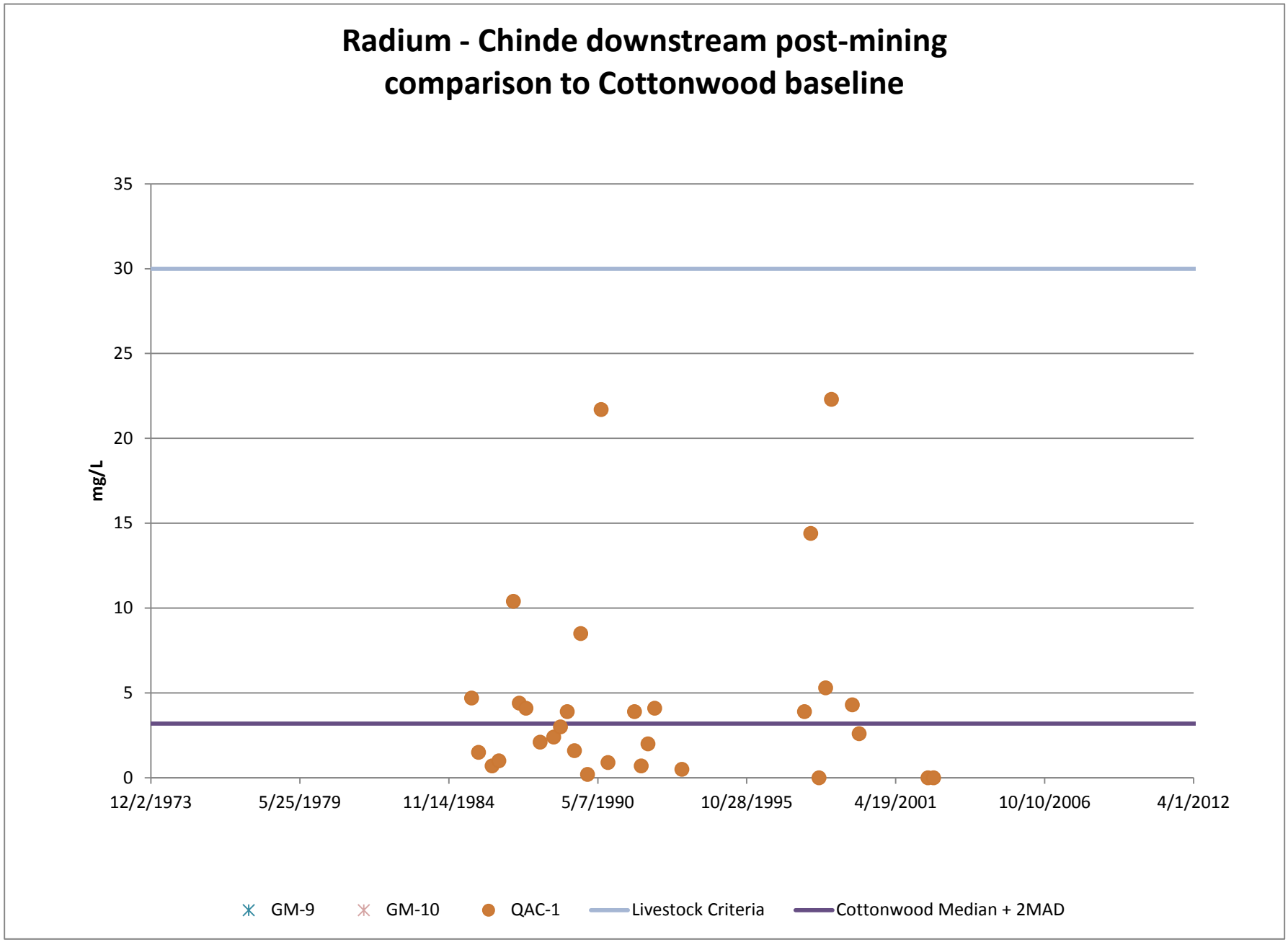

Chloride - Chinde downstream post-mining comparison to Cottonwood baseline
y = 0.3135x - 7168.2
R² = 0.7752
mg/L
6000
5000
4000
3000
2000
1000
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD
Linear (QAC-1)

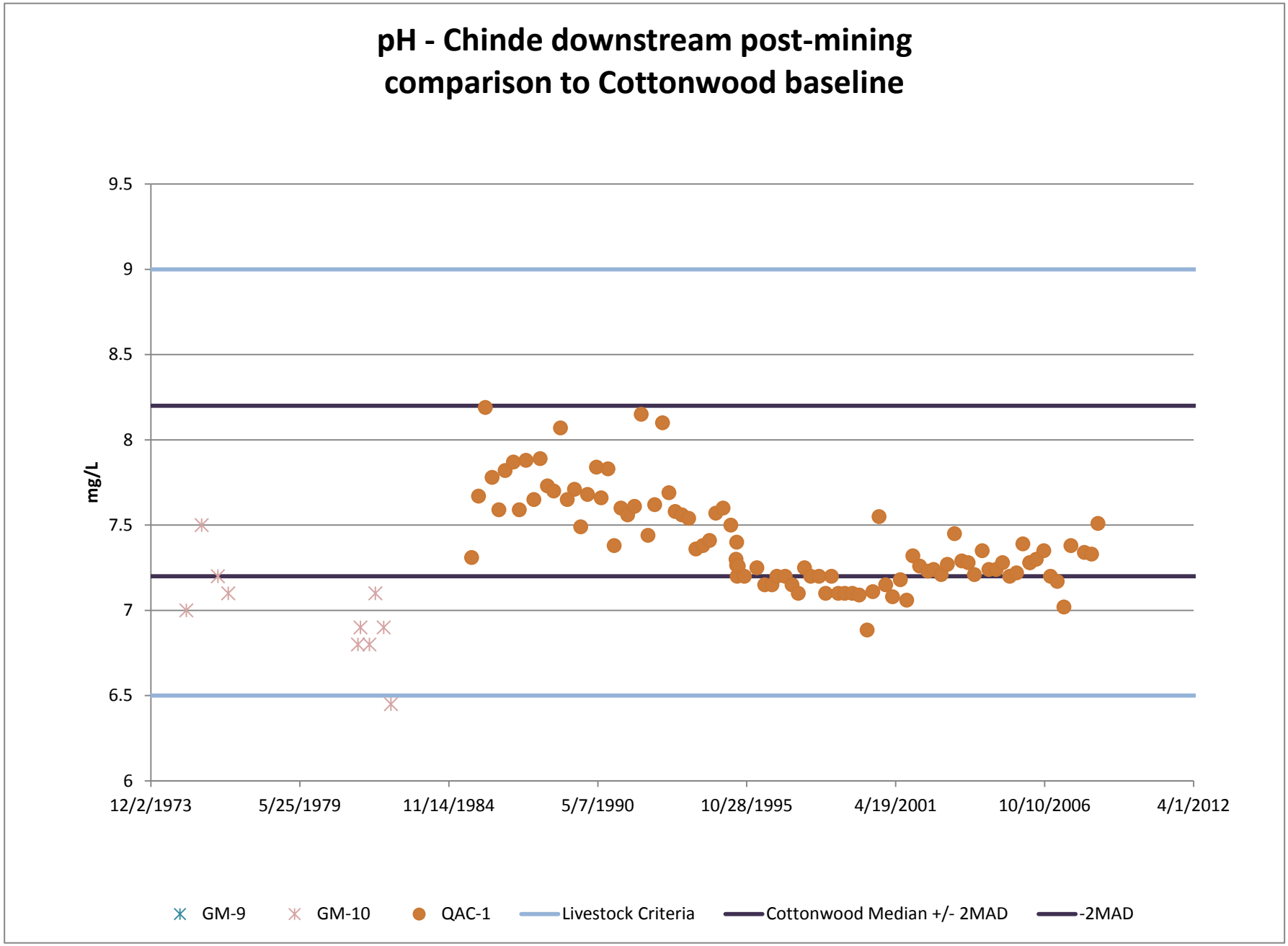

Flouride - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
8
7
6
5
4
3
2
1
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

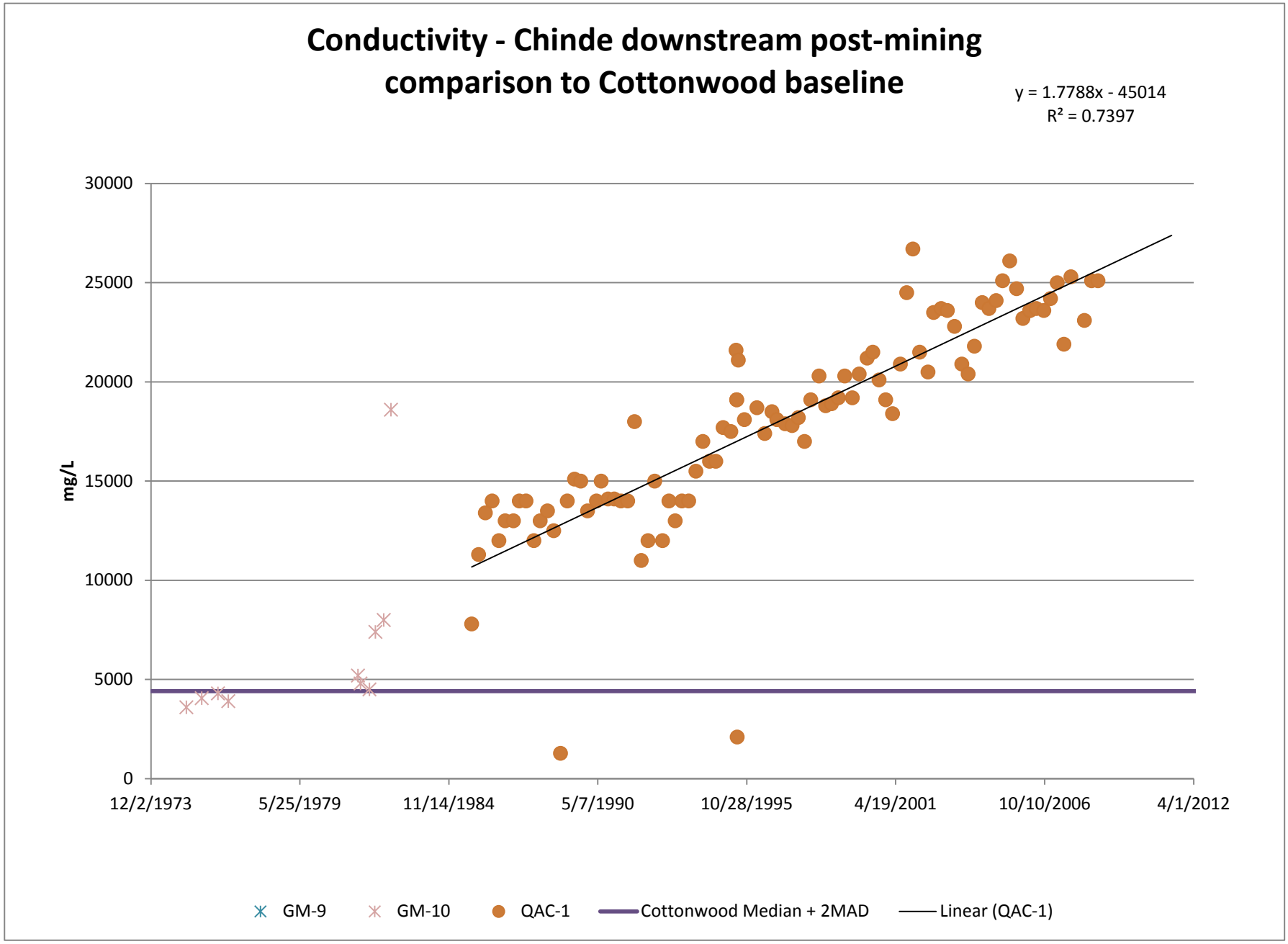

Nitrate - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
1000
100
10
1
0.1
0.01
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

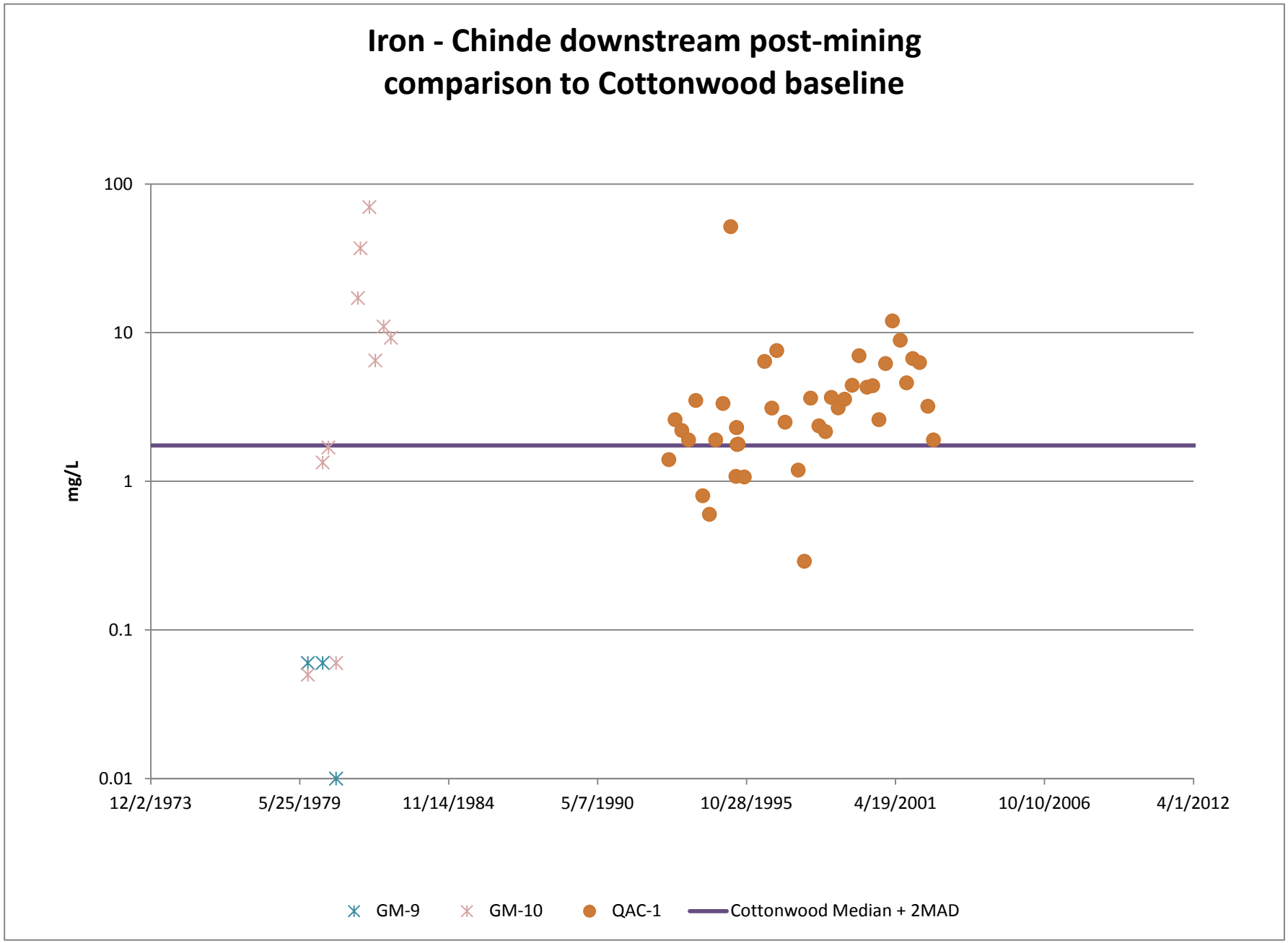

Sulfate - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
7000
6000
5000
4000
3000
2000
1000
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD

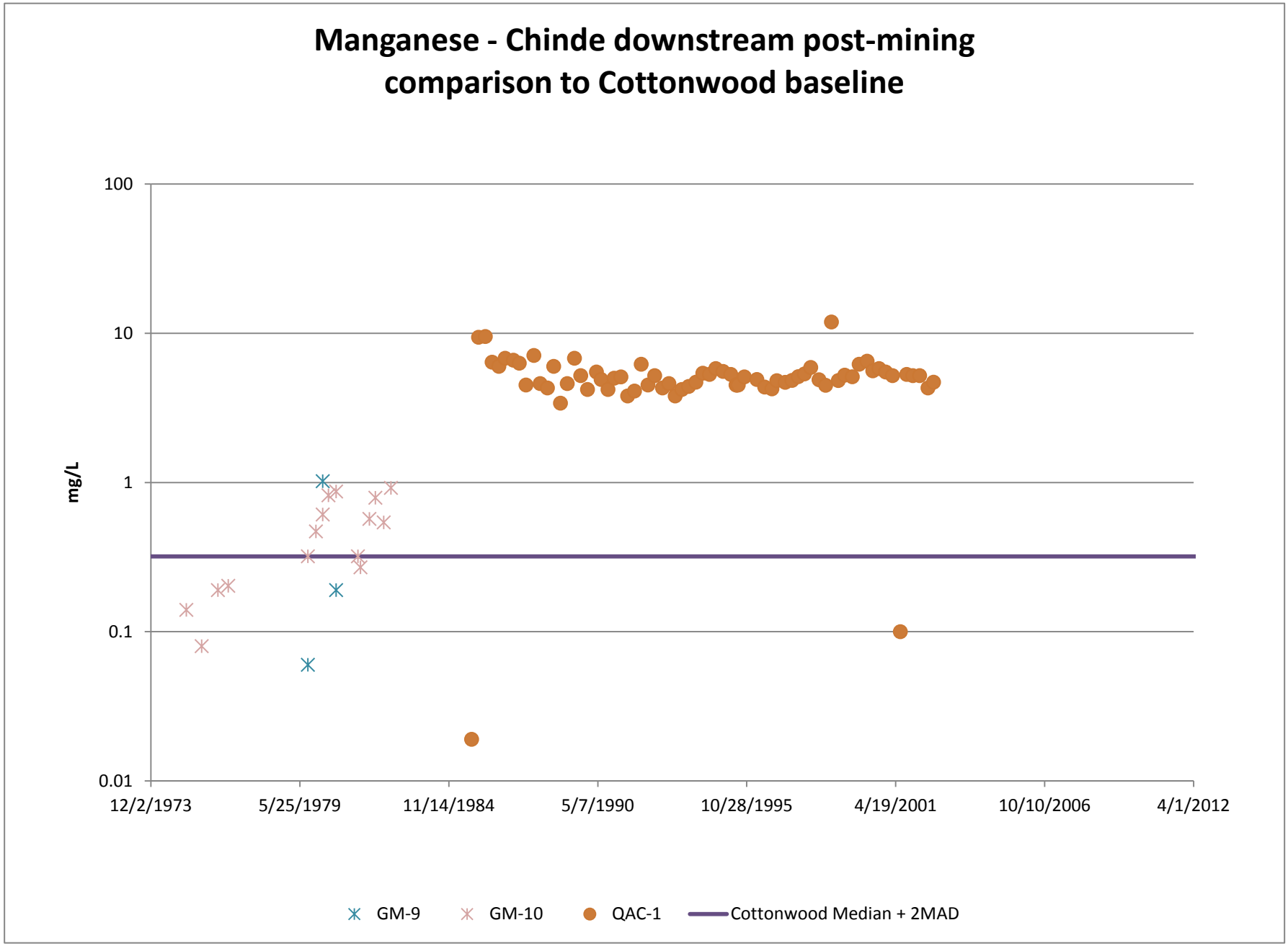

TDS - Chinde downstream post-mining comparison to Cottonwood baseline
y = 0.5508x - 6139.6
R² = 0.7909
mg/L
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD
Linear (QAC-1)


Radium - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
35
30
25
20
15
10
5
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median + 2MAD


pH - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
9.5
9
8.5
8
7.5
7
6.5
6
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Livestock Criteria
Cottonwood Median +/- 2MAD
-2MAD


Conductivity - Chinde downstream post-mining comparison to Cottonwood baseline
y = 1.7788x - 45014
R² = 0.7397
mg/L
30000
25000
20000
15000
10000
5000
0
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Cottonwood Median + 2MAD
Linear (QAC-1)


Iron - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
100
10
1
0.1
0.01
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Cottonwood Median + 2MAD


Manganese - Chinde downstream post-mining comparison to Cottonwood baseline
mg/L
100
10
1
0.1
0.01
12/2/1973
5/25/1979
11/14/1984
5/7/1990
10/28/1995
4/19/2001
10/10/2006
4/1/2012
GM-9
GM-10
QAC-1
Cottonwood Median + 2MAD

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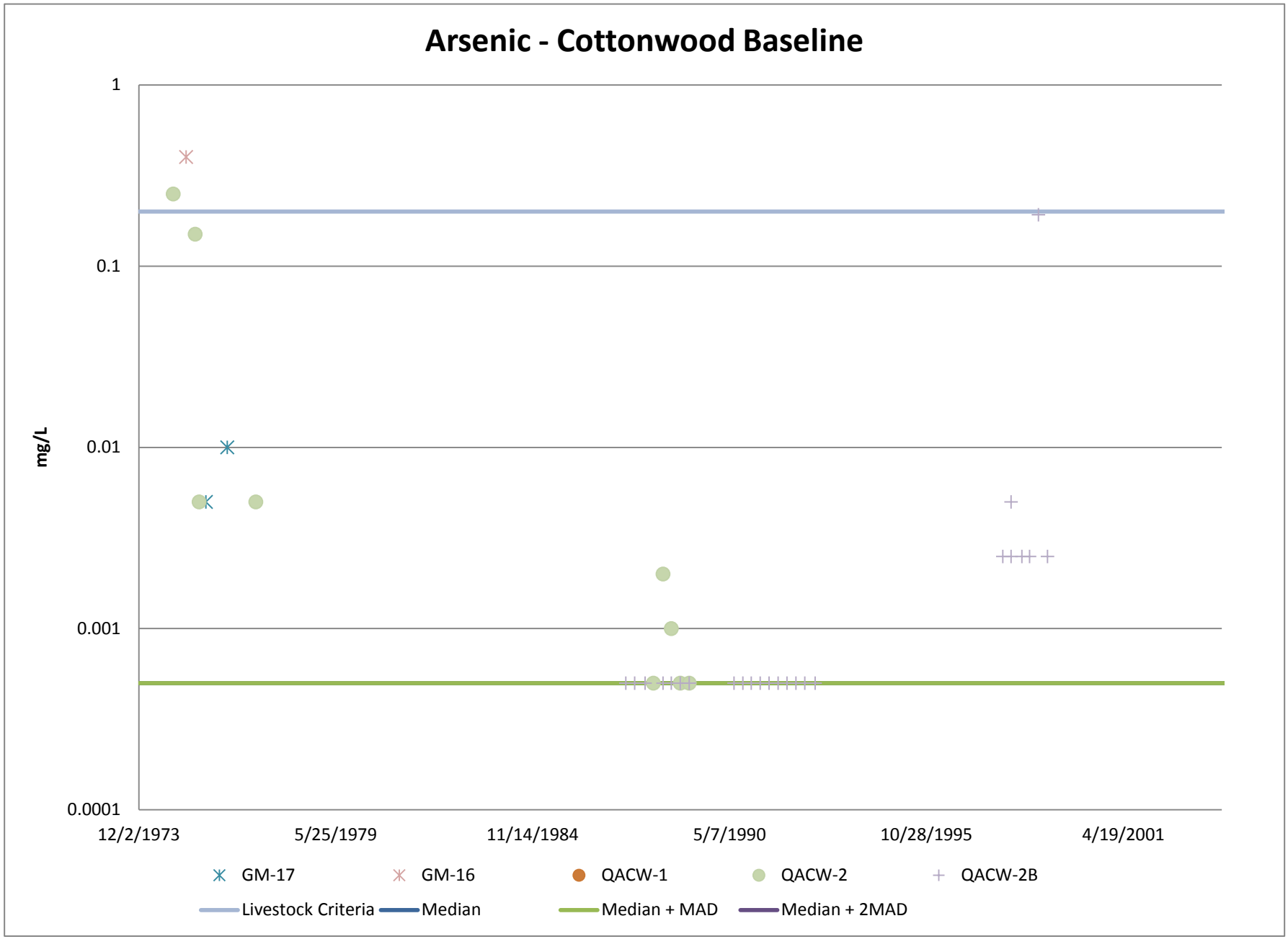
Cottonwood Alluvial Graphs



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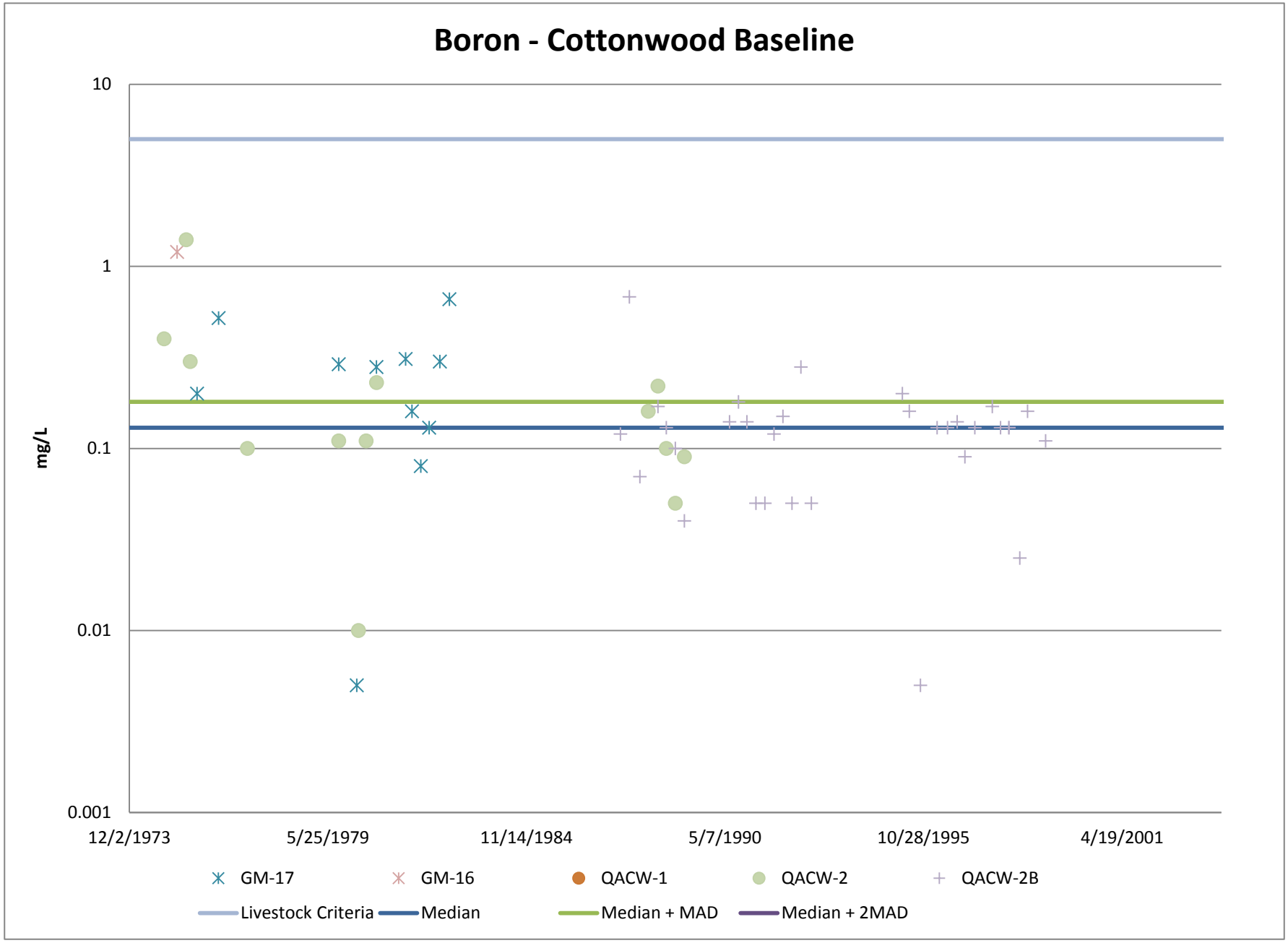

Appendix F - Groundwater Data Summary

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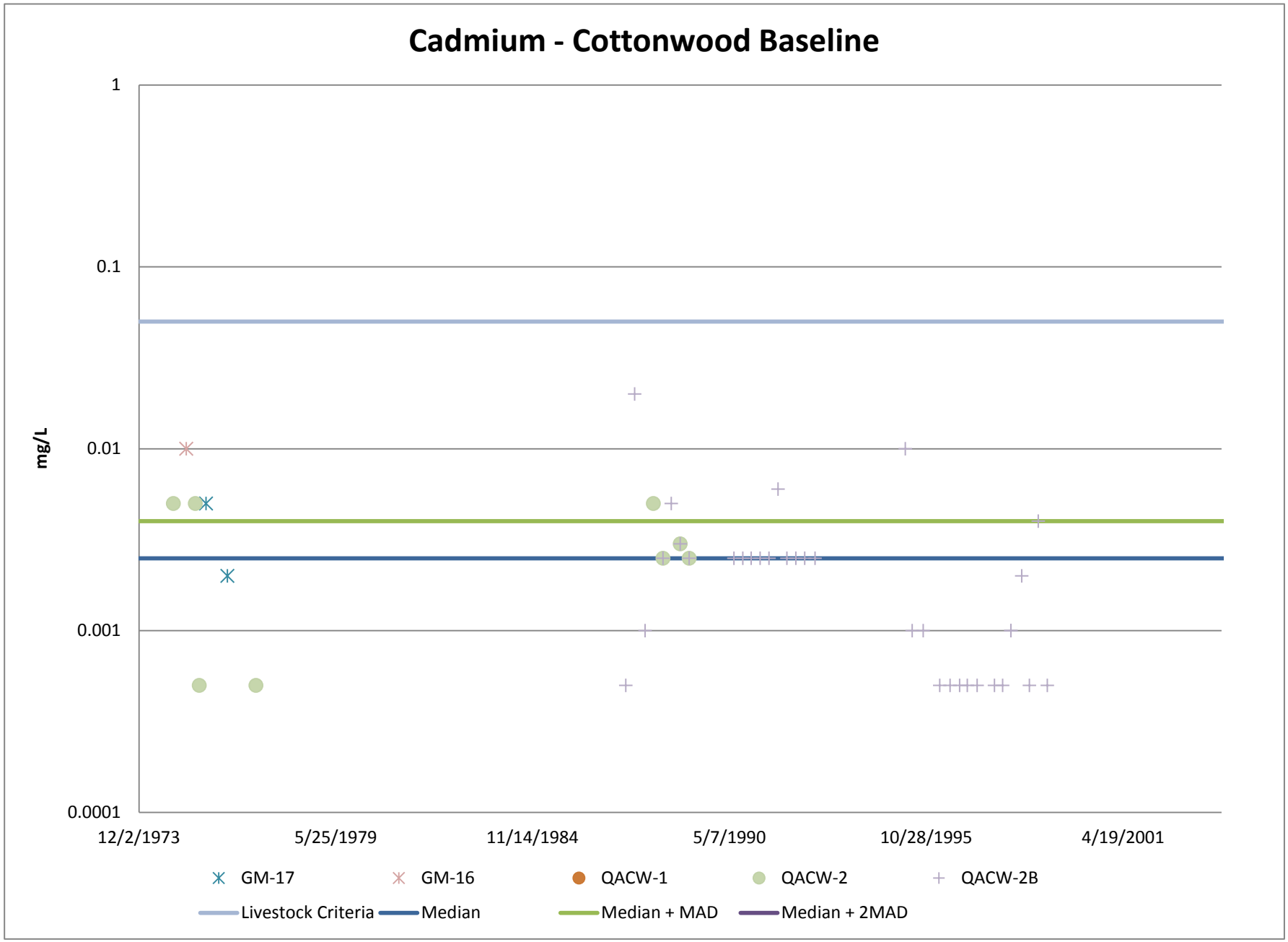

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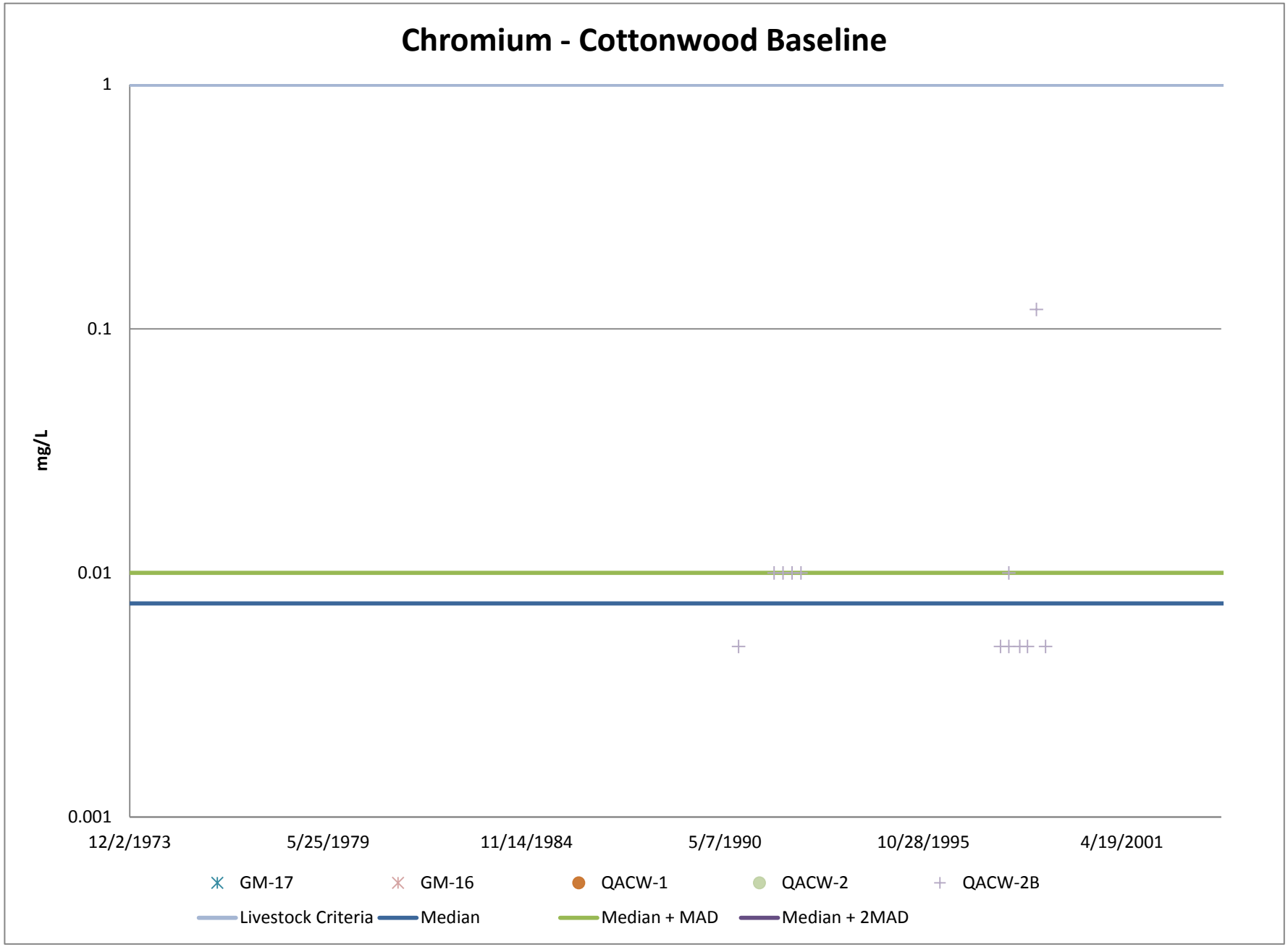

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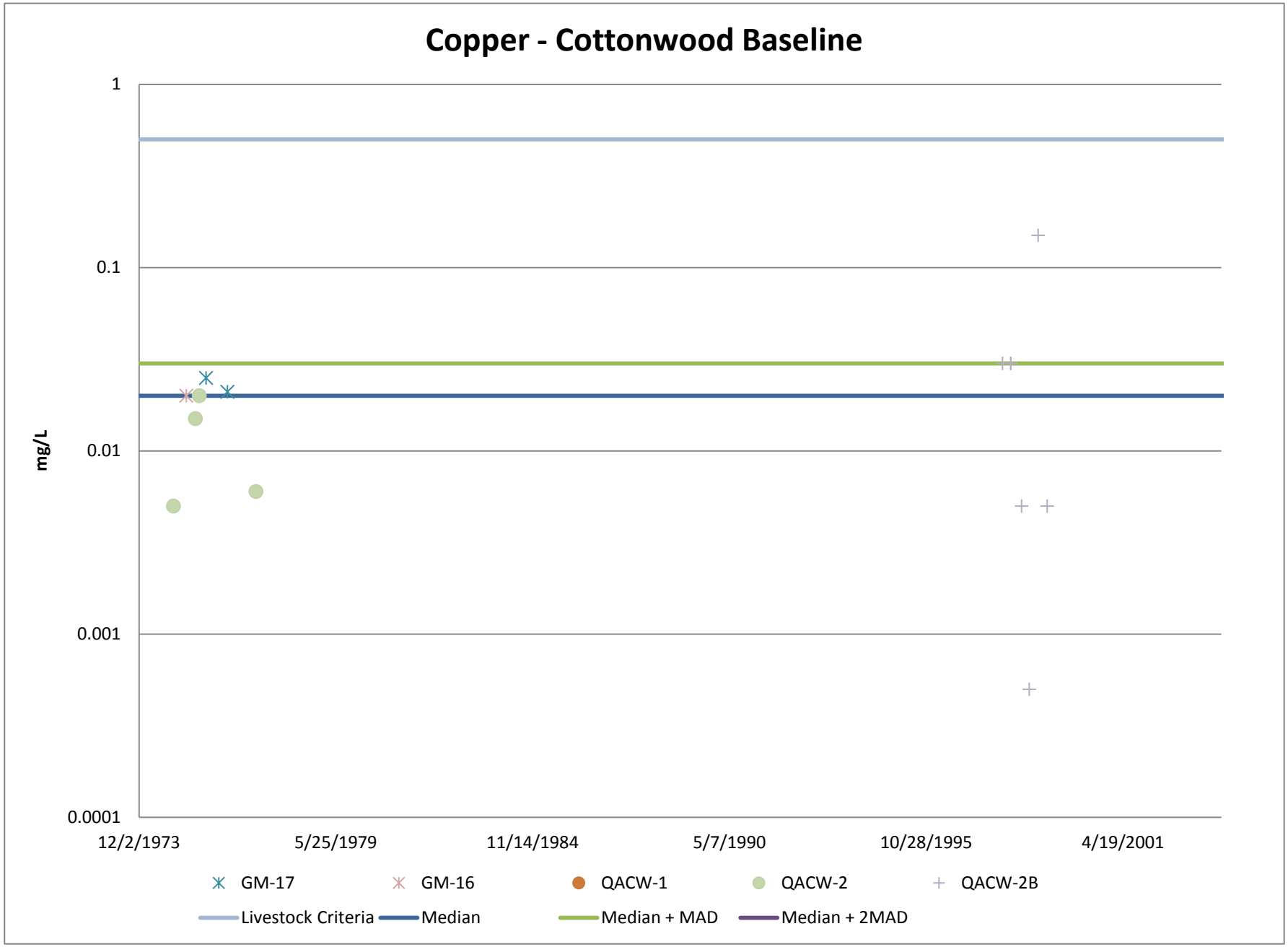

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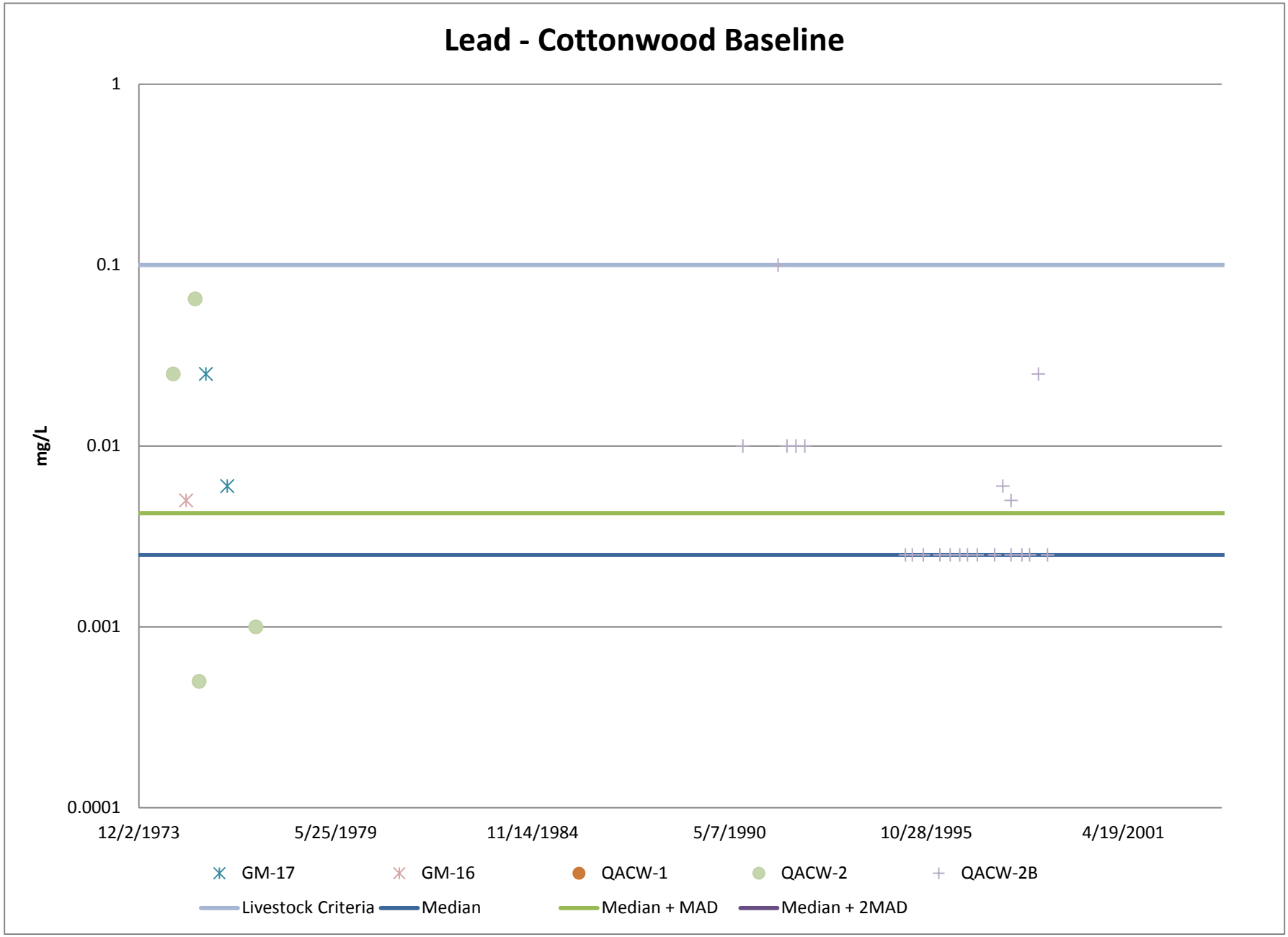

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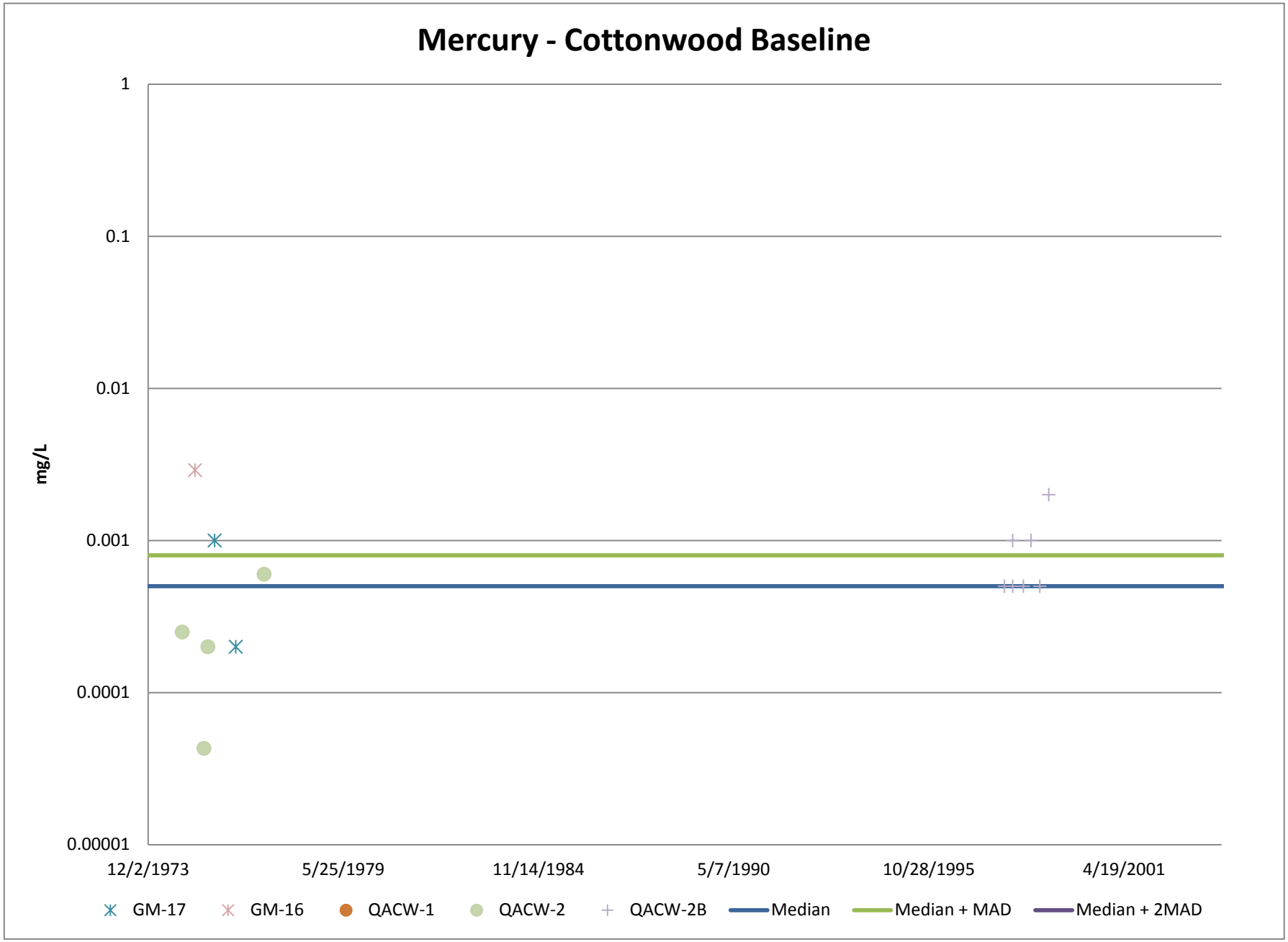

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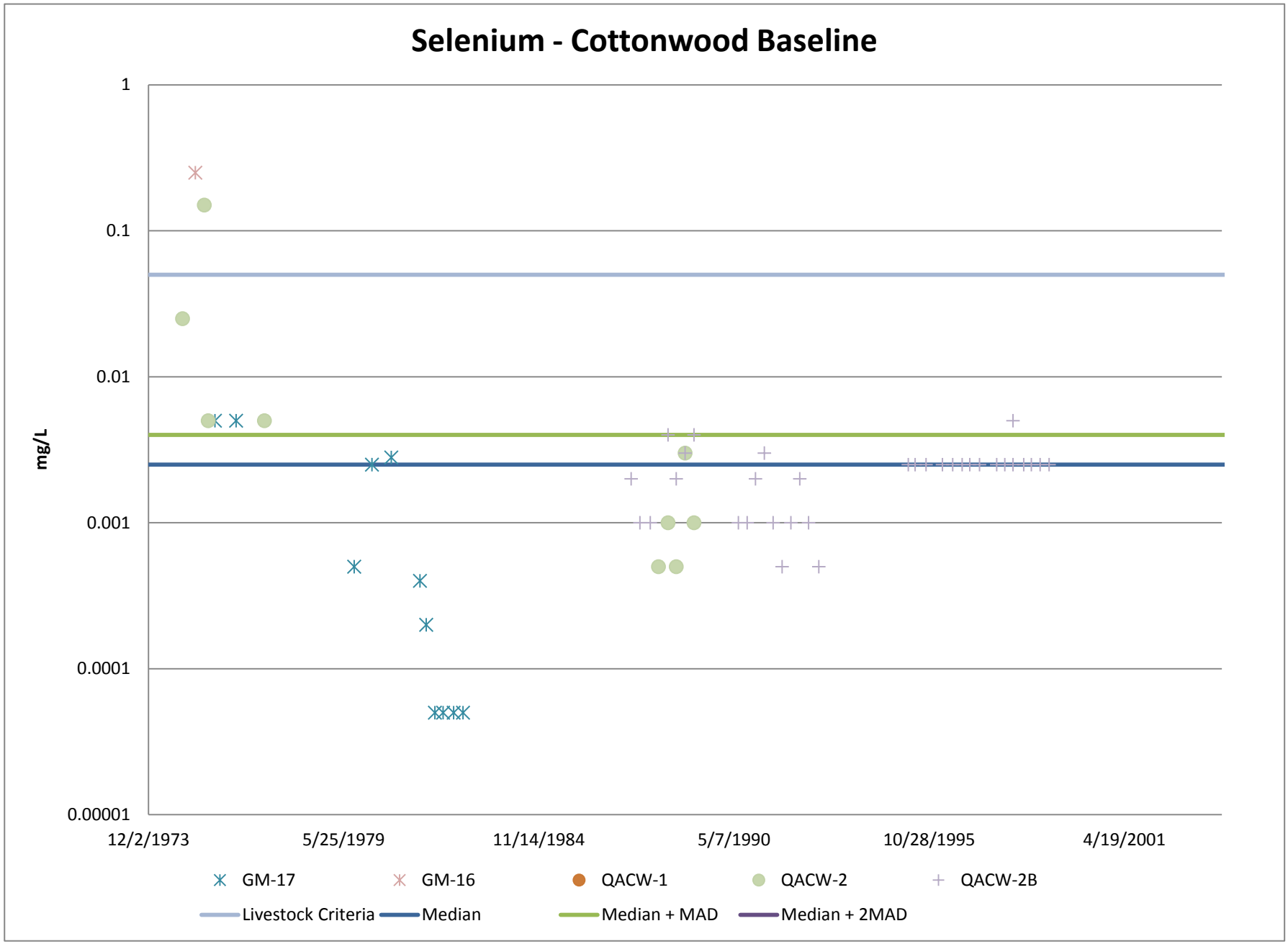

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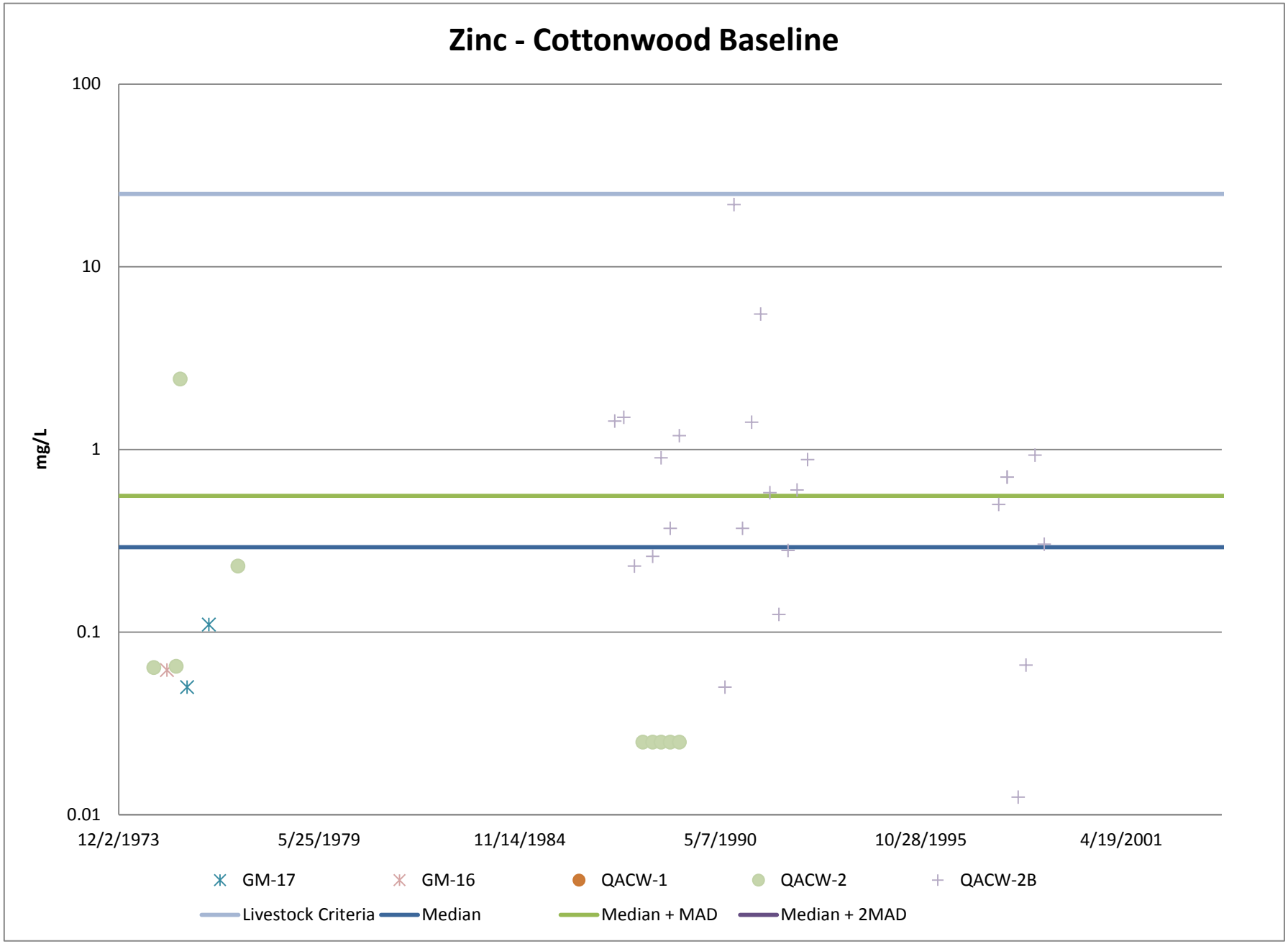

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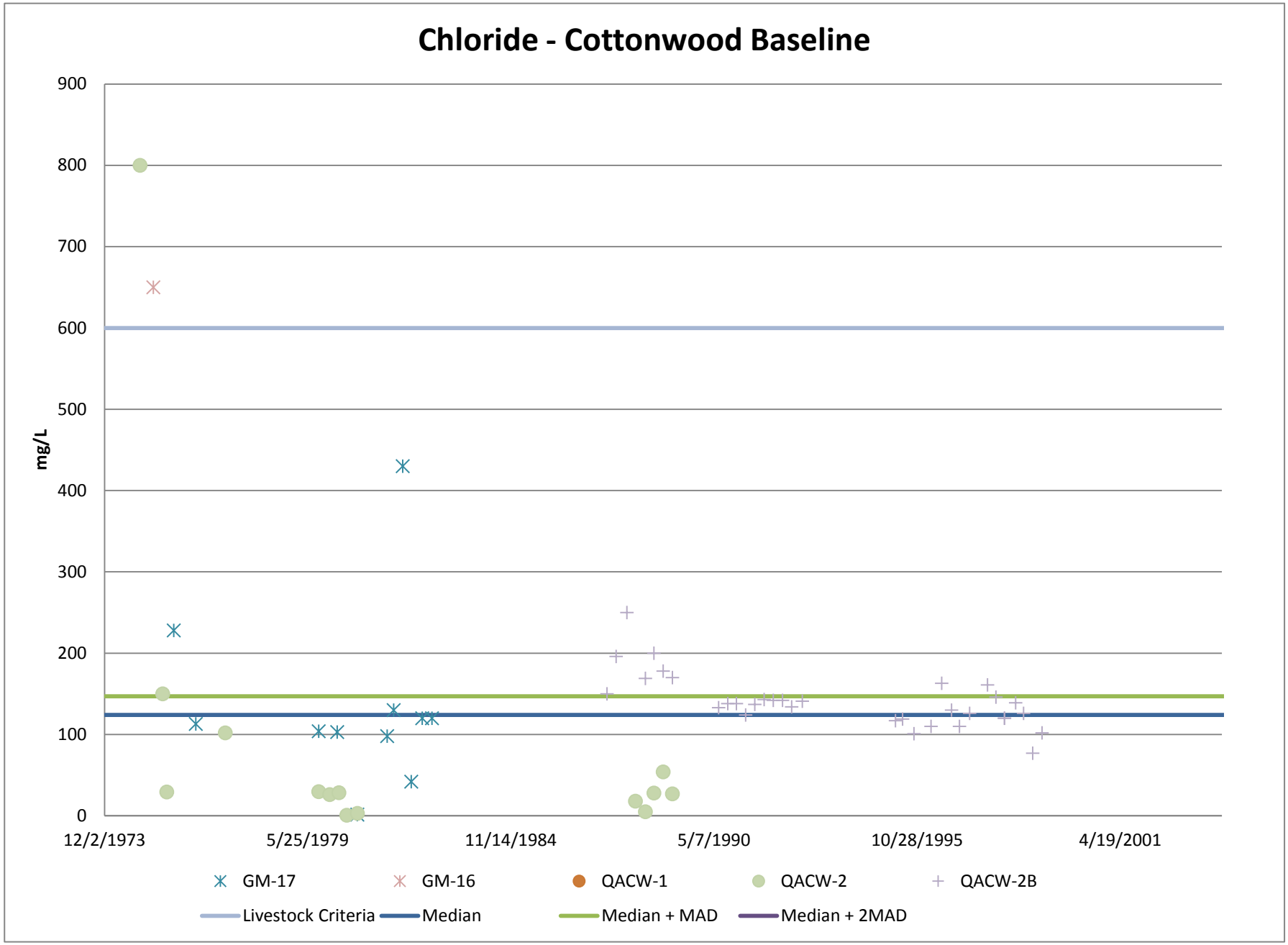

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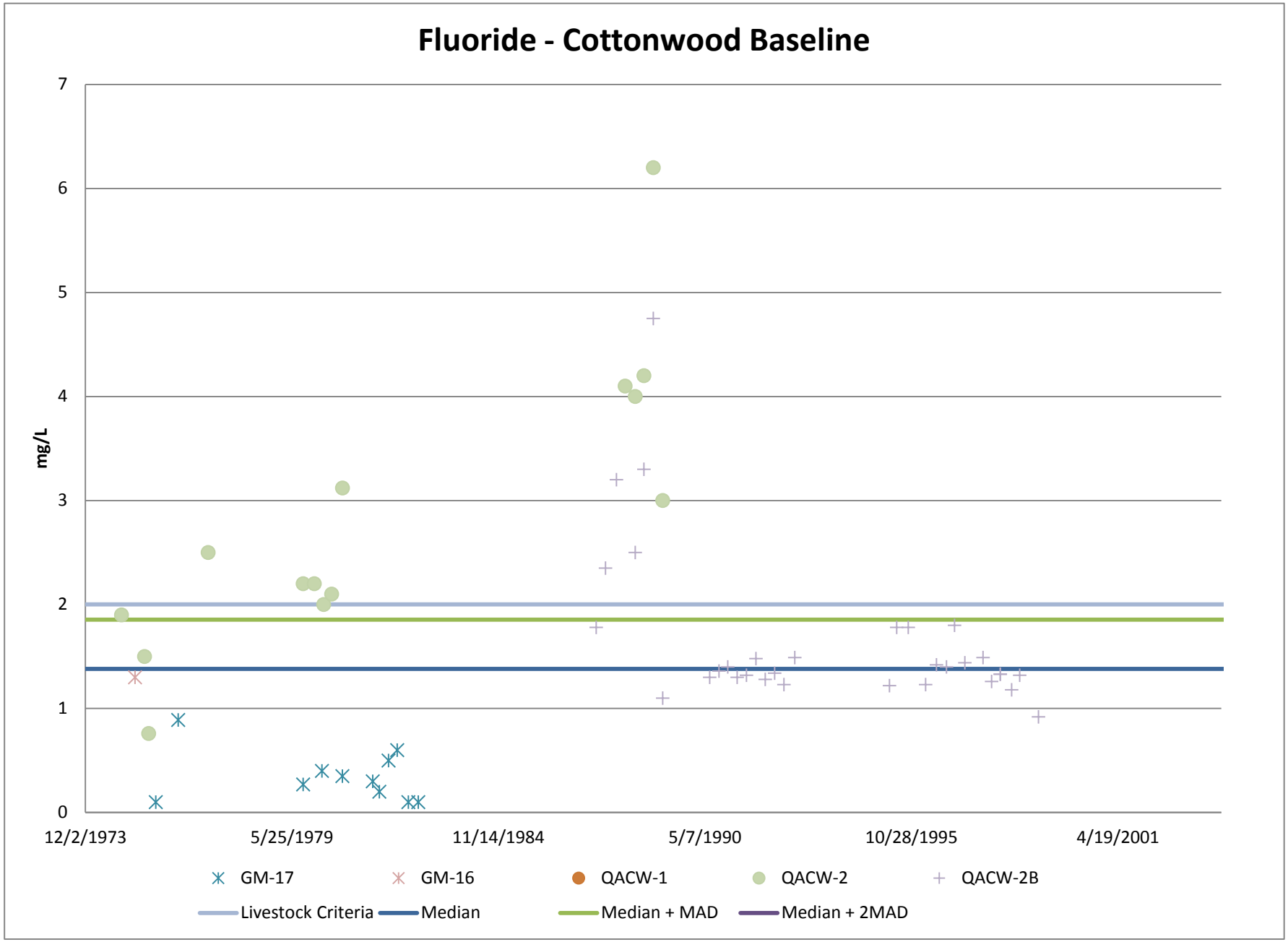

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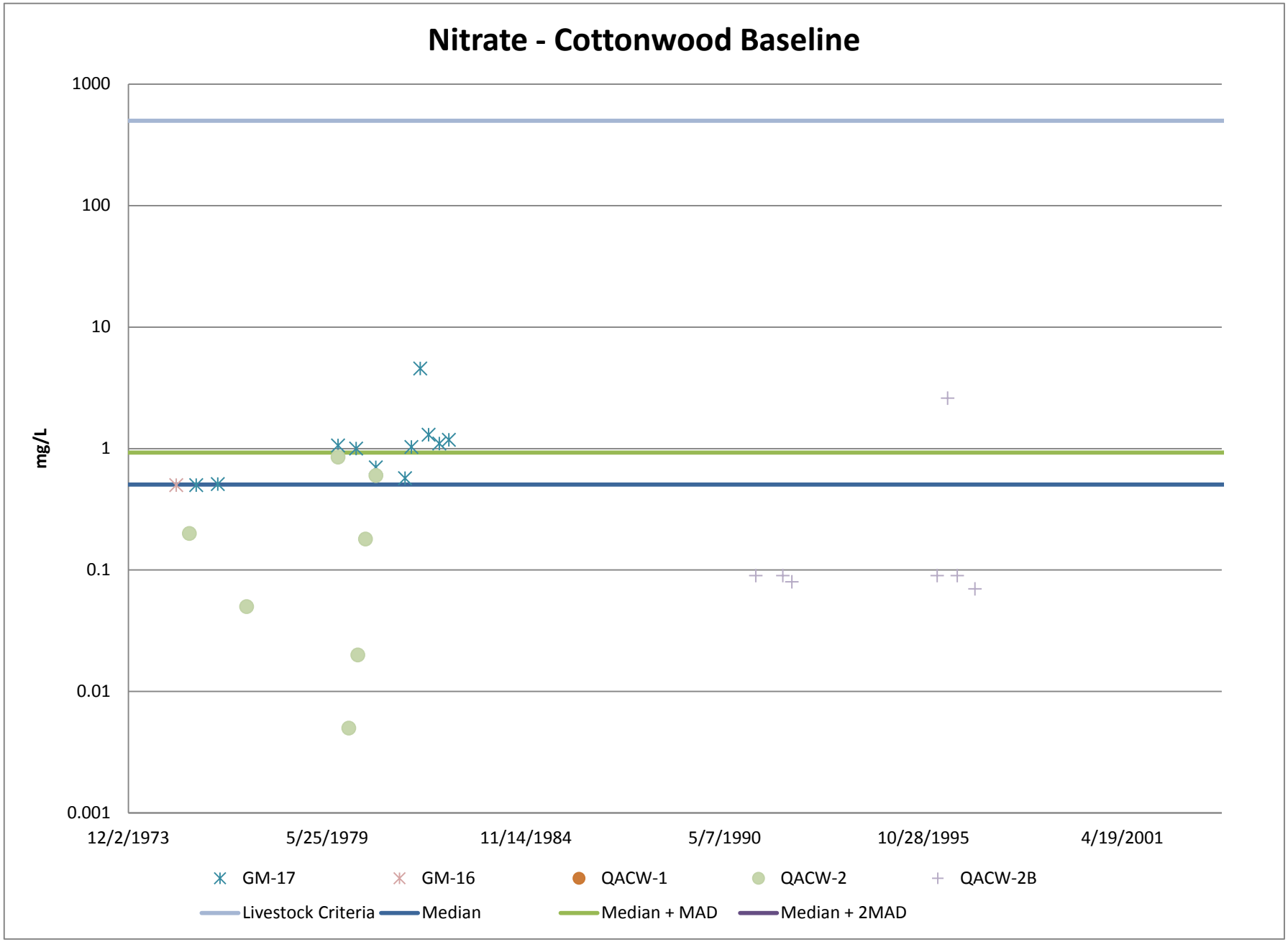

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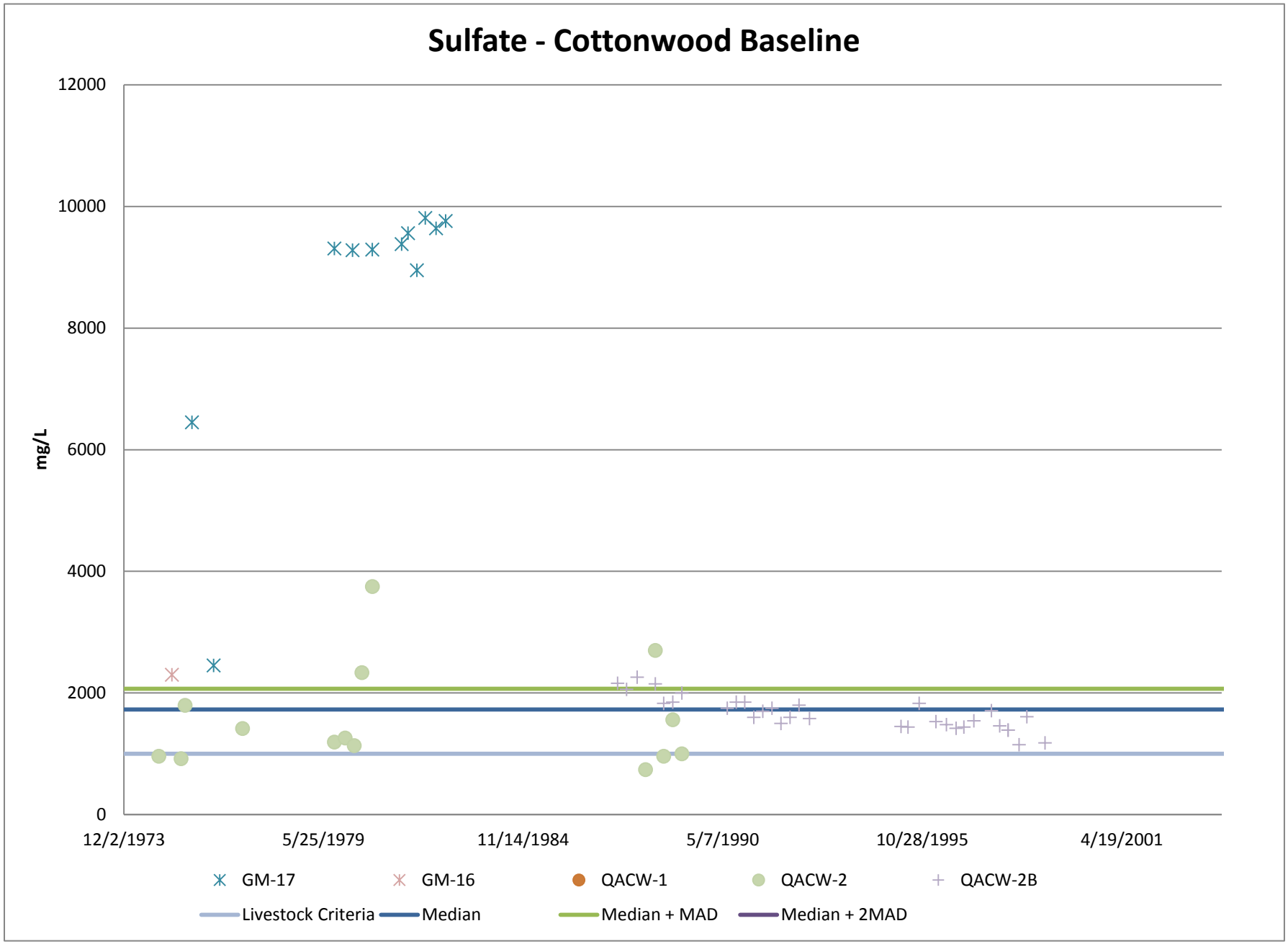

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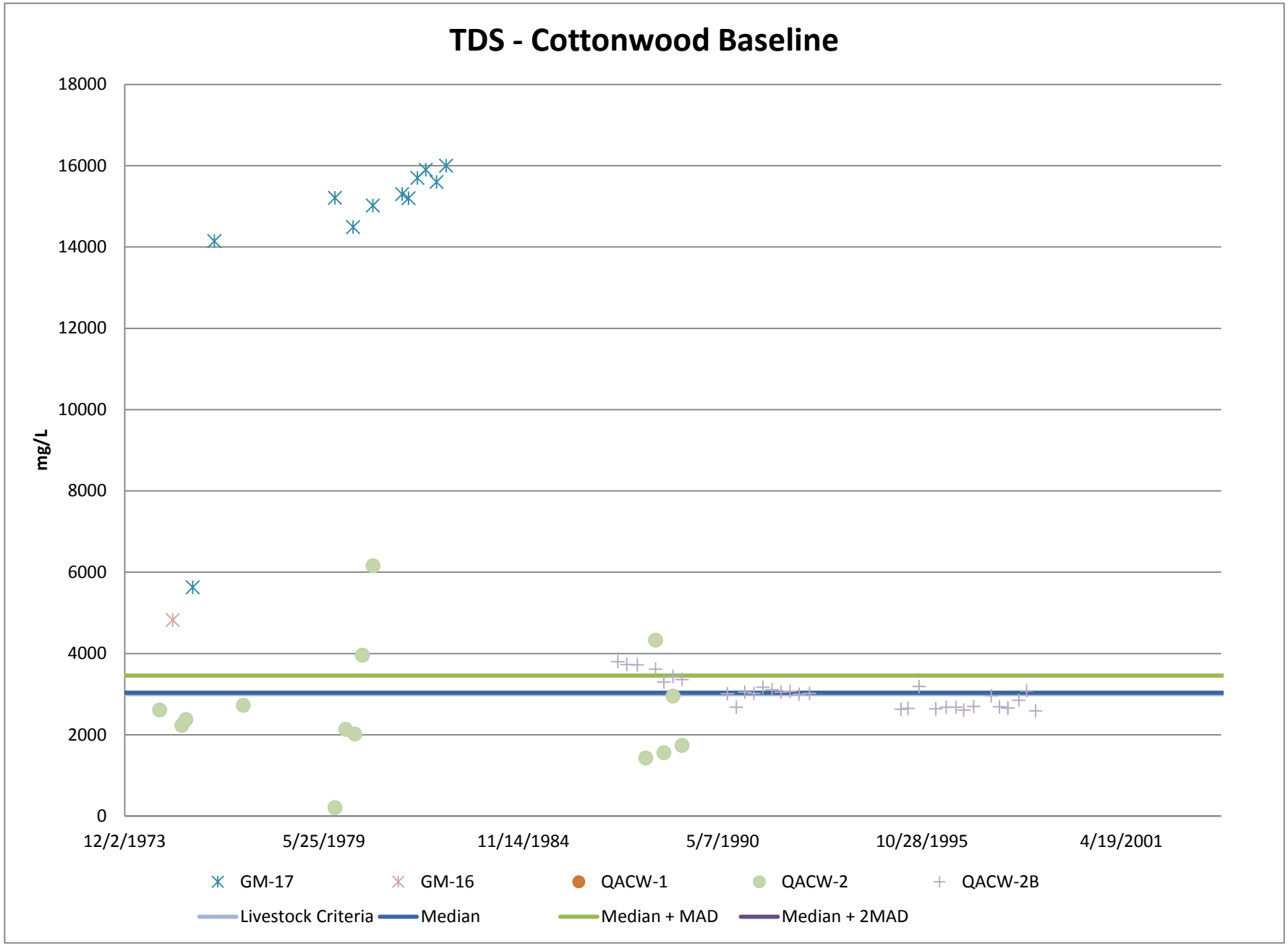

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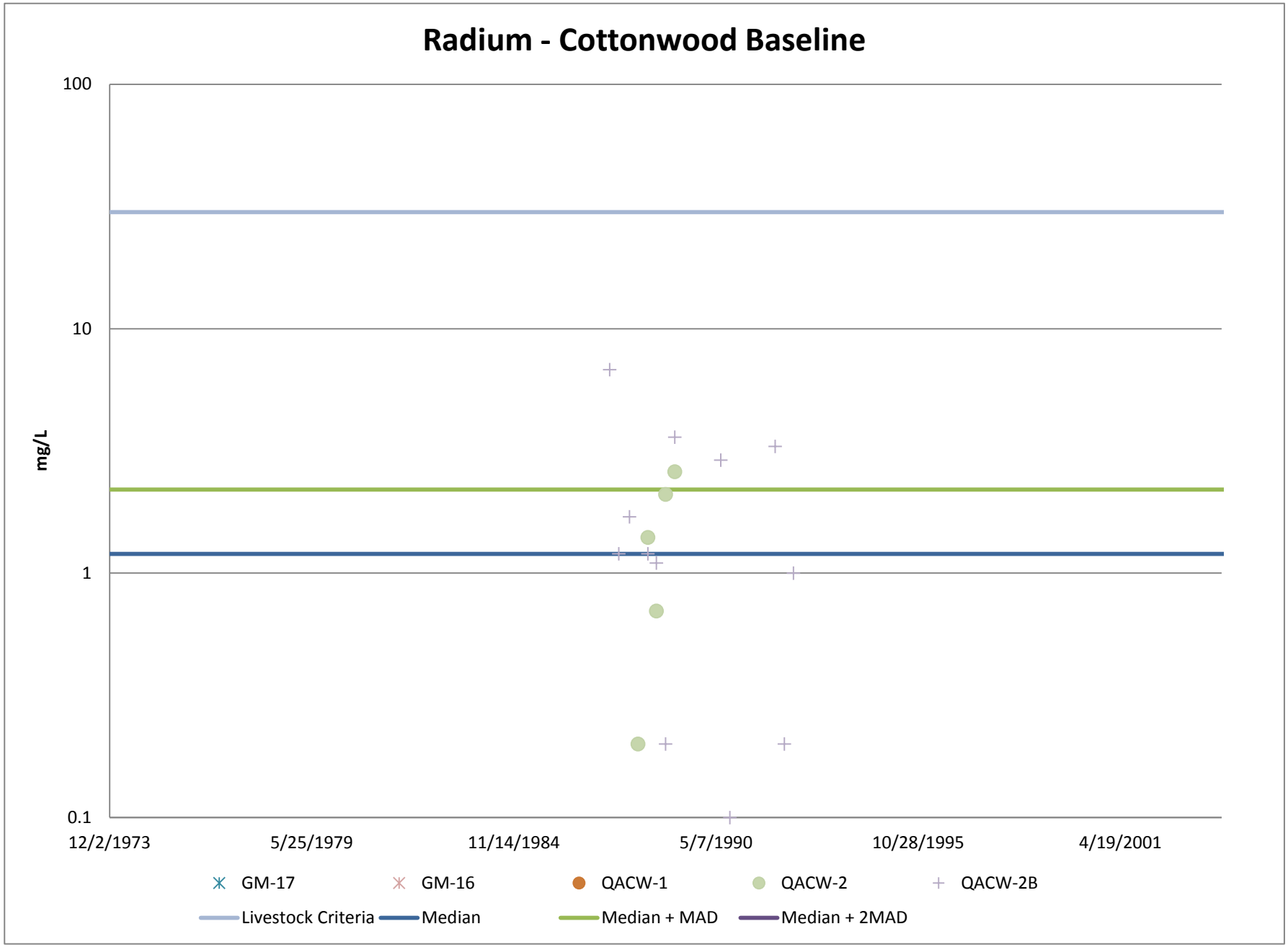

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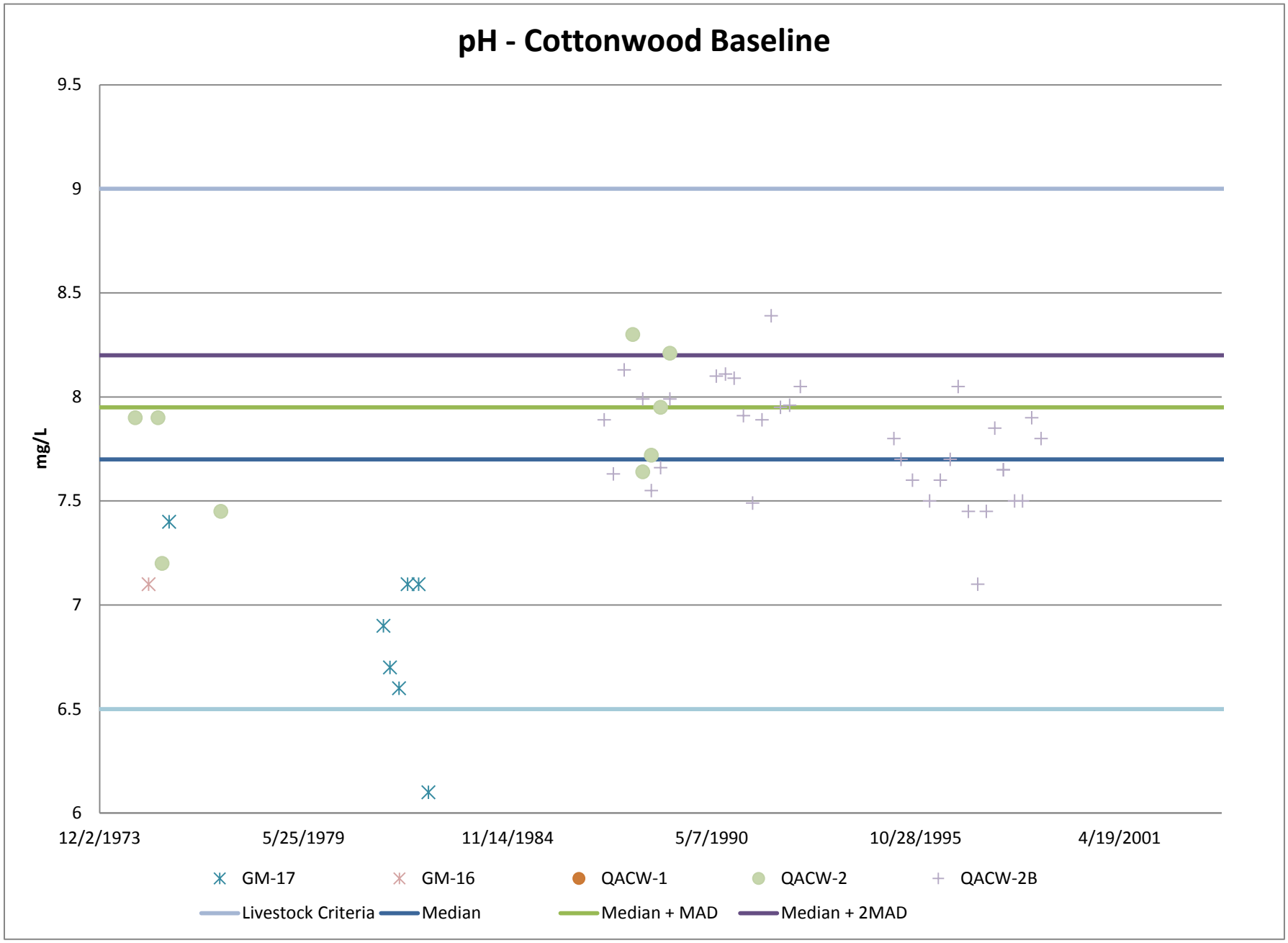

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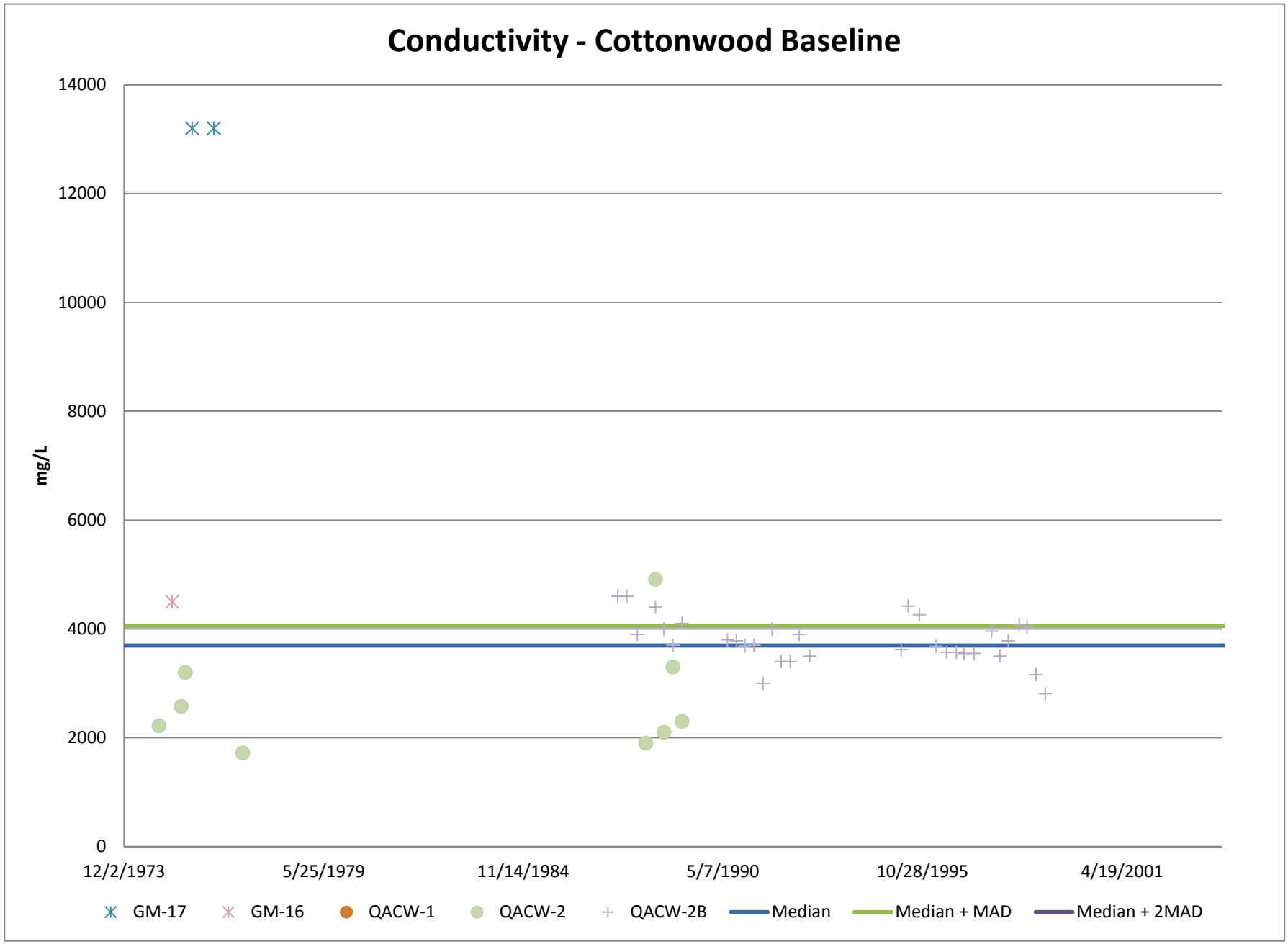

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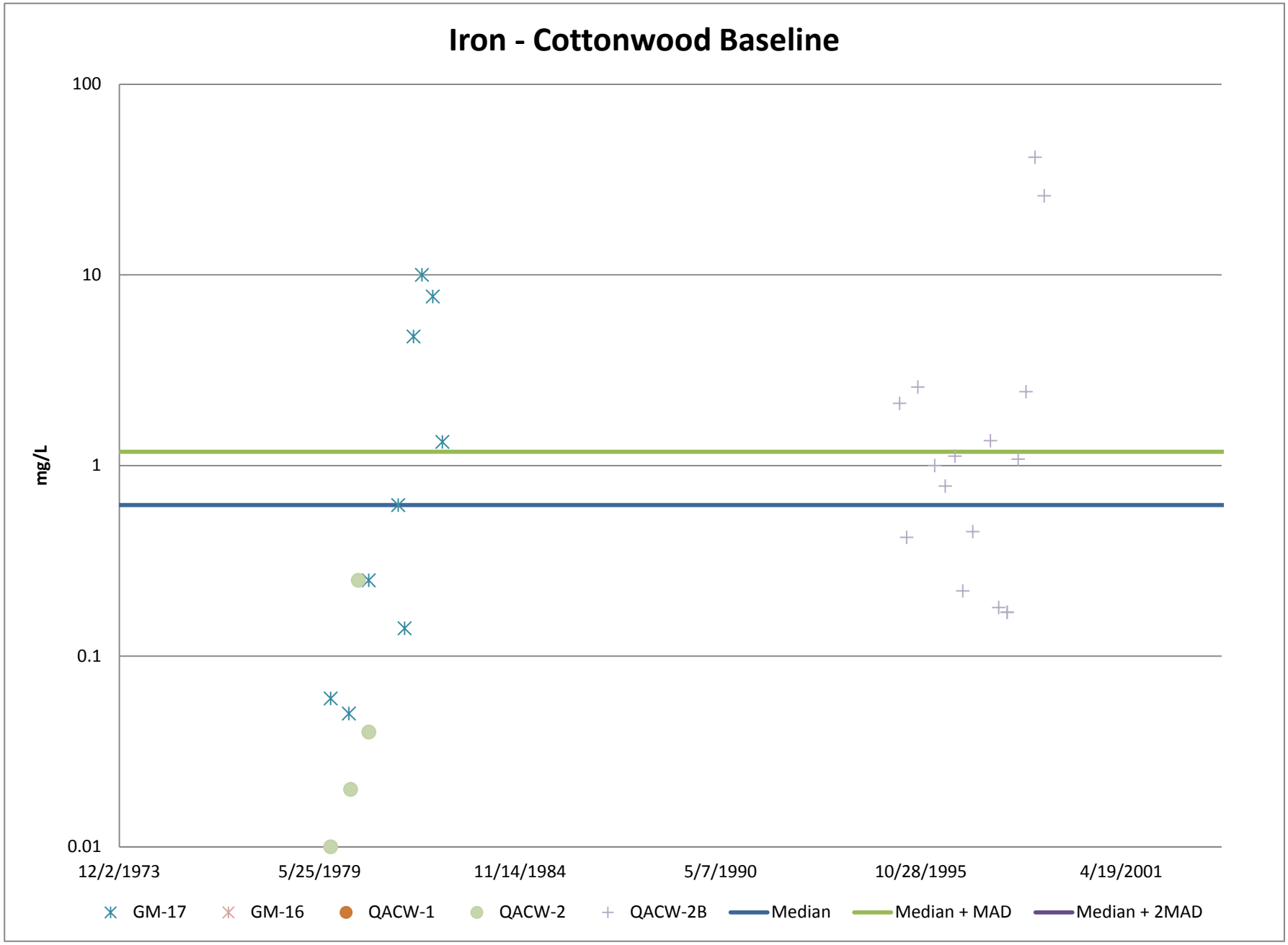

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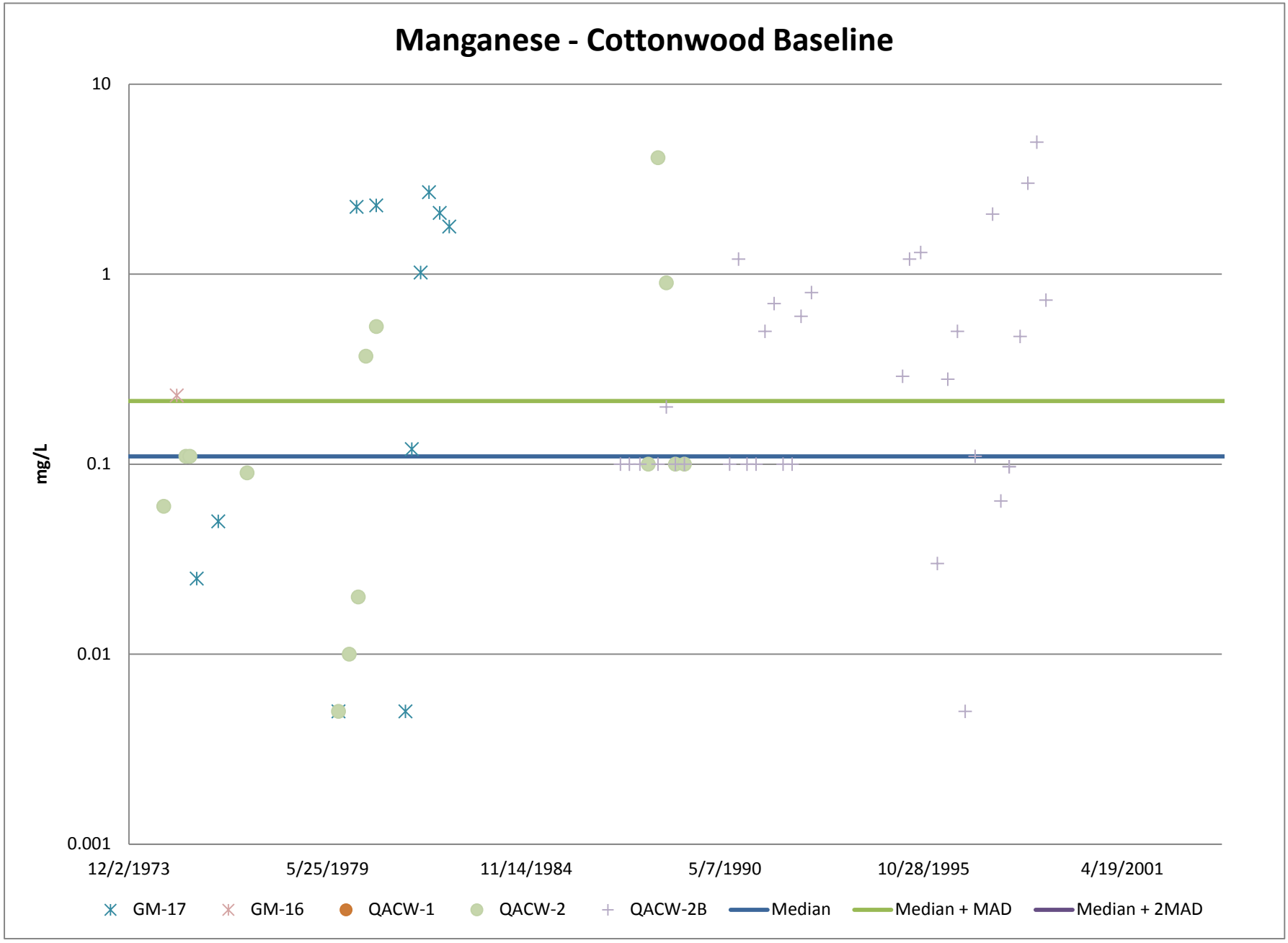

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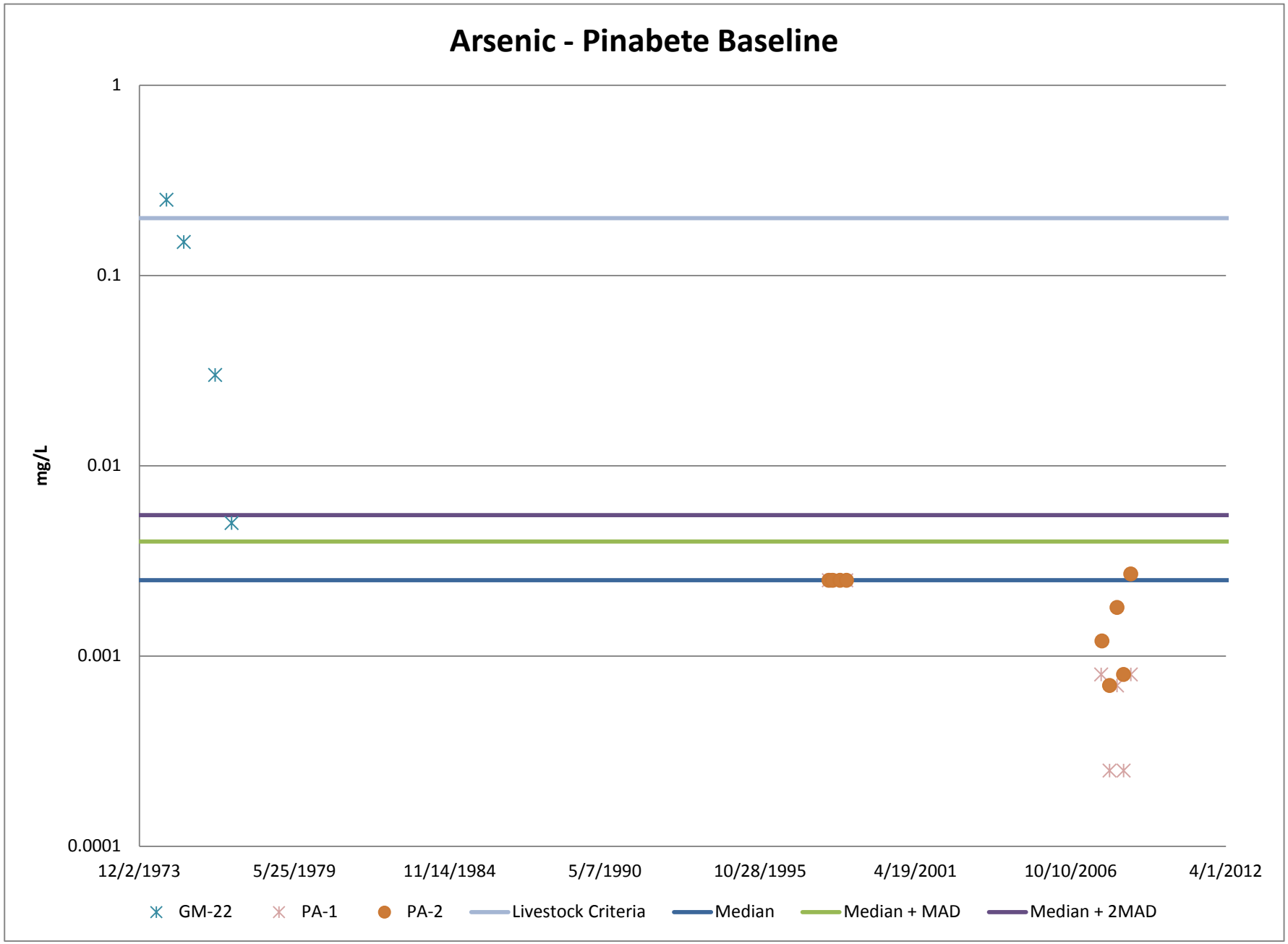
Pinabete and No Name Alluvial Graphs



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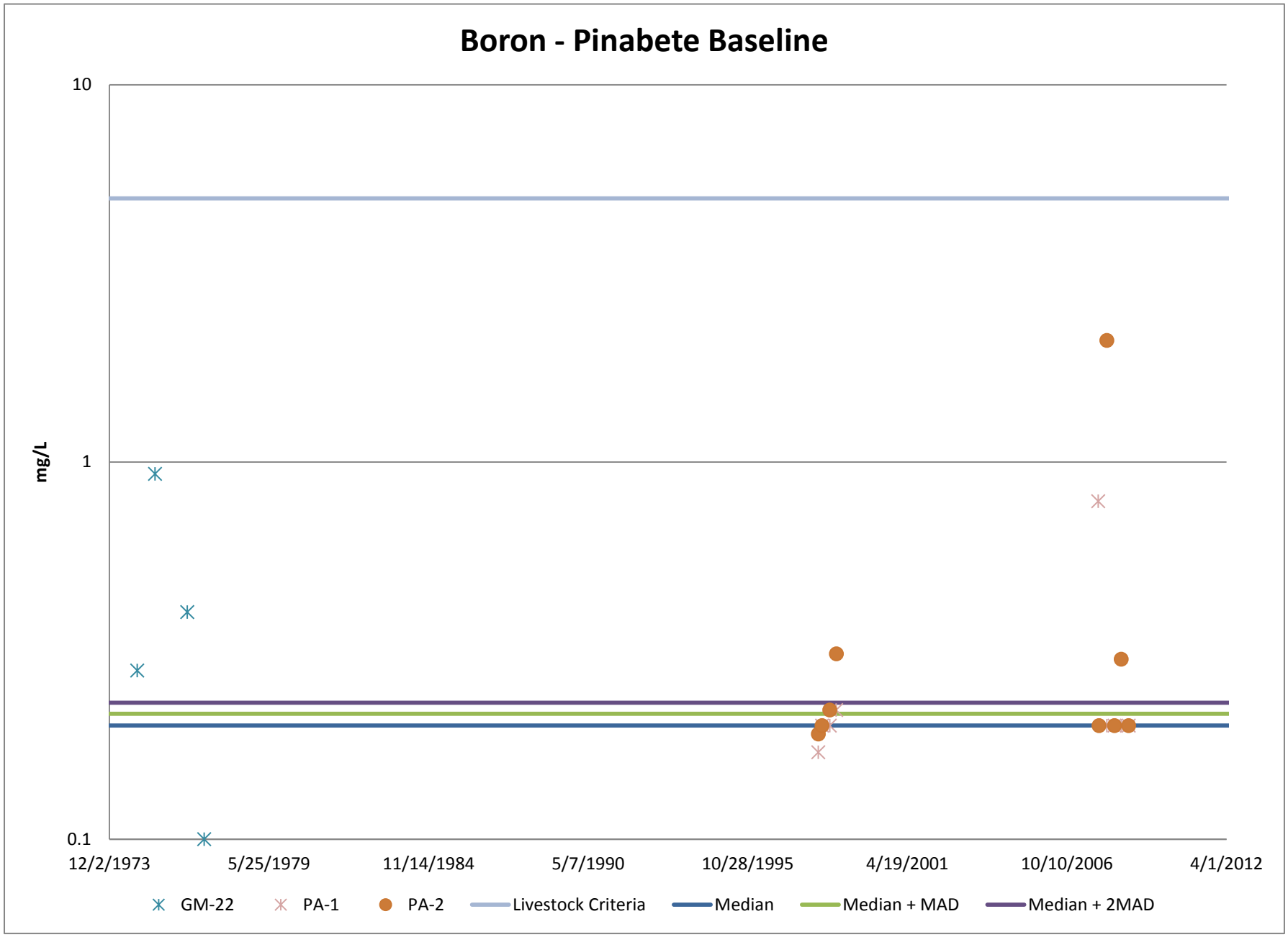

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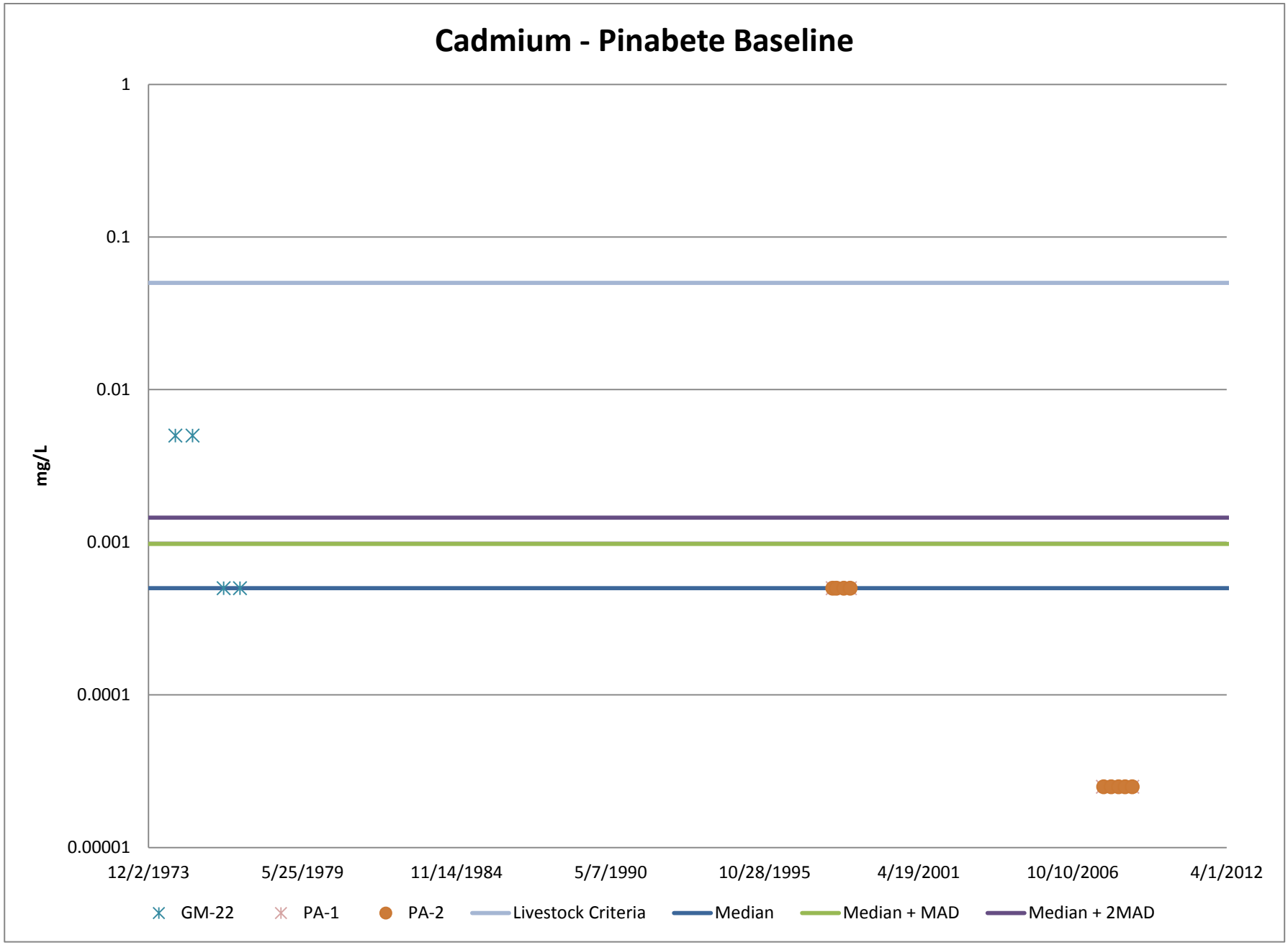

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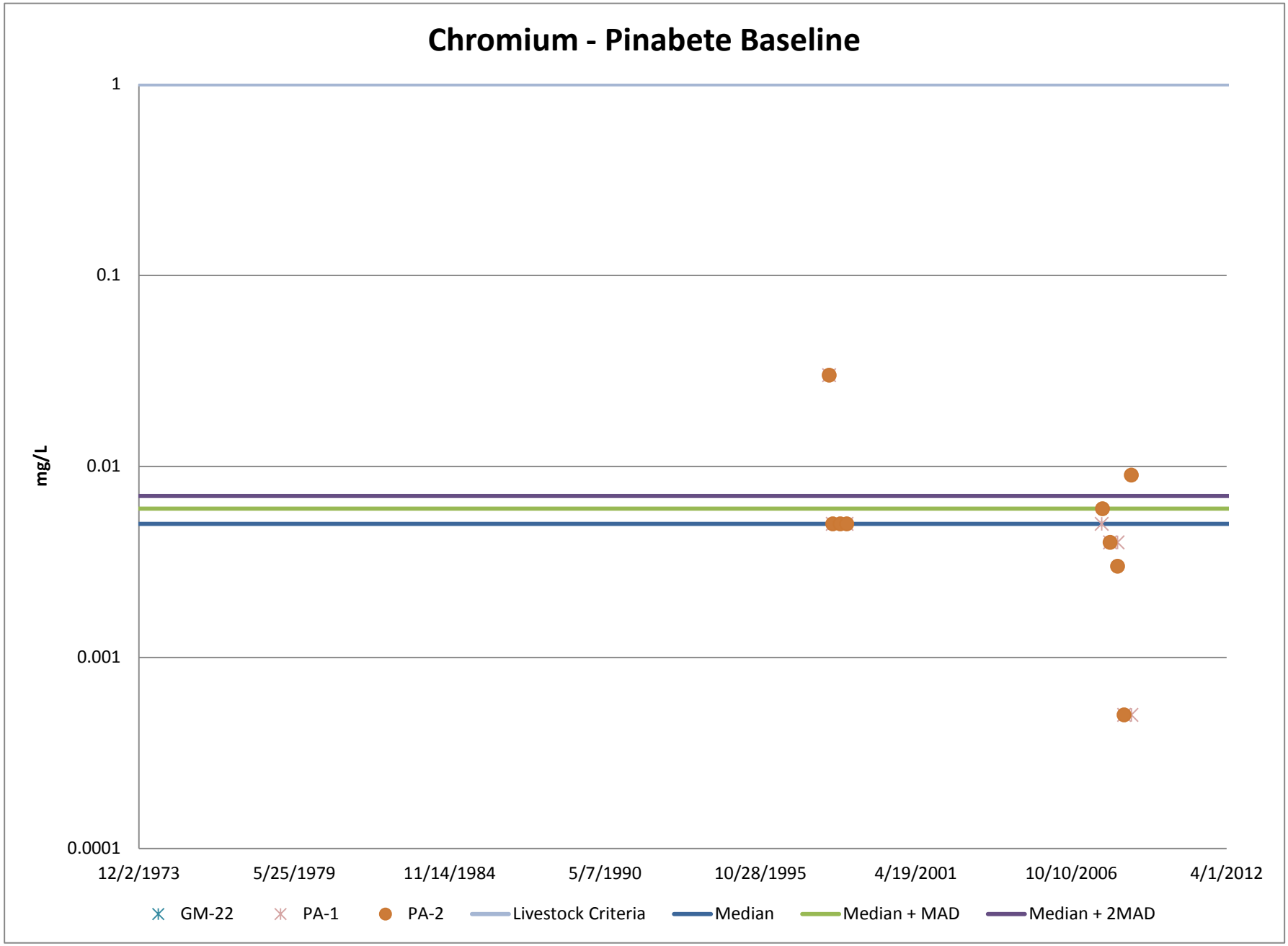

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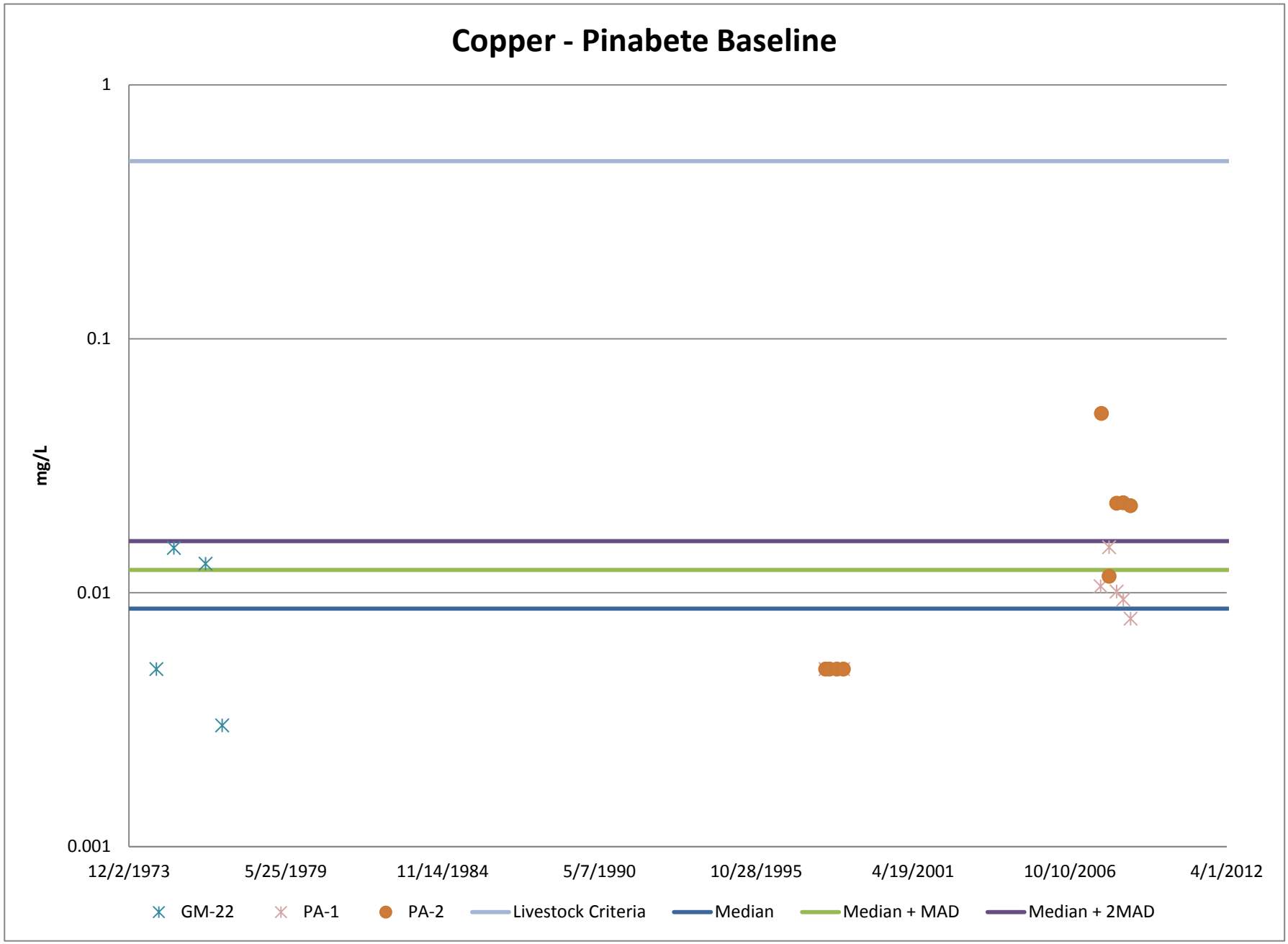

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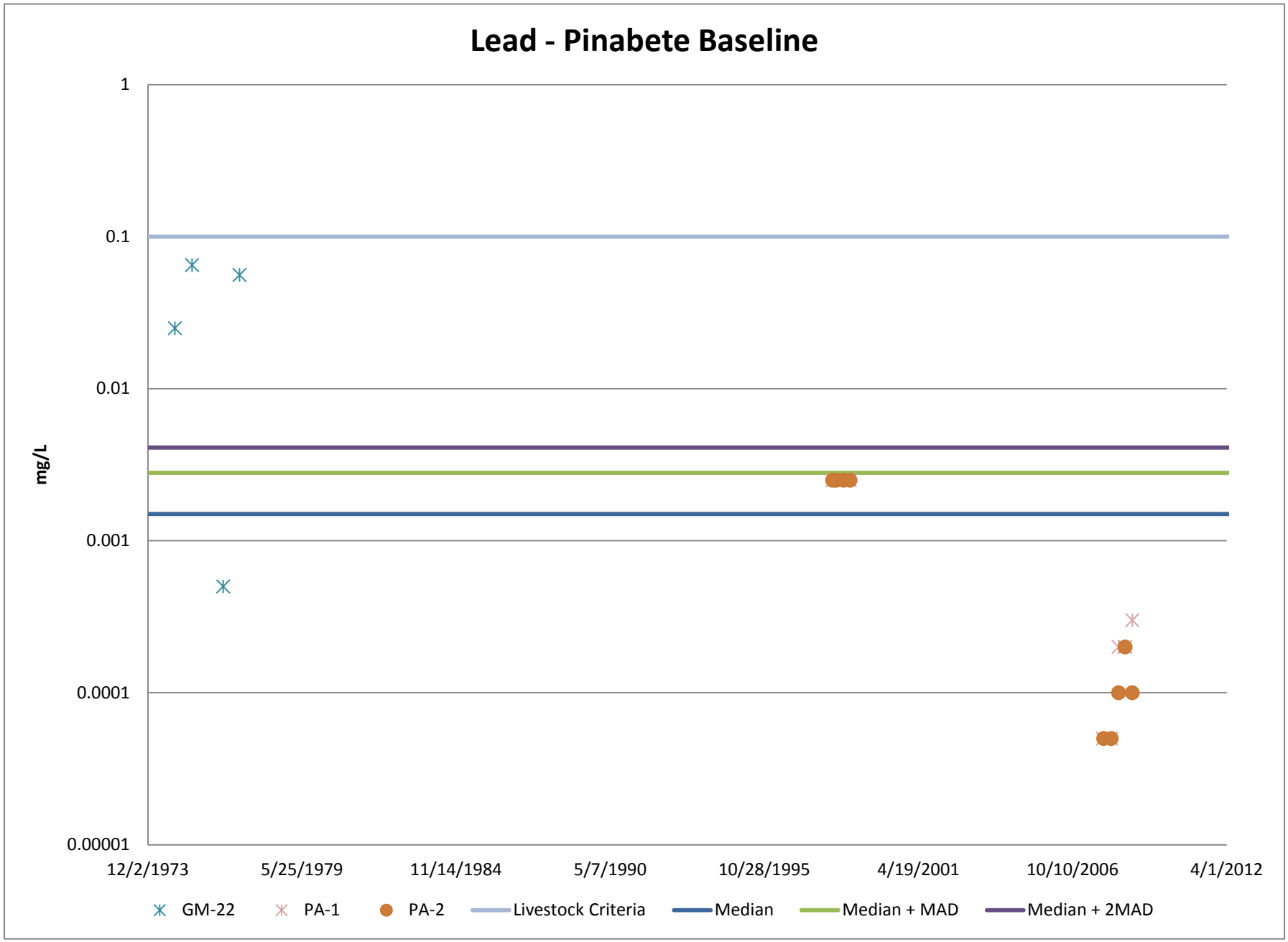

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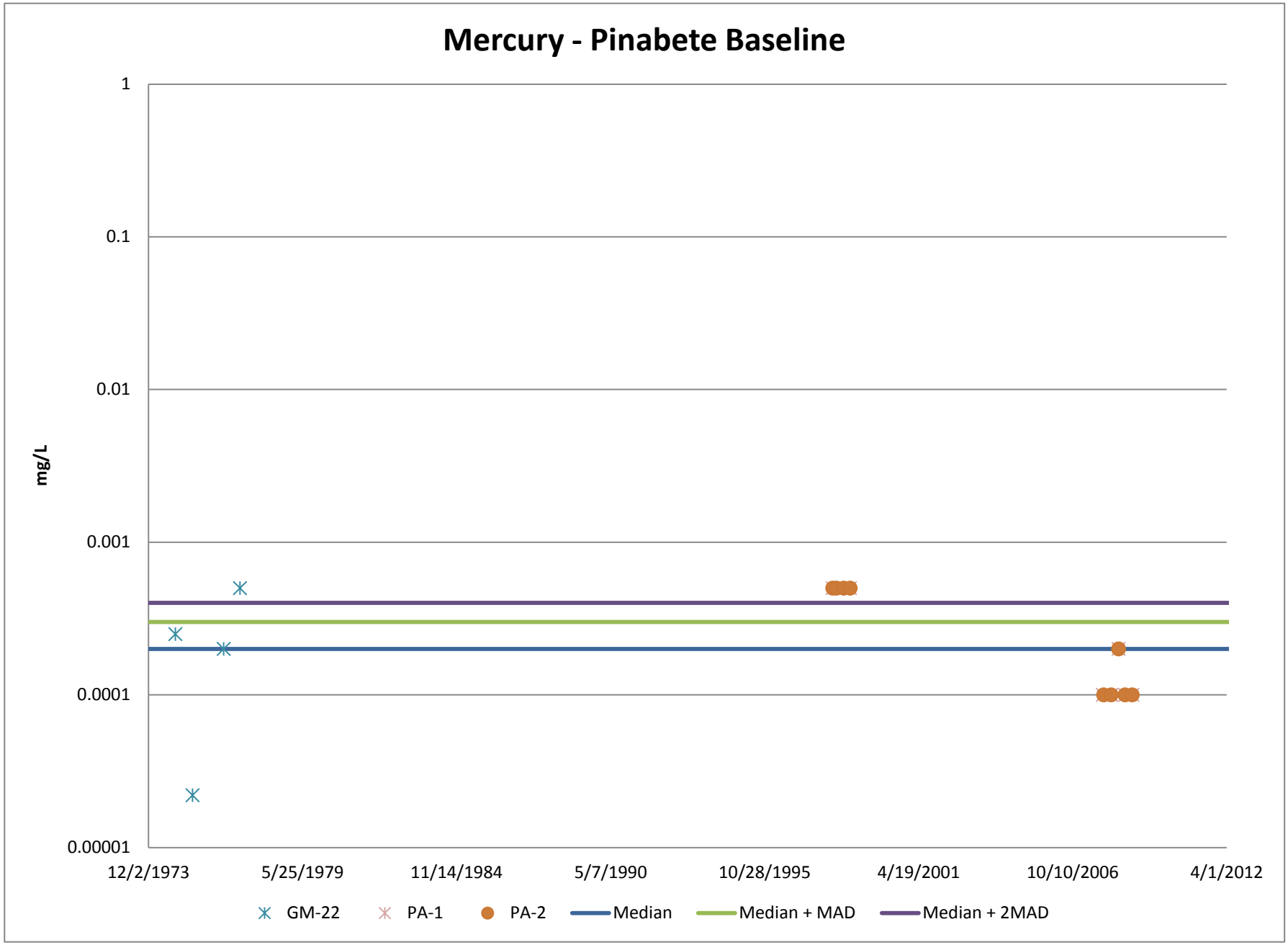

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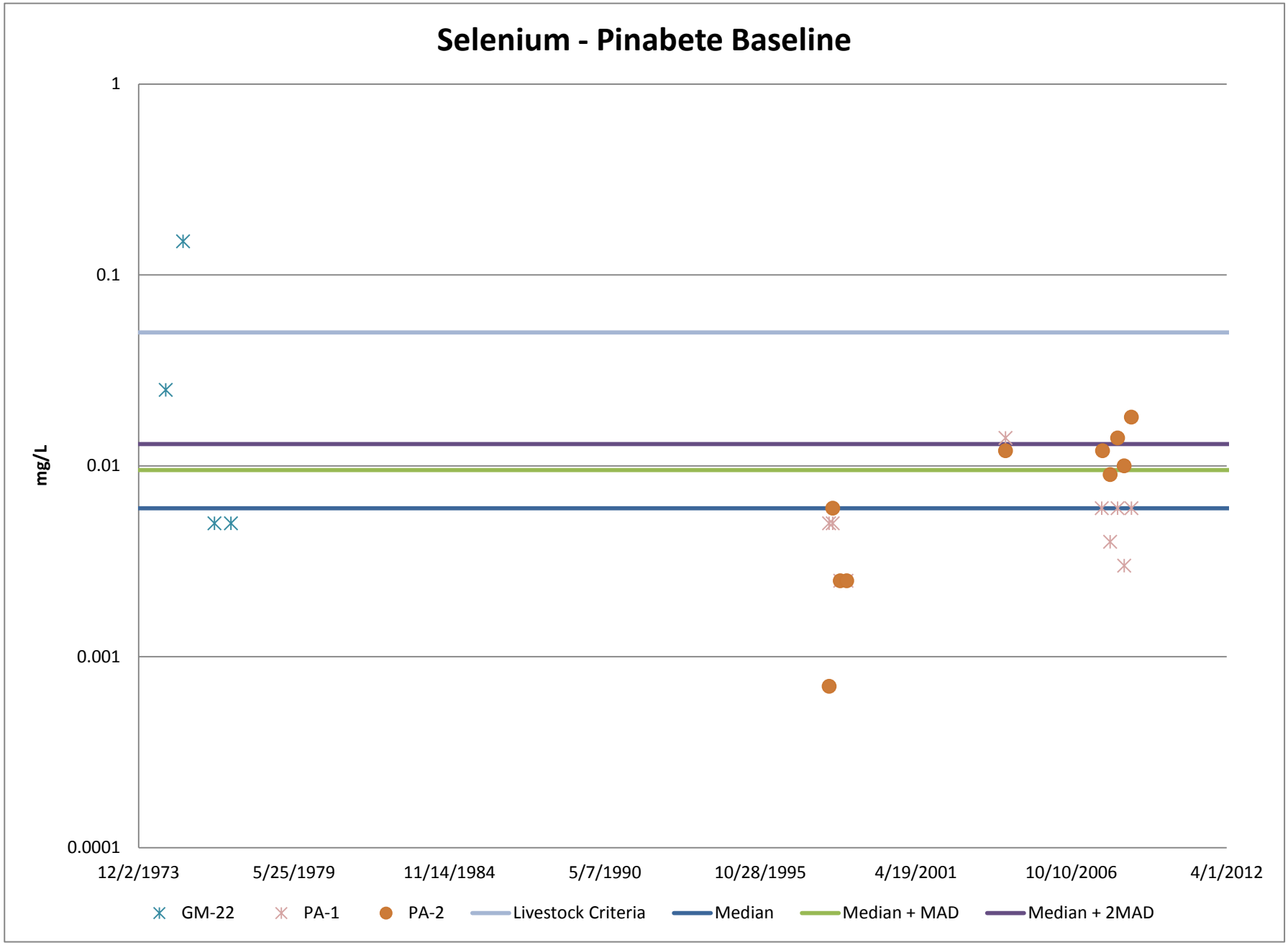

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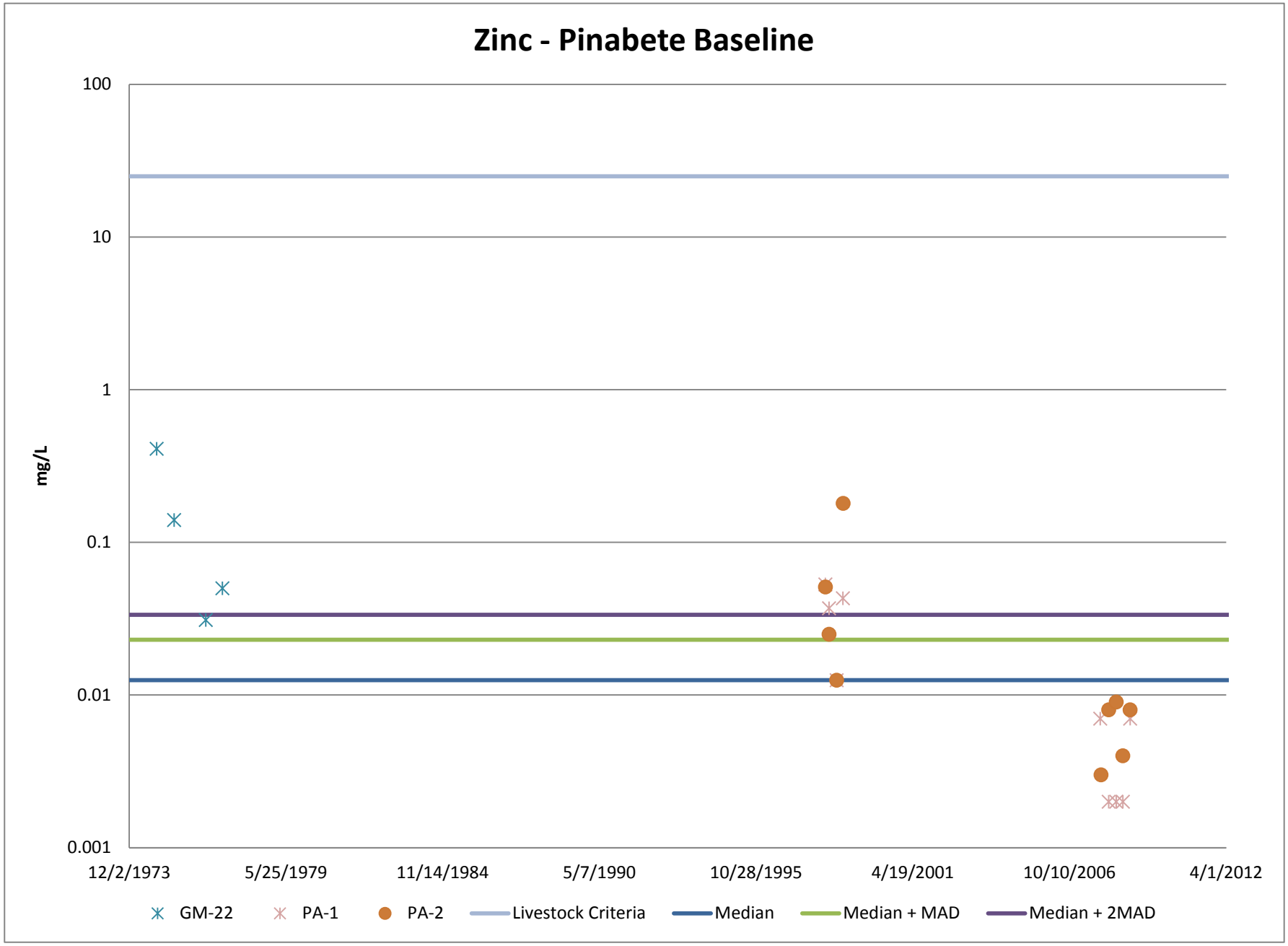

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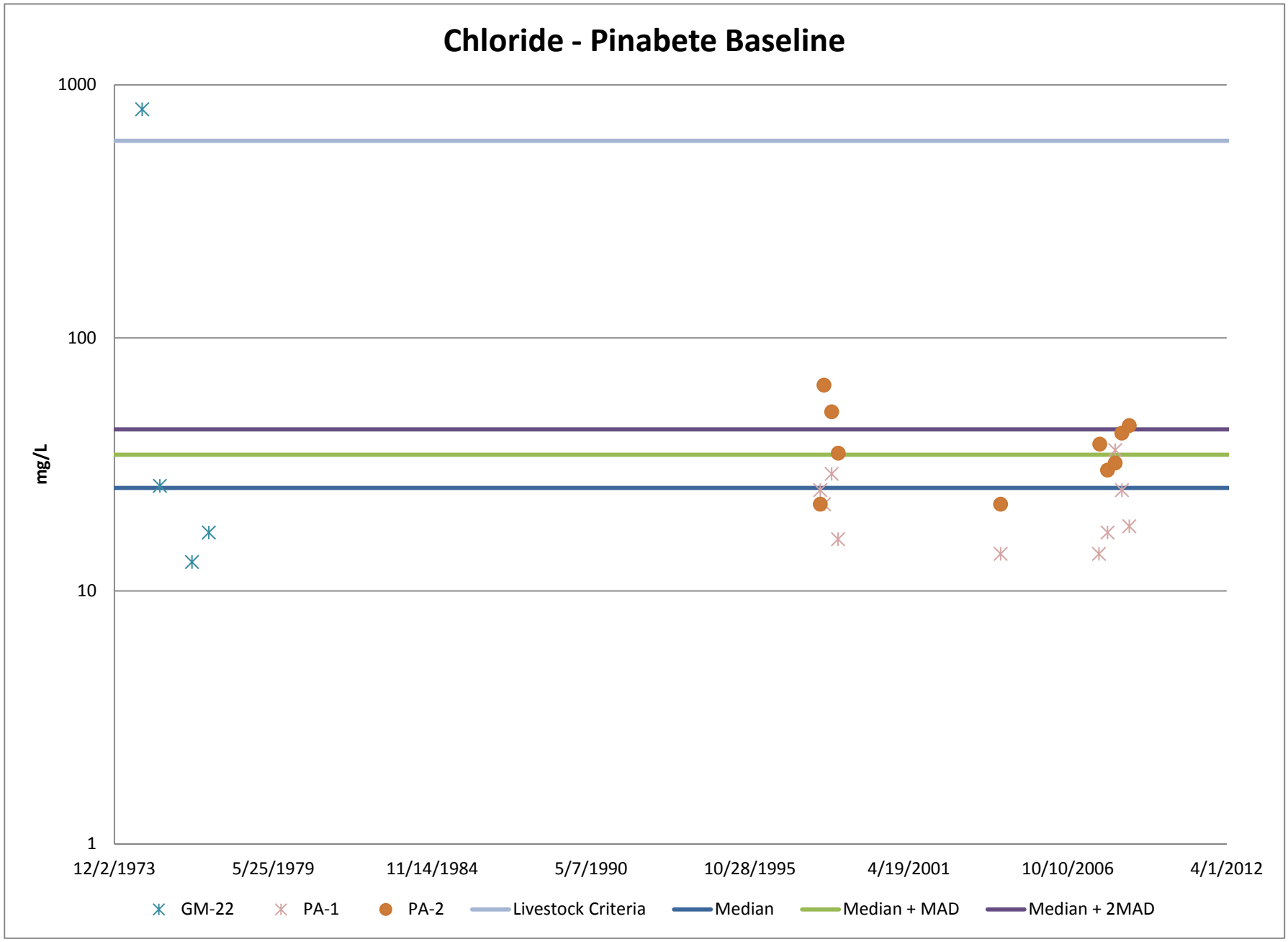

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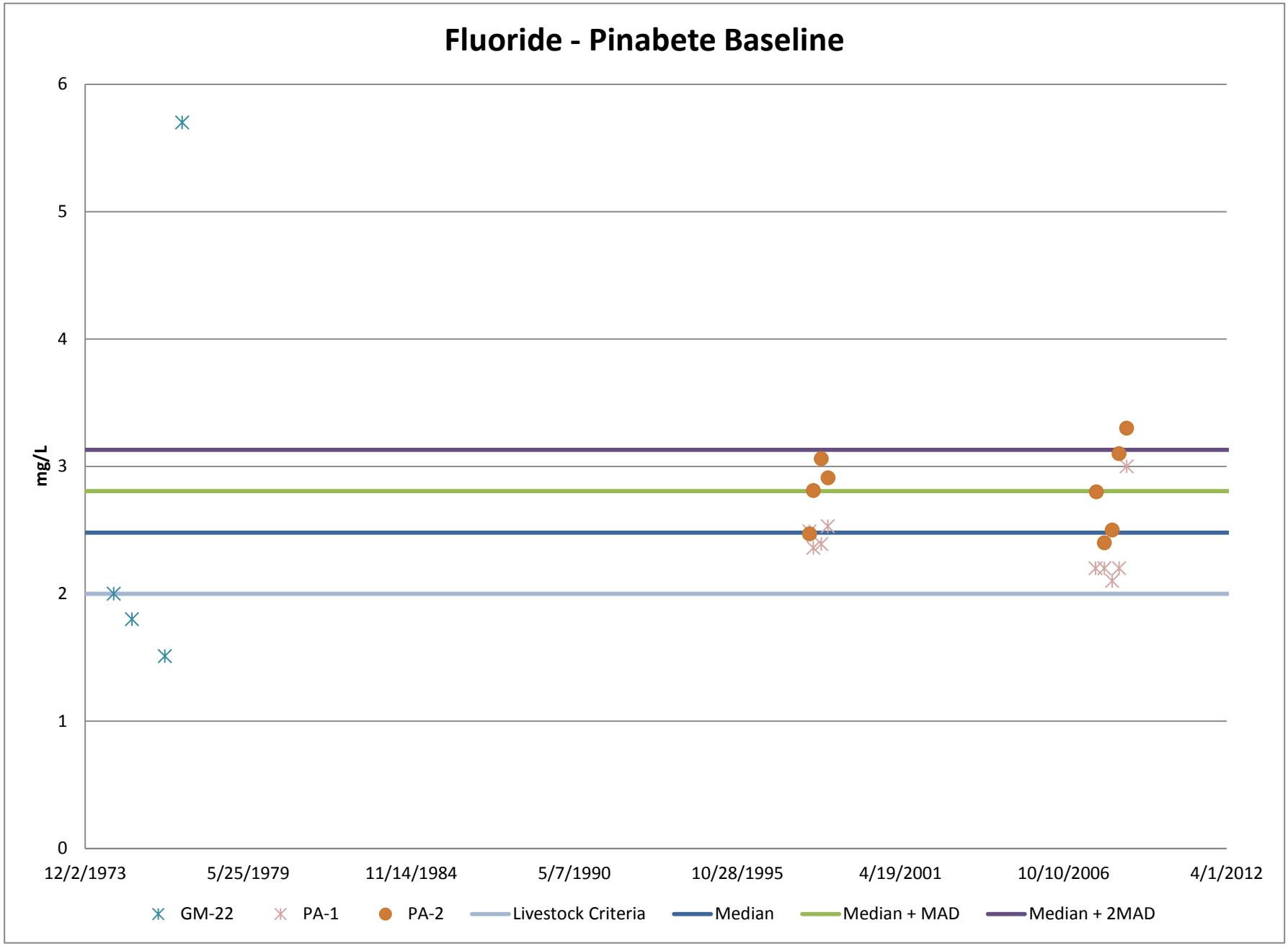

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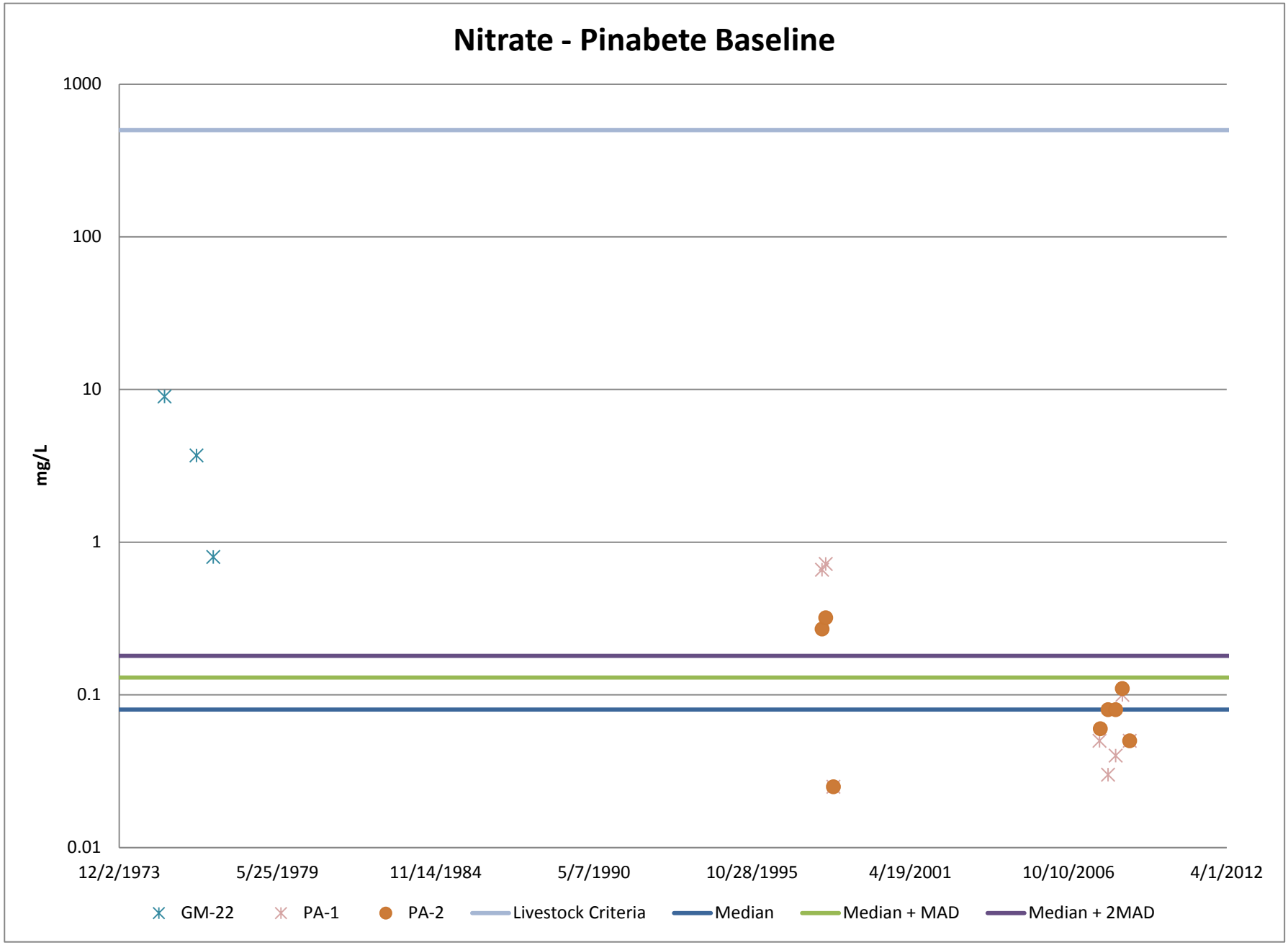

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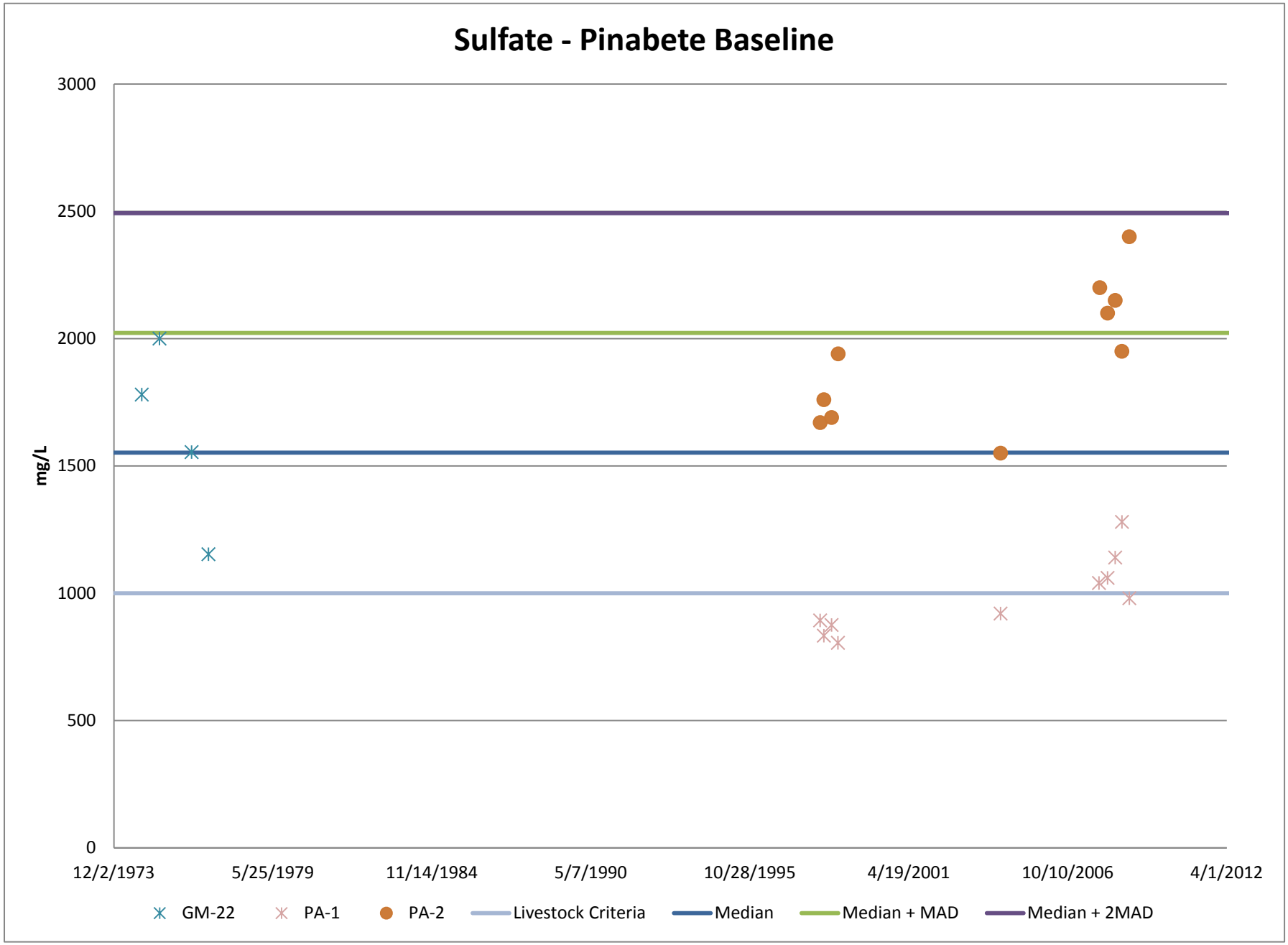

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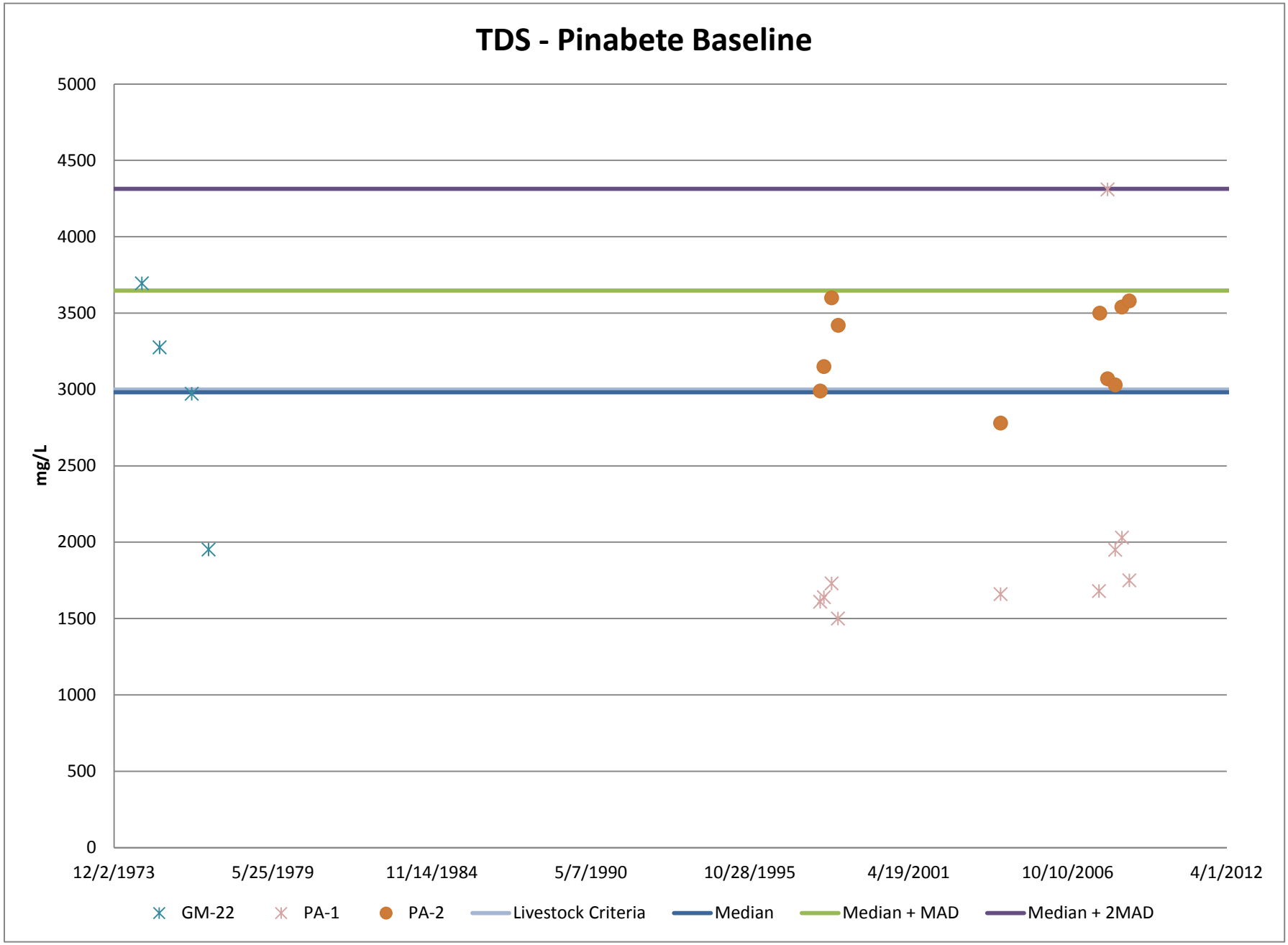

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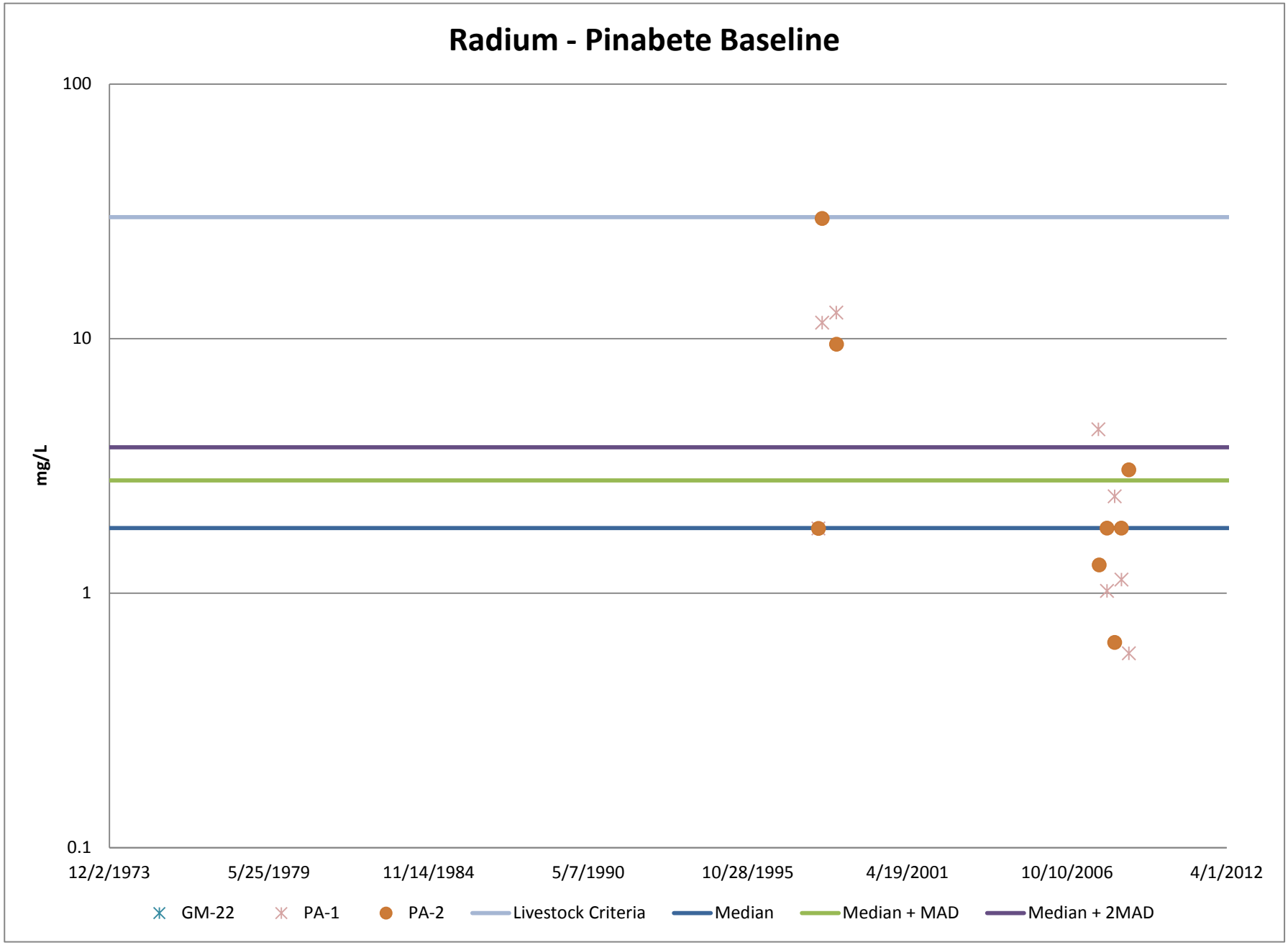

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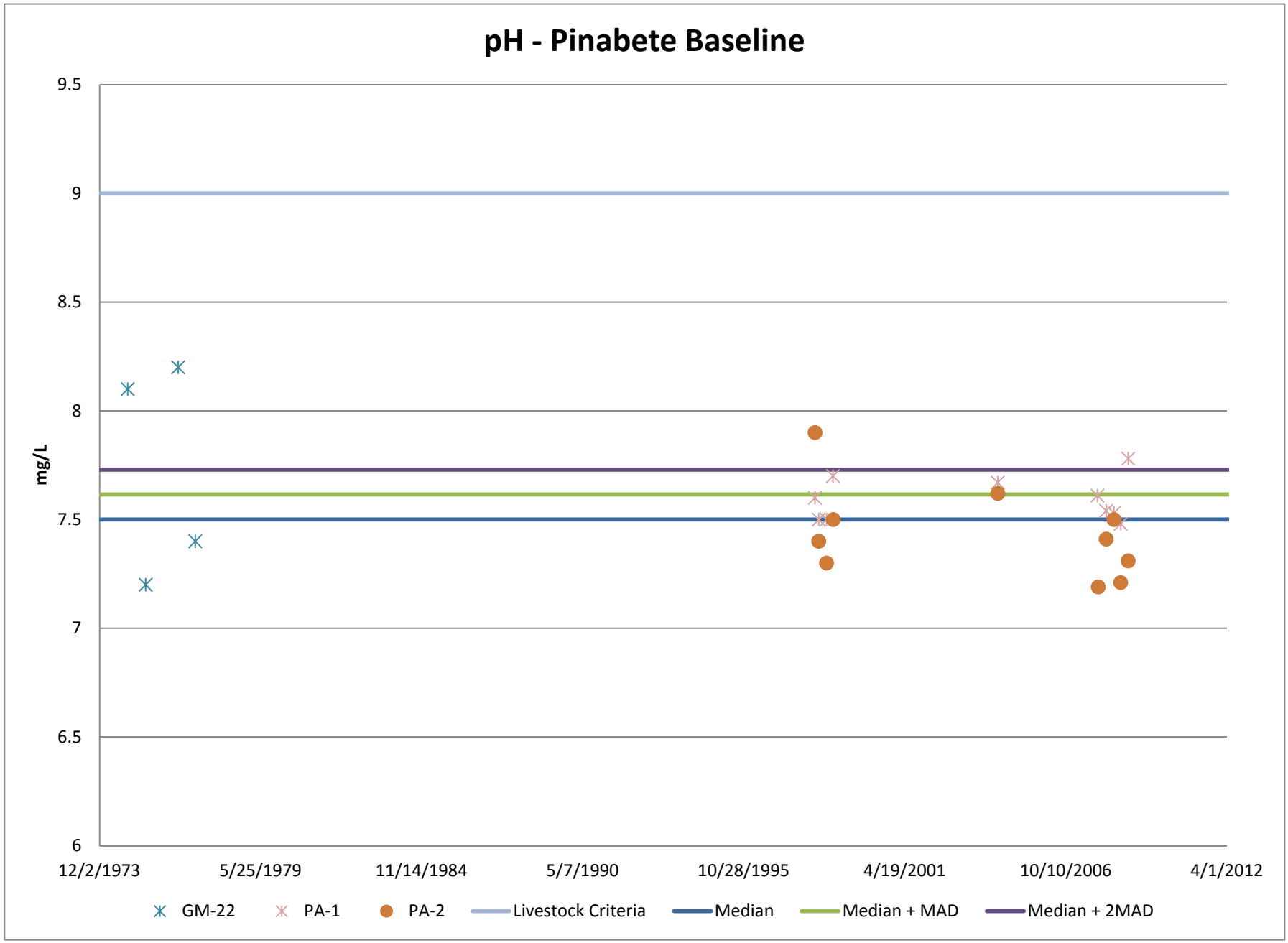

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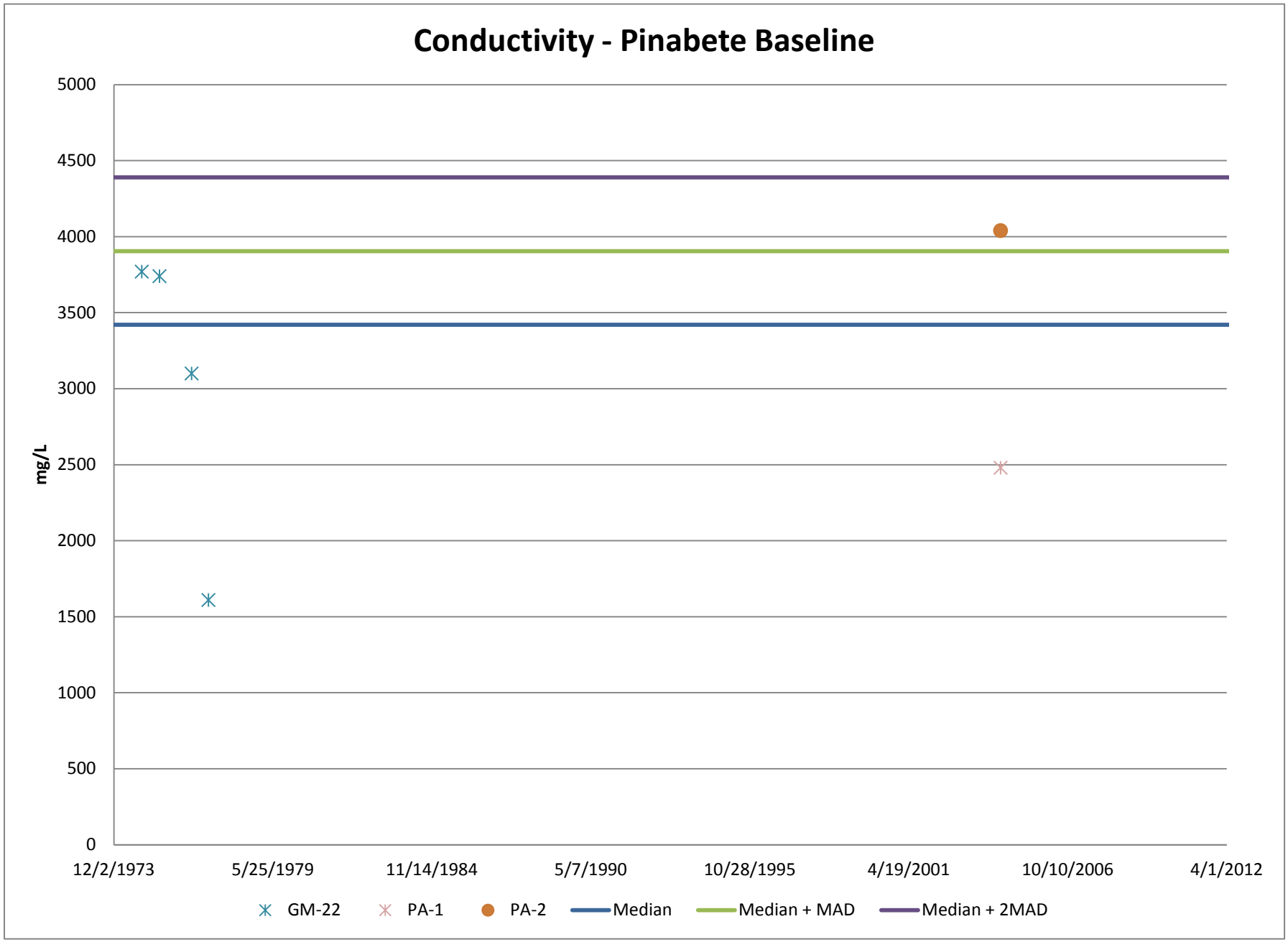

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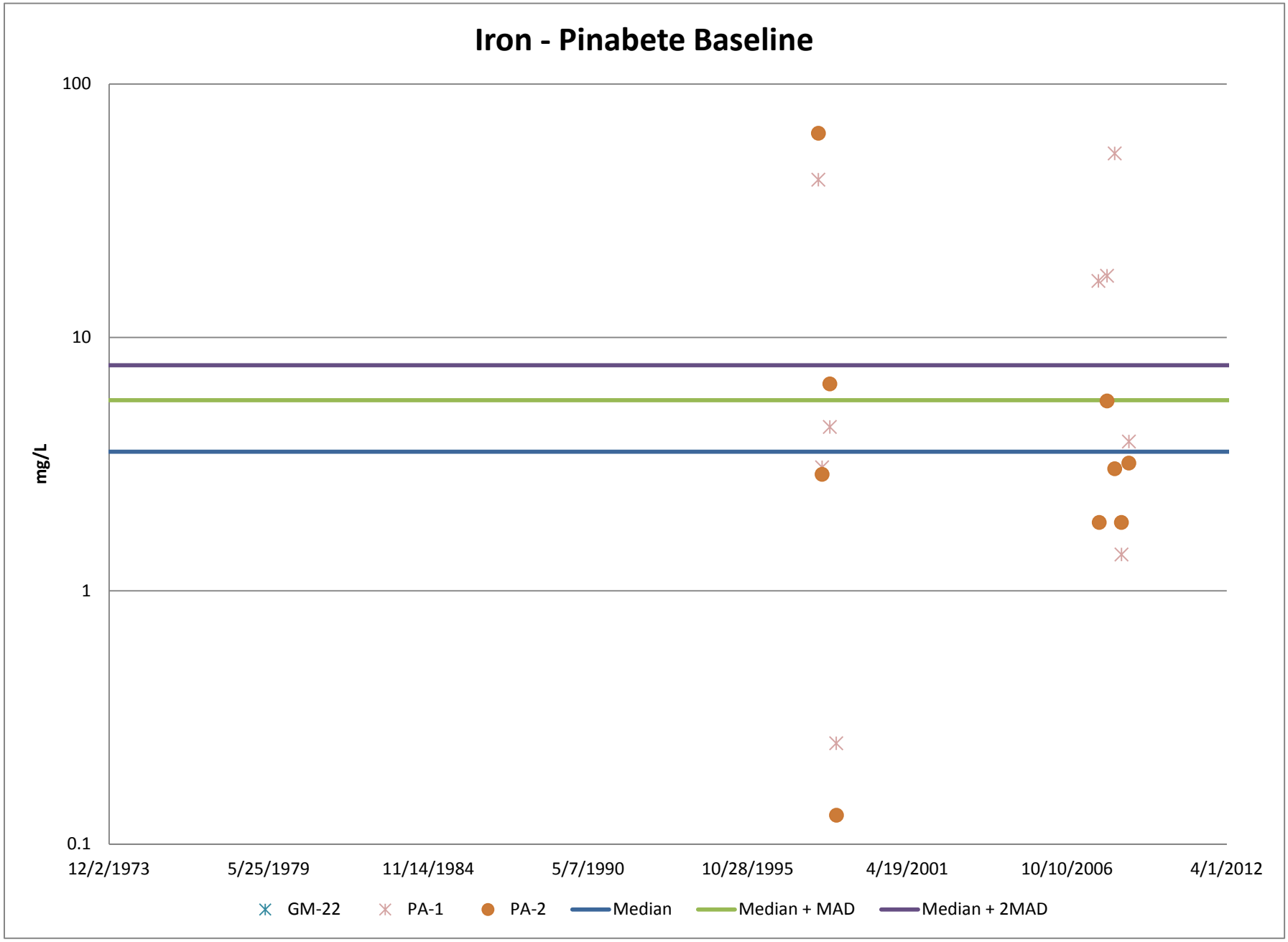

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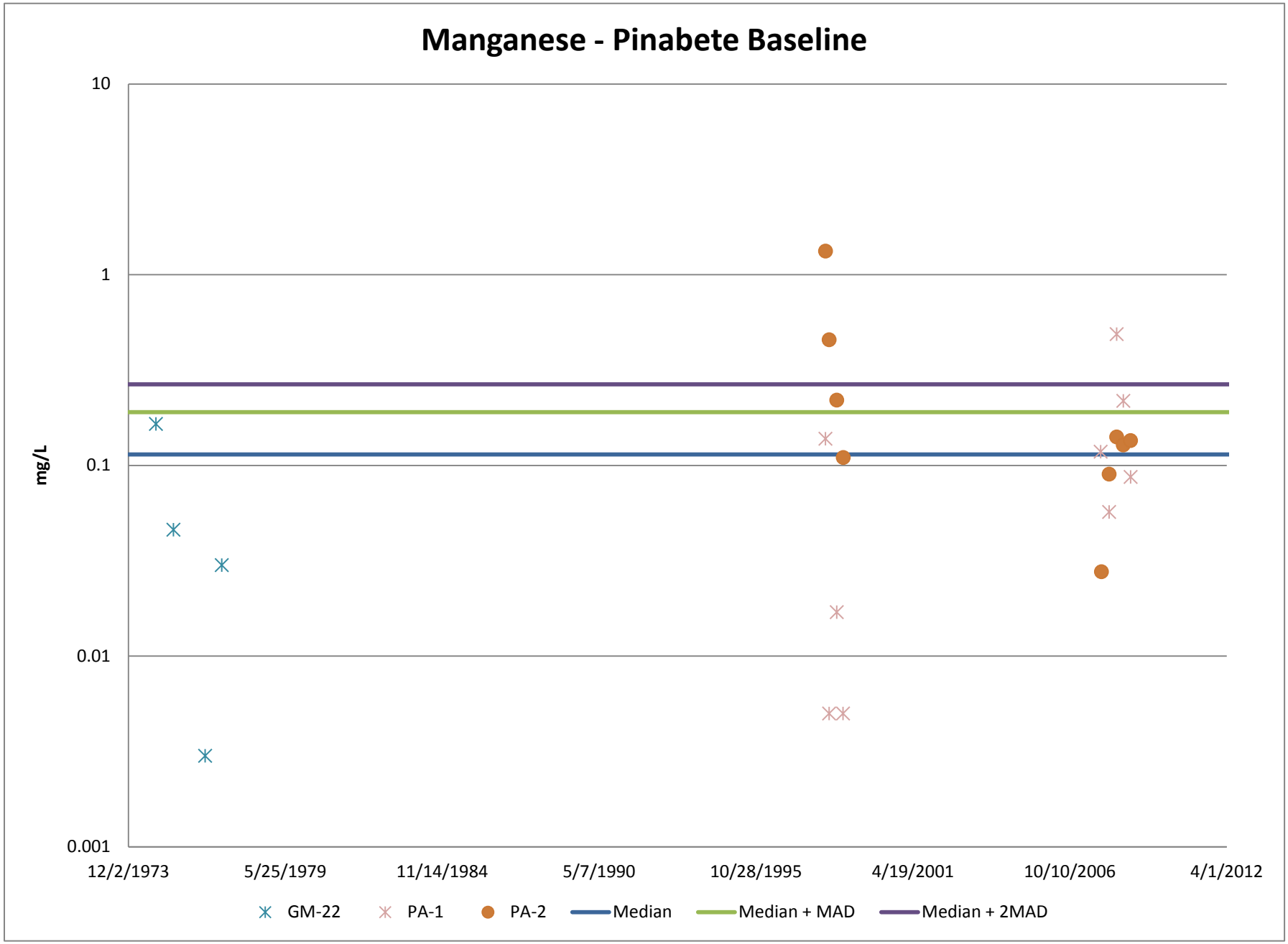

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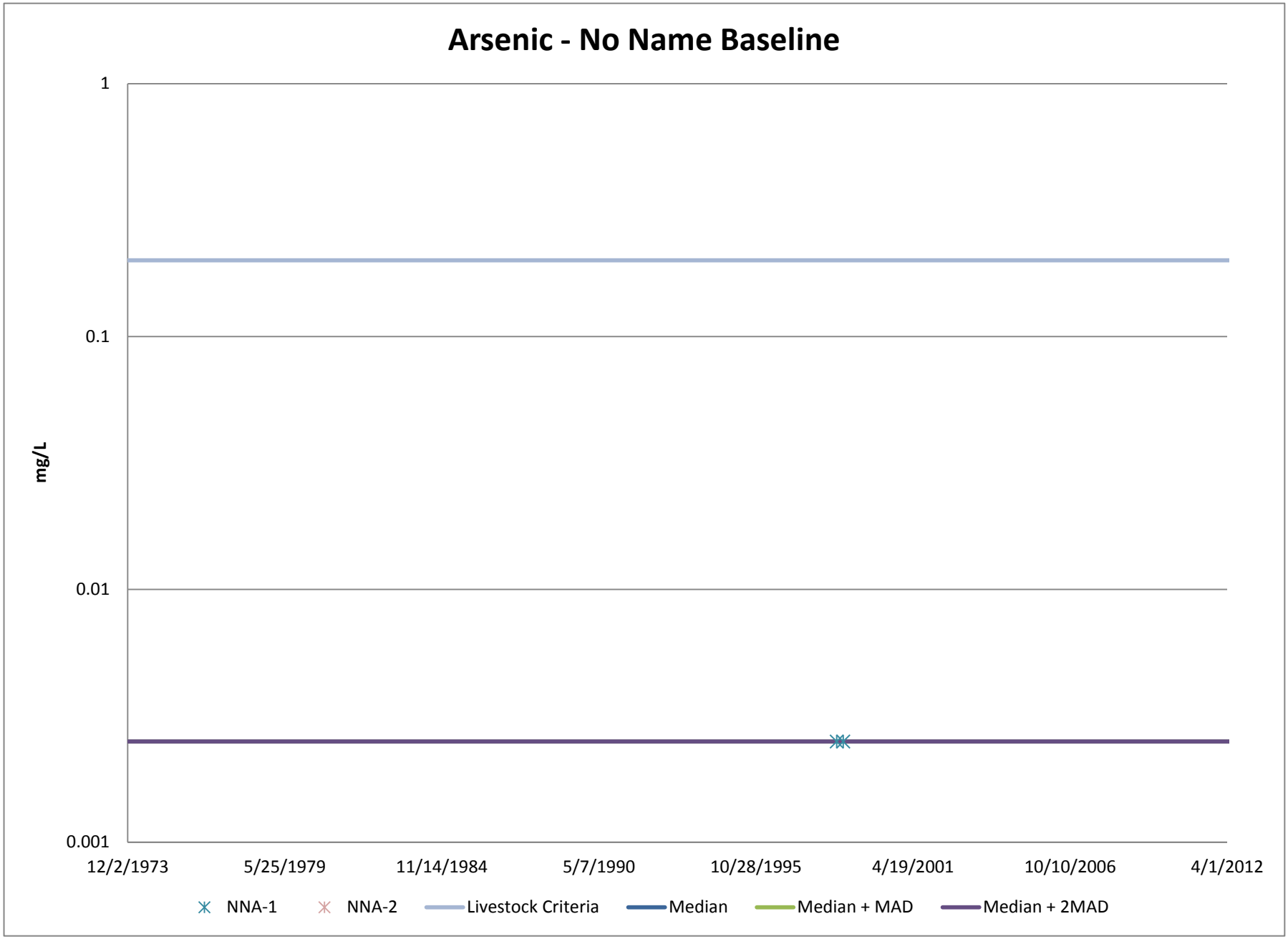

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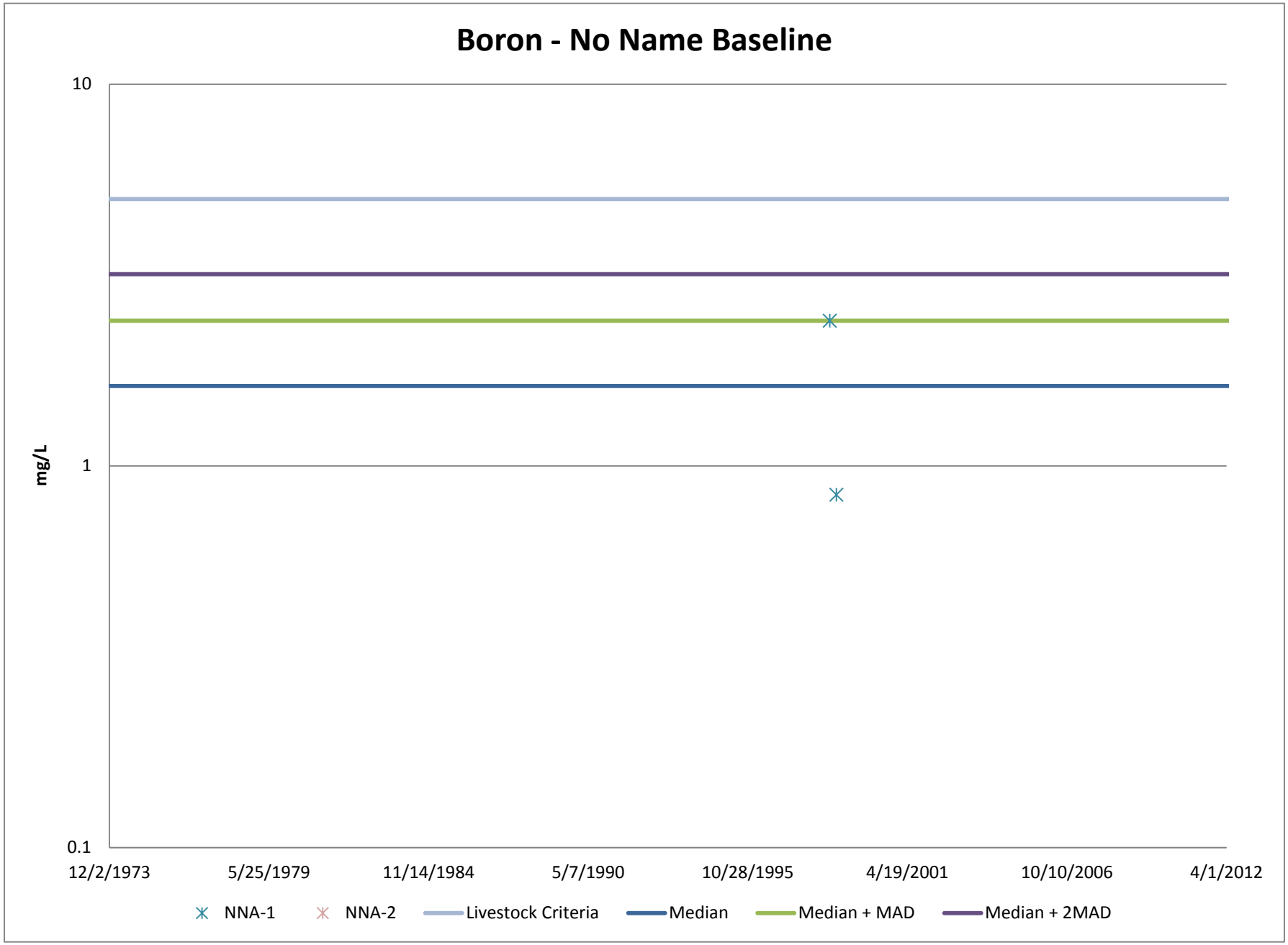

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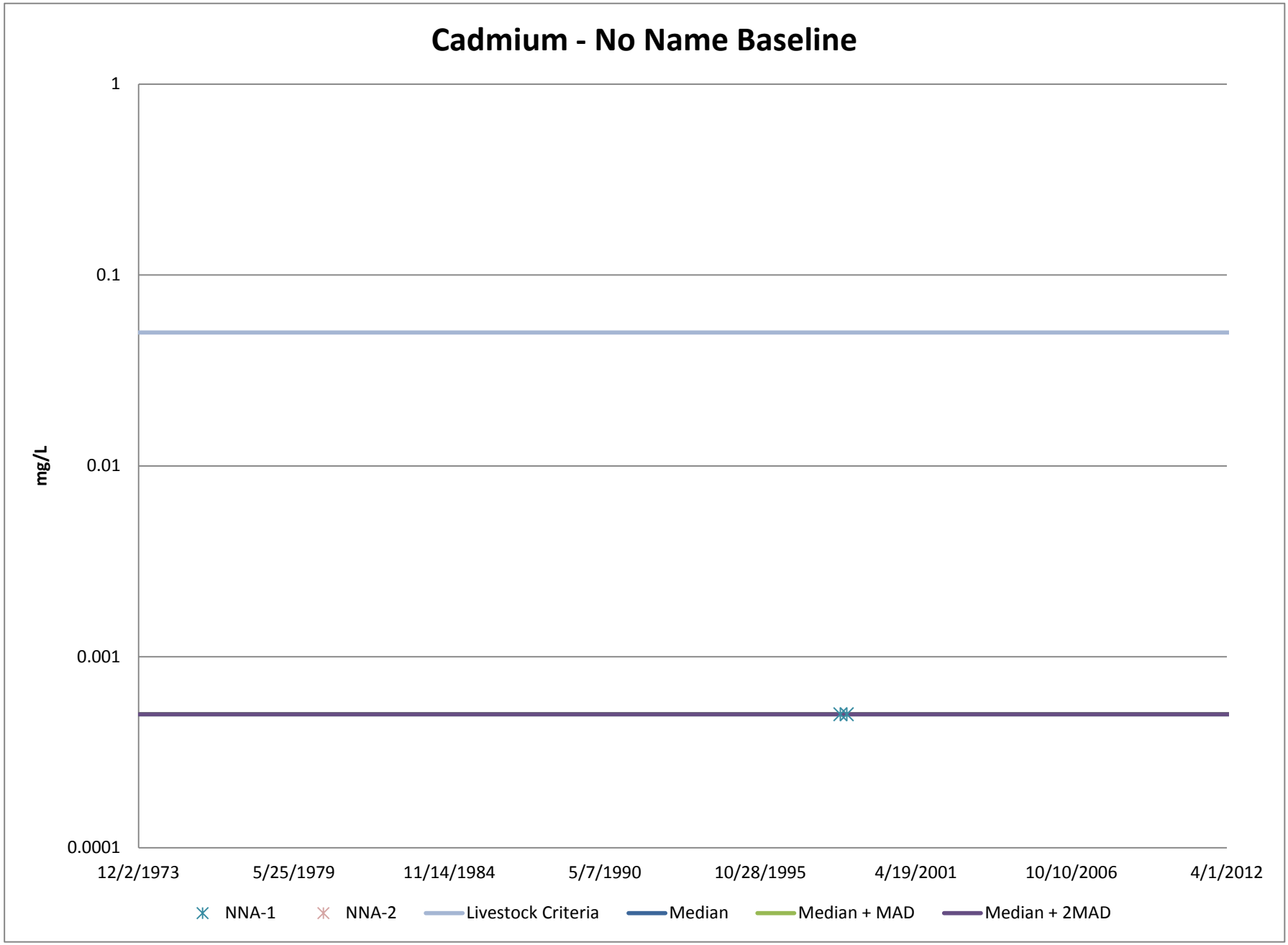

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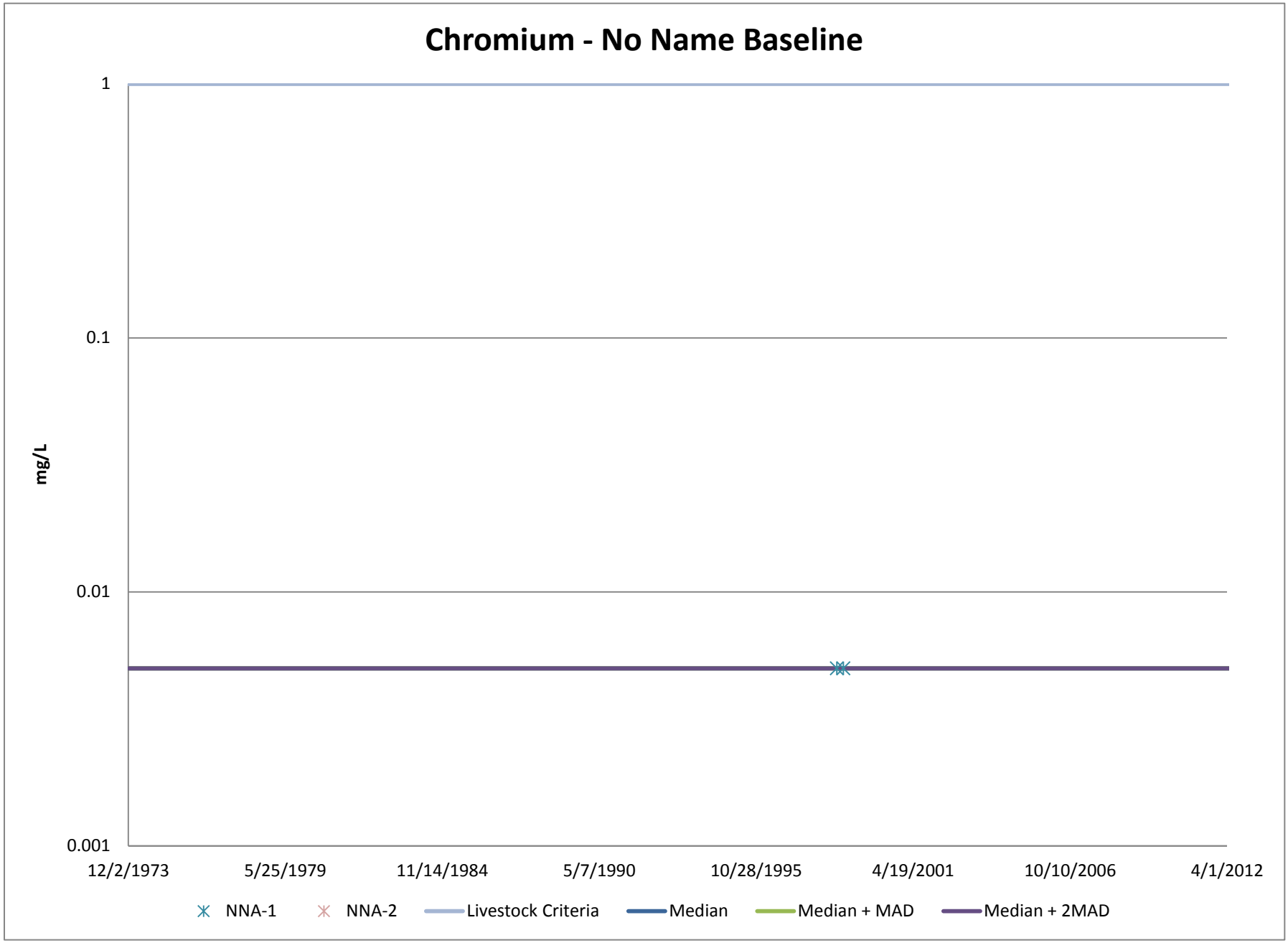

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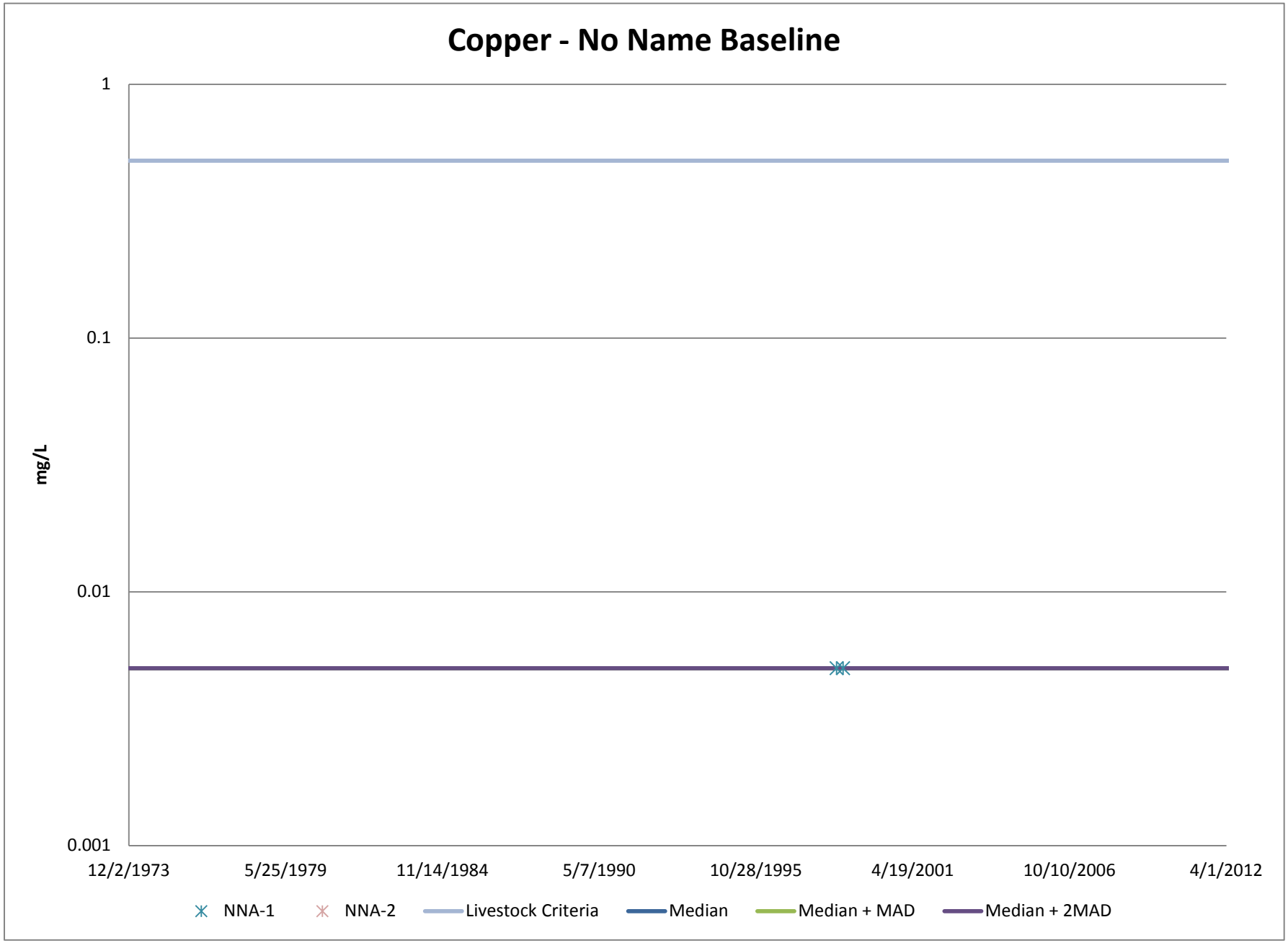

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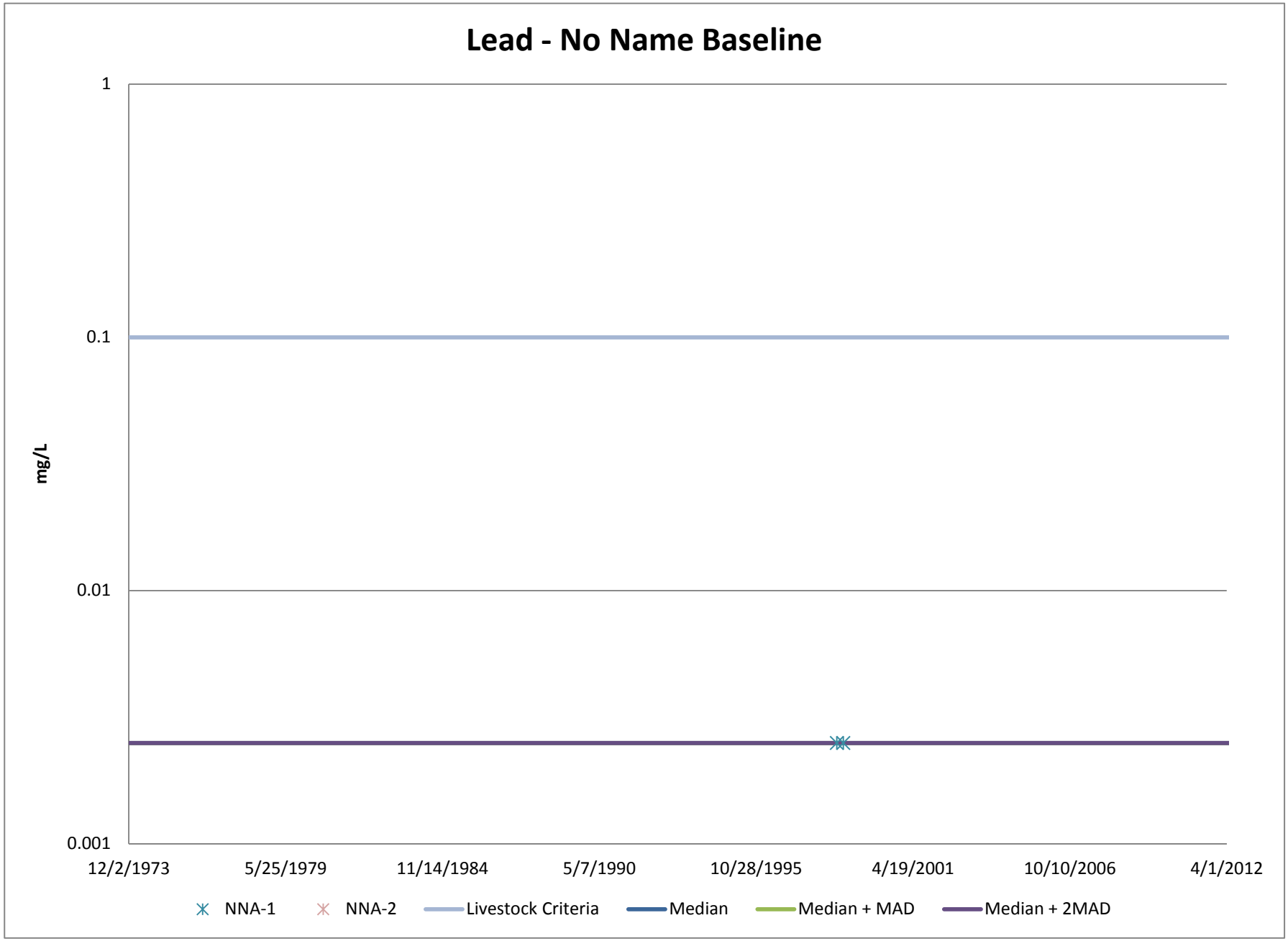

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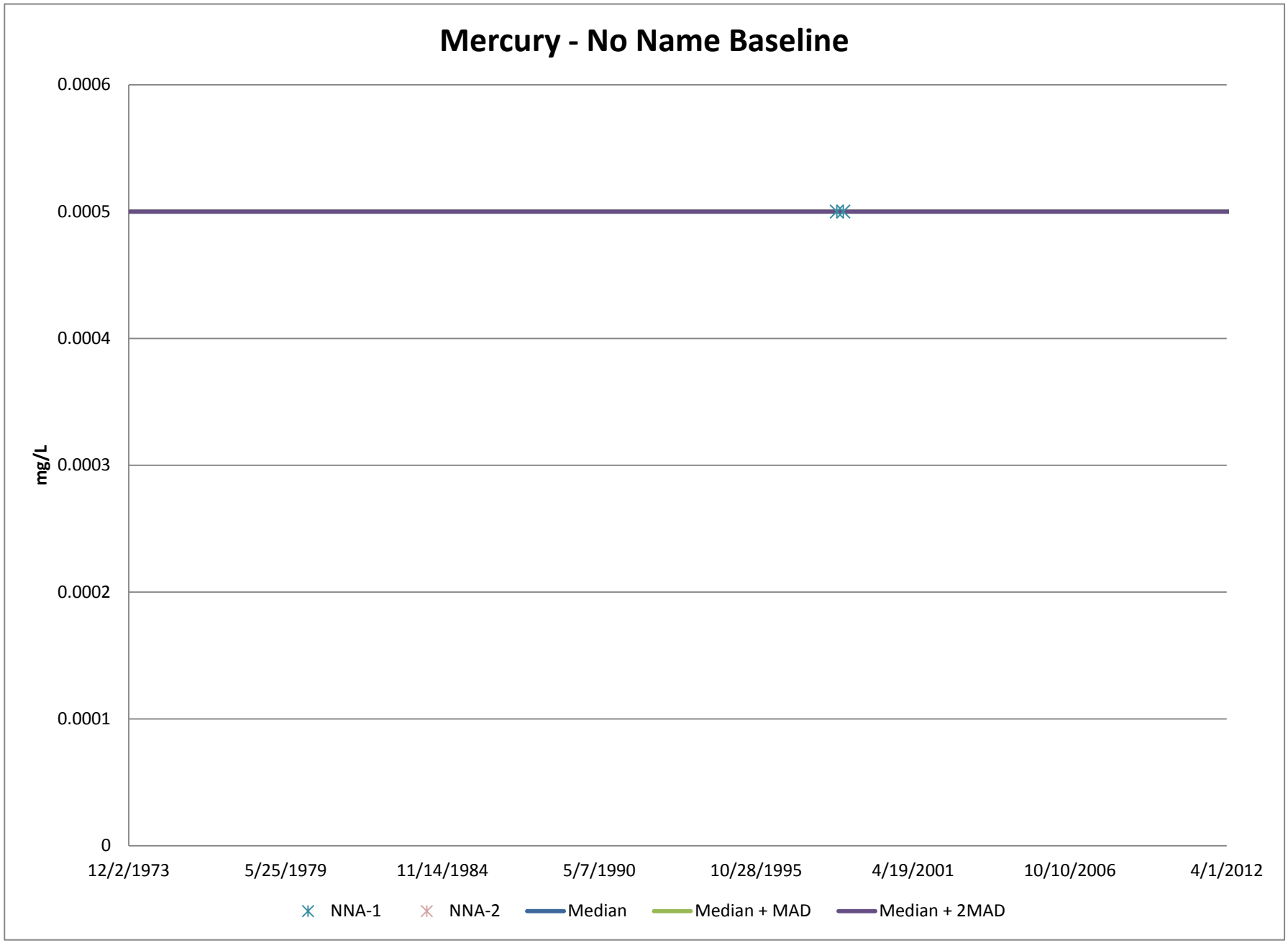

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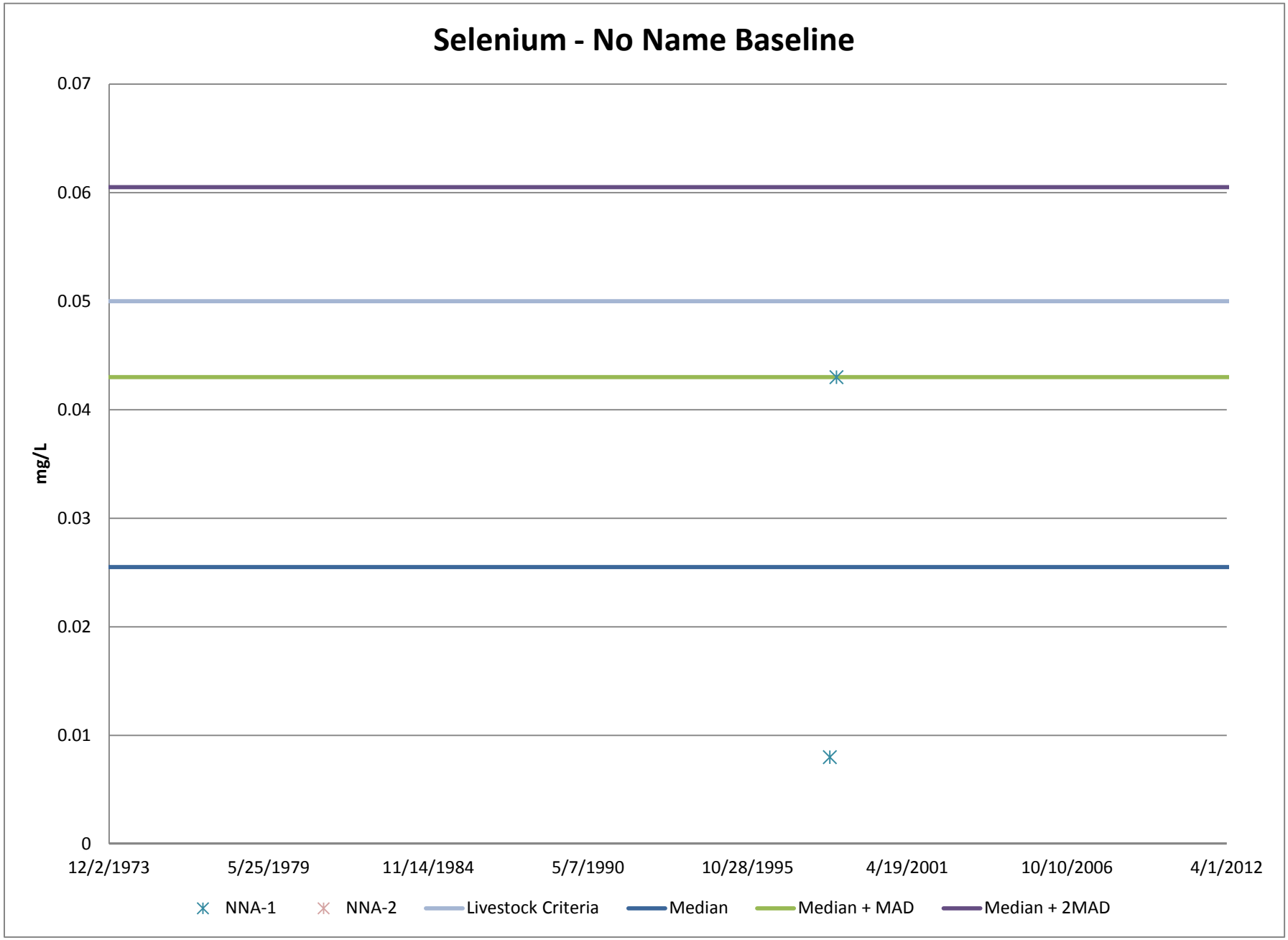

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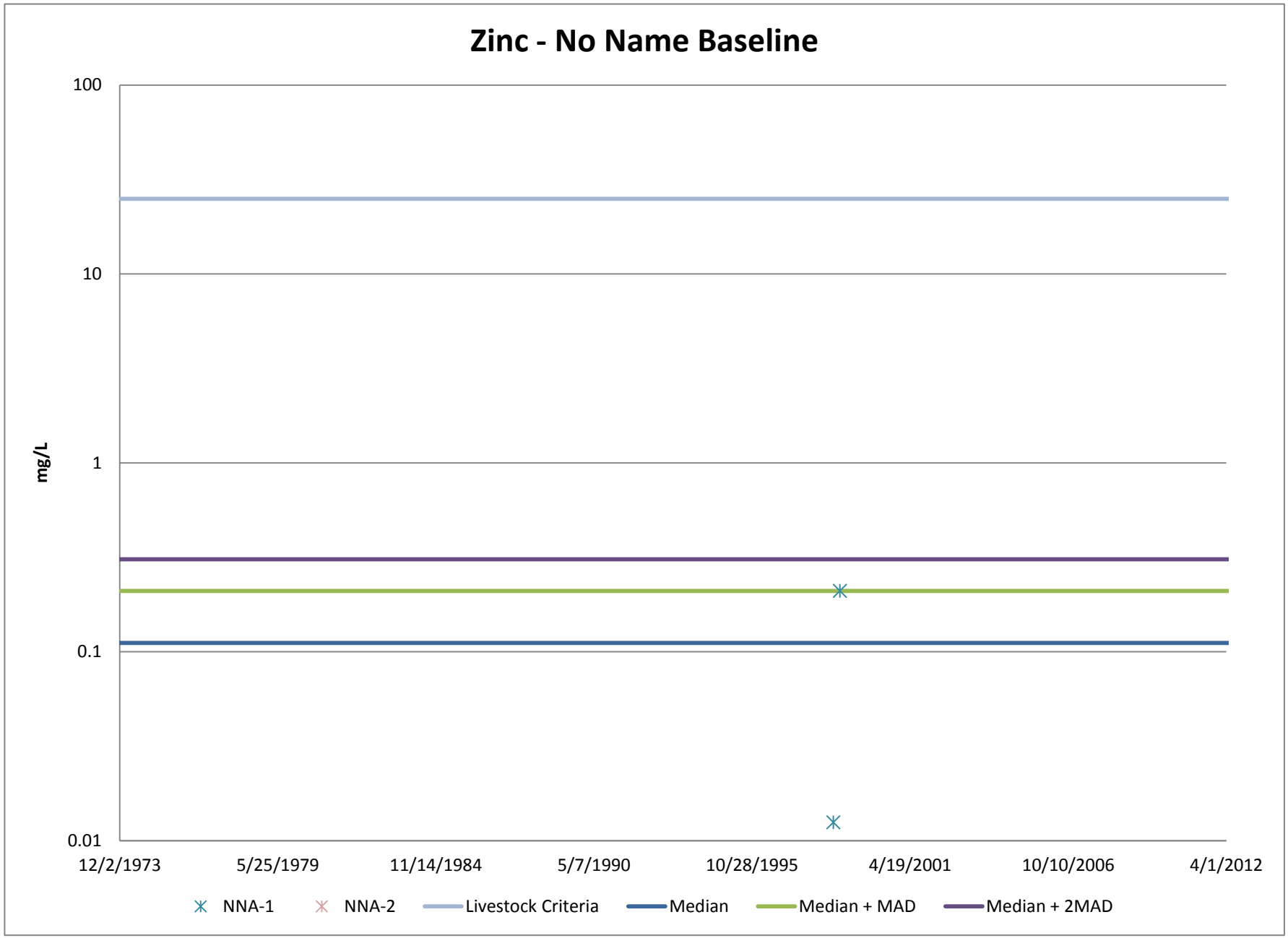

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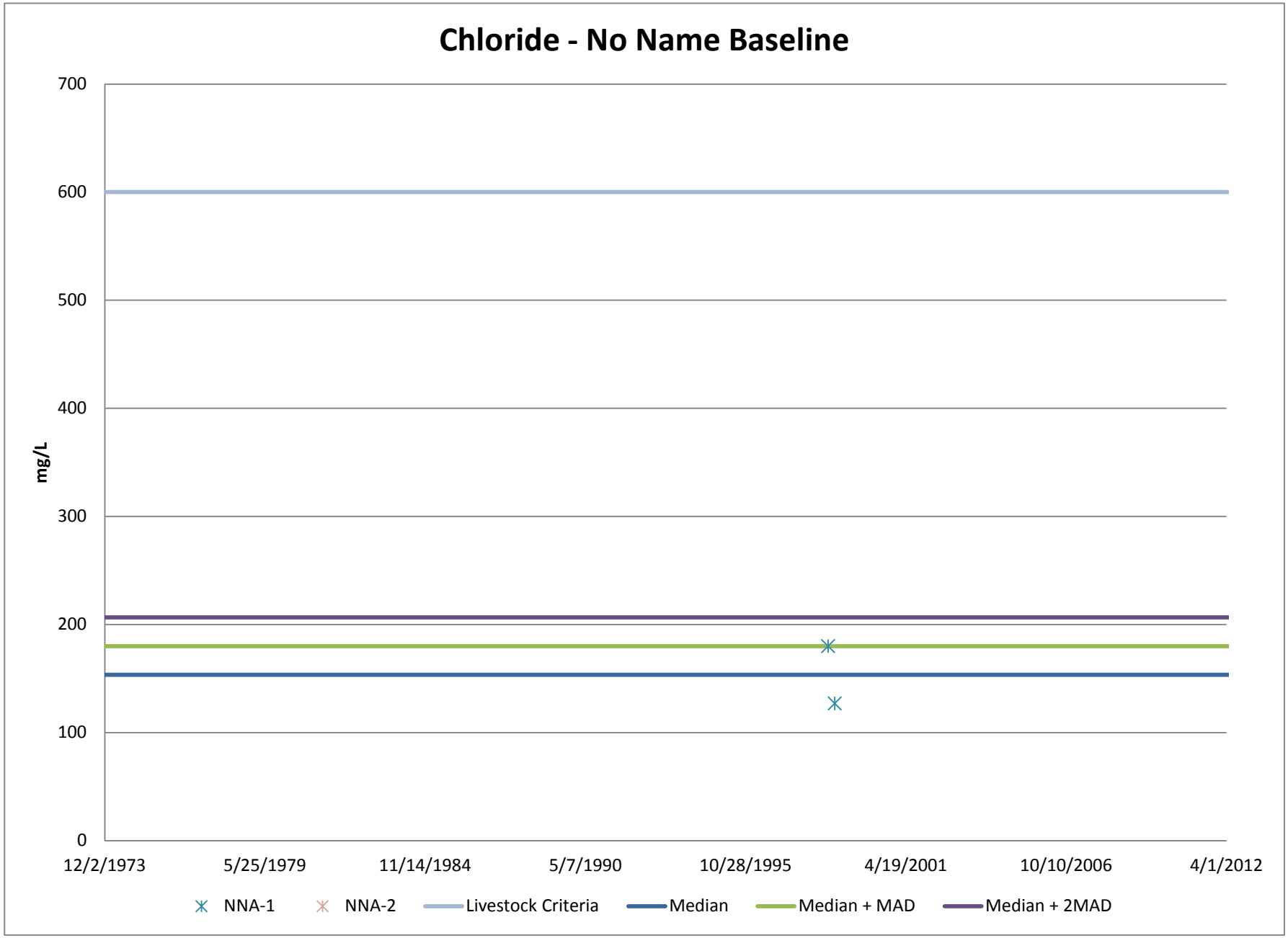

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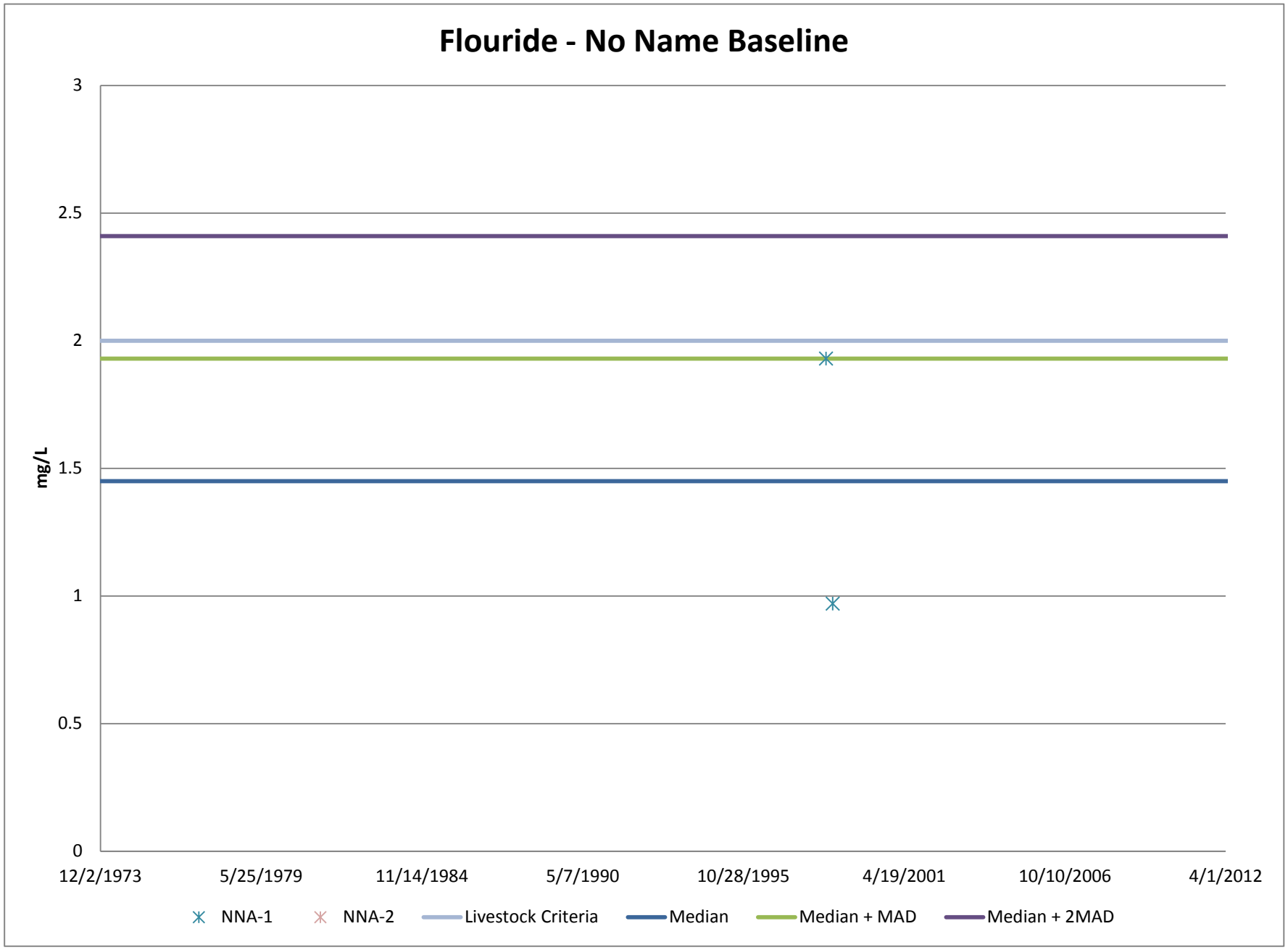
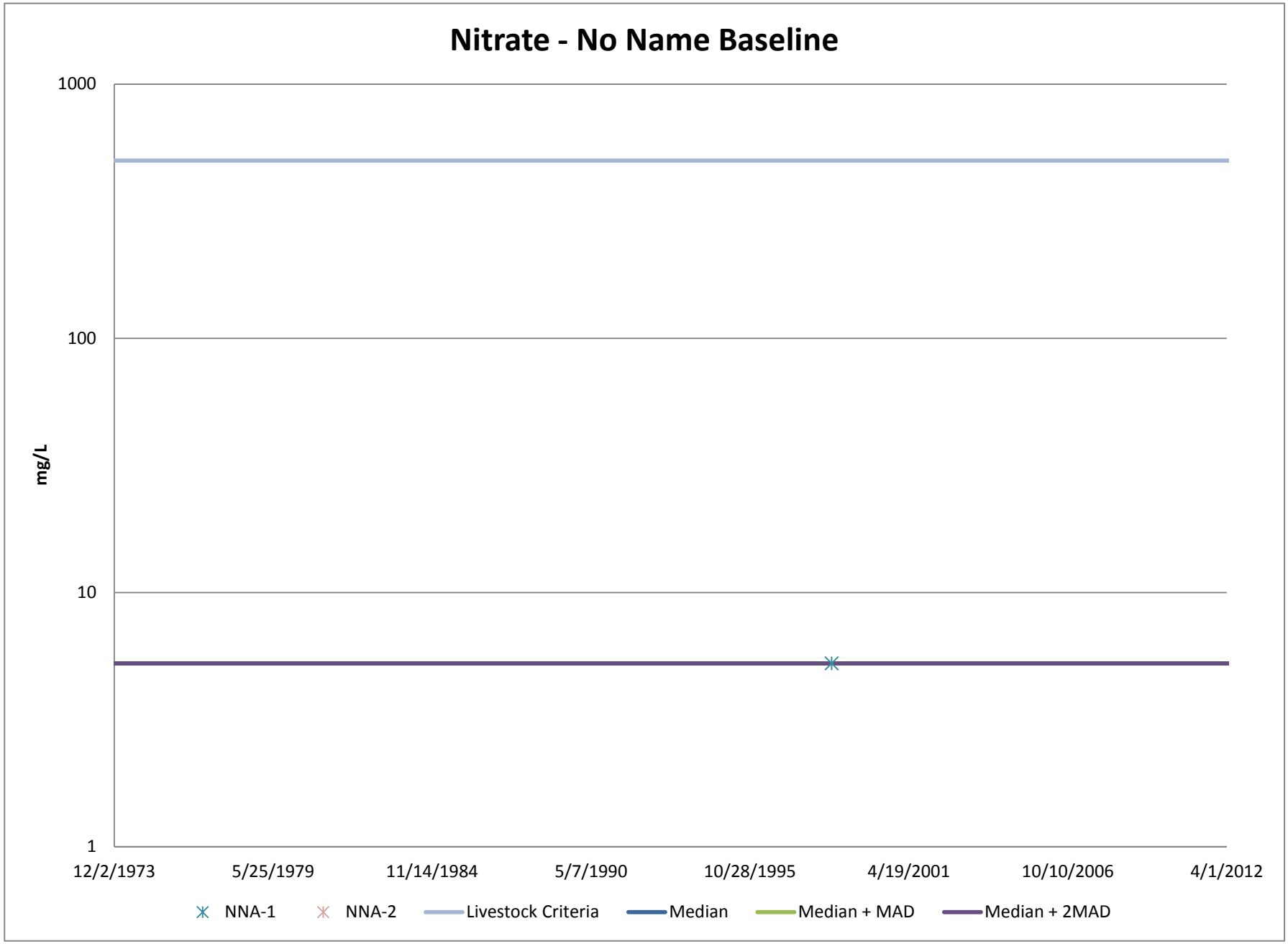


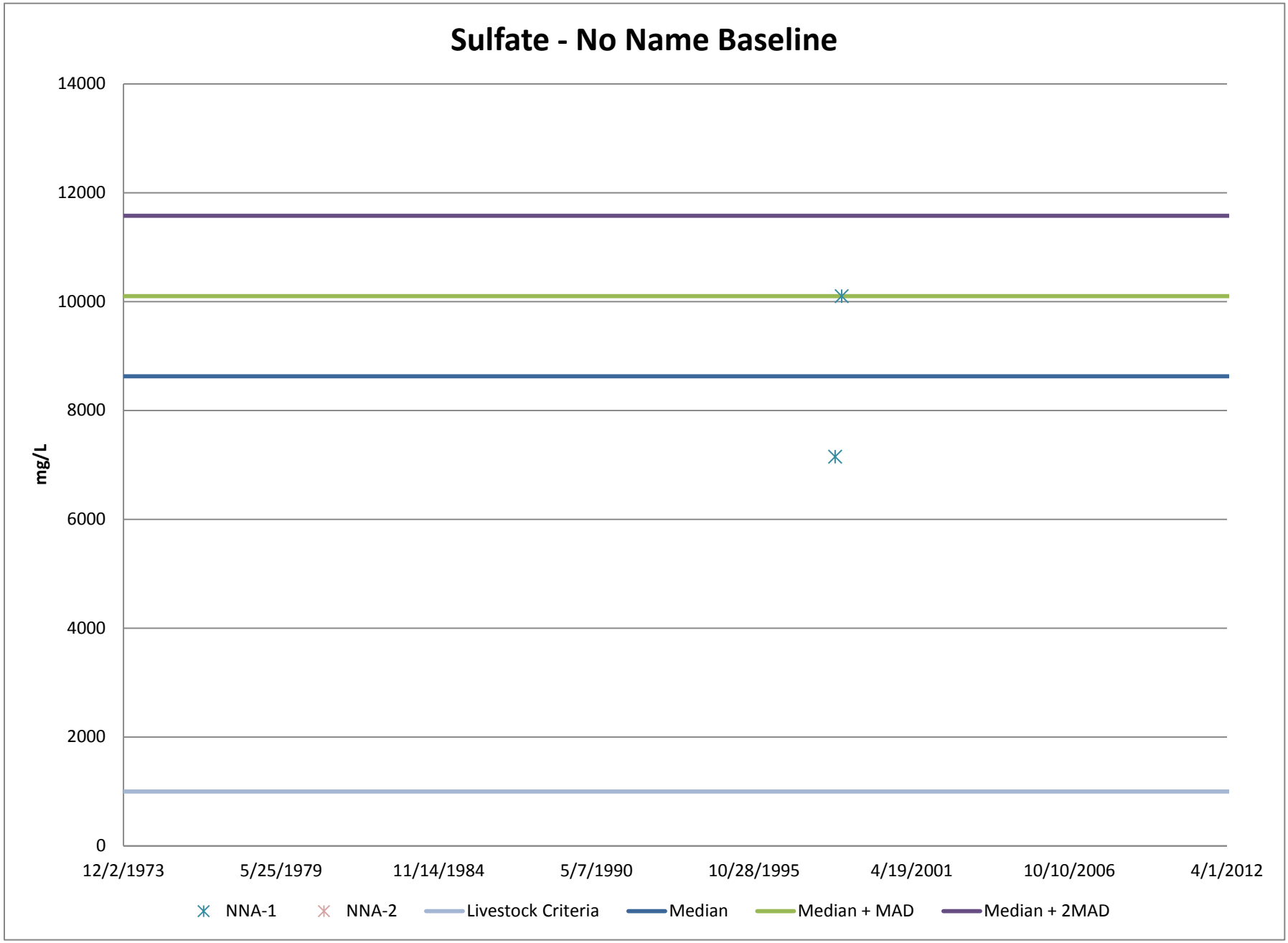
Appendix F - Groundwater Data Summary

Pinabete and No Name Alluvial Graphs



Appendix F - Groundwater Data Summary

Pinabete and No Name Alluvial Graphs



Appendix F - Groundwater Data Summary

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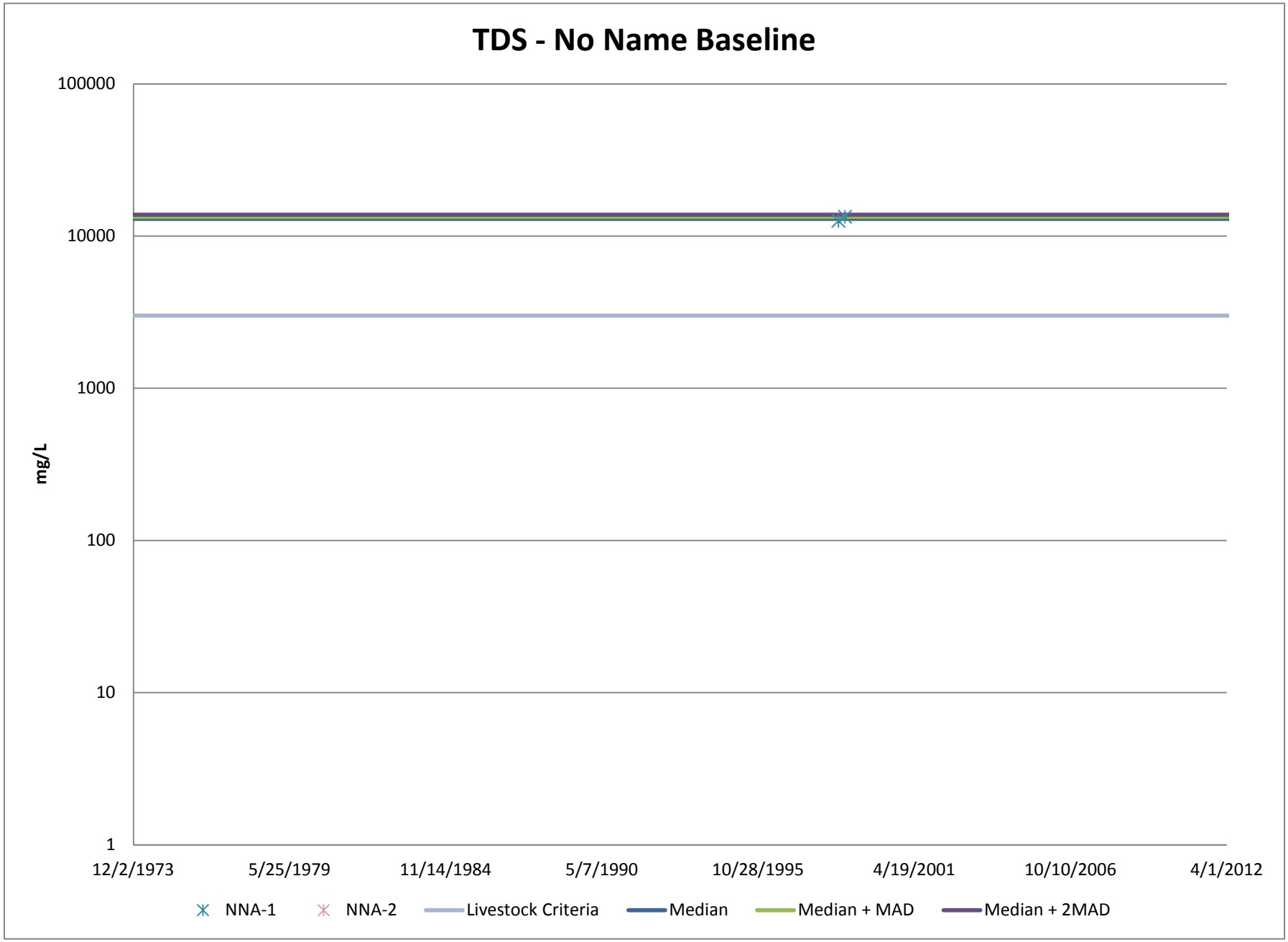

Appendix F - Groundwater Data Summary

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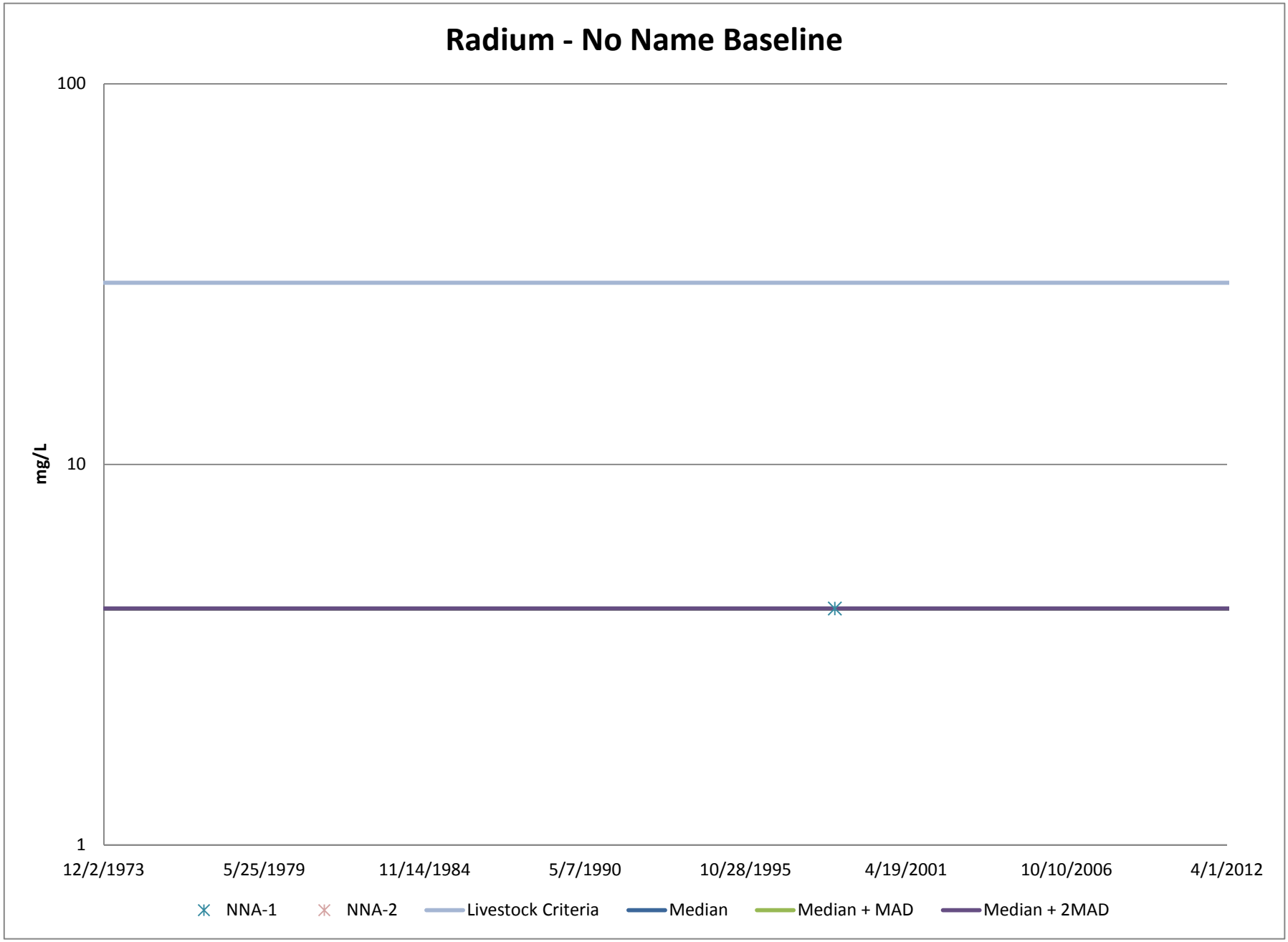

Appendix F - Groundwater Data Summary

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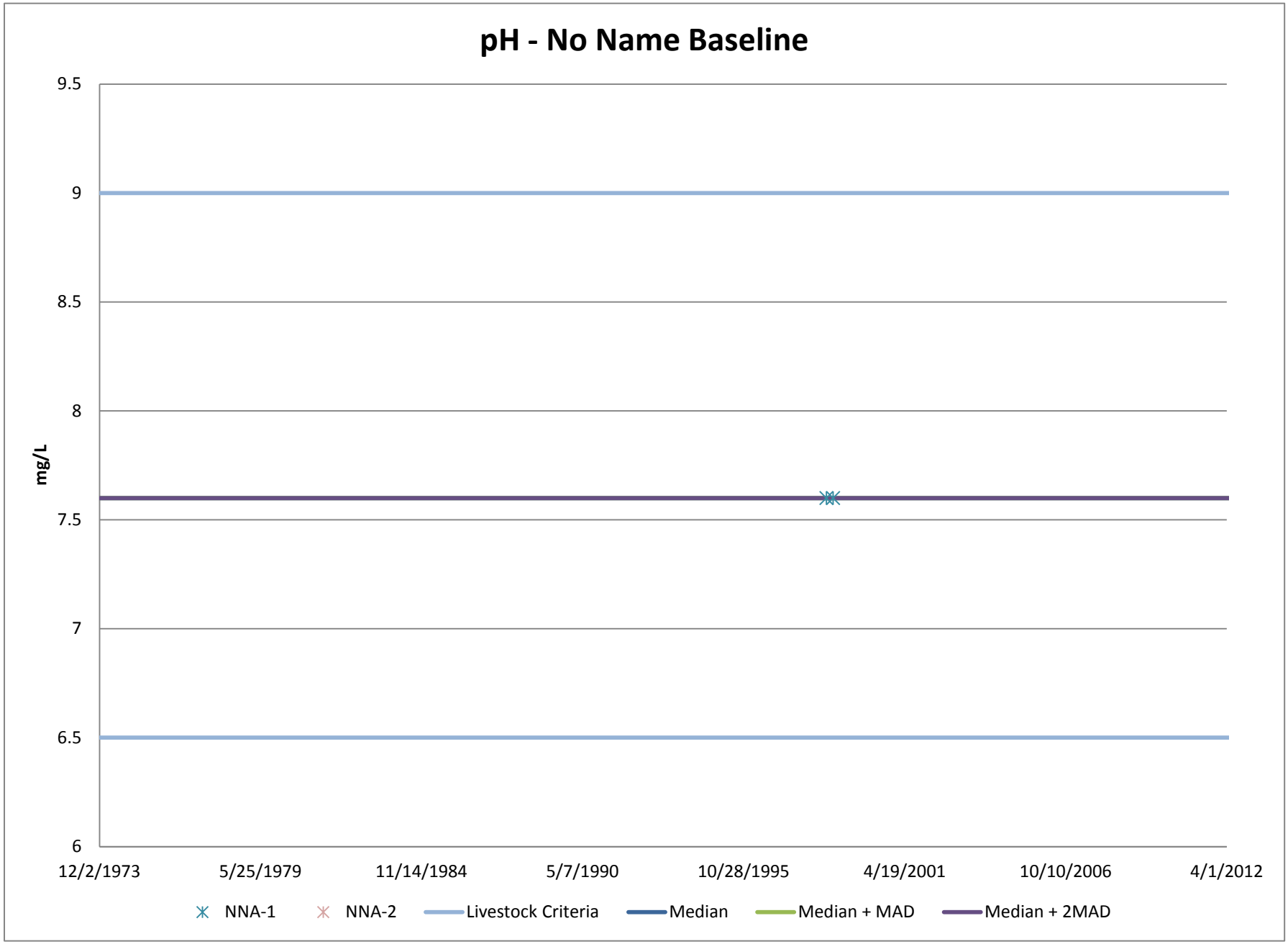

Appendix F - Groundwater Data Summary

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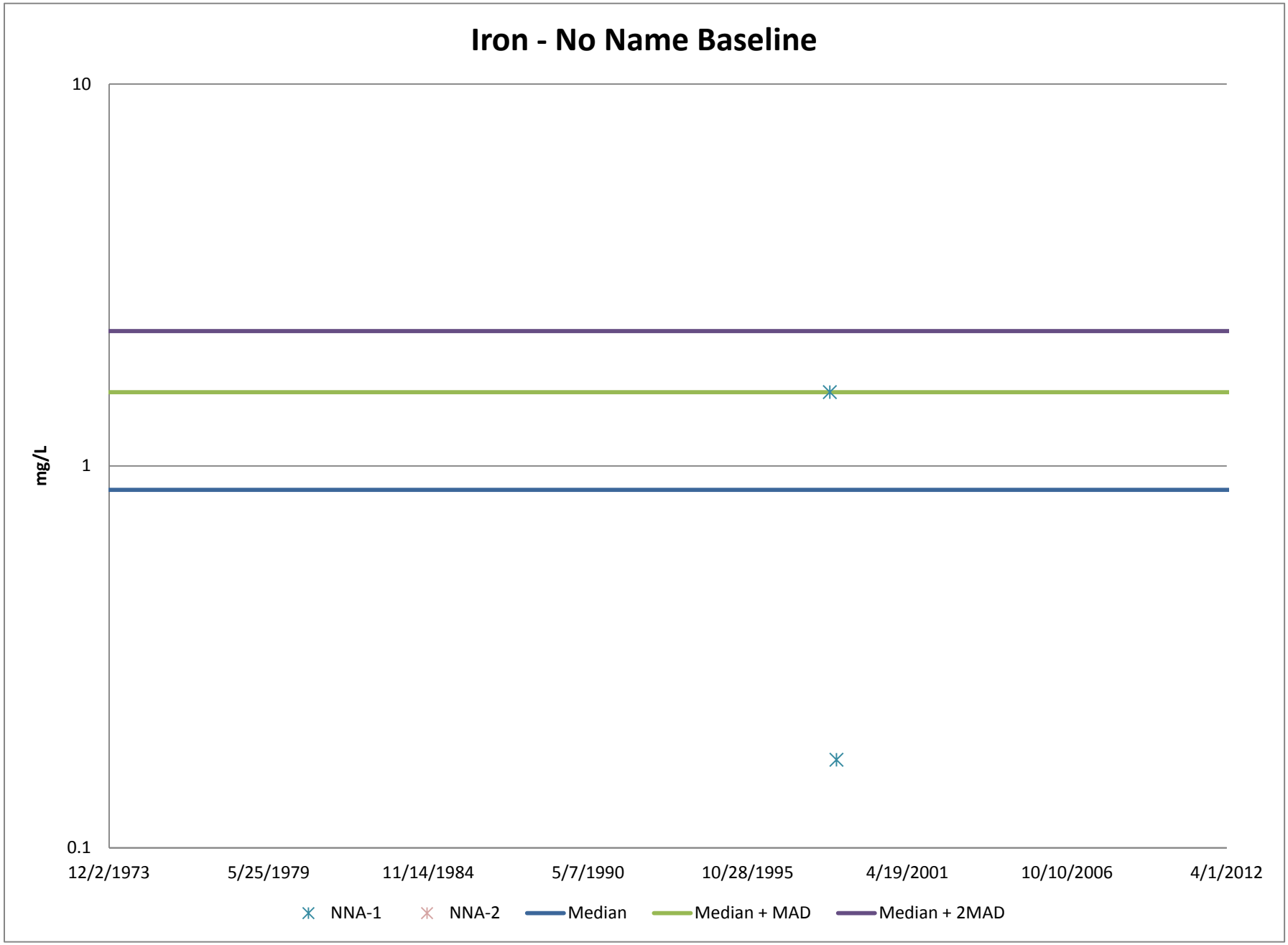
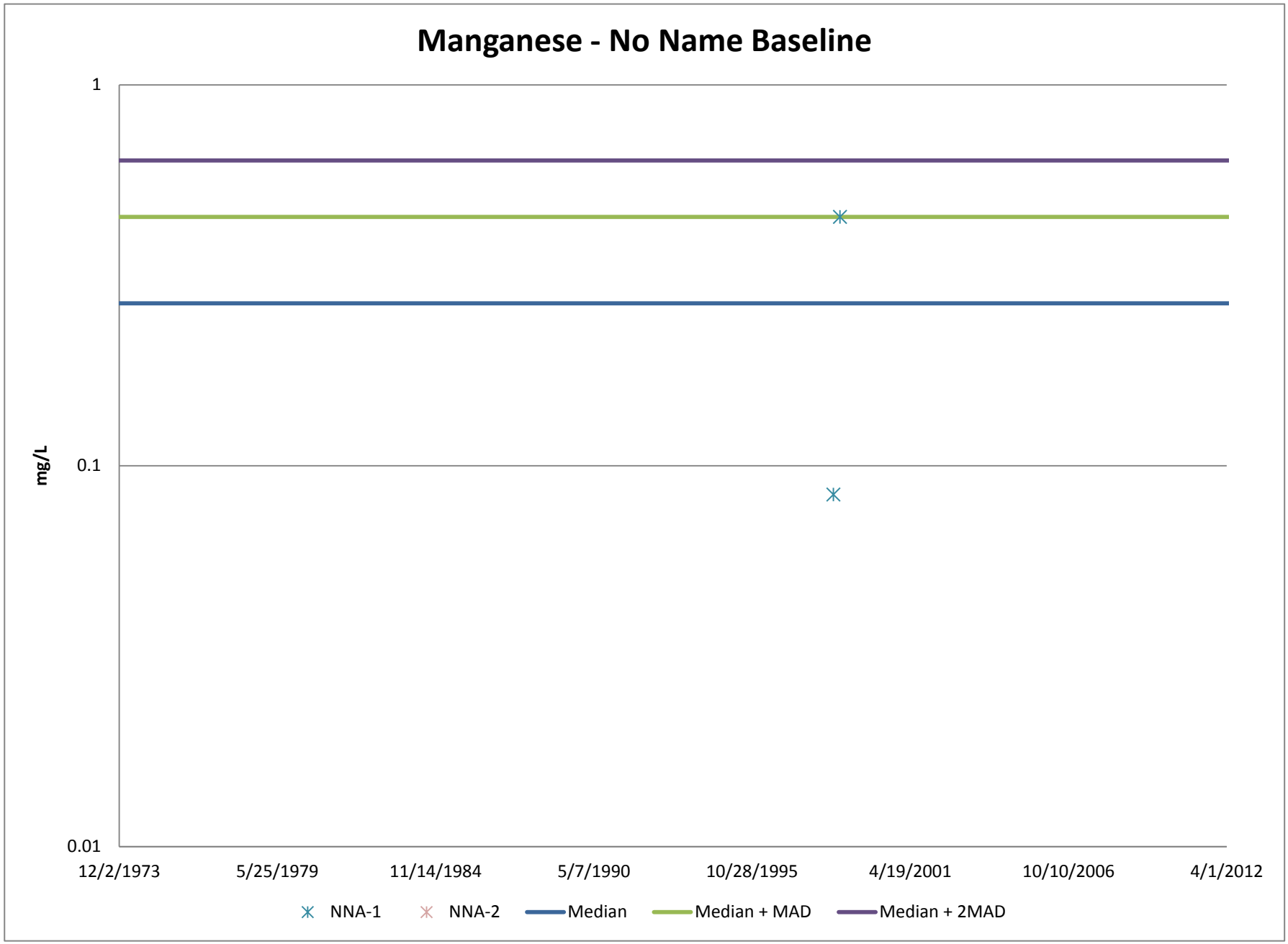


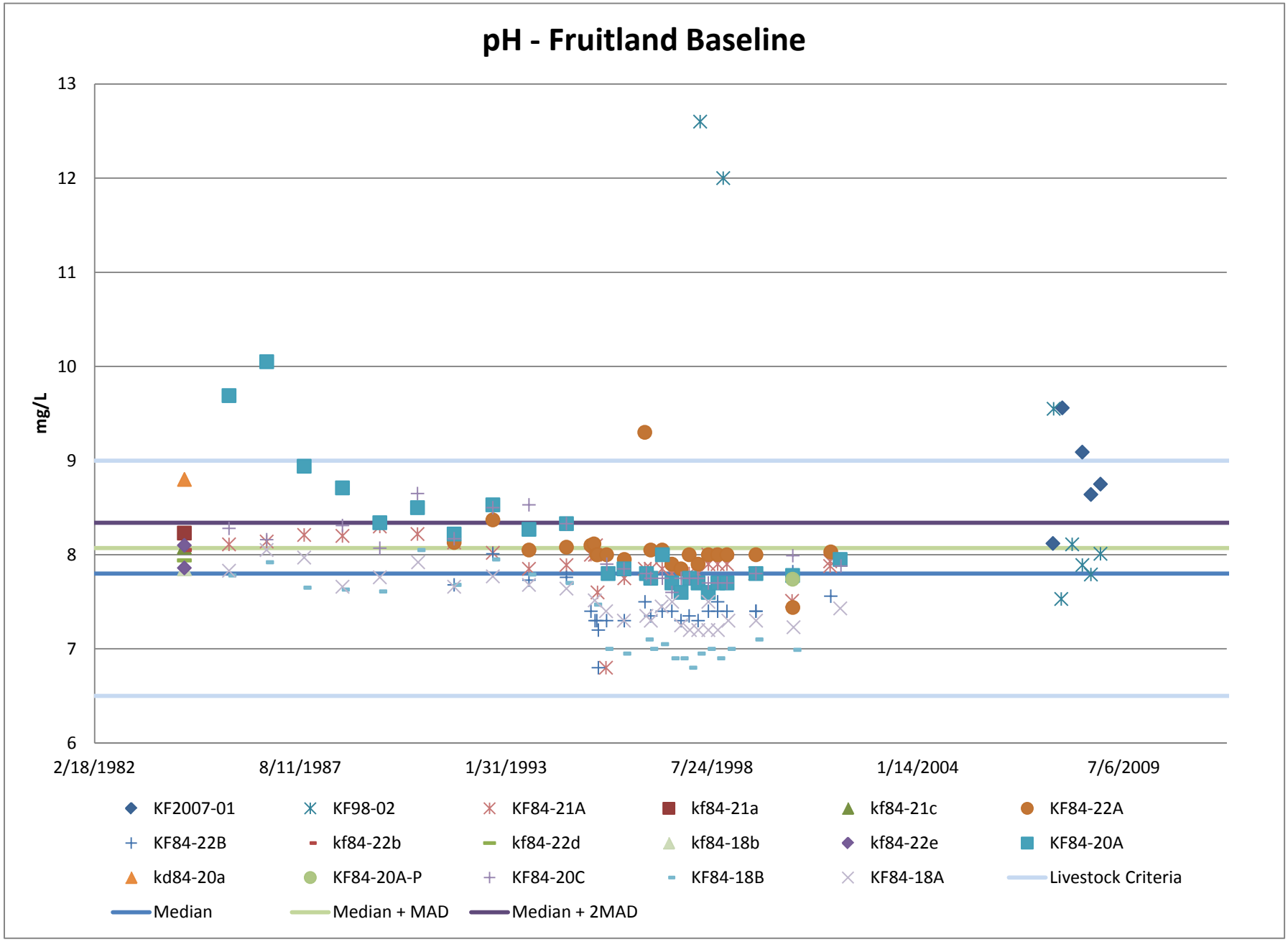
Appendix F - Groundwater Data Summary

Pinabete and No Name Alluvial Graphs



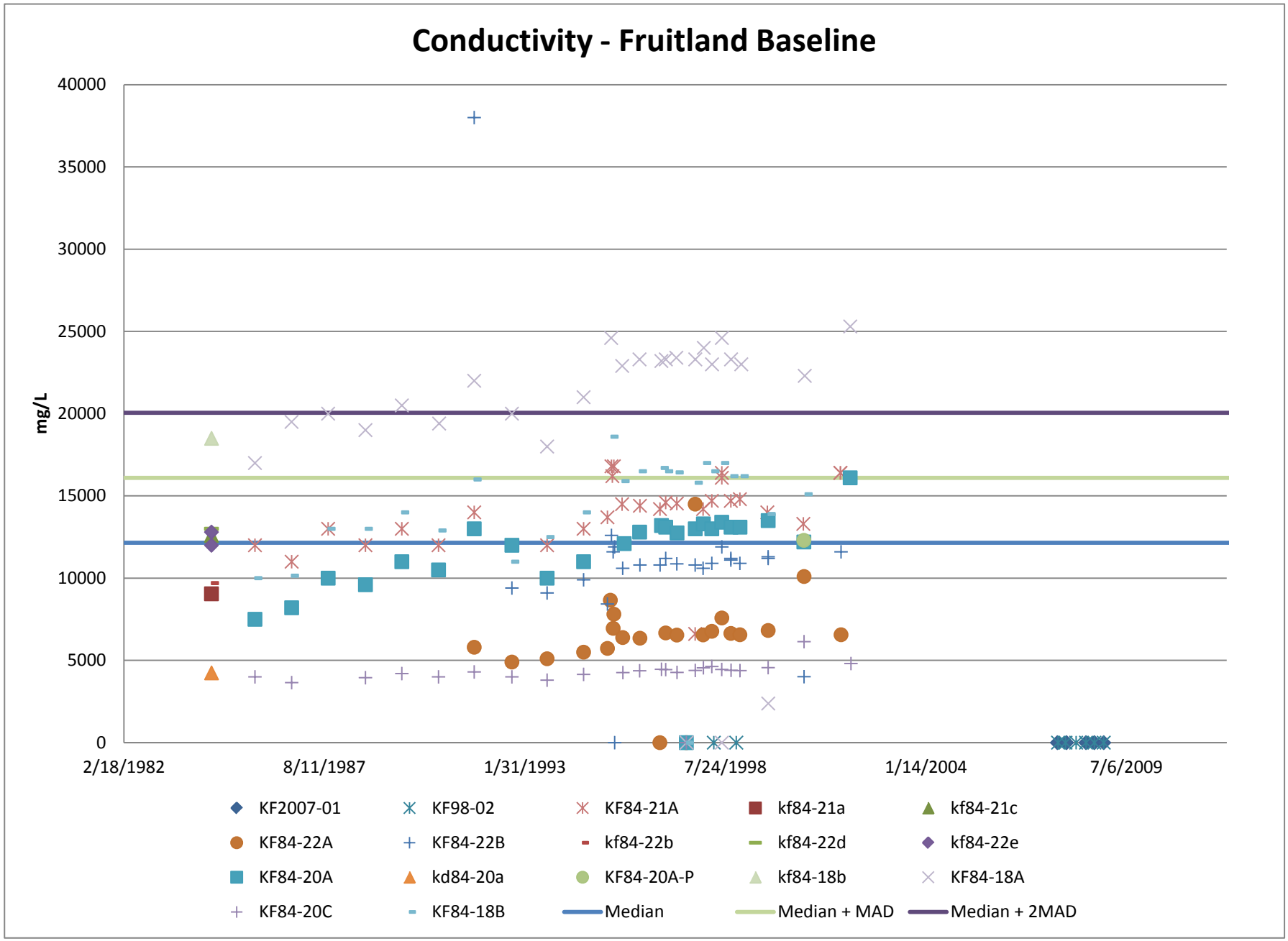
Appendix F - Groundwater Data Summary

Baseline Fruitland Graphs



Appendix F - Groundwater Data Summary

Baseline Fruitland Graphs



Appendix F - Groundwater Data Summary

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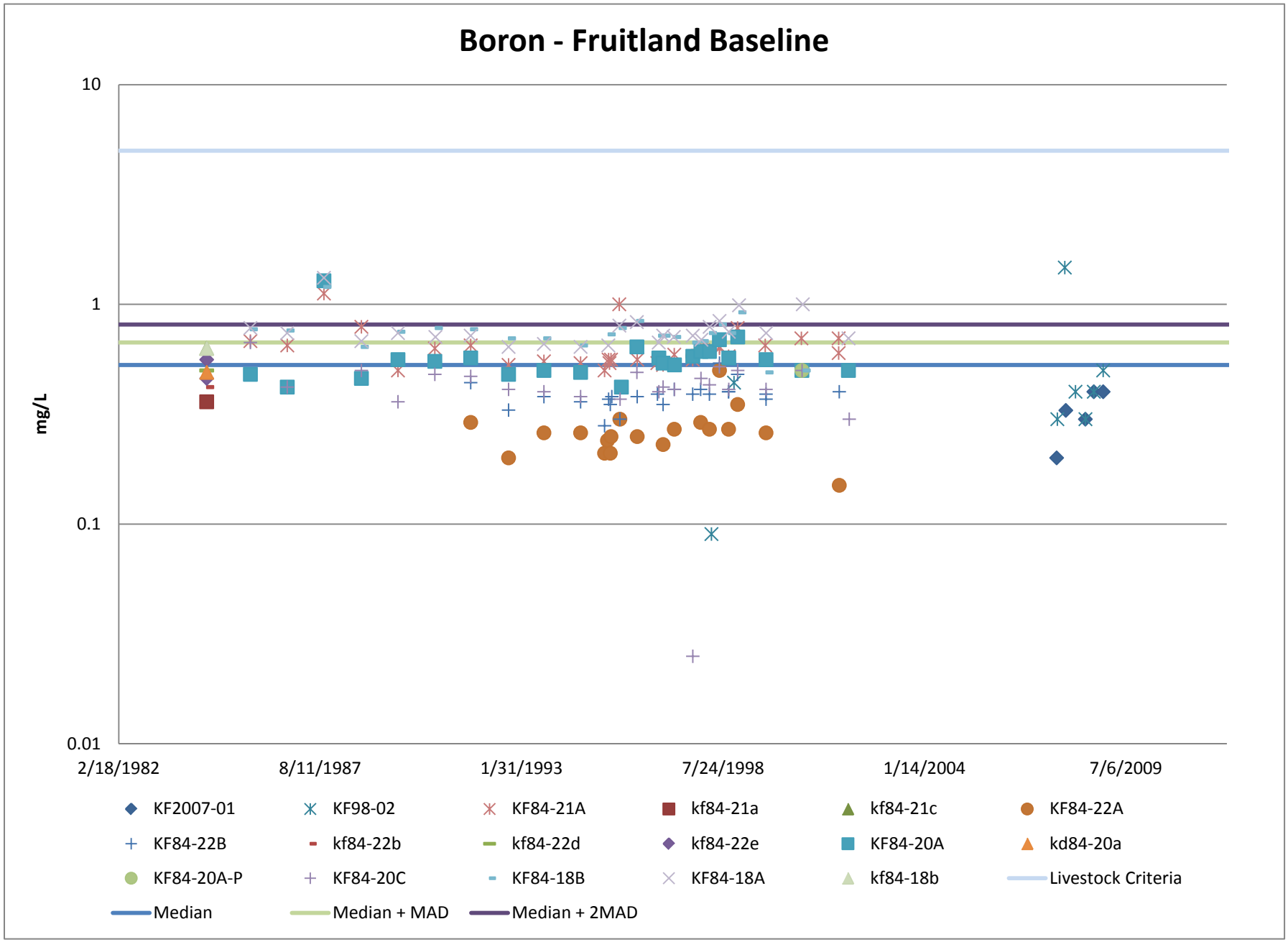

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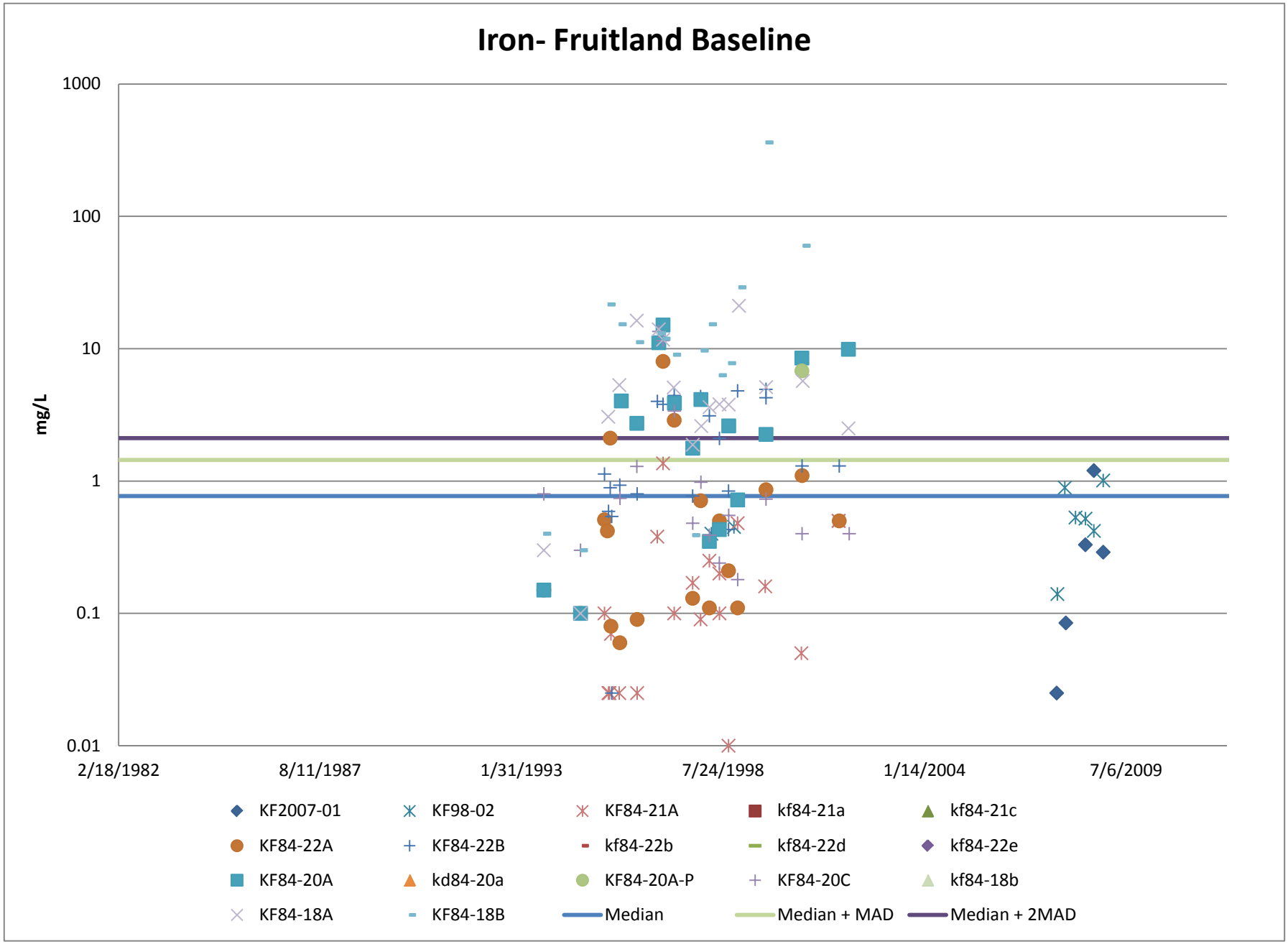
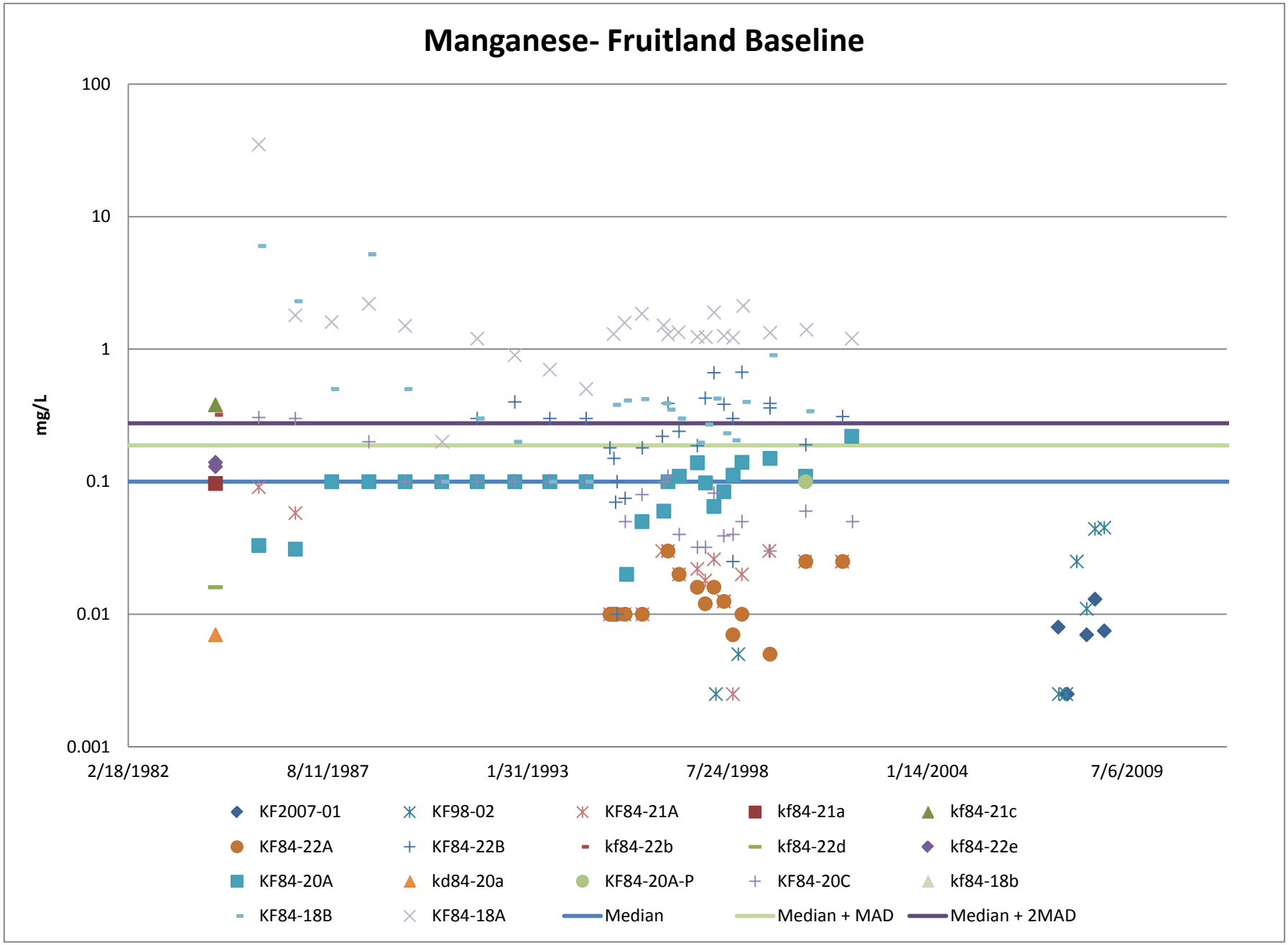


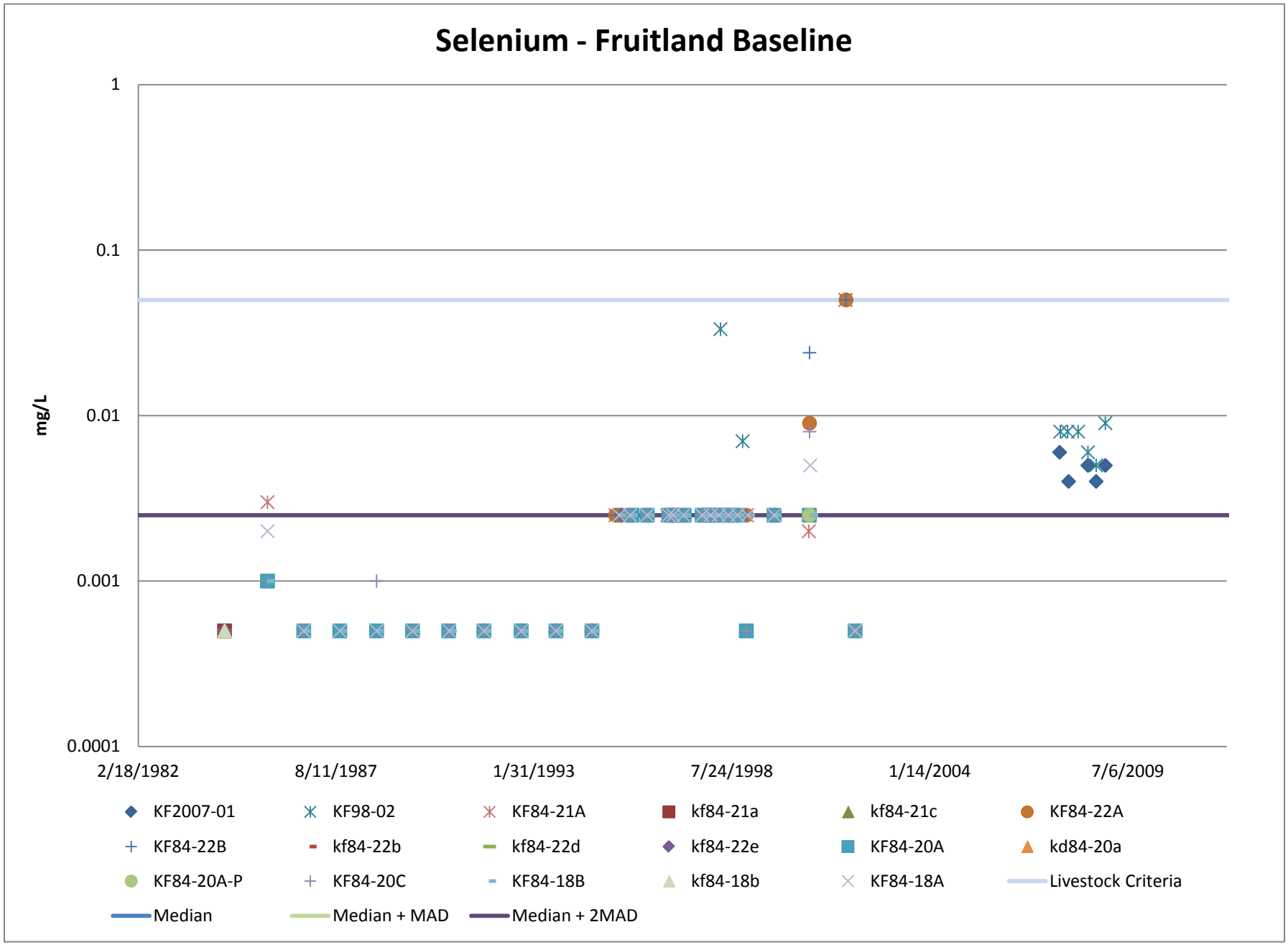
Appendix F - Groundwater Data Summary

Baseline Fruitland Graphs



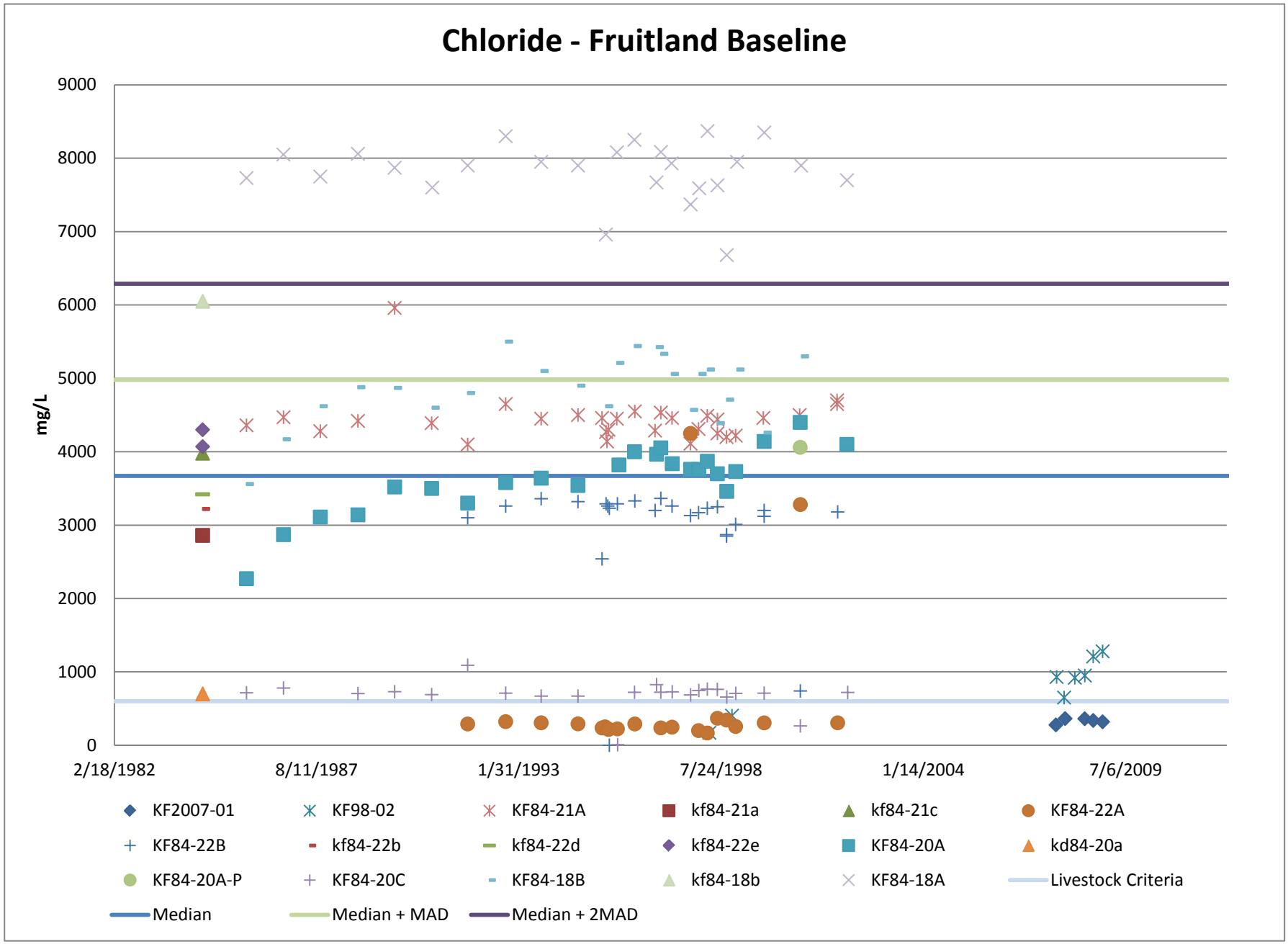
Appendix F - Groundwater Data Summary

Baseline Fruitland Graphs



Appendix F - Groundwater Data Summary

Baseline Fruitland Graphs



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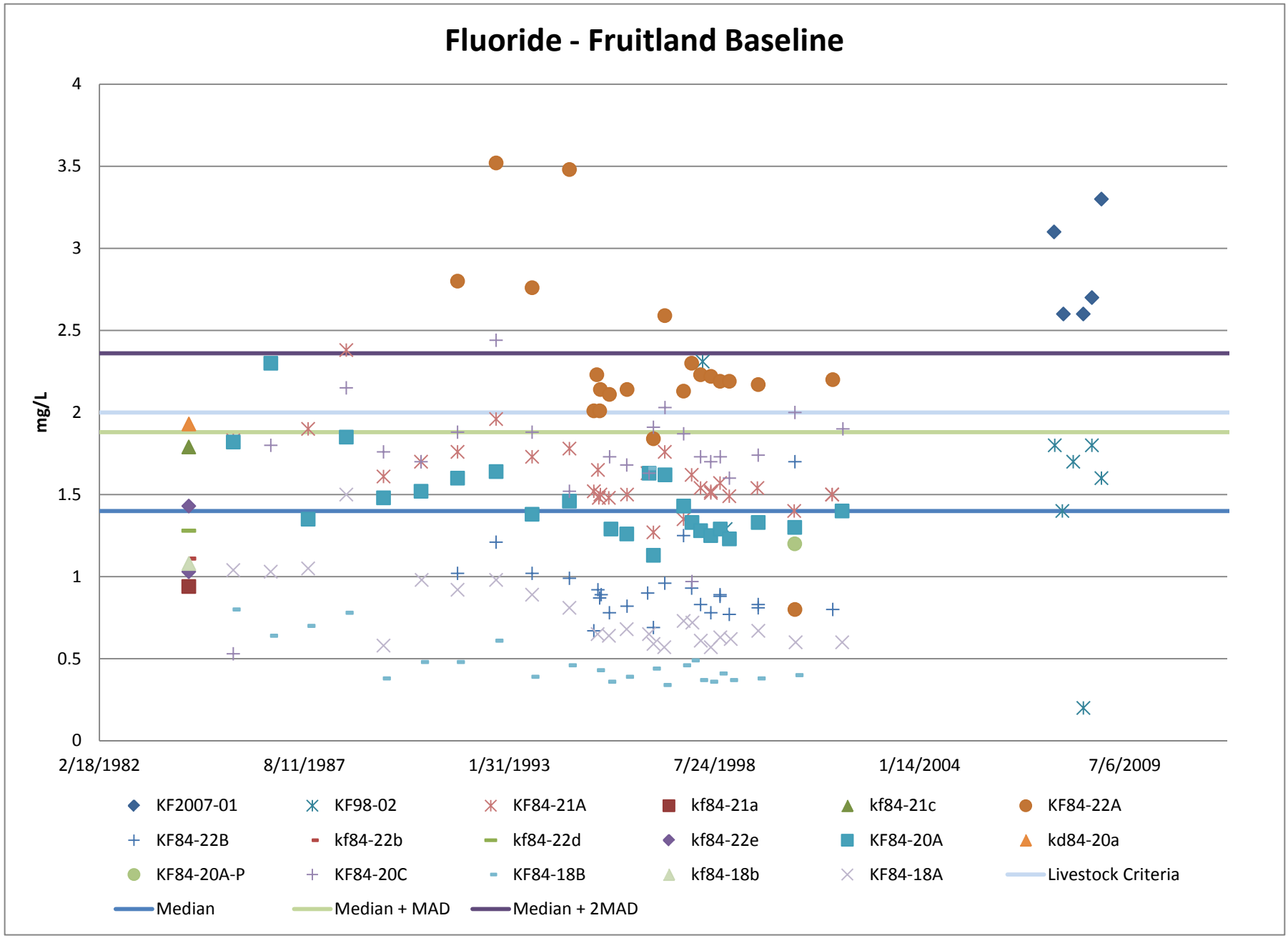
Baseline Fruitland Graphs



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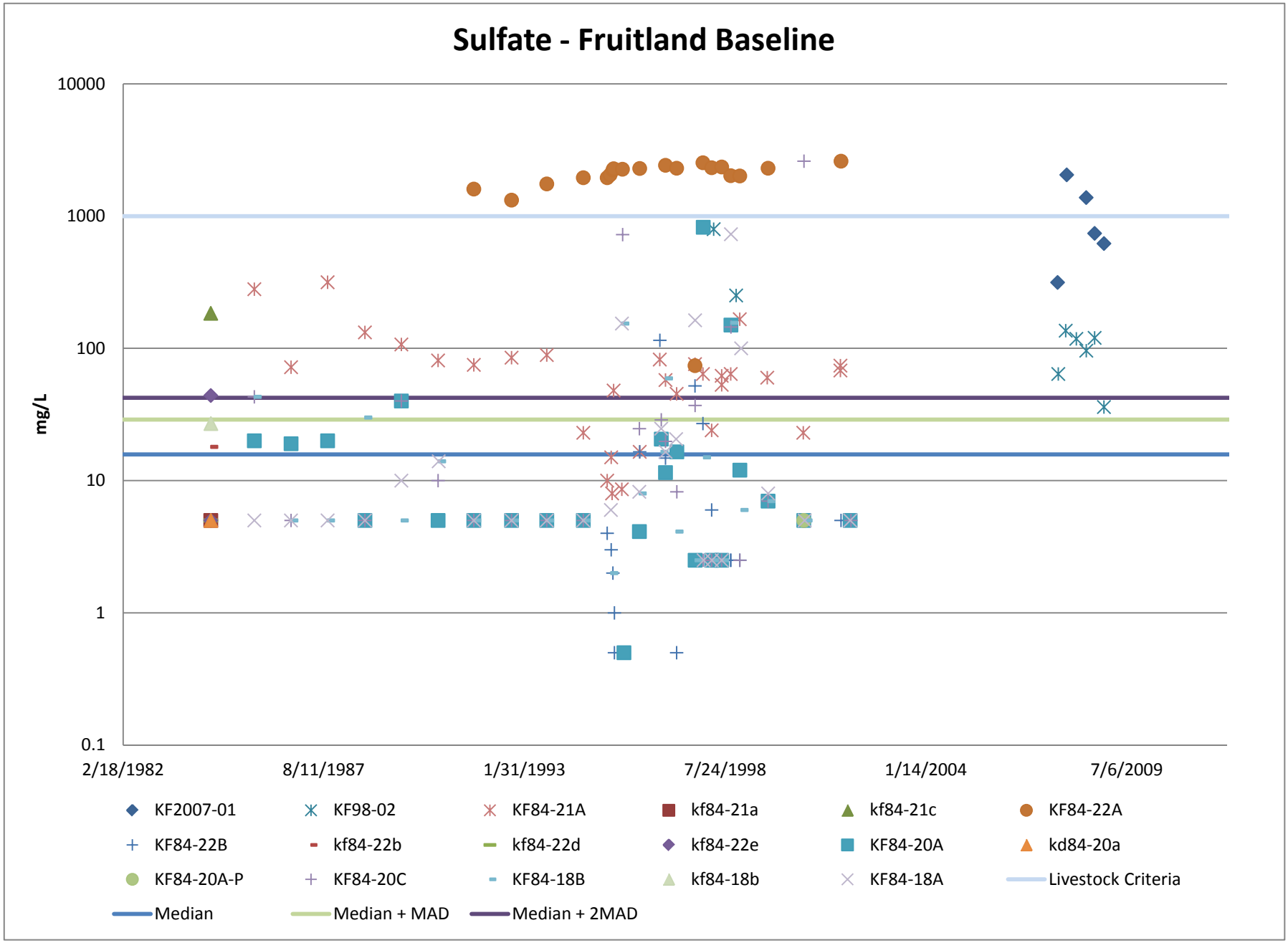
Baseline Fruitland Graphs



Appendix F - Groundwater Data Summary

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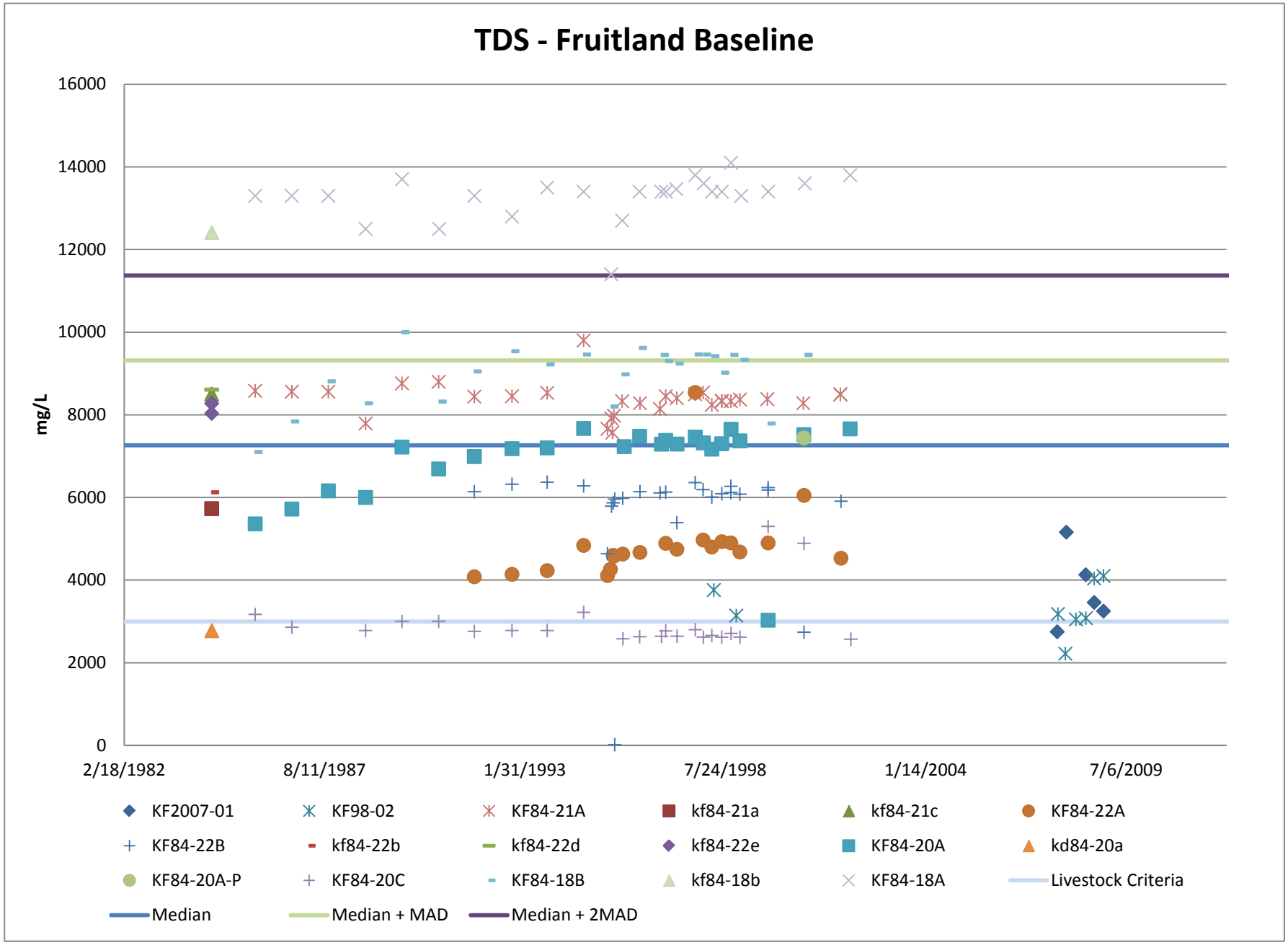
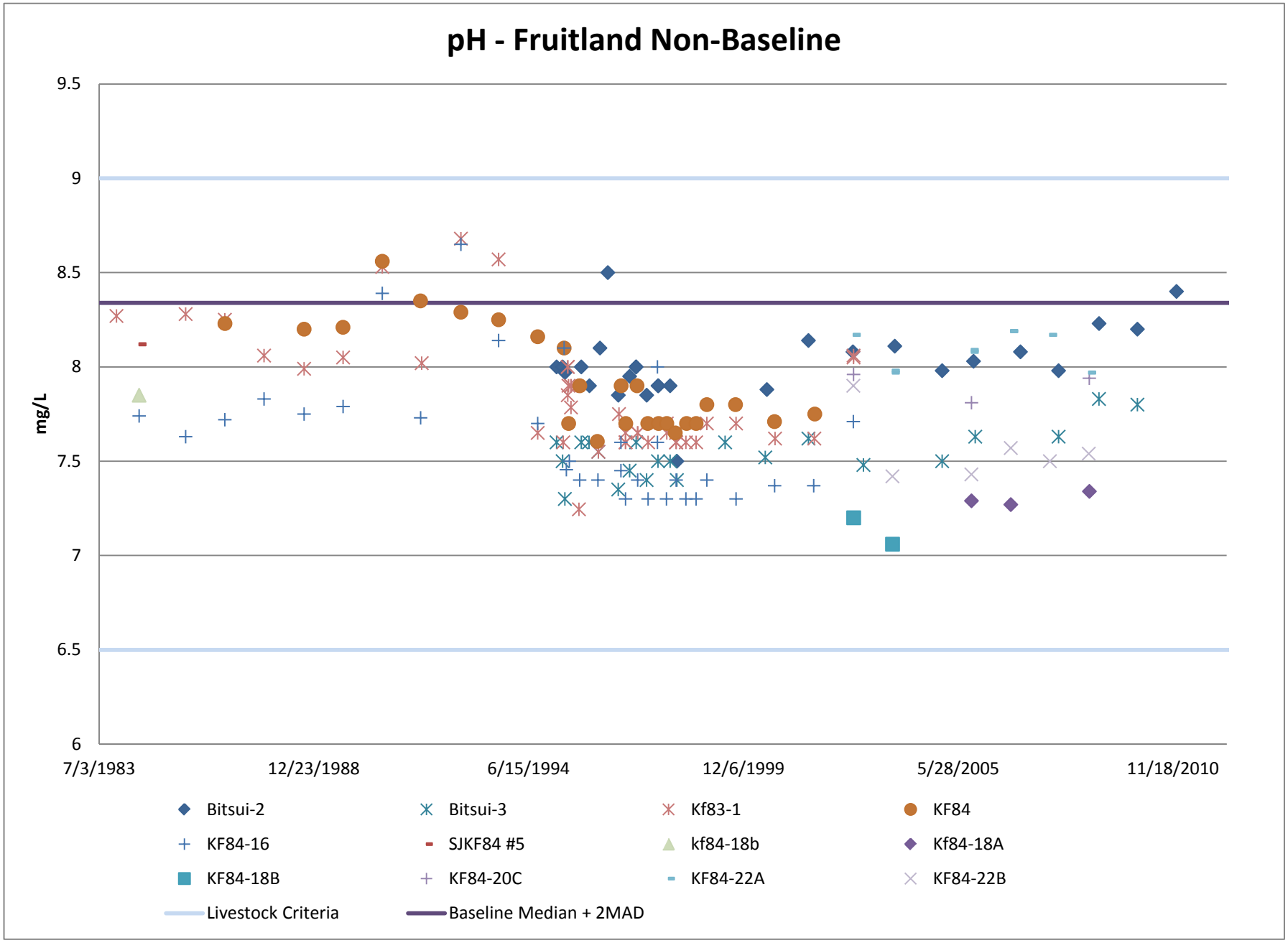


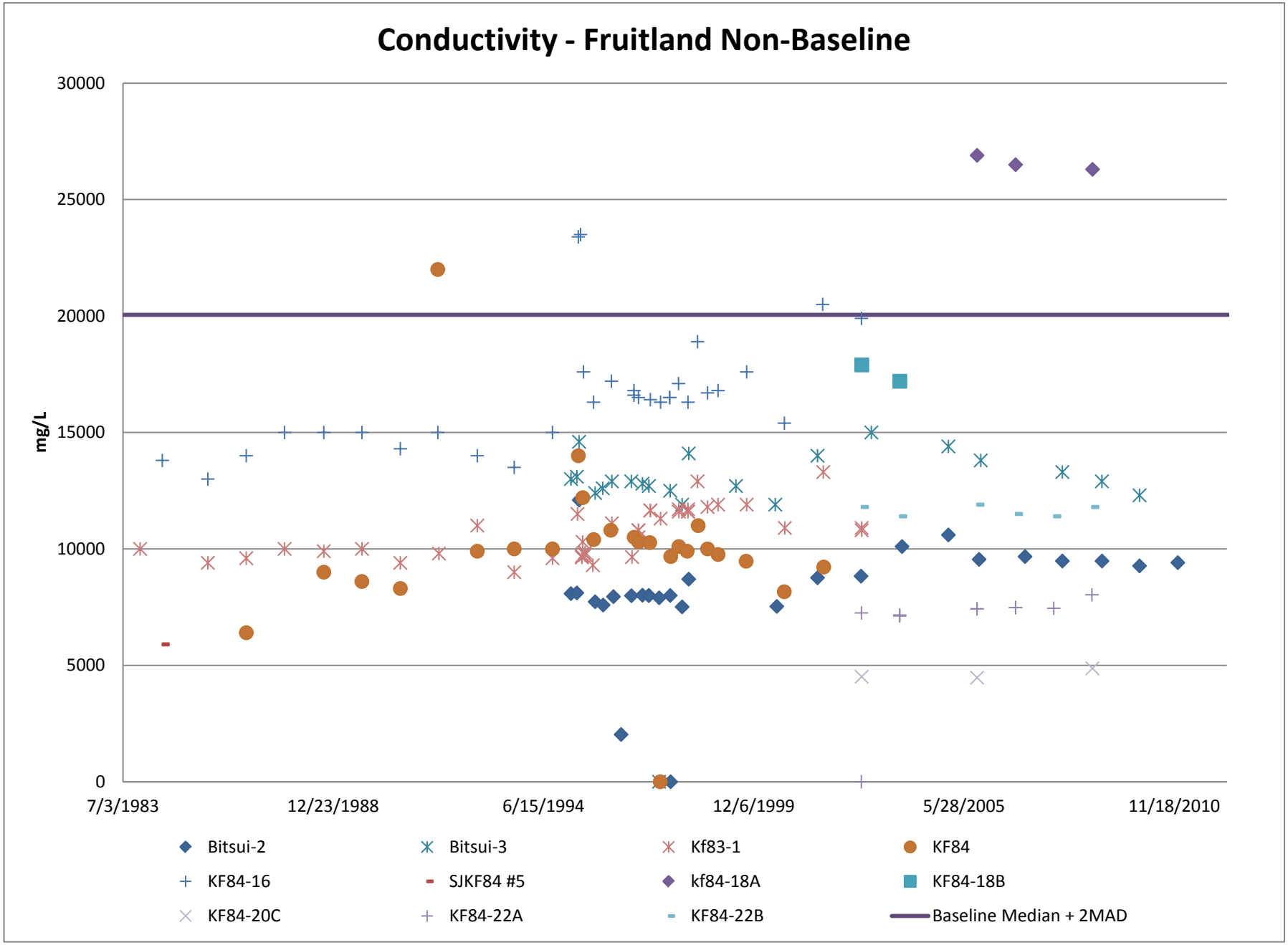
Appendix F - Groundwater Data Summary

Non Baseline Fruitland Graphs



Appendix F - Groundwater Data Summary

Non Baseline Fruitland Graphs



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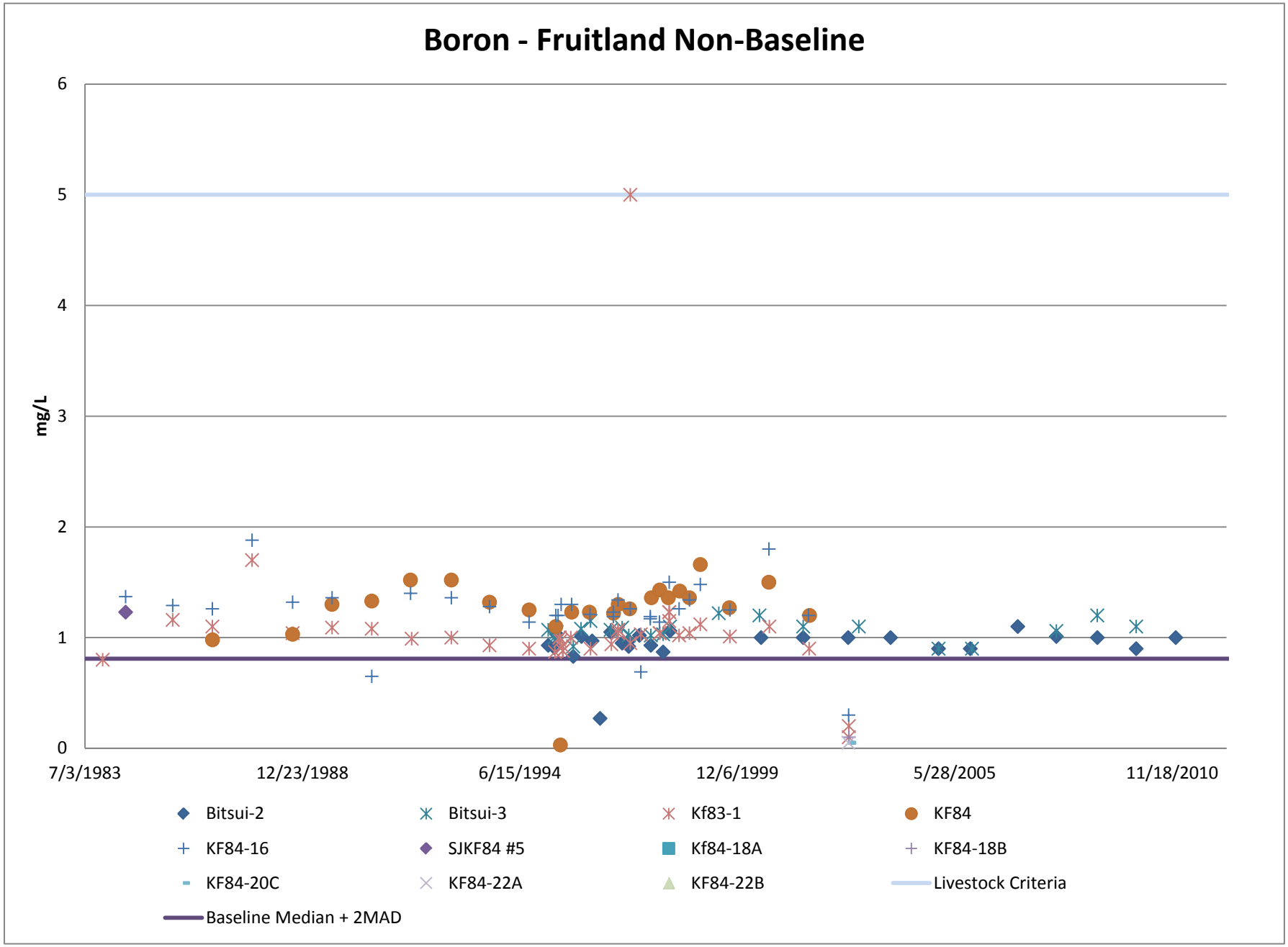
Non Baseline Fruitland Graphs



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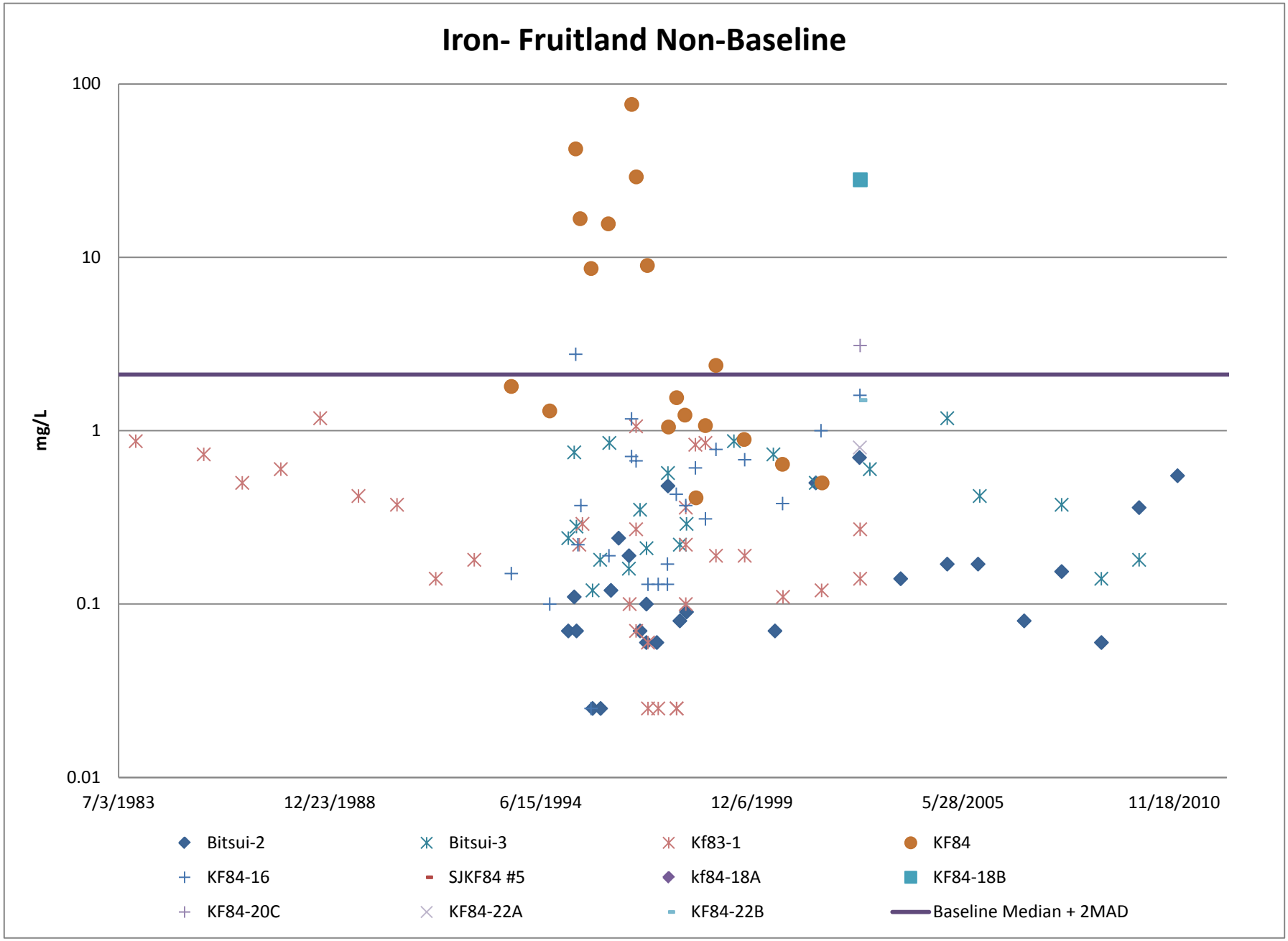

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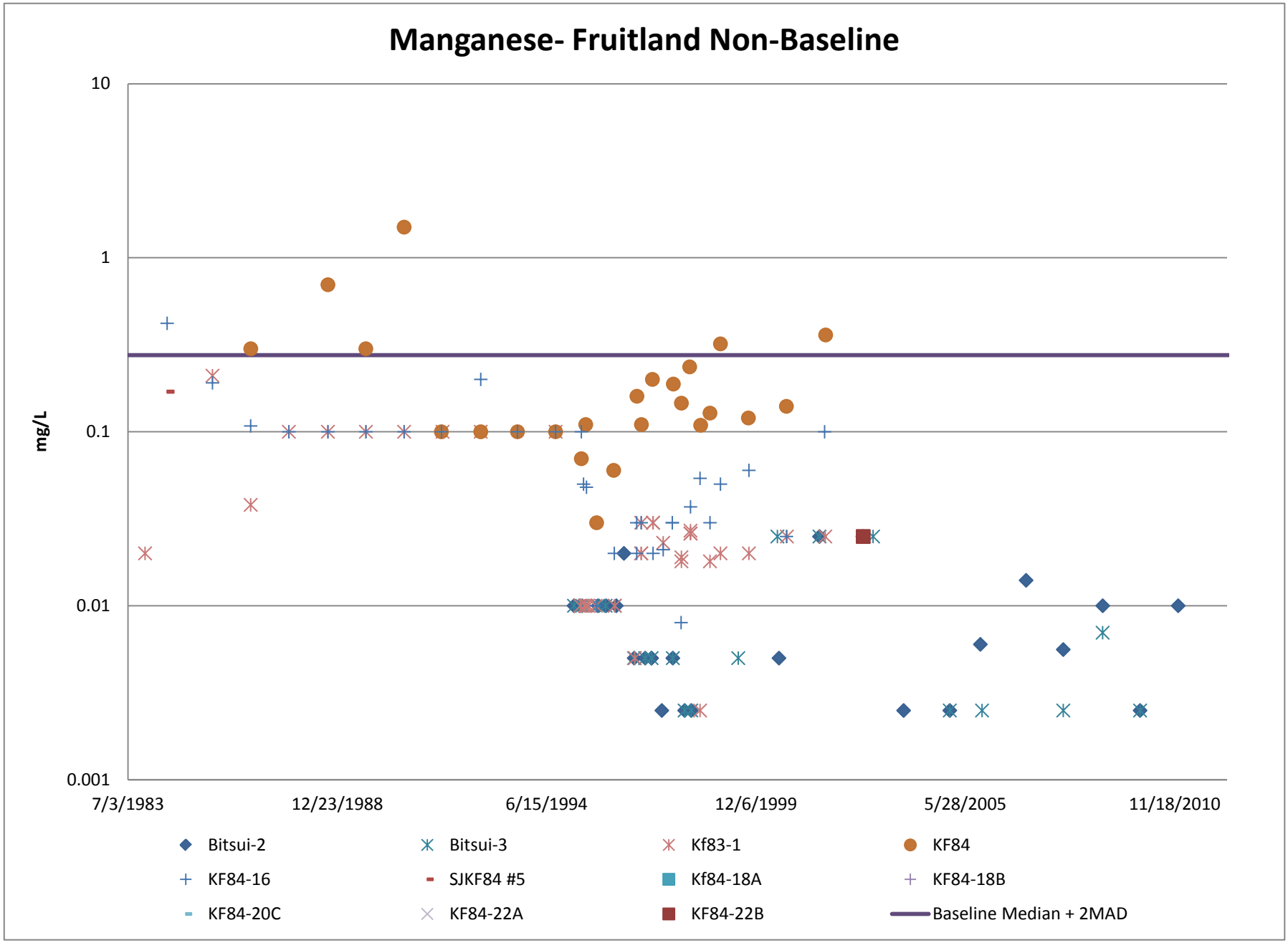

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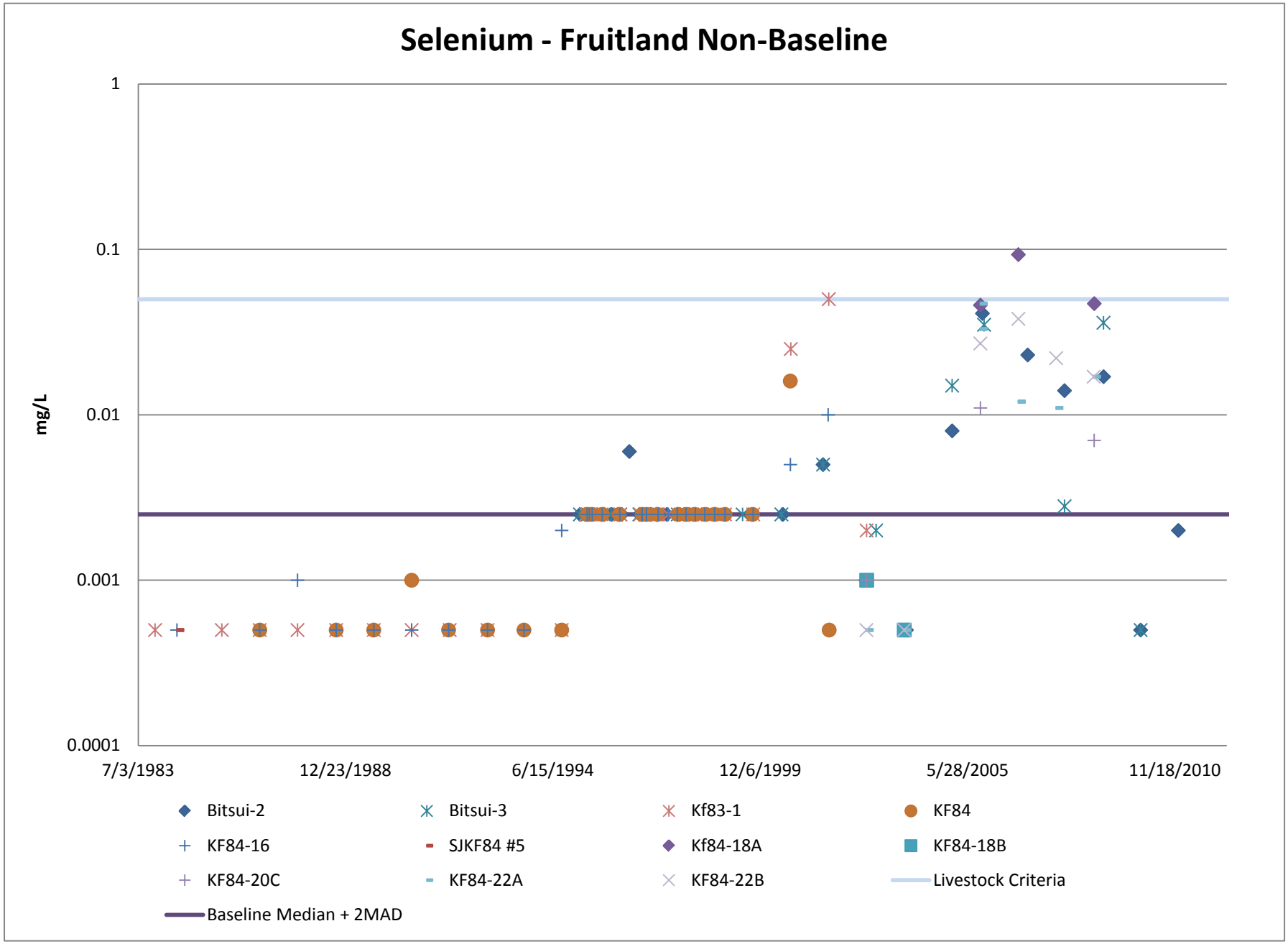
Non Baseline Fruitland Graphs



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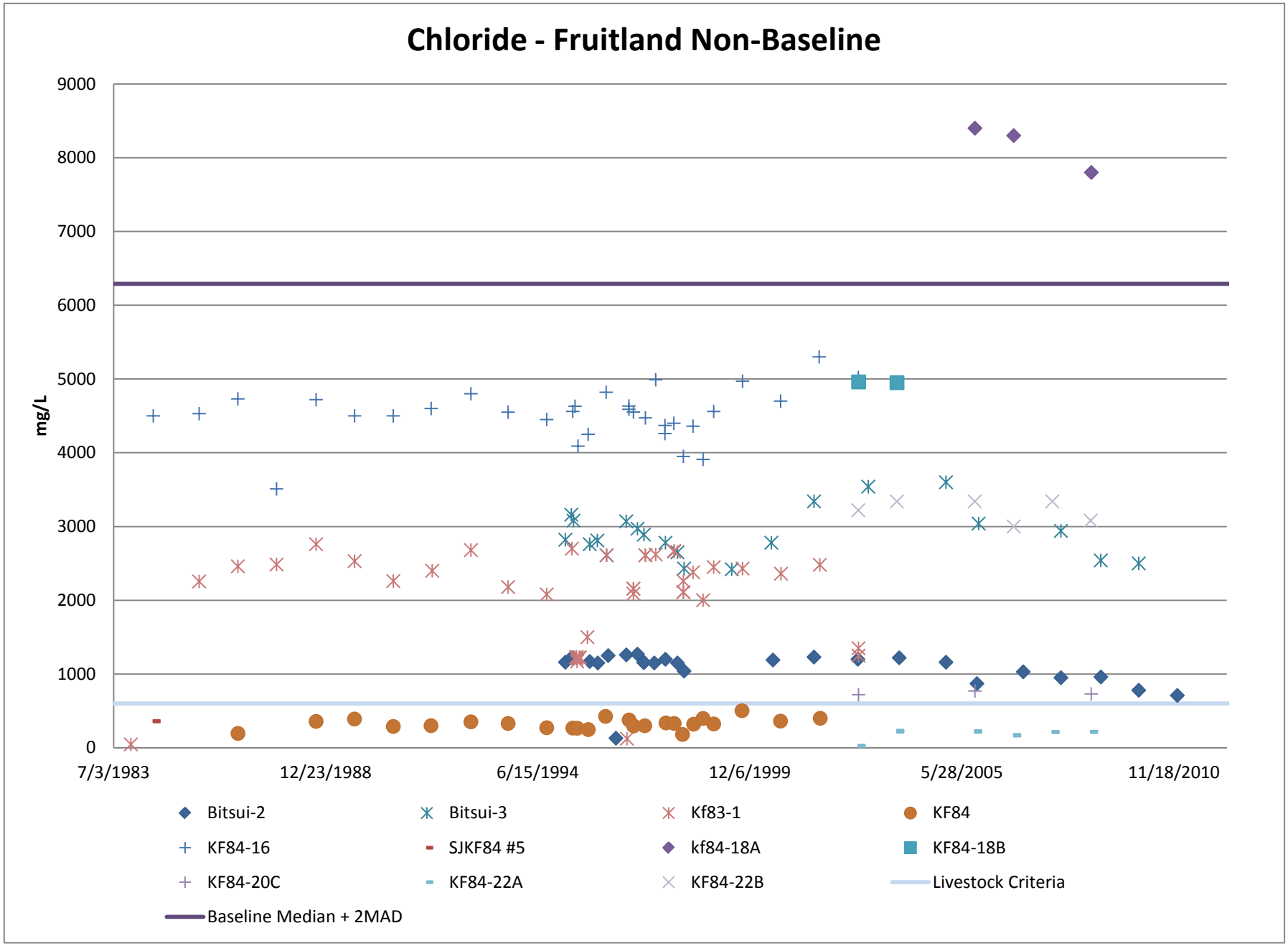

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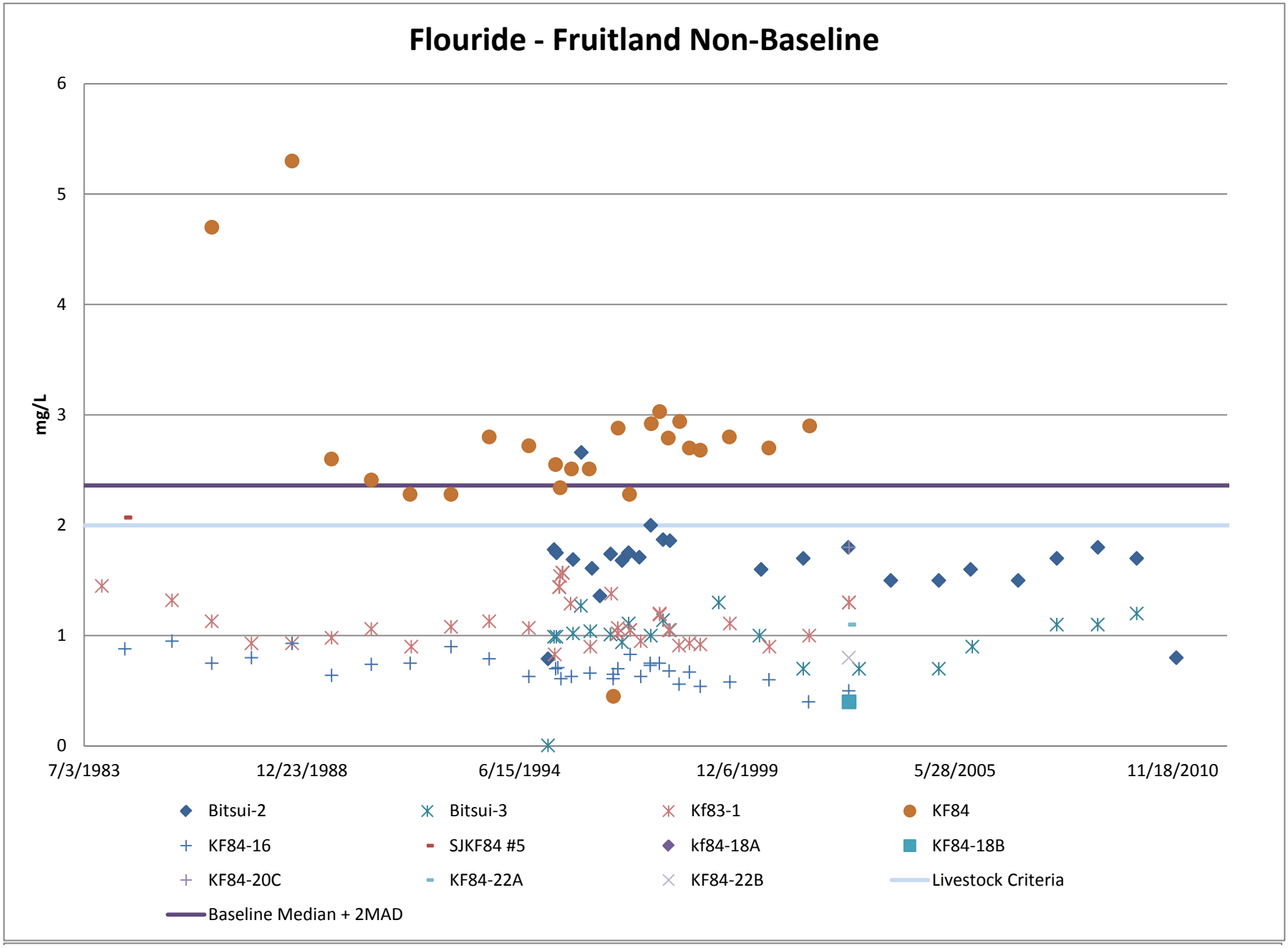

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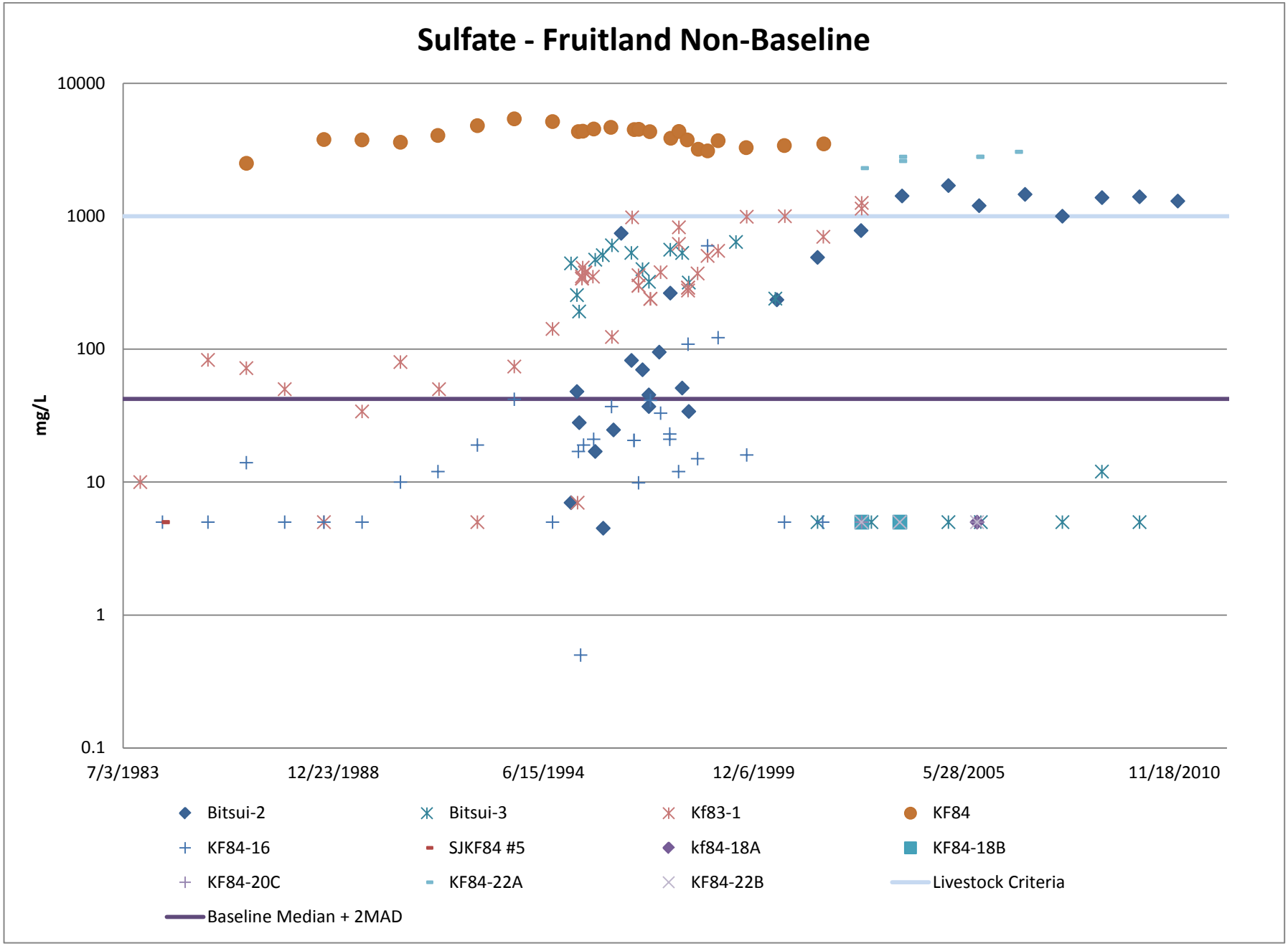

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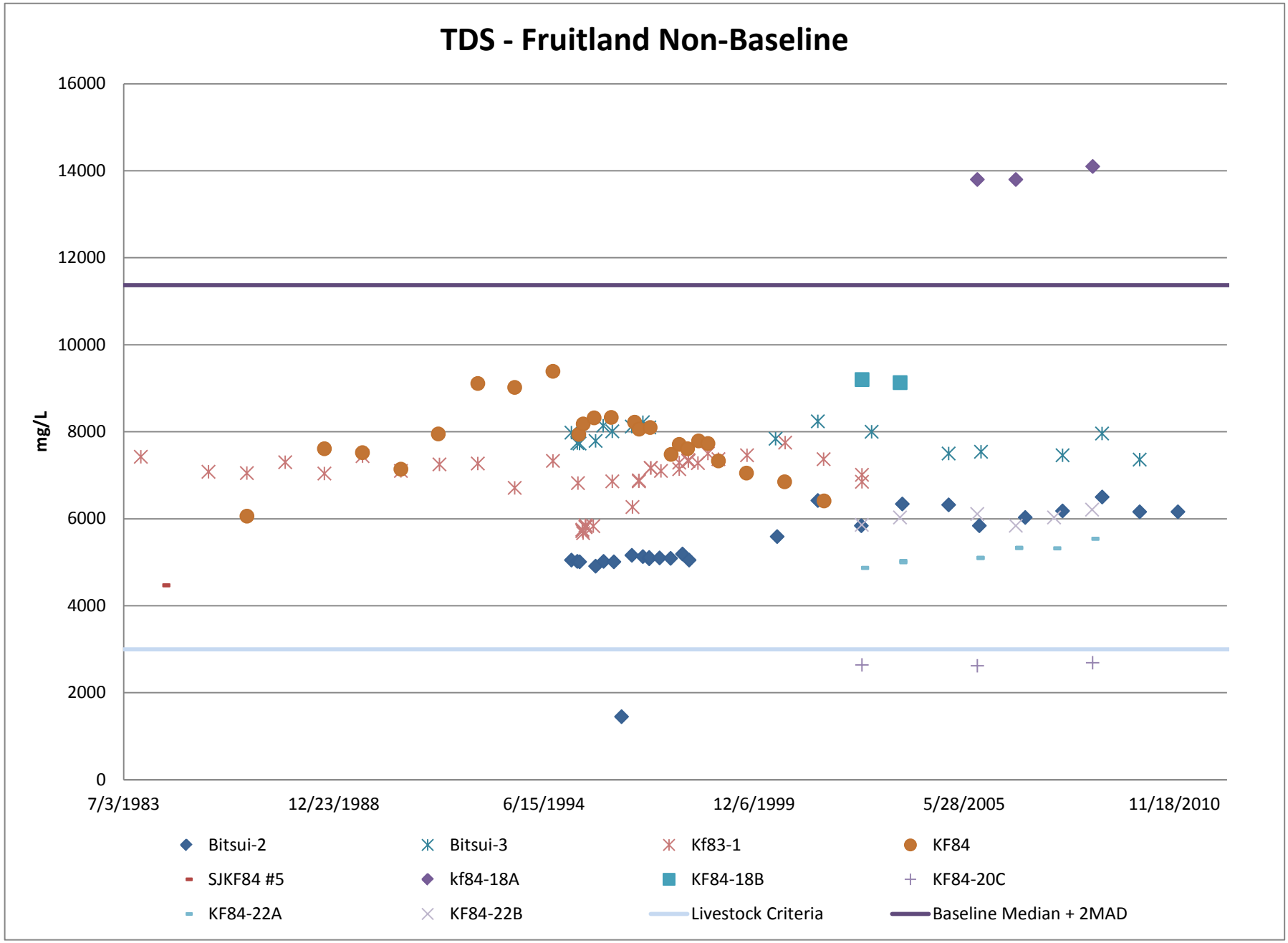
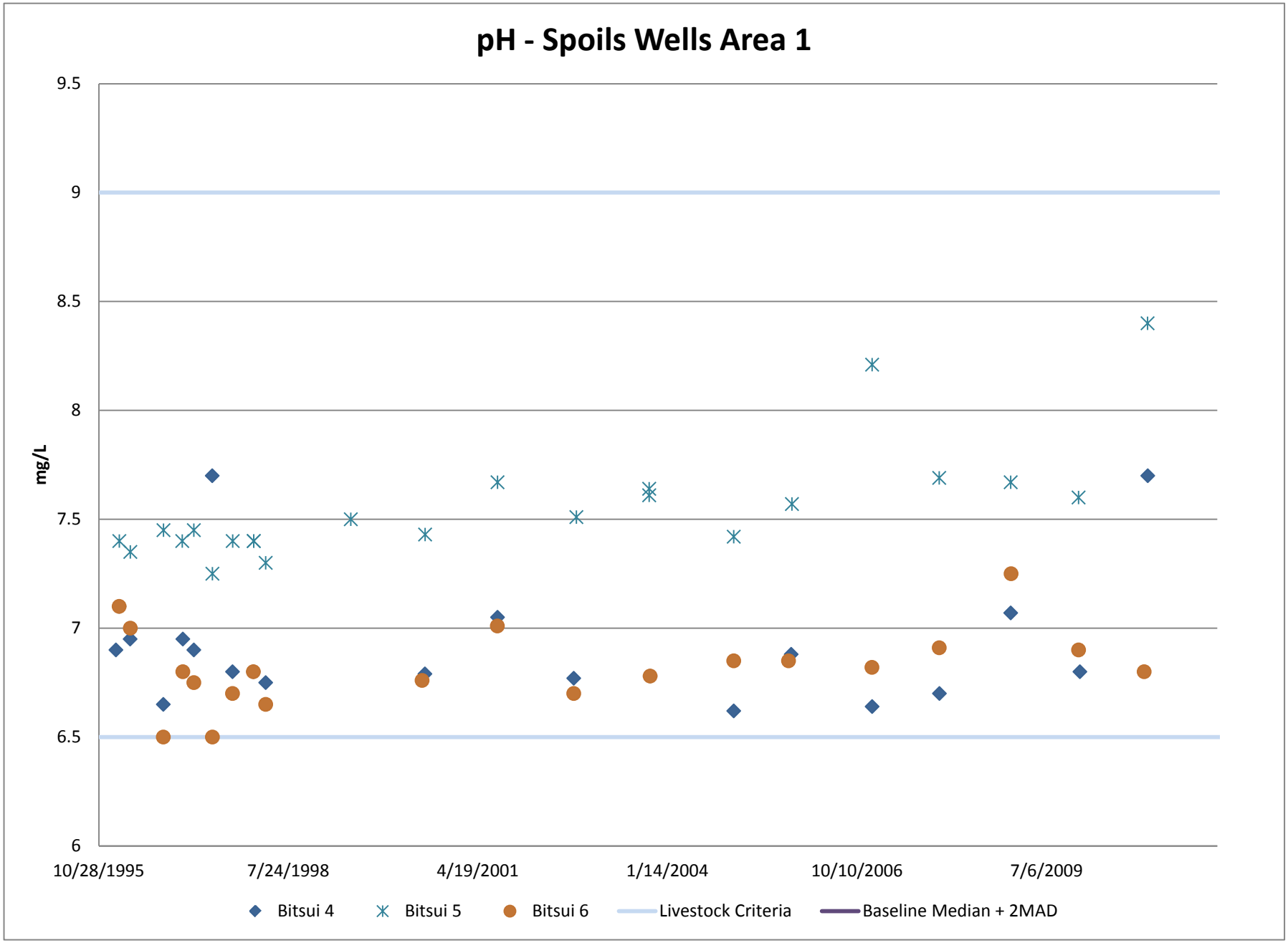


Appendix F - Groundwater Data Summary

Area I Spoil Graphs



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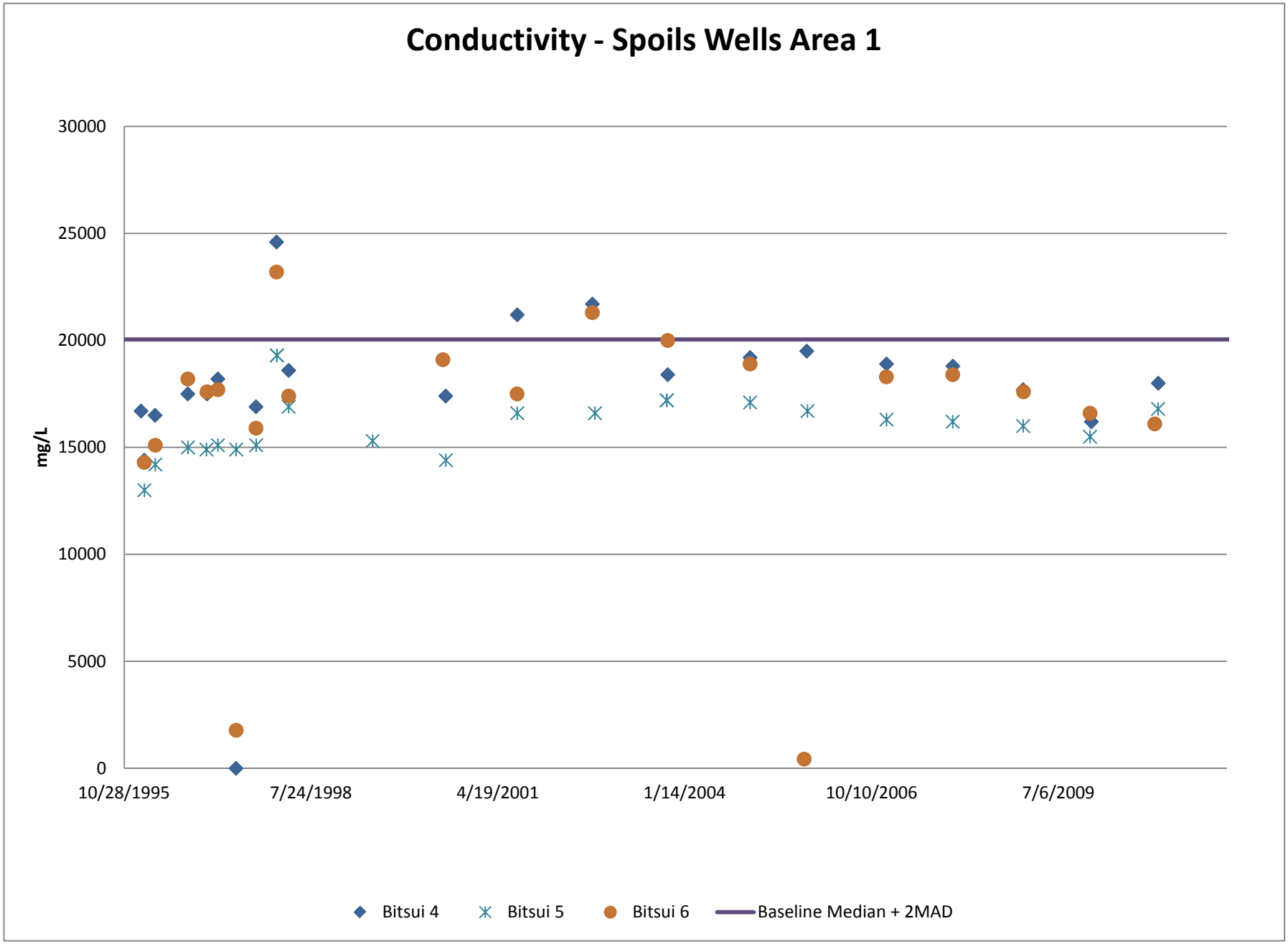

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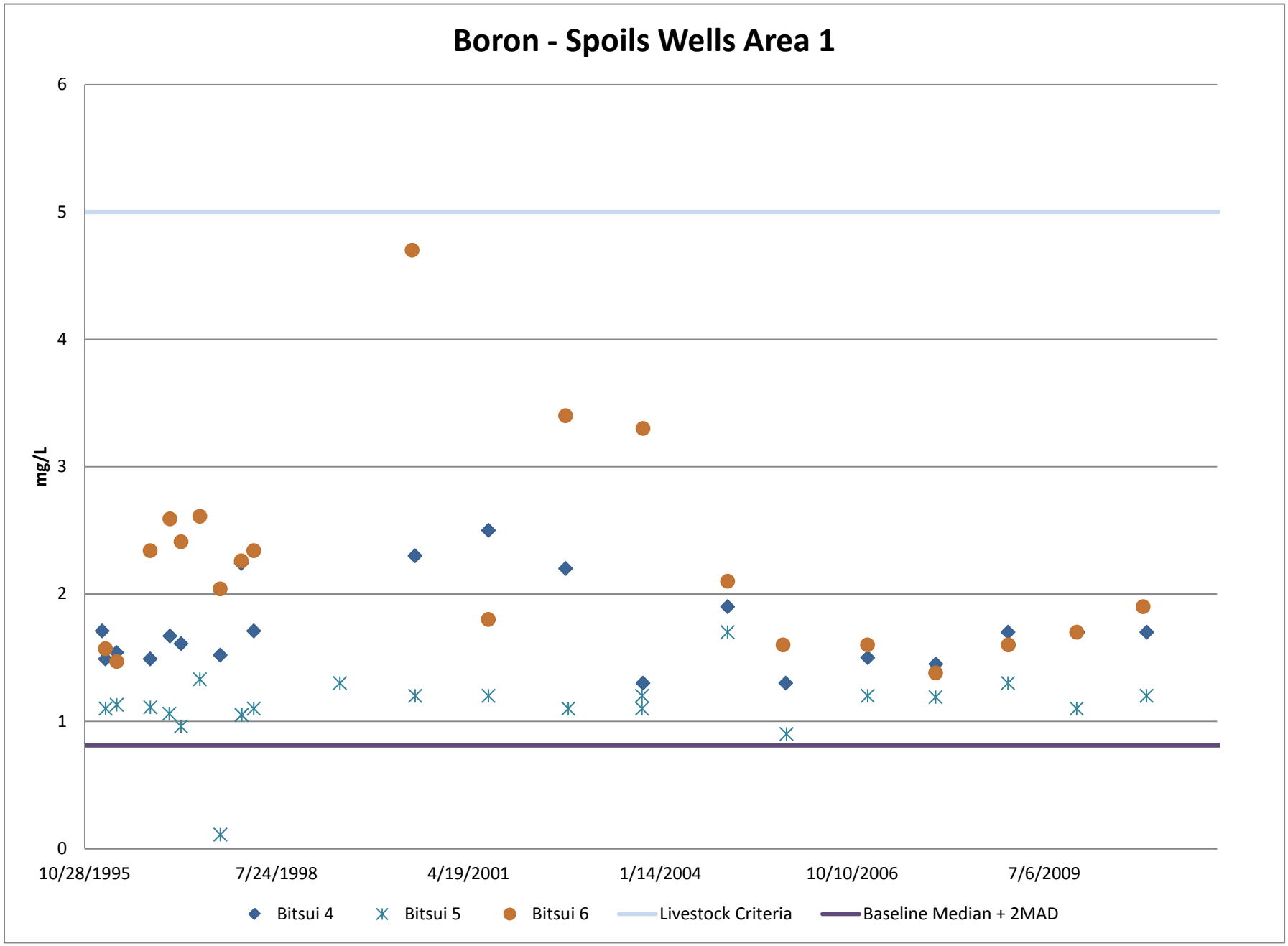

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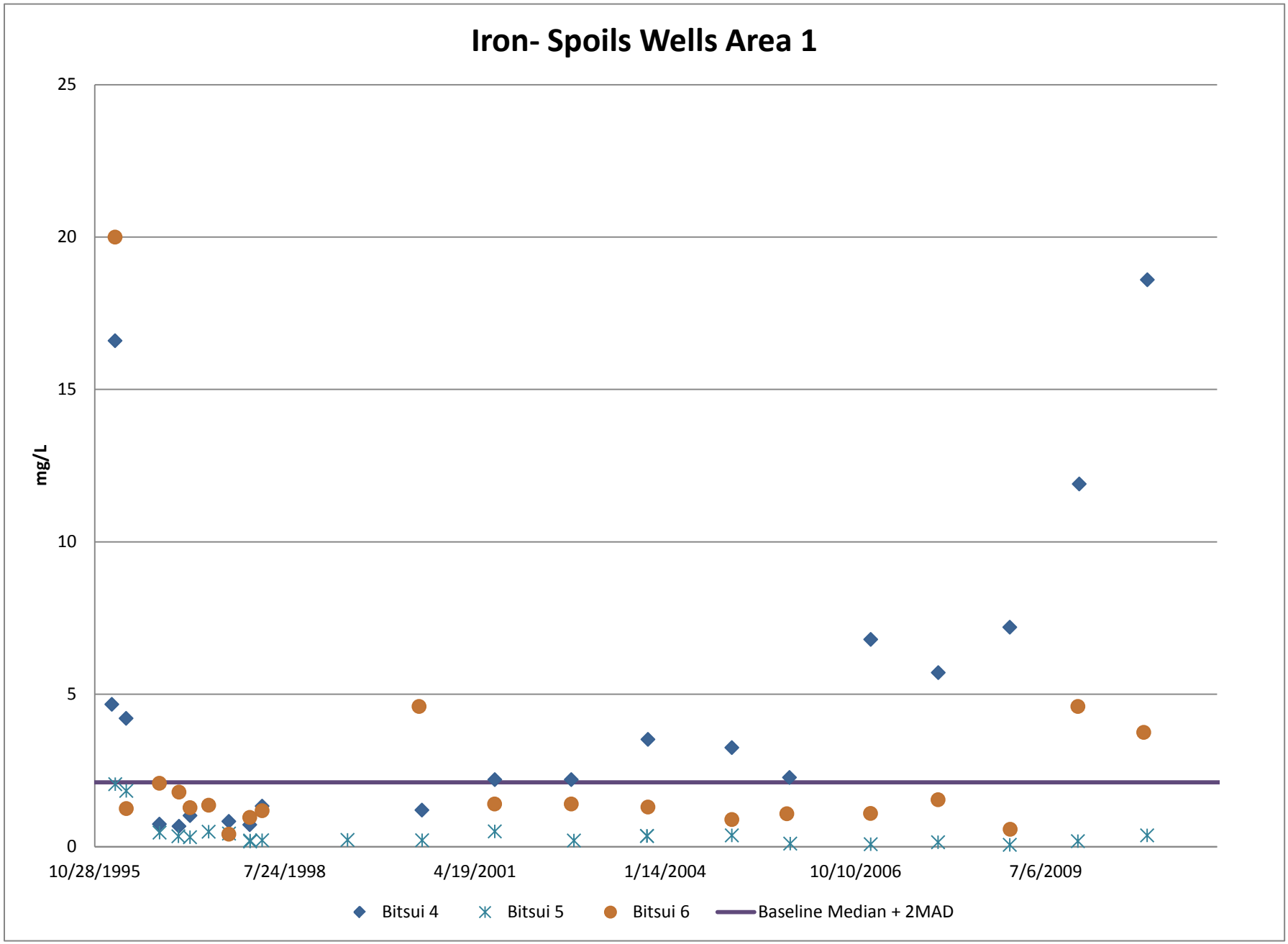

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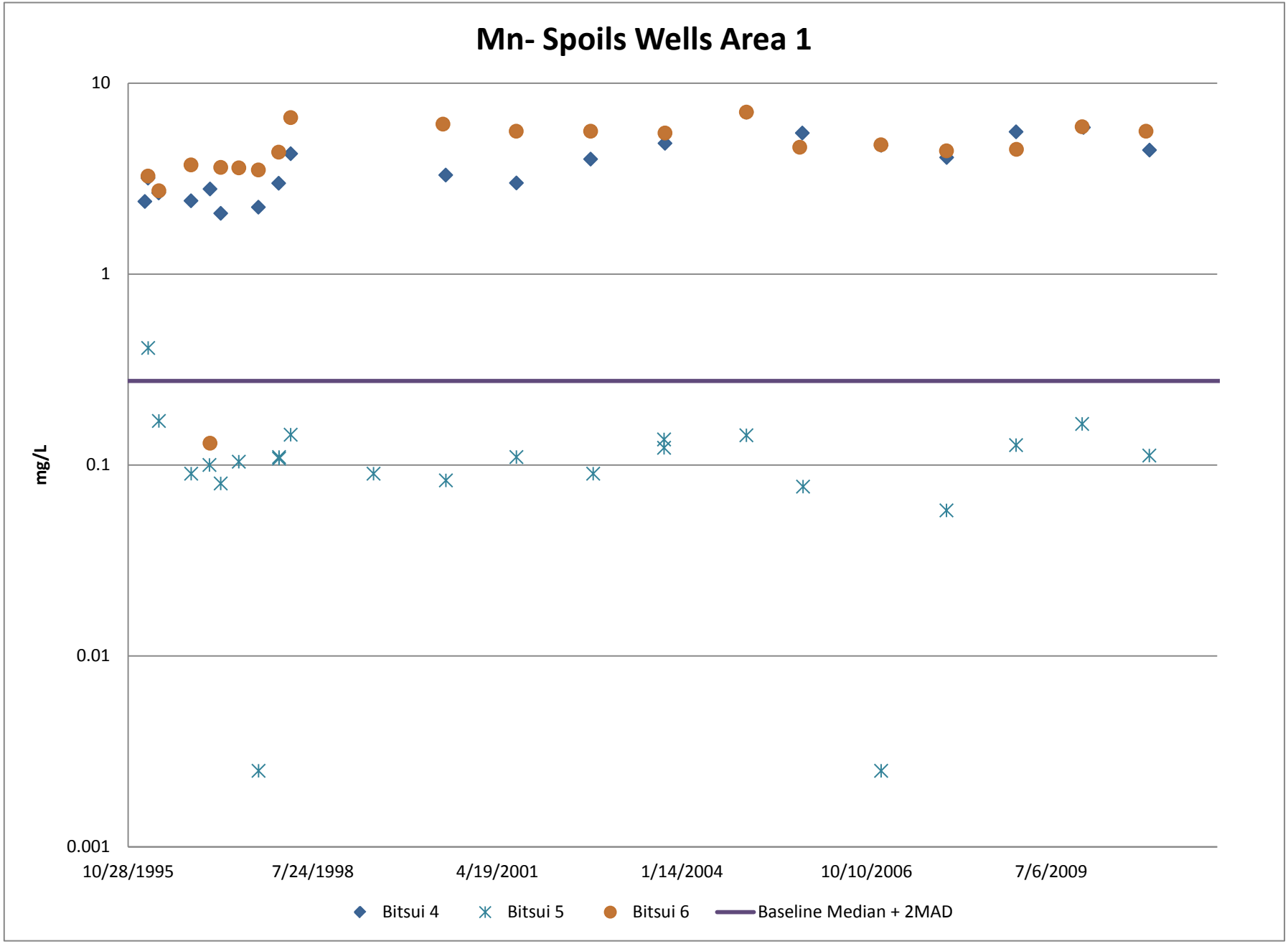

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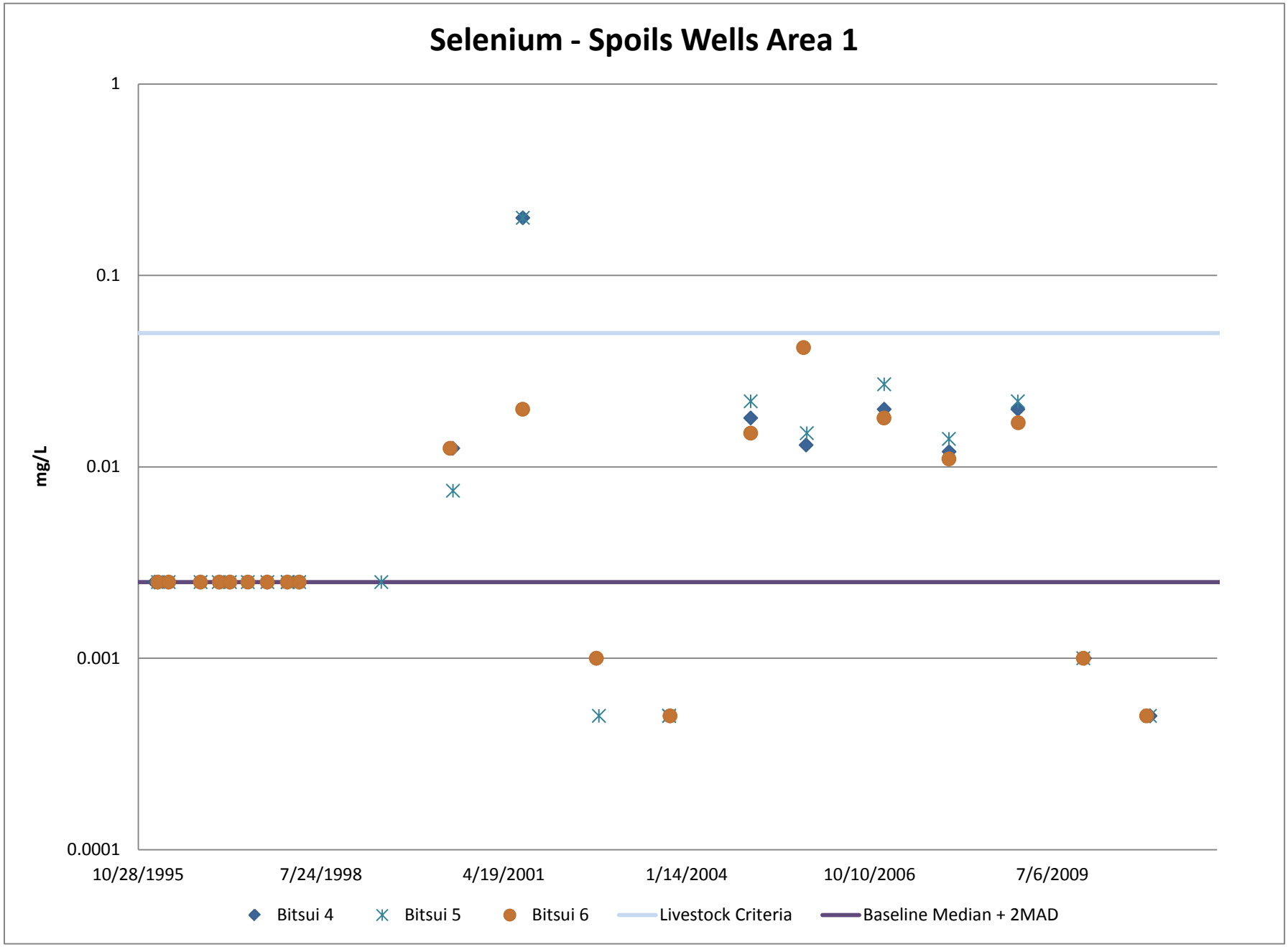

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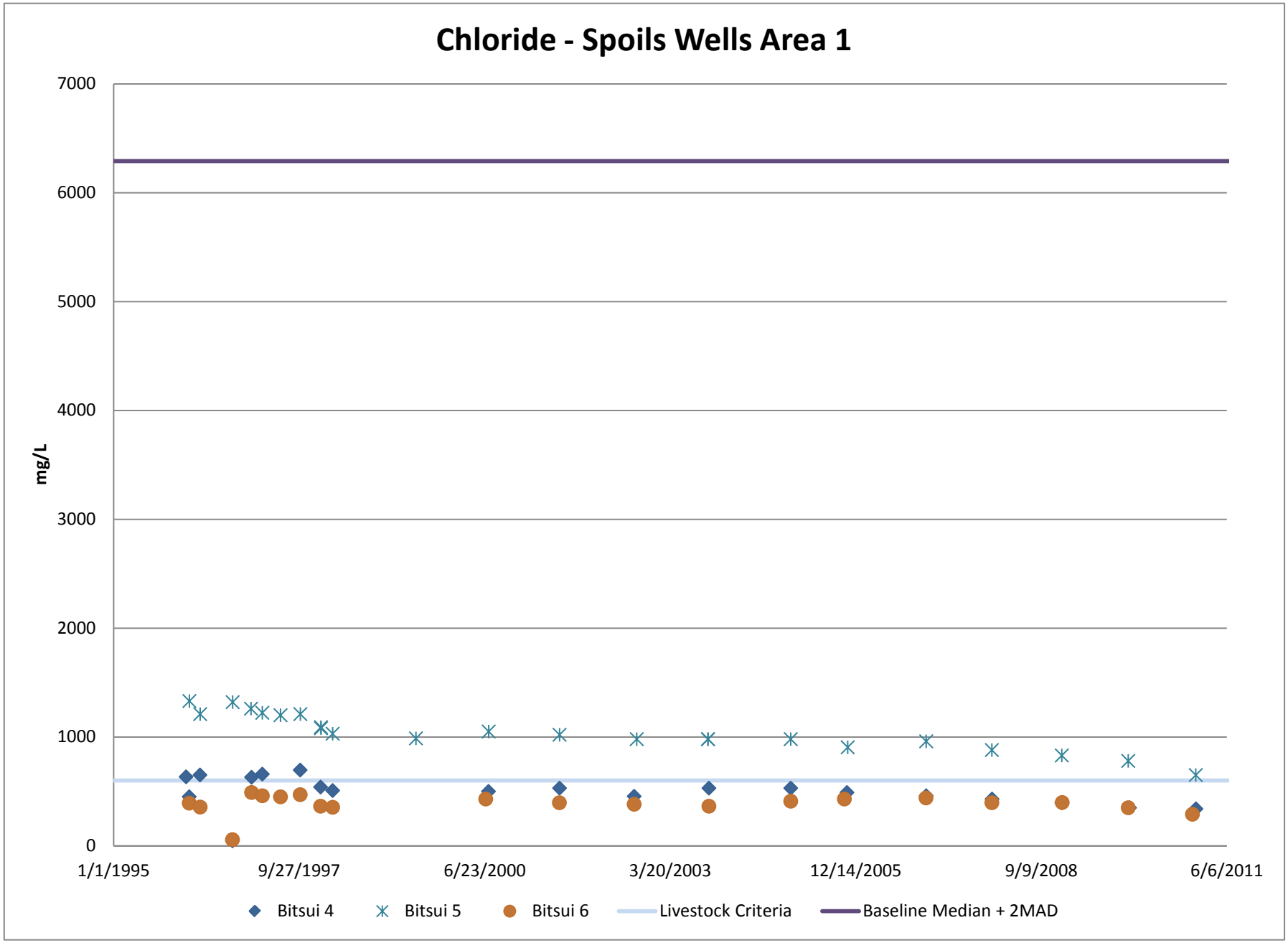

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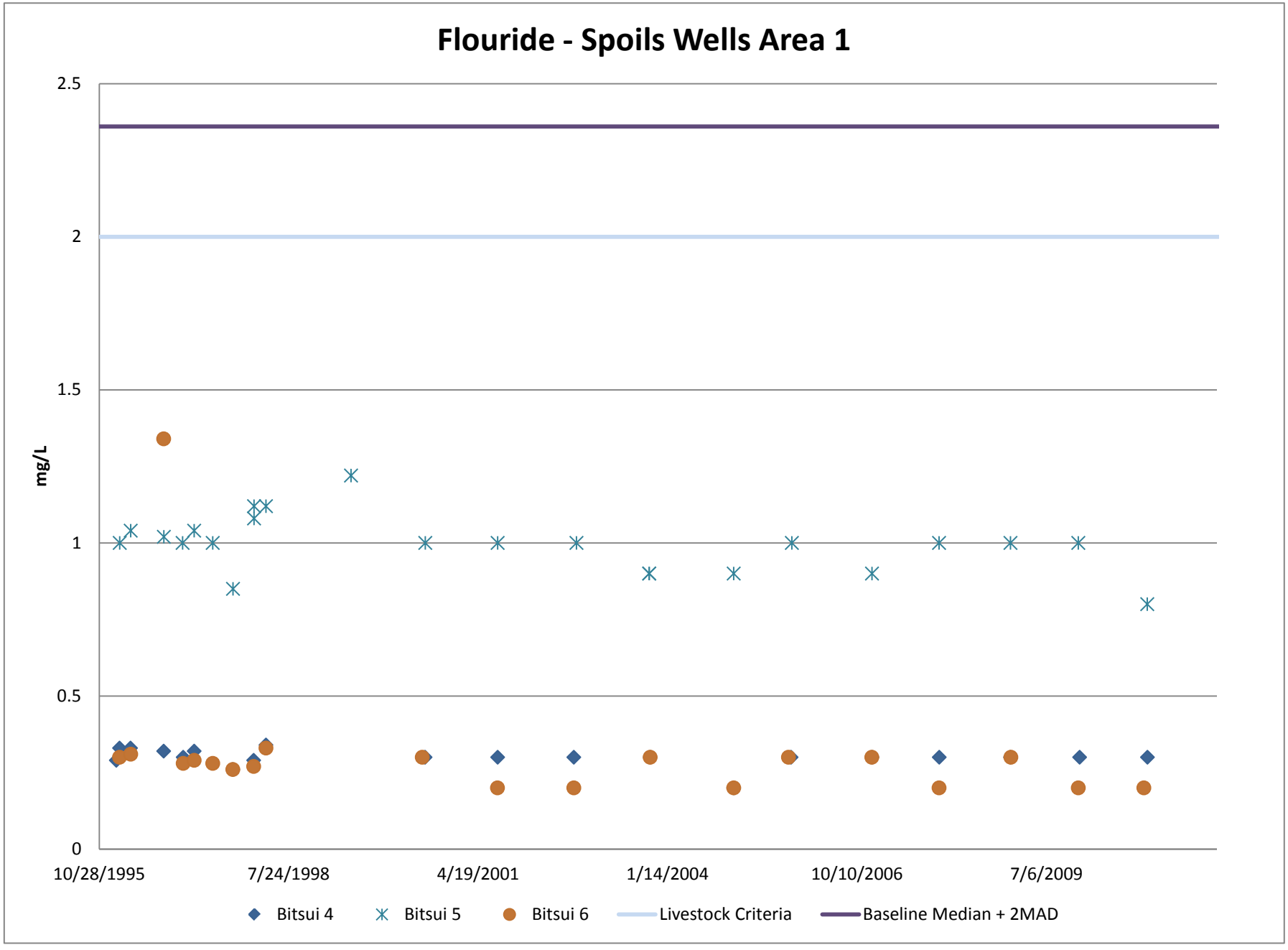

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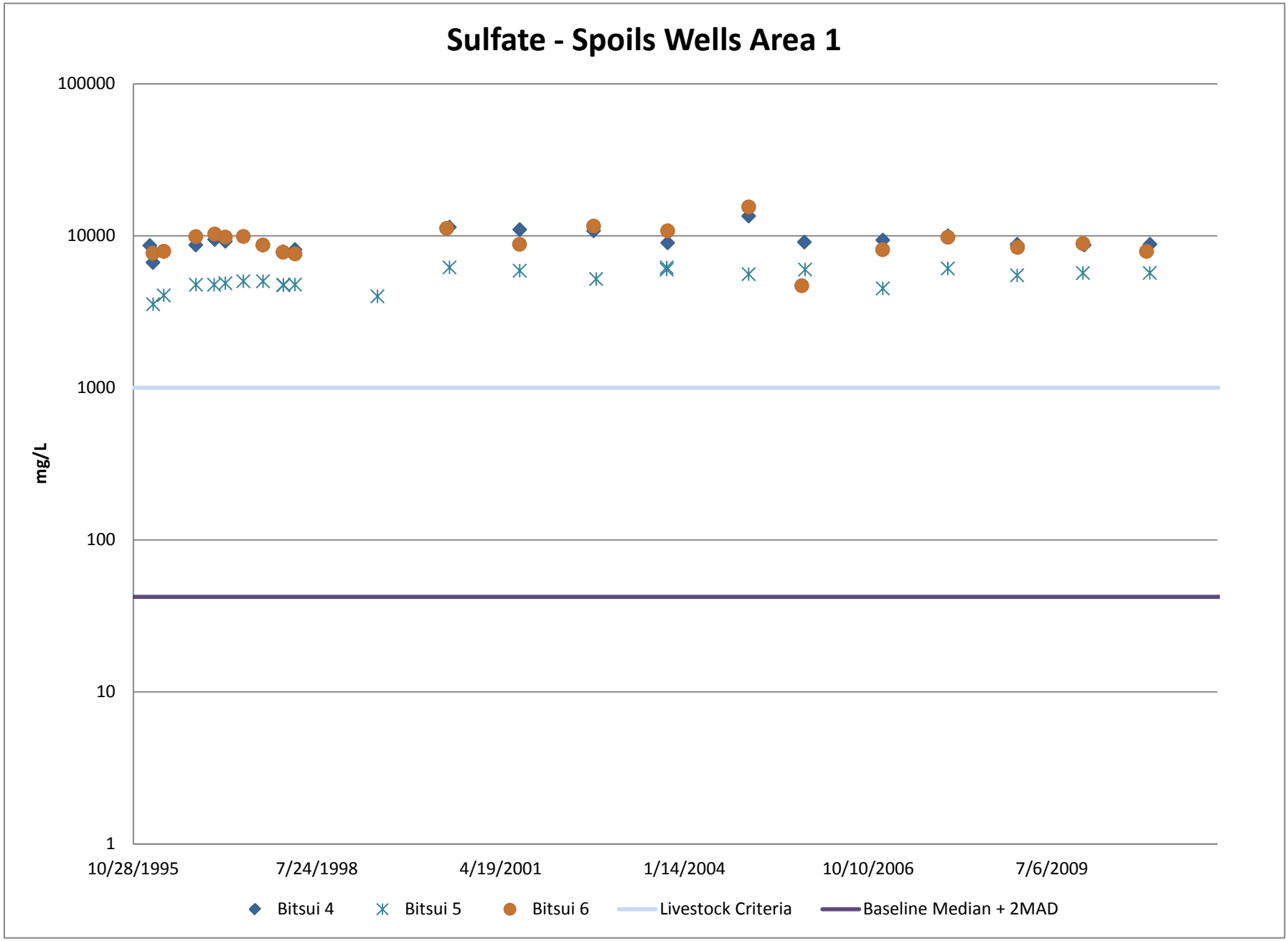

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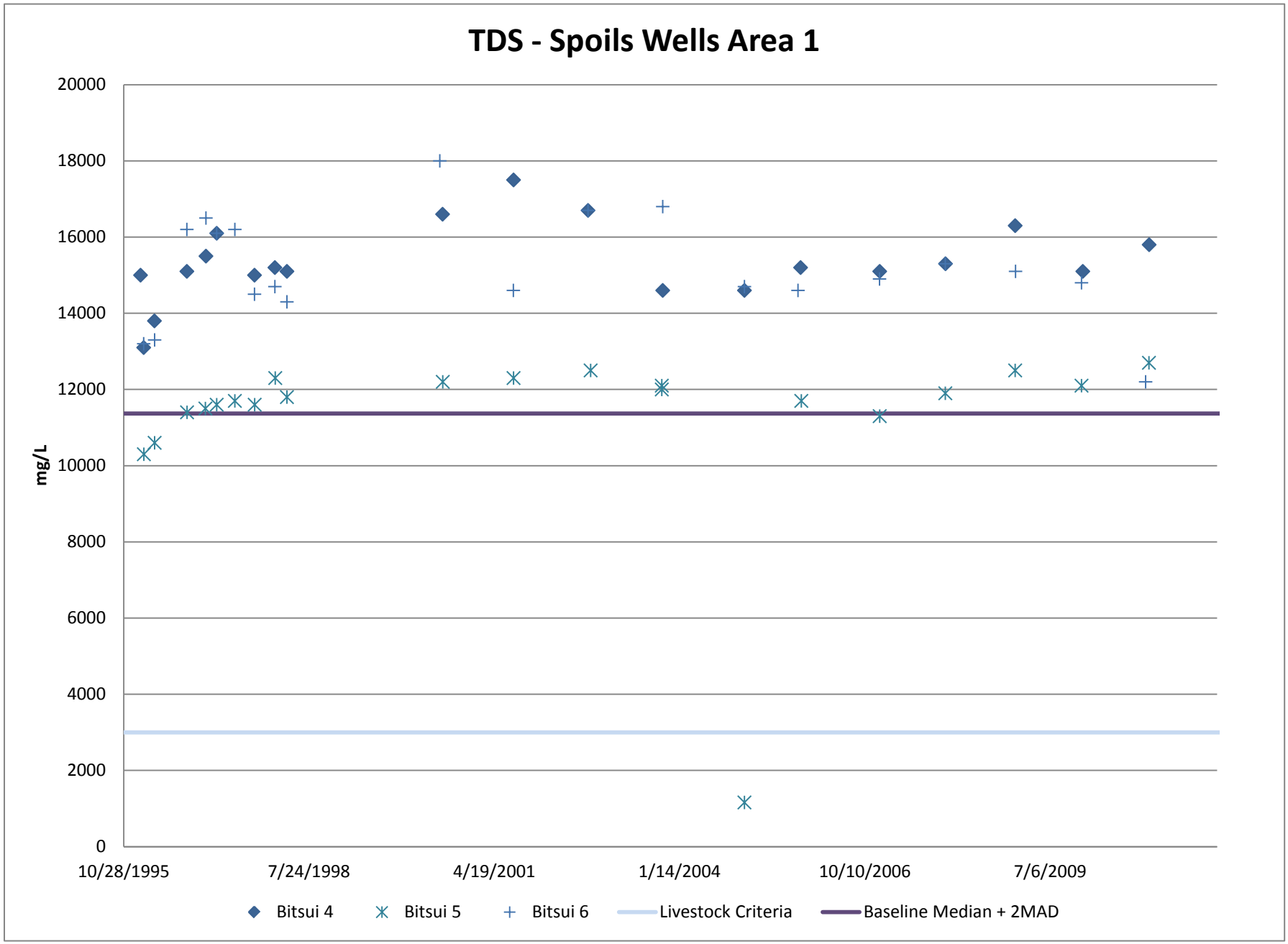
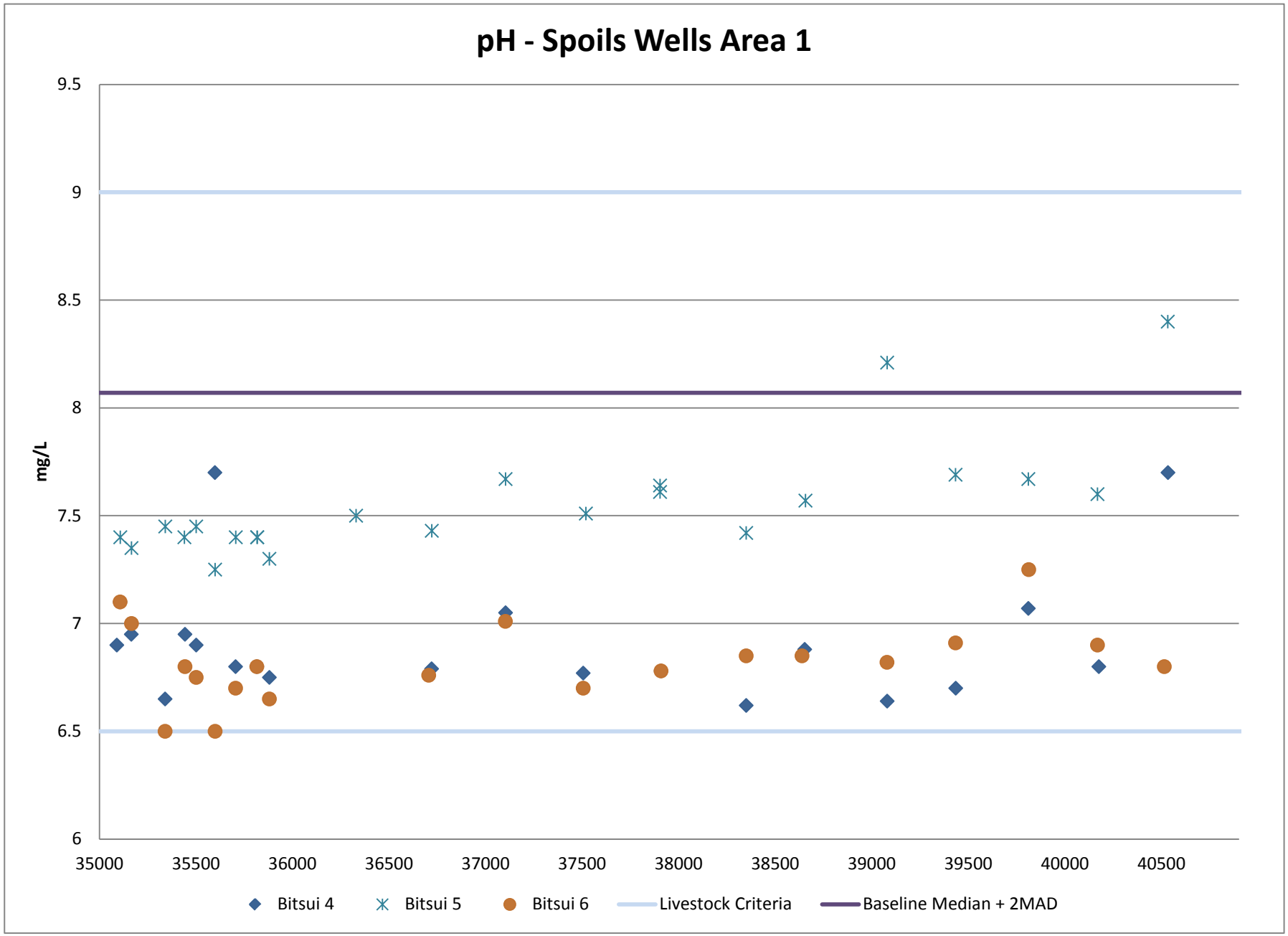


Appendix F - Groundwater Data Summary

CCB Well Graphs



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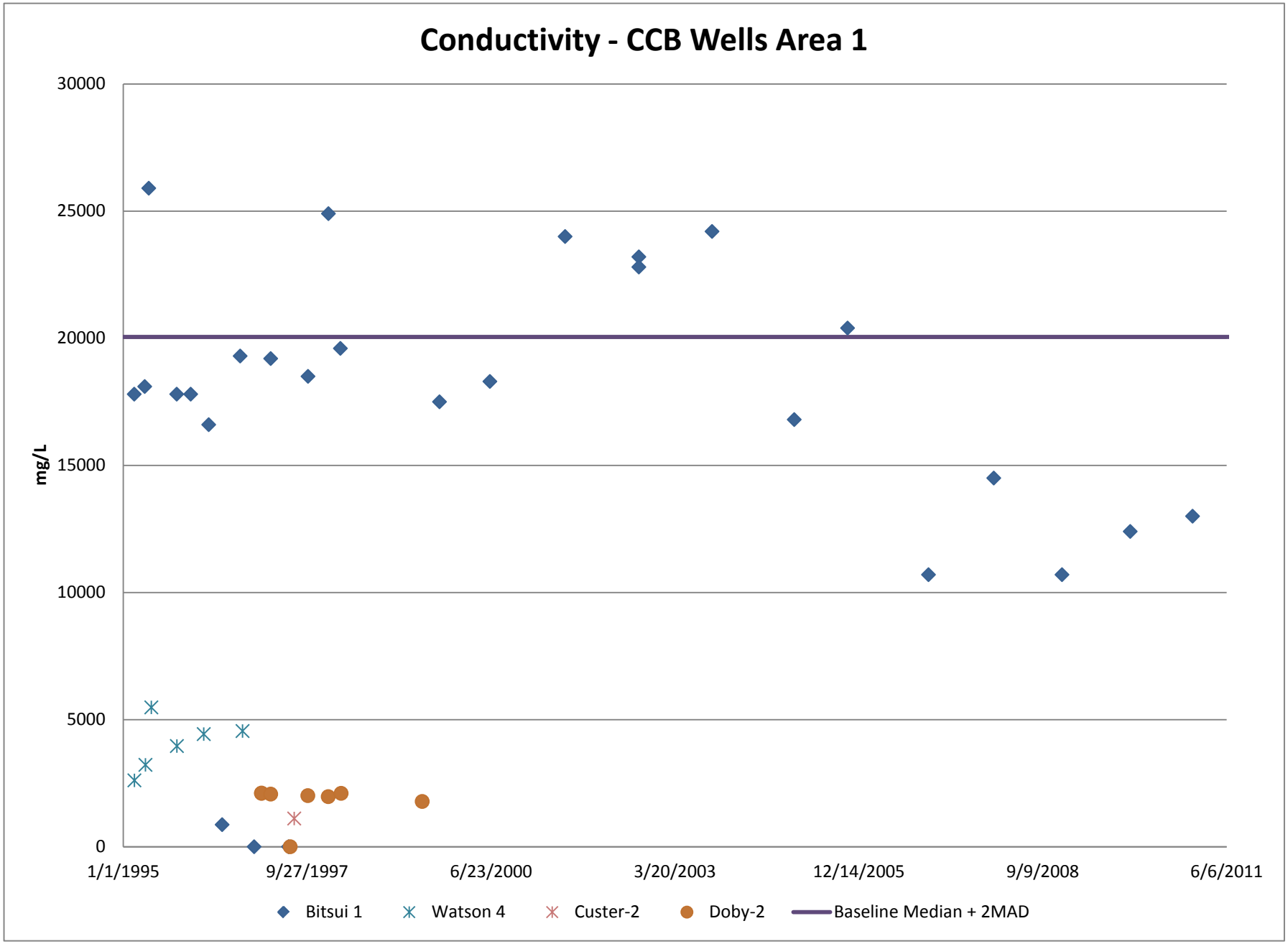

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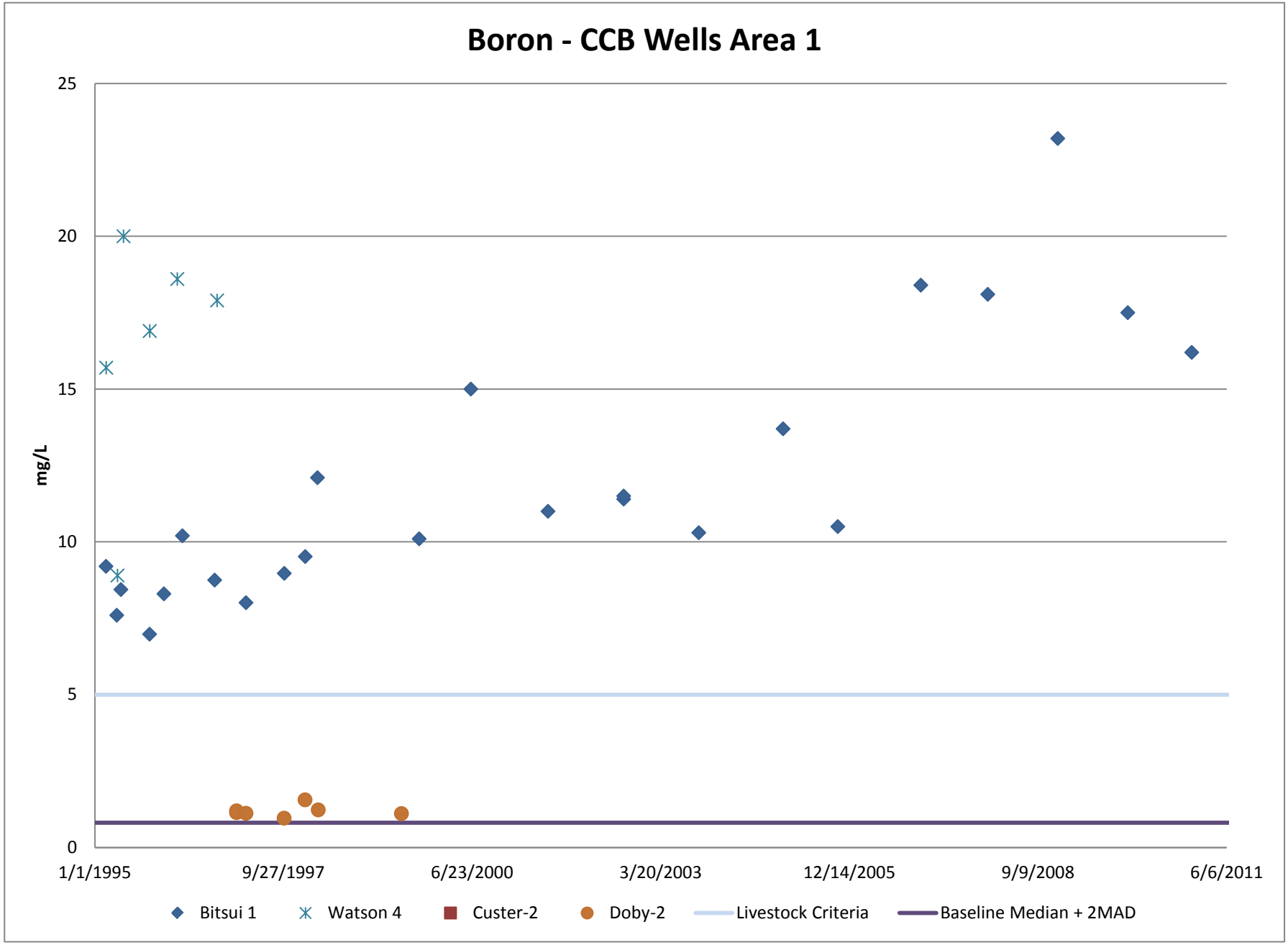

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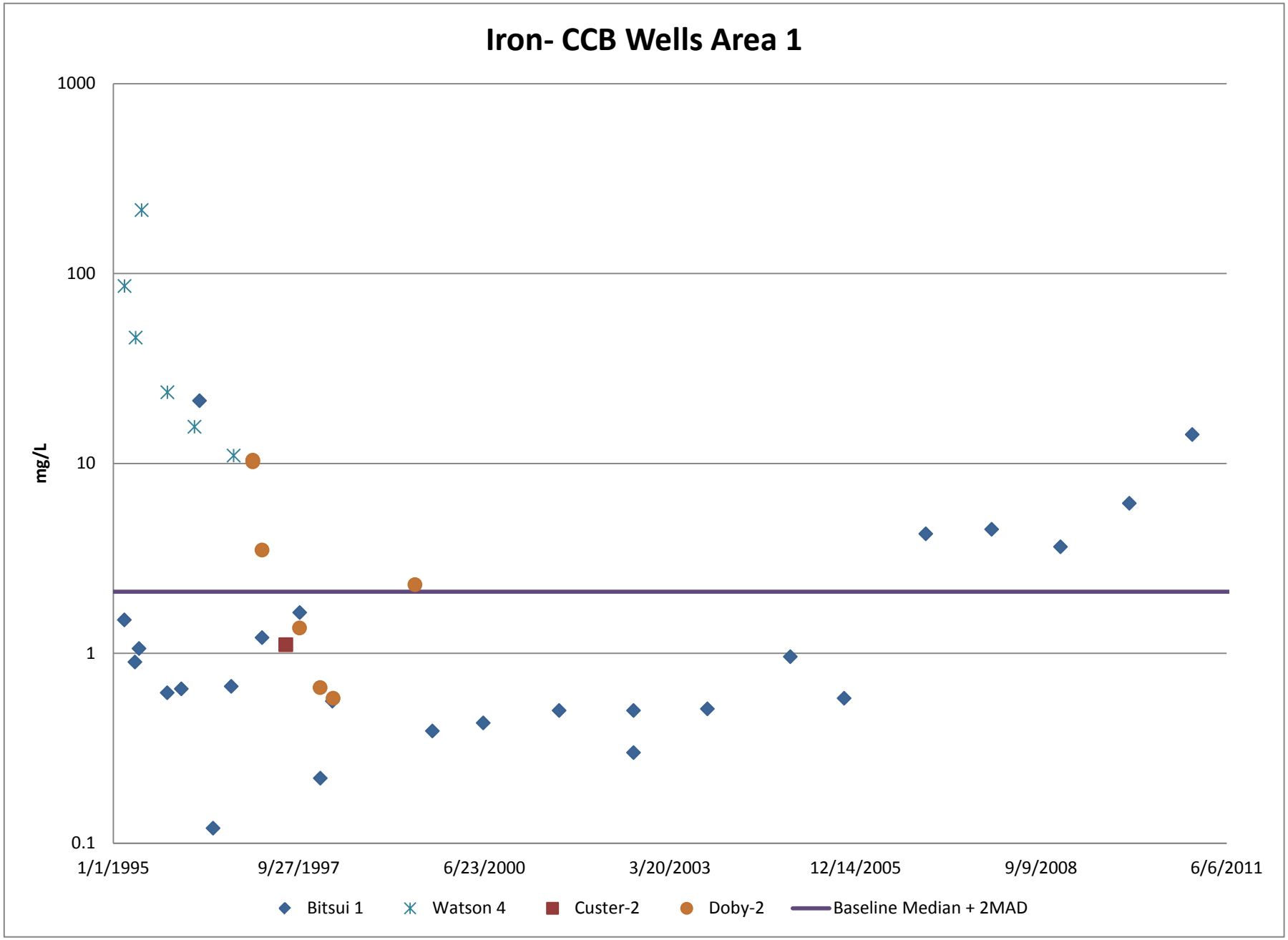

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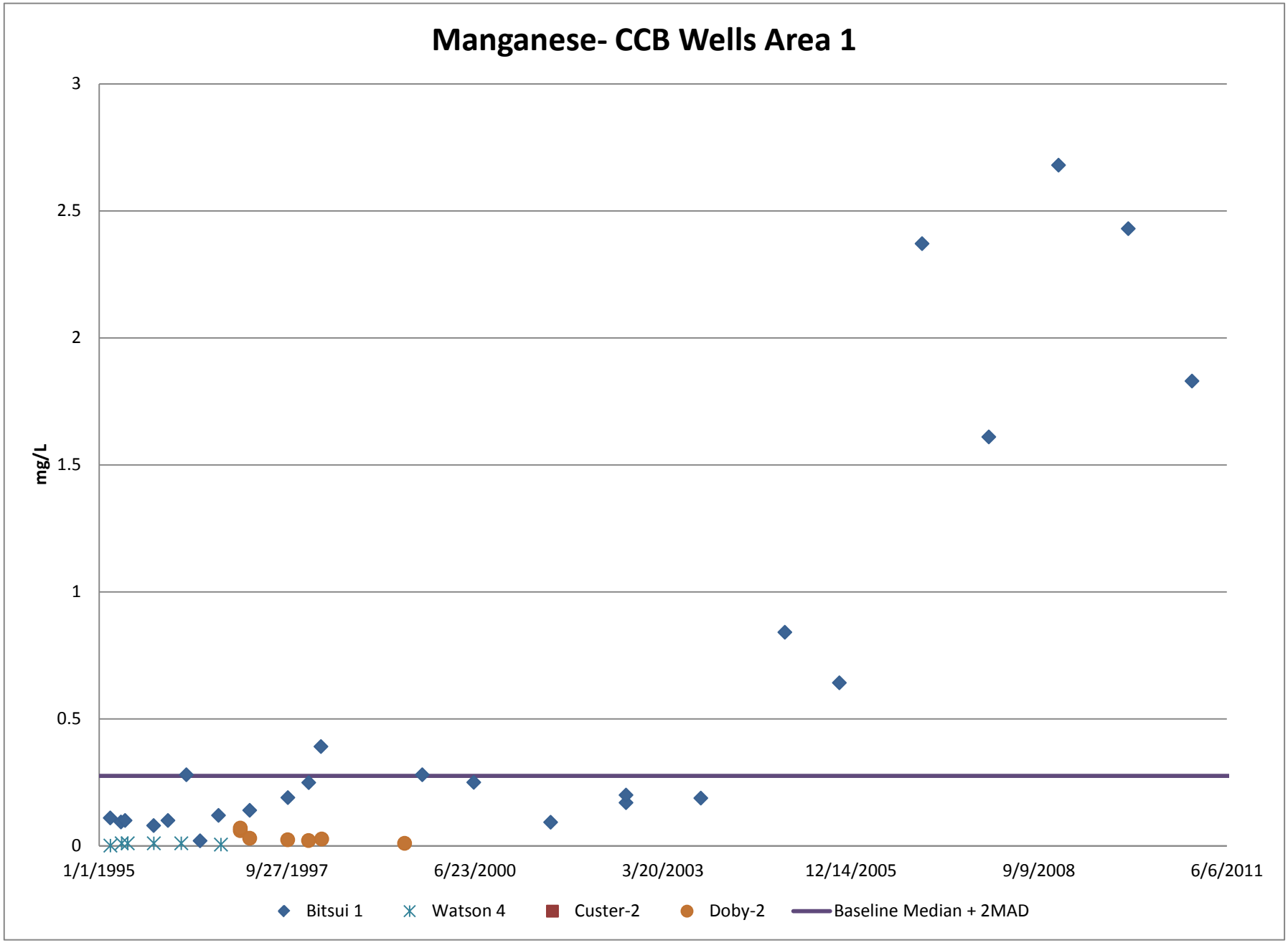

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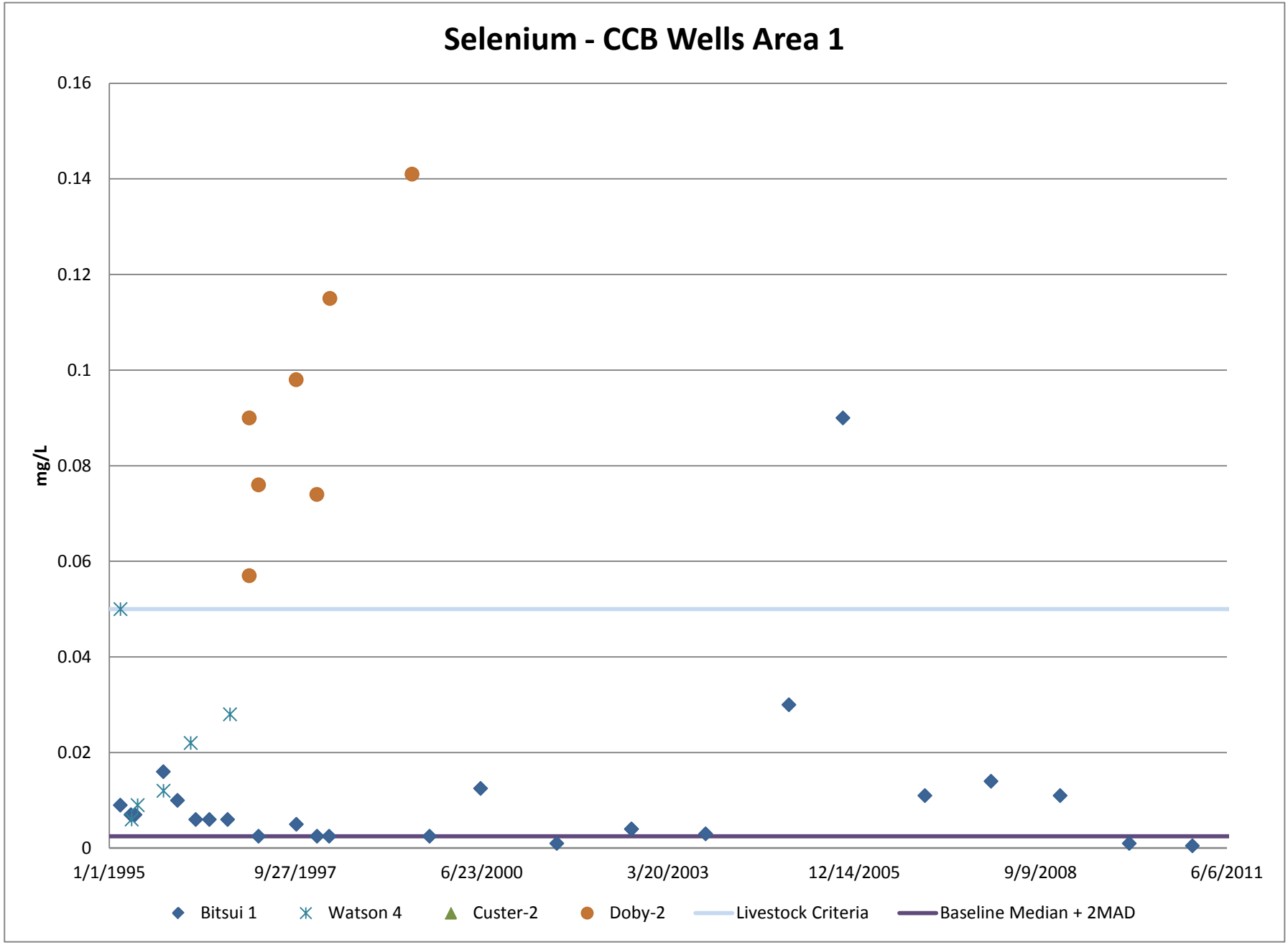

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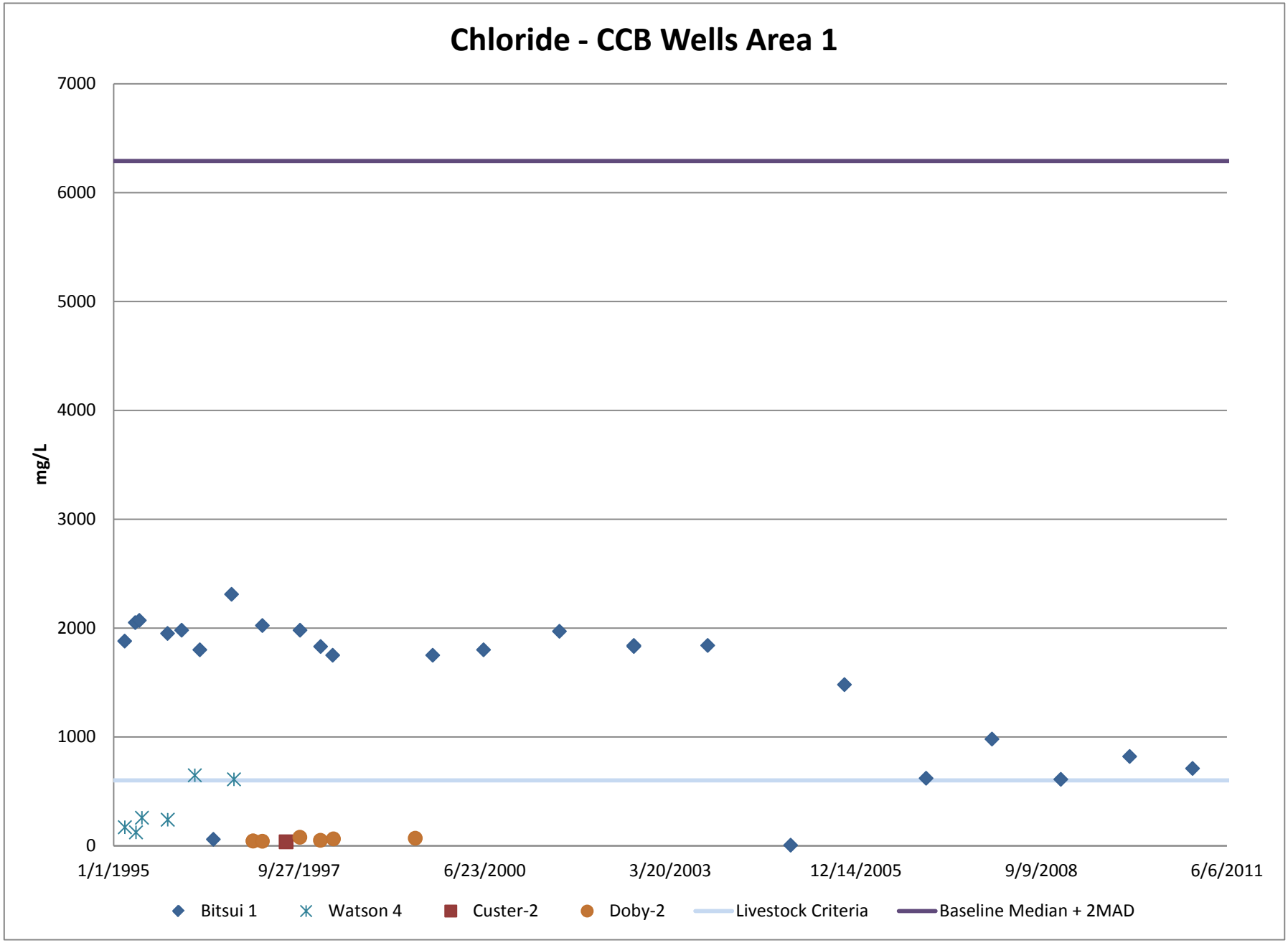

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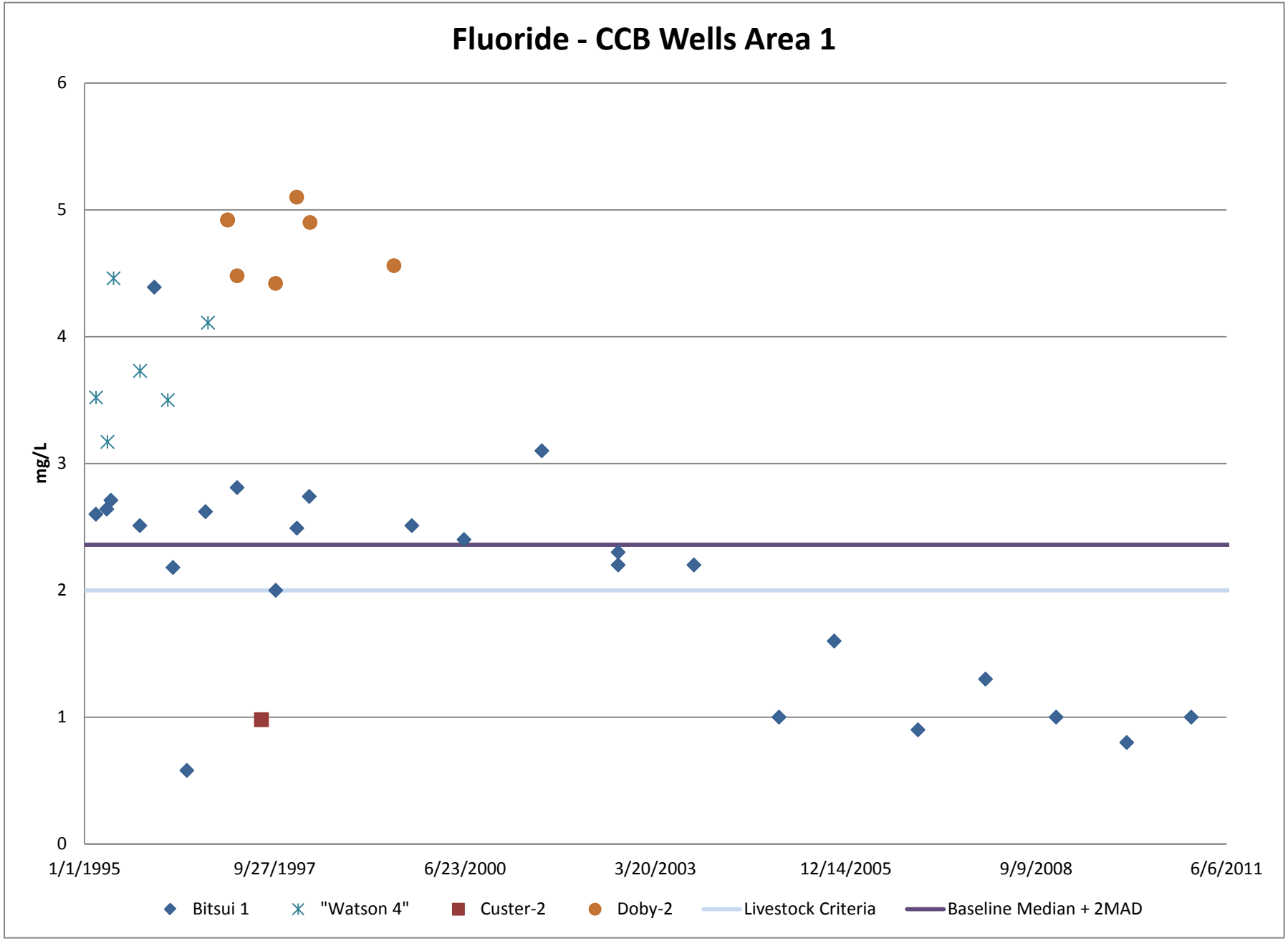

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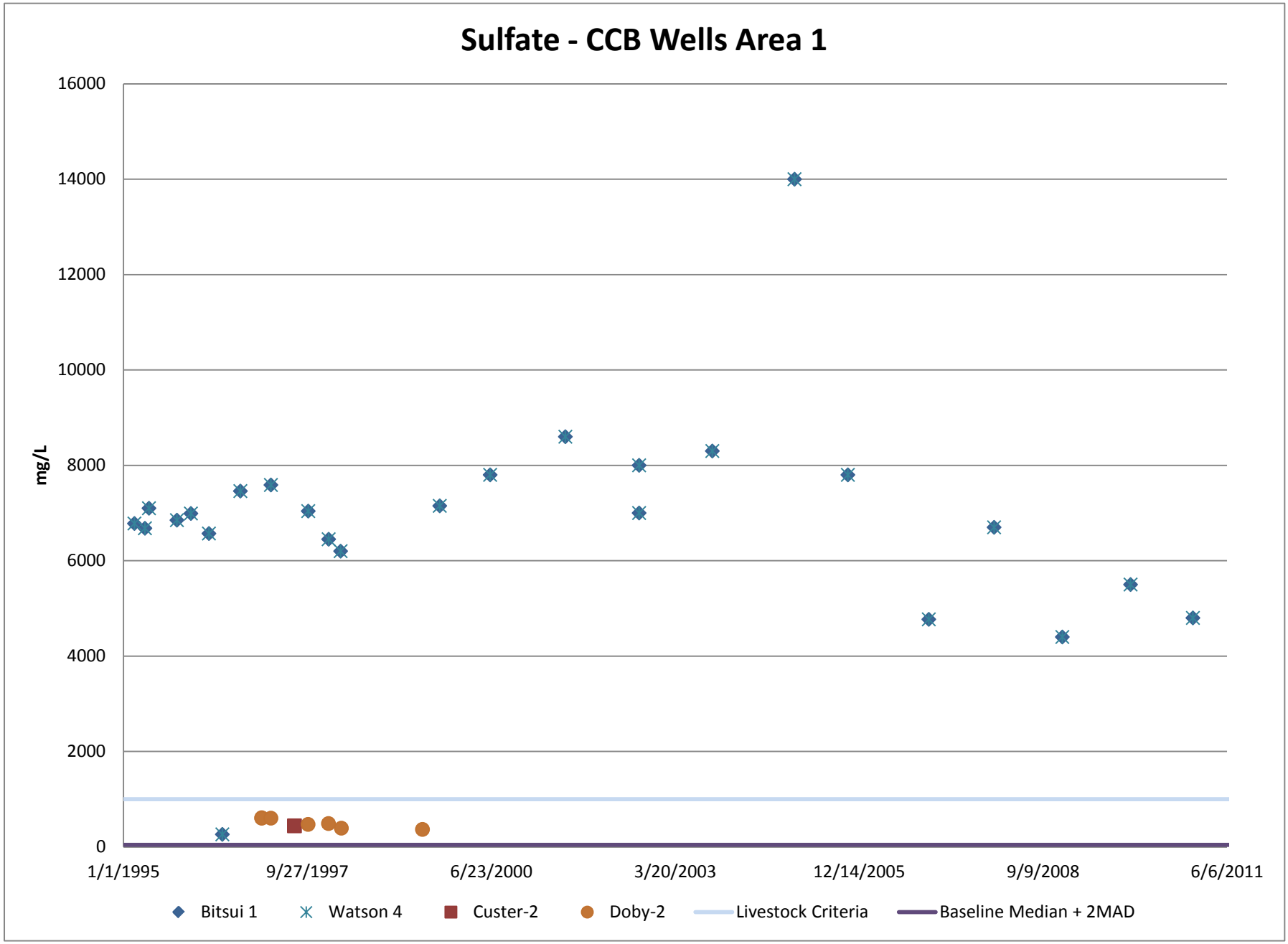

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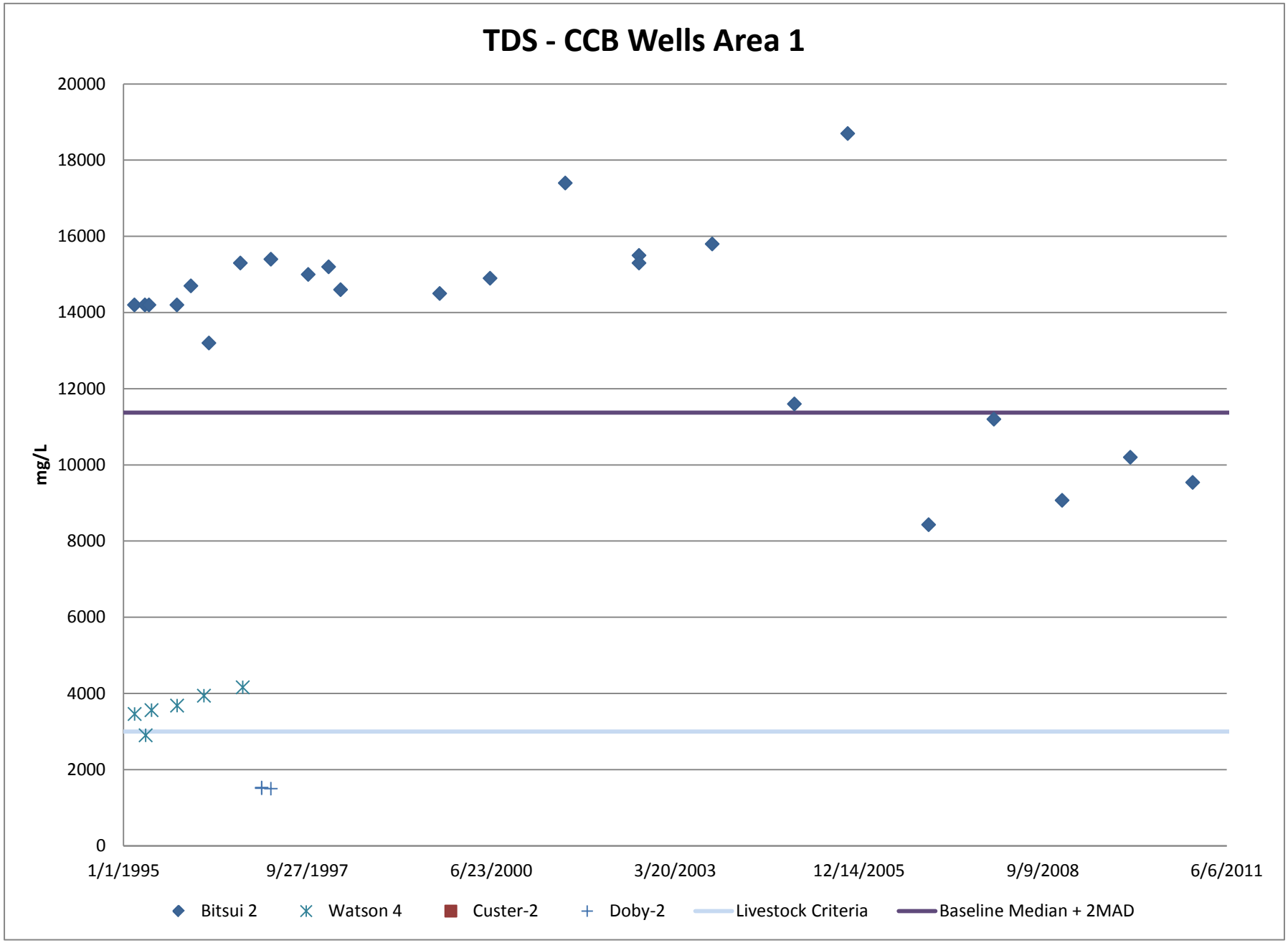
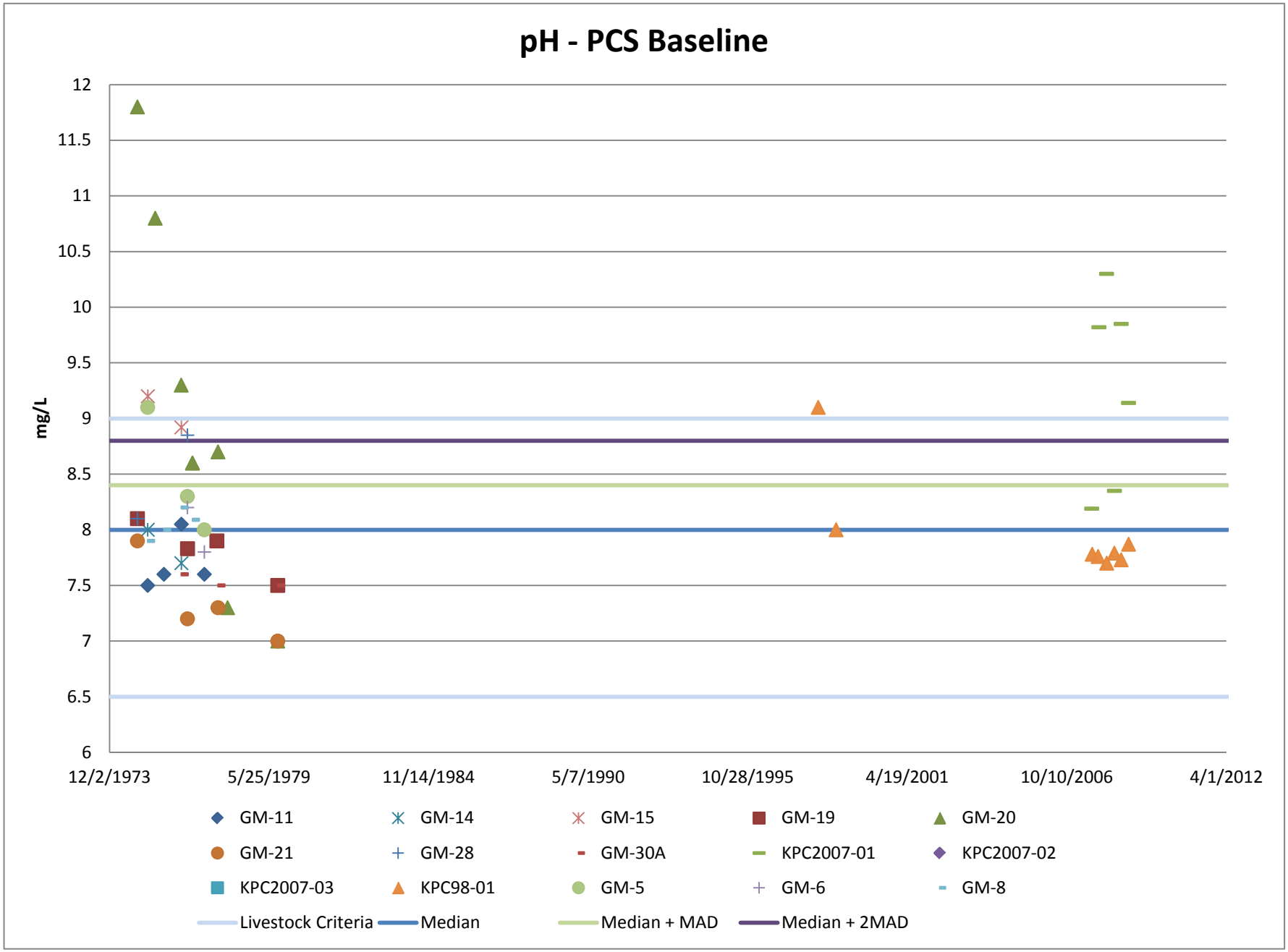


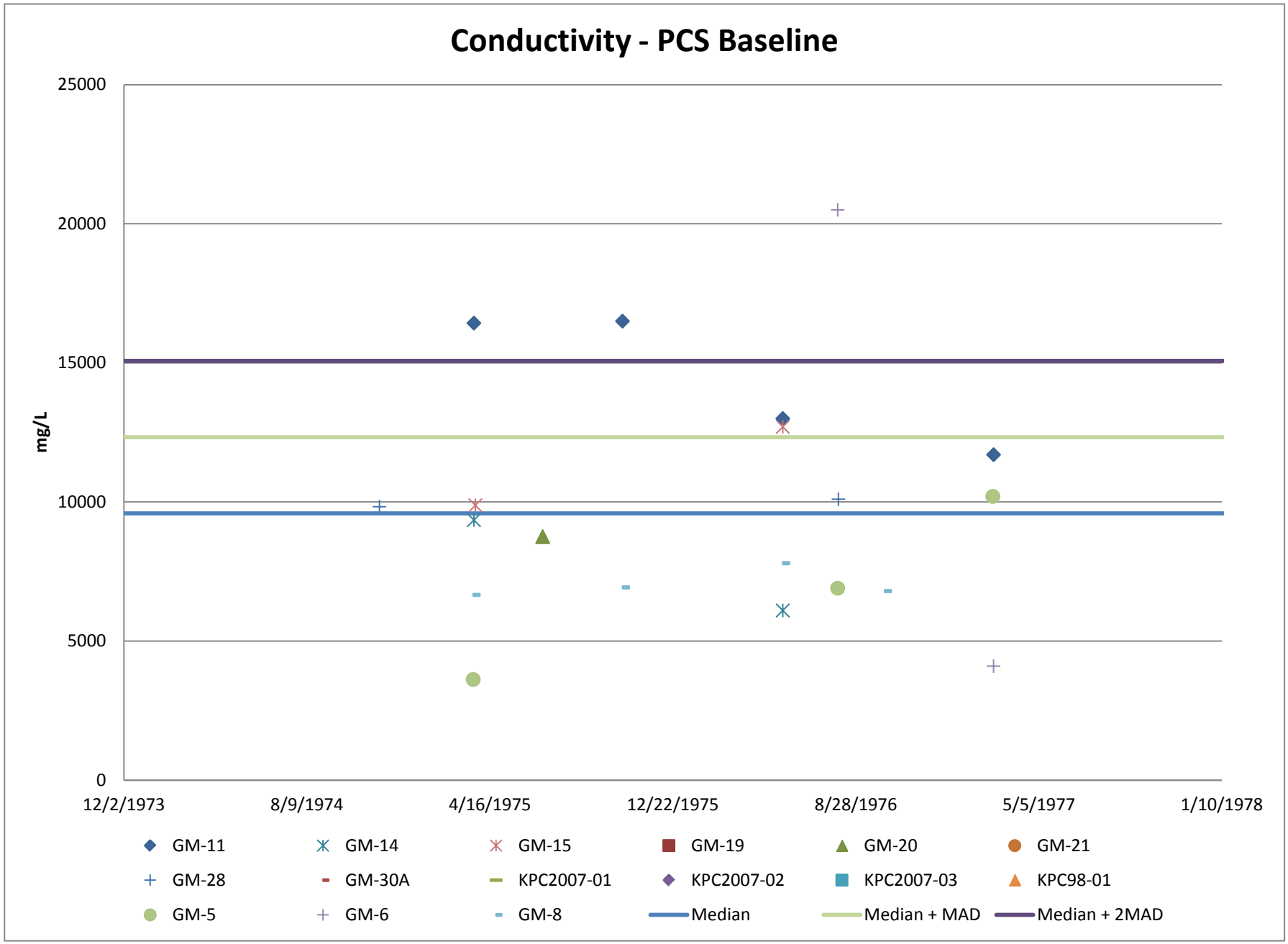
Appendix F - Groundwater Data Summary

Baseline PCS Well Graphs



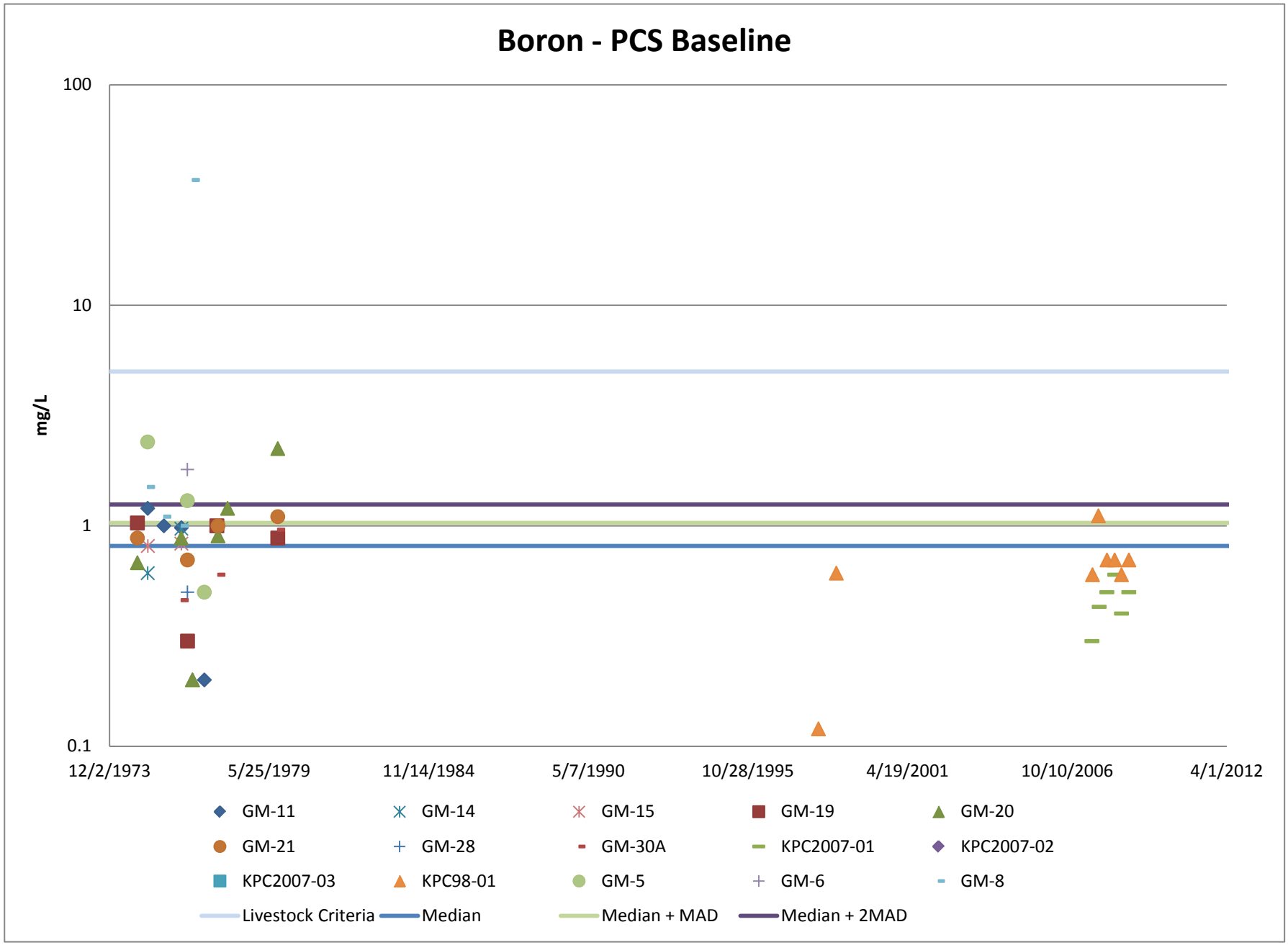
Appendix F - Groundwater Data Summary

Baseline PCS Well Graphs



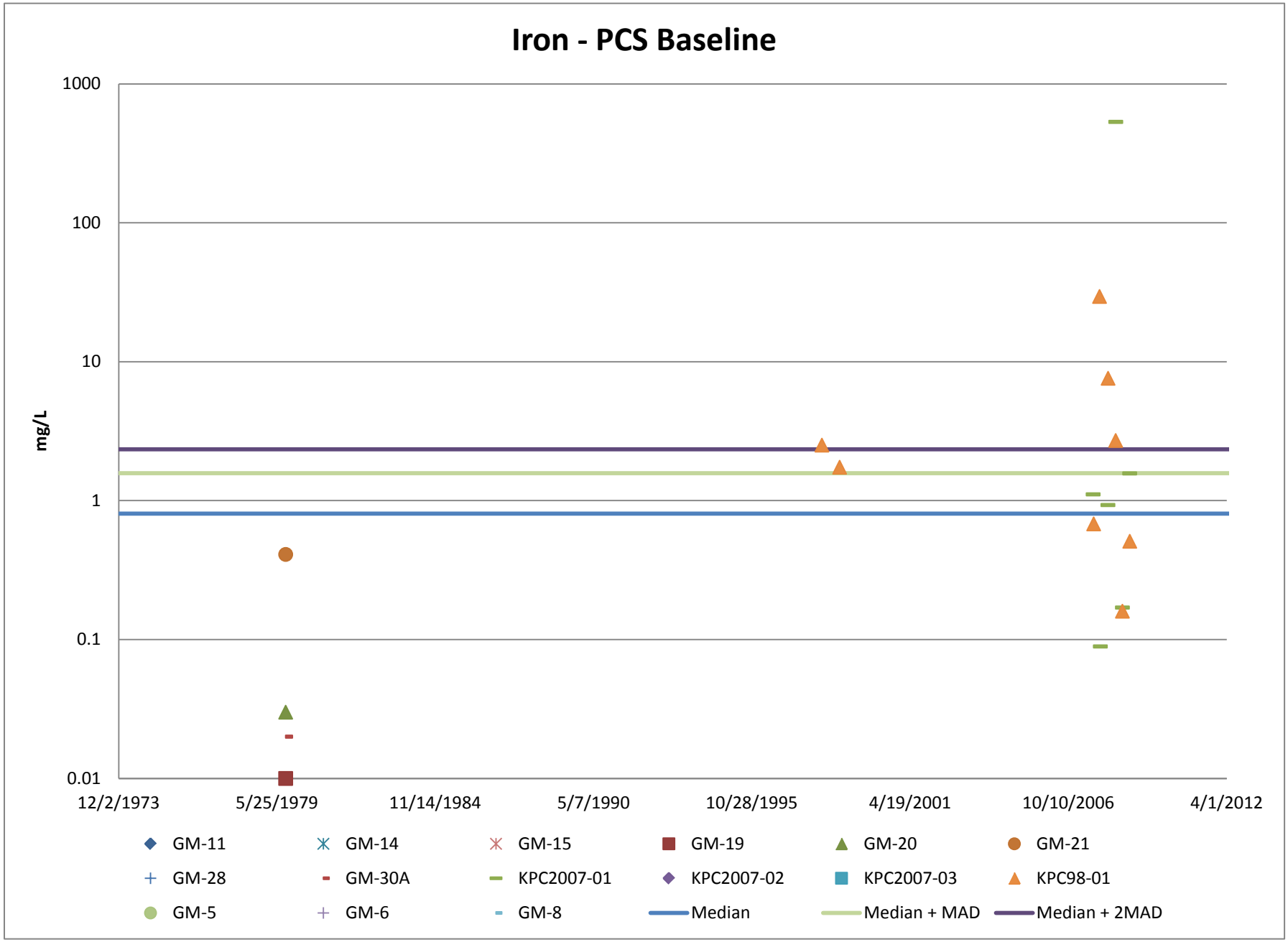
Appendix F - Groundwater Data Summary

Baseline PCS Well Graphs



Appendix F - Groundwater Data Summary

Baseline PCS Well Graphs



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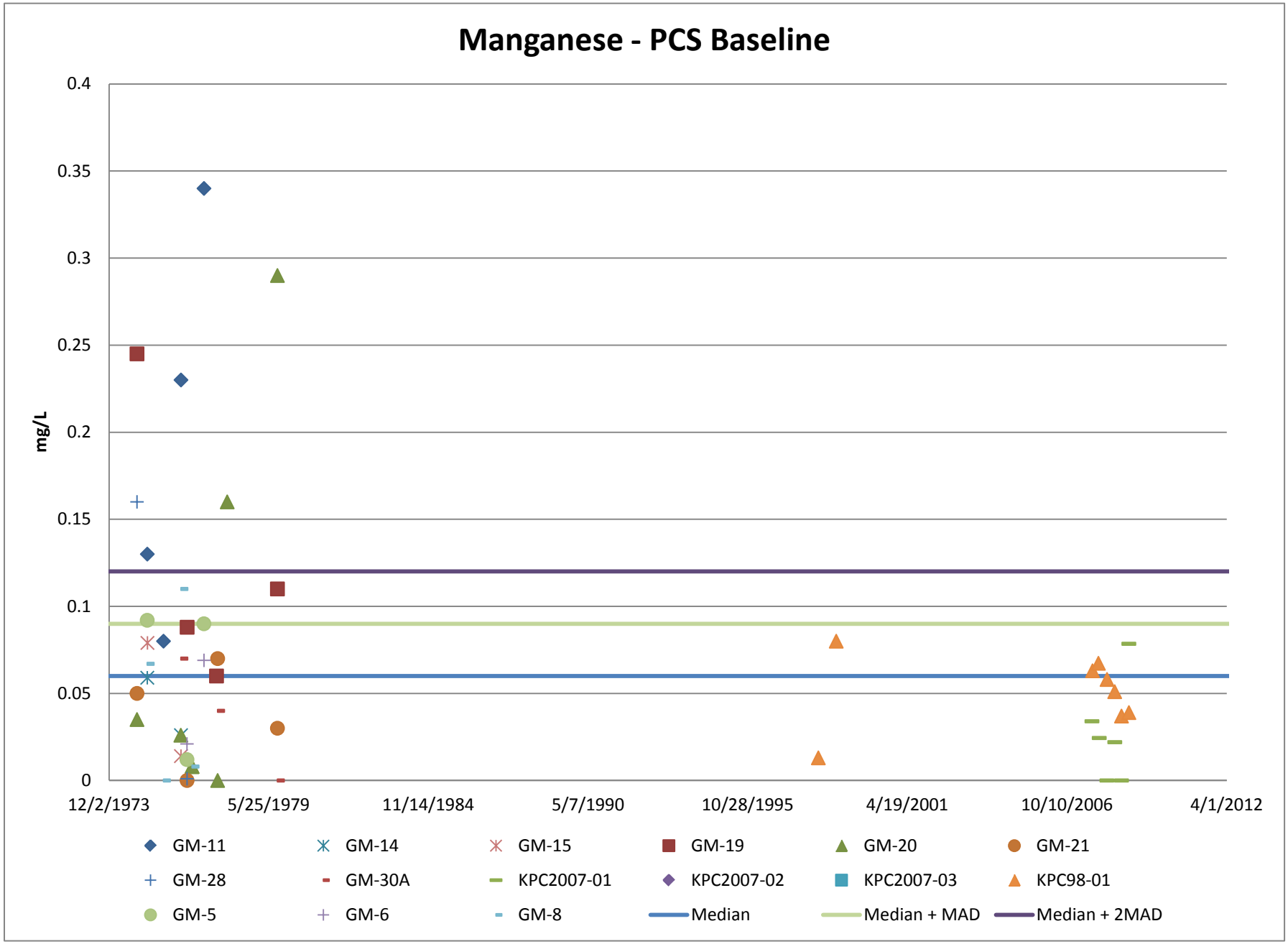

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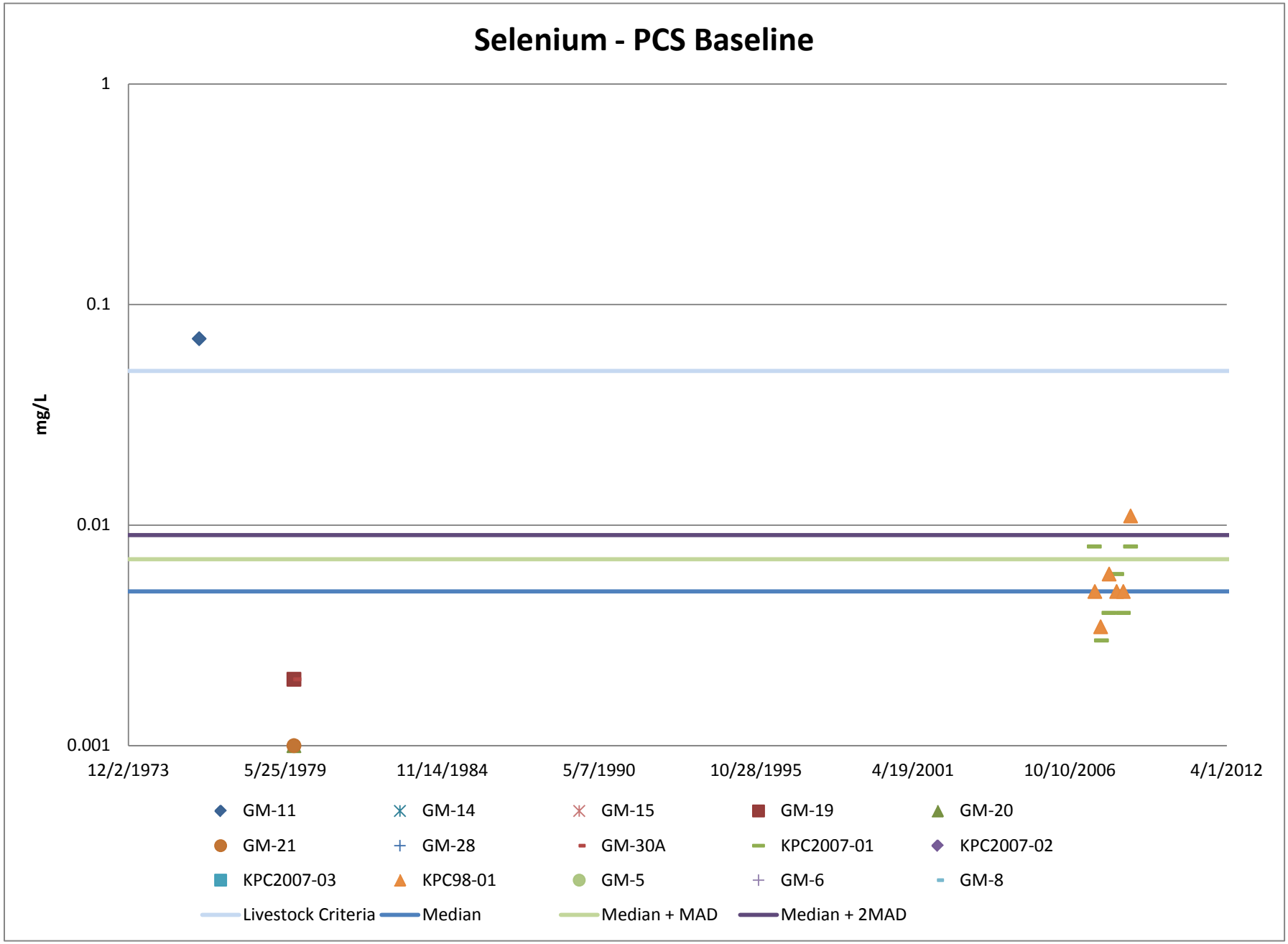
Baseline PCS Well Graphs



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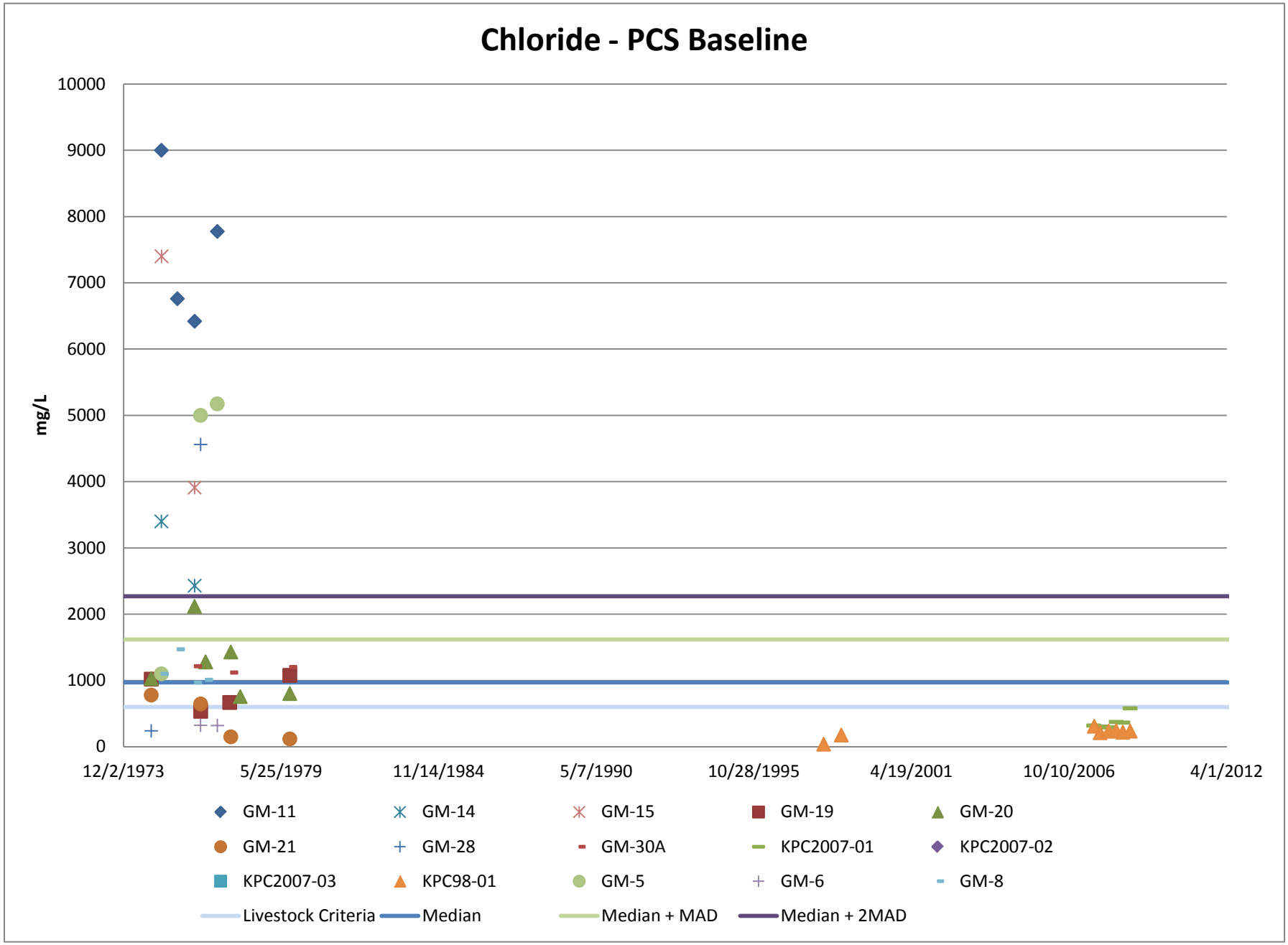

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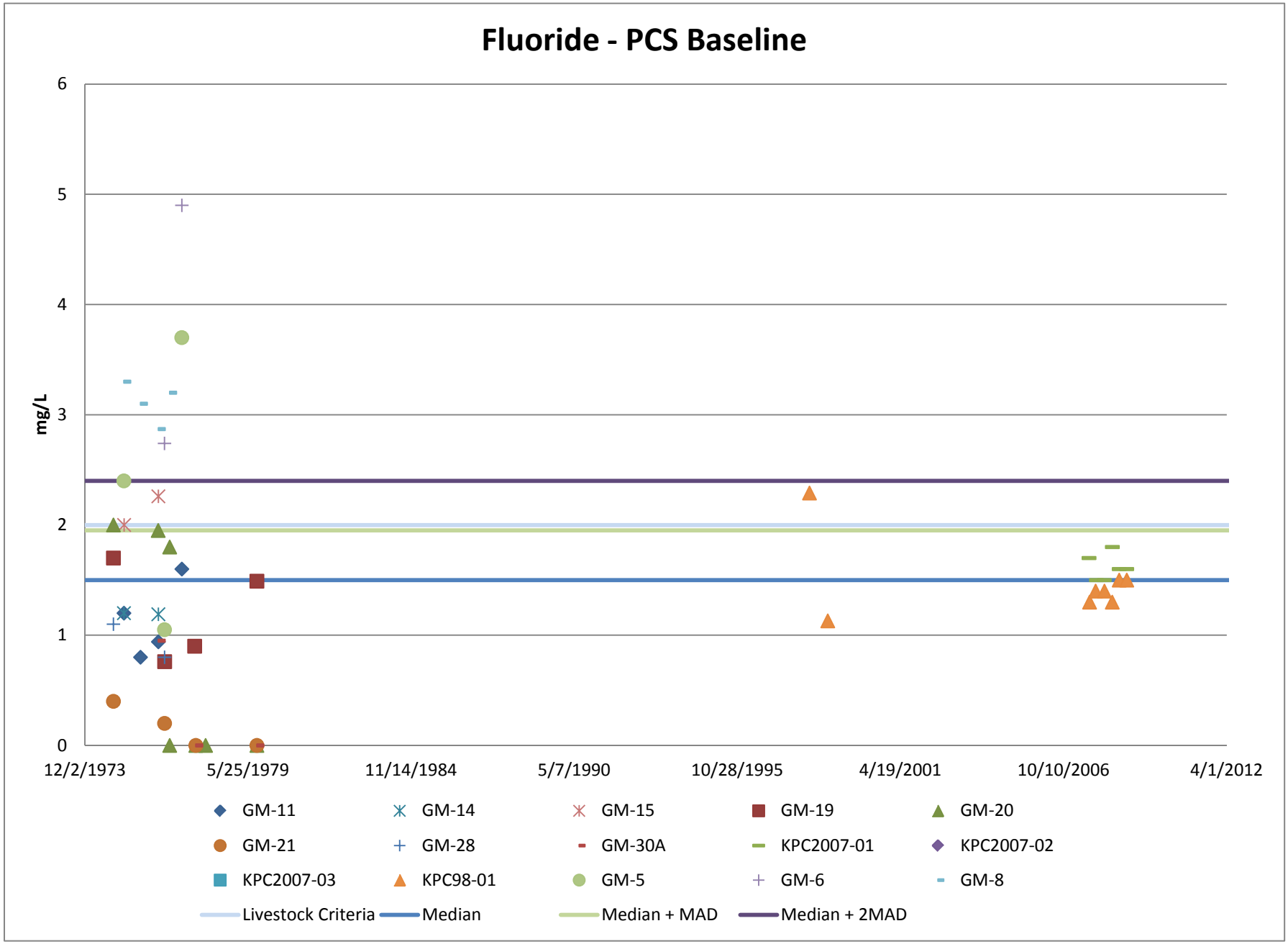
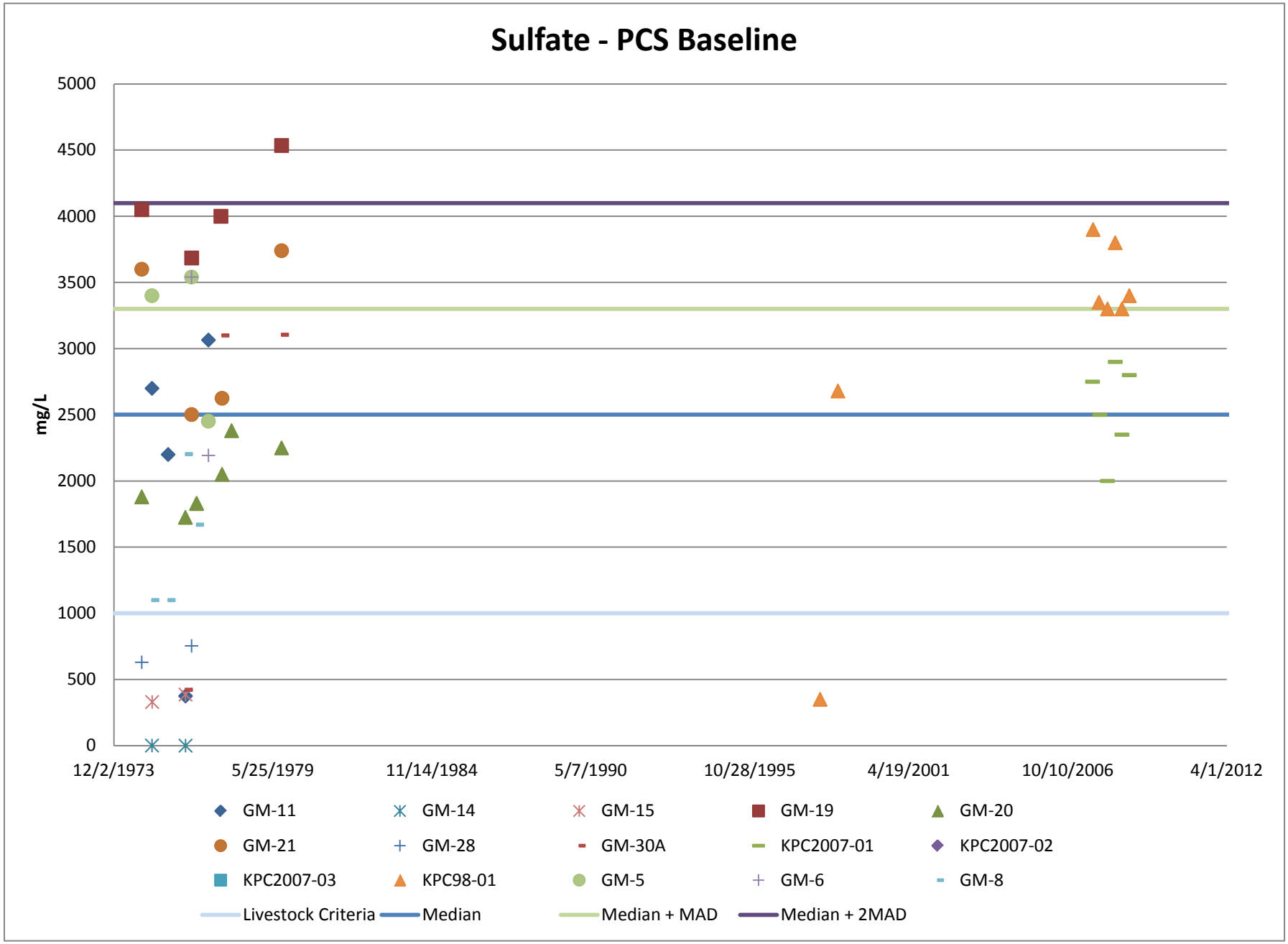


Appendix F - Groundwater Data Summary

Baseline PCS Well Graphs



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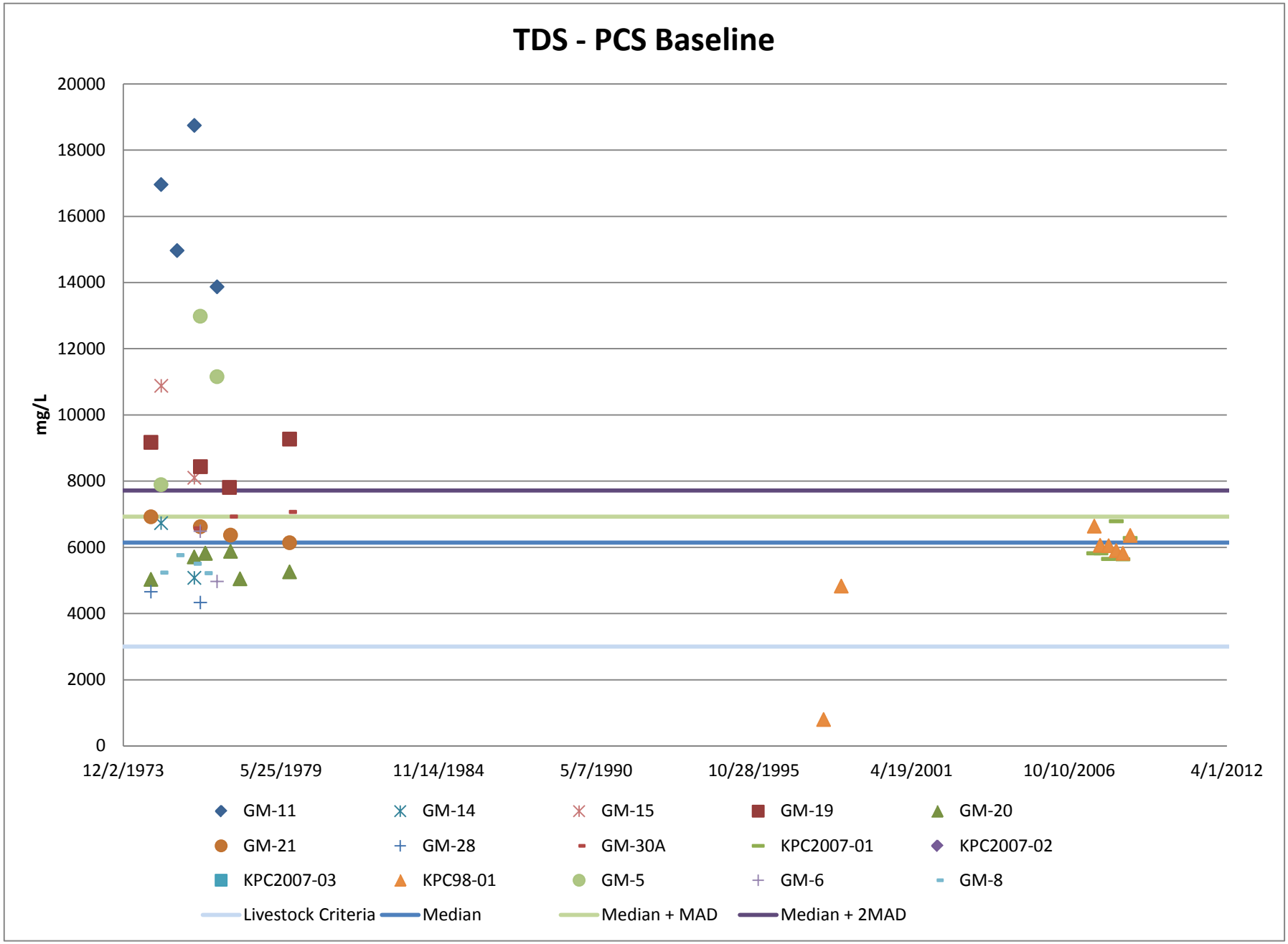

Appendix G:
Coal Combustion Byproduct Assessment

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Background

Under the Navajo Mine's fuel supply contract with Arizona Public Service, the Navajo Mine accepted CCBs from the Four Corners Power Plant units 4 and 5 for disposal in final pits and ramps from 1971 to 2008. CCBs disposed of at Navajo Mine included: fly ash, scrubber sludge, and bottom ash. CCBs from the Four Corners Power Plant were placed in mined-out pits and ramps of the Navajo Mine to help achieve approximate original contours (AOC) (NTEC, 2013).

Fly ash and bottom ash are generated by the combustion of coal at the Four Corners Power Plant. The fly ash is collected in emission control baghouses. Fabric bags in the baghouses act as a filter removing the fly ash from the flue gas stream of units 4 and 5. Ash too large to be carried by the flue gas to the baghouse falls to the bottom of the boiler during the combustion process and is removed as bottom ash. Scrubber sludge is the byproduct of removing SO_2 from the flue gas. The SO_2 reacts with lime to form calcium sulfite and calcium sulfate. The major chemical constituents of CCBs disposed of at the Navajo Mine include: Silicon Dioxide ($Si0_2$), Aluminum Oxide ($Al0_3$) and Calcium Sulfite ($CaS0_3$).

Coal fly ash is made up of 3 different types of materials: un-reactive and stable solids ($Si0_2$, $Al2O_3$, Fe_2O_3, etc.), semi-soluble solids (borates, sulfates, carbonates, etc.), and solids that react with water (CaO, MgO, Na_2O, etc.). The insoluble constituents of fly ash are composed of spherical, glassy mixtures of metal-oxides and sometimes other compounds. The chemistry of the coal determines whether the coal ash is basic or acidic, and this in turn affects leaching properties of the ash once it is in contact with water (Vories 2001). Coal ash typically exhibits a point of zero charge, PZC_{pH}, of around 4.6, and sorption/leaching properties within a given ash are greatly controlled by the pH of the mixture once it is slaked. With regards to alkaline or Class C coal ash, the main constituents of concern in terms of leaching are boron, arsenic, and possibly selenium (Manoharan 2007). Although arsenic is fairly susceptible to attenuation in the subsurface, boron can be quite chemically stable while being transported over large geographic areas.

Disposal History and Techniques

The Navajo Mine and the San Juan Mine formerly used CCBs from adjacent generating stations as a backfill material to achieve AOC. Approximately 4 million tons of ash was placed in mined out pits and ramps at the two mines annually. Disposal of CCBs in this manner at the Navajo Mine was seen as the best long-term solution for CCB disposal in the absence of other beneficial uses for the ash. Placement of ash was governed by a detailed ash disposal plan developed and approved for the Navajo Mine. It described performance standards for the use of ash as mine backfill.

The performance standards required physically characterizing the ash, covering the ash with spoil, not burying ash beneath large drainages, and performing reclamation on the affected areas. The precautionary measures were designed to prevent the ash from being exposed on the ground and to prevent plant roots and surface water from directly coming into contact with the buried ash. Due to the arid environment of Northwest New Mexico and the absence of any significant groundwater, ash placement was in dry pits and ramps.

The AOC surrounding all ash disposal areas was designed to have positive drainage away from the ash and avoid any puddling, sheet flow, or other collection of water above or adjacent to disposal areas. This design specification has kept most of the permanent program and interim ash disposal areas unsaturated, which can be verified from the monitoring well data. In addition to this, all post-mining drainages that intersected an ash disposal area were modified to flow across the ash disposal area at approximately right angles to the long axis of the disposal site to minimize potential infiltration of surface waters into the ash. This design specification limits the amount of contact time that running water has with the ash-reclaimed areas.

Navajo Mine monitors a suite of wells in a historic, Pre-Law CCB disposal area (Bitsui and Watson Pits) that has become water-saturated due to NAPI activity adjacent to the area. It is important to note that disposal of CCB in this area occurred not only prior to SMCRA but prior to NAPI activities. A map displaying the outline of the Bitsui ash disposal area and relevant wells is seen in Figure 1. The influence of NAPI activity in the area has raised groundwater tables and increased surface water movement contributing to the saturation level of the buried CCBs.

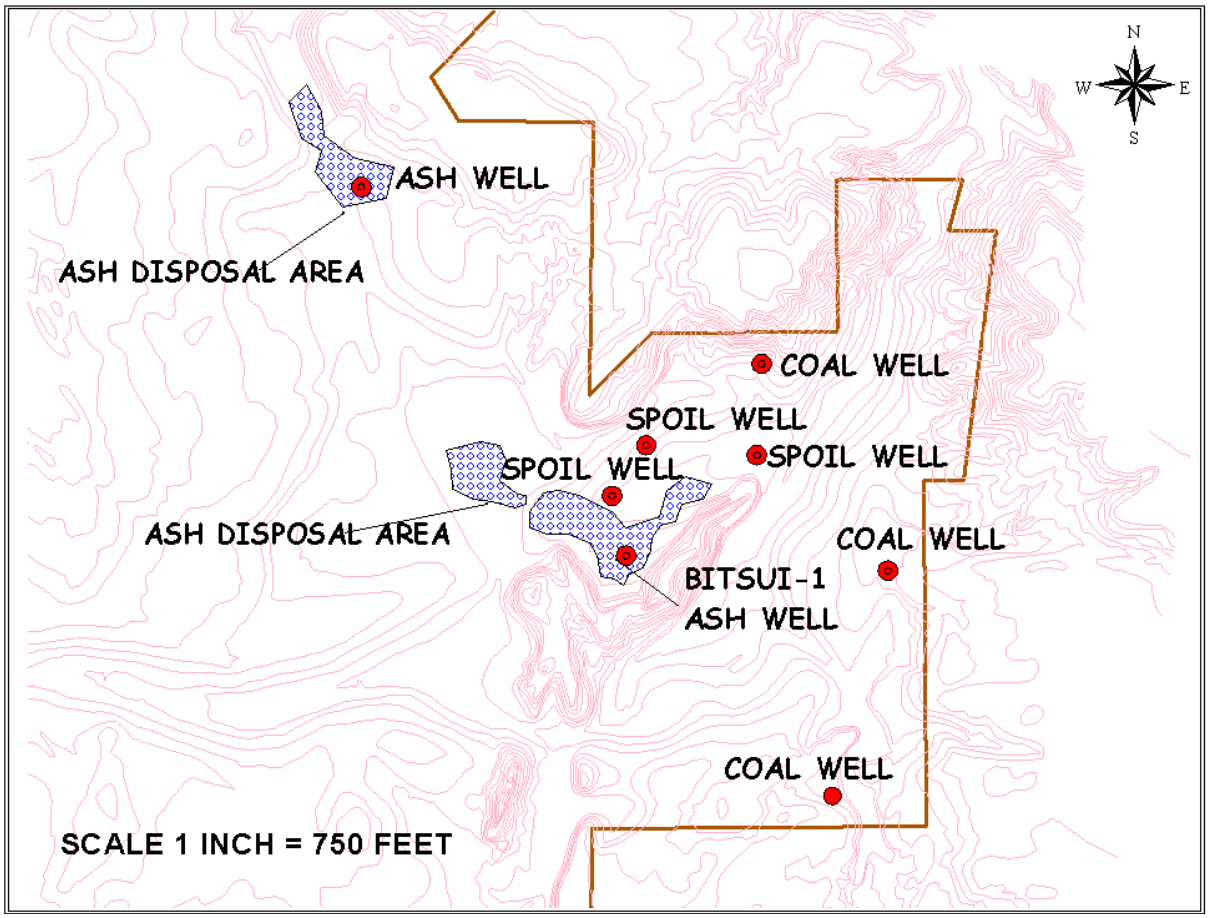

Figure 1: Bitsui Ash Disposal Area Delineation and Monitoring Wells

Ash was covered by a minimum of 10 feet of spoil material, plus any required topdressing and the required topsoil thickness. The spoil material has a low hydraulic conductivity of 10^{-6} cm/sec (four samples ranged from 1.66 x 10^{-6} to 5.4 x 10^{-6} cm/sec), which has helped to minimize vertical infiltration of surface water. During the process of reclamation, active ash disposal areas were regularly overlain with spoil material to cover the surface and minimize fugitive dust as the ash was backfilled into the pits (NTEC, 2013).

The geological conditions surrounding the Navajo Mine pits where the ash was disposed create favorable condition for ash disposal in pits. After mining was completed in the ash disposal areas, the pit floor was directly on top of a low-conductivity (10^{-7}cm/sec, comparable to many commercial grade liners) shale/mudstone stratigraphic unit which is part of the lower shale members of the Fruitland Formation. This layer restricts vertical transport of CCB leachate-laden water into the underlying PCS unit. The surrounding spoil disposed in the pits along with the CCBs is a mixture of sandstones, mudstones, coal processing waste, and shale.

Hydrologic Effects

Pre-mine water level data from the coal seams record that the seams were dry (unsaturated) in the majority of the coal lease, particularly Barber, Pinto, and Doby pits, except for a few localized areas in Area III (Lowe/Dixon pits). Hydraulic conductivity within the coal seams in the Navajo Mine, determined from aquifer tests reaches a maximum of 2.68 X 10^{-5} cm/sec in some places (NTEC, 2013). It could potentially take quite a long time for ash disposal areas to become saturated in some places because of the slow groundwater velocities in the lease area and because of the small effective porosity of the coal seams through which transport occurs.

Regular irrigation of NAPI agricultural fields immediately east of the Bitsui mine pit area contribute to development of saturated conditions in portions of backfilled and reclaimed Bitsui pits. Shallow groundwater has accumulated in aeolian sand units south and east of the Bitsui area and is perched on top of the low permeability shale and mudstone units of the Fruitland Formation. The saturation measured in the reclaimed area results in part from excess irrigation water migrating down gradient from the agricultural fields and toward the backfilled pit and also from the gradient created by Morgan Lake (0.01 ft/ft). Regional shallow groundwater gradients (Keller-Bliesner 1997) in the sand unit indicate that the groundwater contained in the aeolian sand will discharge to Bitsui Wash.

The Bitsui area was mined during 1964-1965 and backfilled in the mid-1970s. Some of the backfill in this area consisted of ash from the Four Corners Generating Station. NAPI activity began in the late 1970s. The Navajo Mine monitoring program has been recording groundwater levels and quality in the Bitsui area since 1995. A total of seven monitoring wells were placed in both spoil and ash disposal areas, and in the No. 8 coal seam within the immediate Bitsui area as seen in Figure 1. Additionally, water level and chemistry data was collected from the No. 8 coal seam well KF84-16 that is 1,400 feet to the east of the Bitsui area. Monitoring of static water level in the No. 8 seam coal in the Bitsui area began in 1985 in wells KF83-1 and KF84-16. Over an 11-year period from 1985 to 1996, water levels in the No. 8 coal seam rose 11 feet in well KF83-1 to the southeast and 6 feet in well KF84-16, further to the east. Water levels in both wells appear to have reached an equilibrium stage with relatively little change since 1996. Monitoring of these two particular wells has since ceased.

No. 8 coal seam wells Bitsui-2 and Bitsui-3 are located in the former highwall adjacent to the mined out area and have been monitored since 1995. Water levels from these two wells record a pattern of initial recharge followed by a period of steady state that is similar to wells KF-84-16 and KF83-1. The cumulative effect of the return flows from irrigation has produced perennial surface water flows in Bitsui Wash and a large perennial pond upslope of the mined out area. These perennial sources of water located at a higher elevation than the former Bitsui pit would have sufficient volume of flow, given enough time, to migrate down slope and saturate the Bitsui mined out area. The likely sequence is that soon after NAPI began irrigating, return flows began accumulating in the mined out areas until a steady state condition developed. Due to the low groundwater velocities in the area and the large distance (about two miles) from Morgan Lake, it probably has contributed significantly less to the affected saturation levels in the Bitsui pit.

Leachate Studies

The CCBs from the Four Corners Power Plant were analyzed along with coal spoil from the Navajo Mine to determine chemical constituents. Column leaching tests were performed on the CCBs to measure how much a number of key constituents were susceptible to leaching. Chromium, boron, molybdenum, potassium, magnesium, calcium, and sodium were determined to be key species for evaluation (Lamkin 1981). These elements were selected because they were found to approach or exceed the drinking water standards in the RCRA leachates or because they were seen as being representative of the behavior of the

major species. The specific method used in this study was the Extraction Procedure (EP) method, which was congruent with RCRA requirements at the time the study was published. Furthermore, the attenuation capacity of the overburden was examined to ascertain the amounts of leachate that could be effectively removed by being filtered through it. The results from this study and a chemical analysis of the spoil and CCBs are presented in Table 1 and Table 2.

Table 1: Leachate Analysis of CCBs (Lamkin 1981)

Chemical of Concern	Total Solid Phase Concentration in CCBs (mg/kg)	Leachable Concentration from CCBs (mg/kg)	Attenuation Capacity of Overburden (mg/kg)
Potassium	6000	34	10
Magnesium	2500	1	0
Calcium	24000	1570	1260
Sodium	16000	270	0
Chromium	30	0.22	0.49
Molybdenum		2.6	0
Boron	220	52	0

In the mid 1980s, an additional study was conducted on the Navajo Mine to determine whether leaching of spoil material and CCBs could potentially have any effects on the environment. Mixtures of spoil and CCBs were leached in the batch leaching process with natural waters from the site. The batch leaching procedures accelerated the leaching process and determined in a shorter time period what the long-term contact between native groundwater, CCBs, and spoil would produce in terms of water chemistry. The data collected from this study was evaluated to determine the net geochemical impact expected as a result of the CCB disposal at the mine site. Additionally, the attenuation properties of various solid materials was evaluated. This study was a follow up to the initial one that characterized the ash composition.

Concentrations in the surface water leachate for boron and selenium increased when leached through fly ash (NTEC, 2013). However, the levels of boron declined slightly when leached through a mixture of ash and spoil, and the increased selenium concentrations were similar to the selenium concentrations in leachate produced by spoil alone. The iron concentration in both surface and groundwater decreased following leaching through spoil, CCBs, or a mixture of the two.

Overall, the conclusions from the study were that the leachate nearly always had higher TDS than the initial groundwater. One exception to this was in the case of leachate produced from a particular mixture of ash and spoil that had lower TDS and lower trace metal concentrations than natural groundwater from coal seams #4-6, though this instance isn't representative of prevalent conditions in the reclaimed areas. Many different attenuation processes such as high cation exchange capacity (CEC) of the spoil, formation of polymeric iron hydroxide complexes, and sorption to CCBs and spoil were suggested.

Table 2: Concentration of Chemical Constituents in CCBs and Spoil (Lamkin 1981)

Element	Concentration (mg/kg)	
	CCBs	**Spoil**
Aluminum	120000	7400
Arsenic	32	6
Barium	700	42
Beryllium	<0.1	
Boron	220	8
Cadmium	<1.6	0.9
Calcium	24000	17000
Chromium	30	3
Cobalt	21	7
Copper	61	6
Iron	23000	13000
Lead	55	32
Magnesium	2500	3100
Manganese	160	200
Mercury	0.033	0.2
Molybdenum	<0.40	<6
Nickel	<0.60	9
Potassium	6000	1400
Selenium	4	<2
Silicon	260000	
Silver	<0.40	<0.2
Sodium	1.60%	2700
Strontium	320	
Titanium	5100	
Uranium	<6.0	
Vanadium	97	
Zinc	150	63

Potential Offsite Migration

Based on the potentiometric surface for the No. 8 coal, the discharge locations for the re-saturated mine spoil within Area I are projected to be: the subcrop of the No. 8 coal and the Fruitland Formation beneath the alluvium of San Juan River Valley to the northeast of Area I and down-dip in the No. 8 coal Seam toward the drawdown influences of nearby coal bed methane wells (NTEC, 2013).

The subcrop of the No. 8 coal seam beneath the alluvium in the San Juan River Valley occurs at elevations below the water levels in the coal seam to the south. The approximate location for the coal subcrop is depicted in Figure 2. The extent of the San Juan River alluvium along the Fruitland Formation subcrop is also mapped out in this figure. This subcrop location along the alluvium of the San Juan River

is thought to be the primary discharge location for groundwater in the No. 8 coal seam and in the undifferentiated Fruitland Formation.

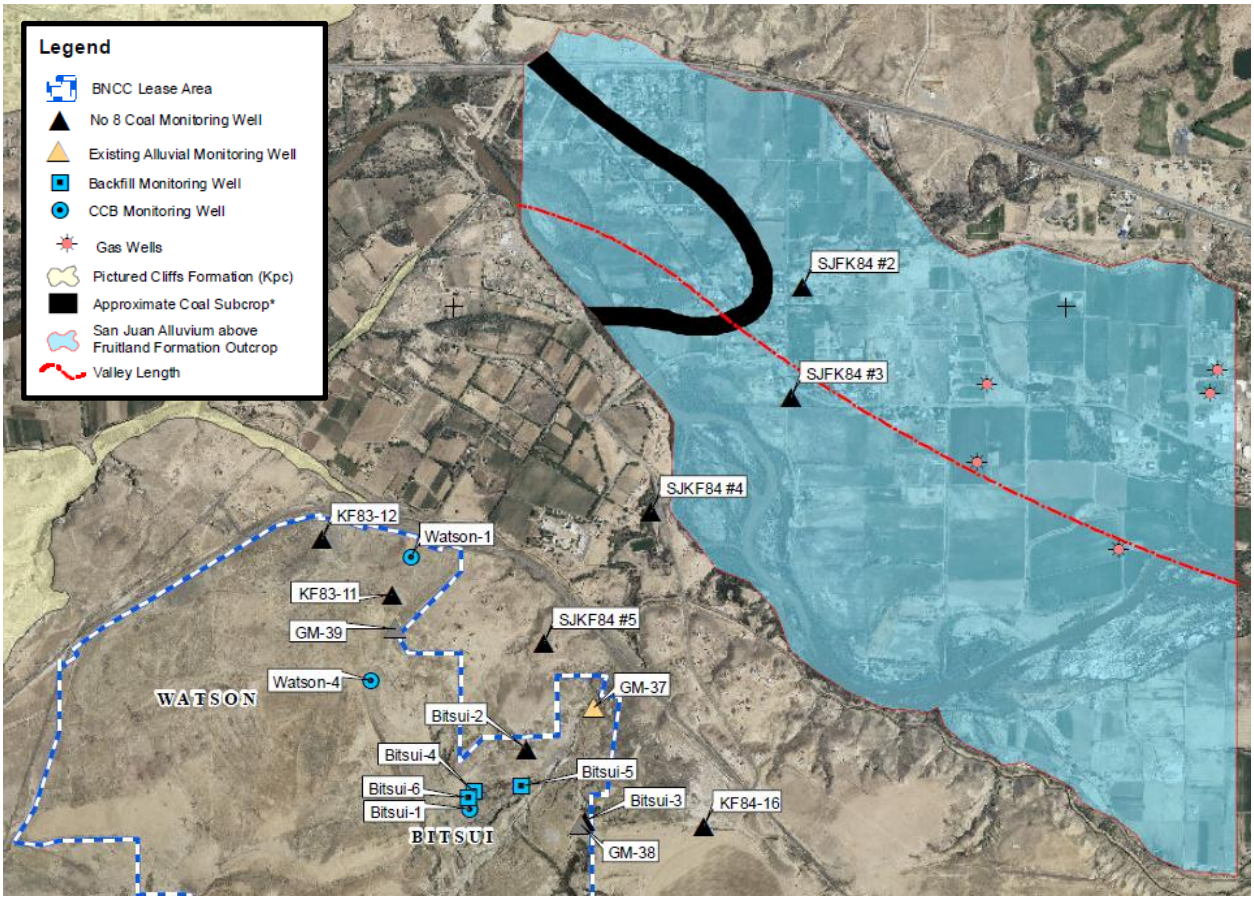

Figure 2: Fruitland coal subcrop and San Juan Alluvium

A hydraulic conductivity of 0.08 feet per day from this table is considered a reasonably conservative estimate for the No. 8 coal based on the test results for wells SJKF84 #3, SJKF84 #4 and SJKF84 #5 located in the coal down gradient of the Bitsui Pit. The porosity of coal seams is primarily associated with cleating and small scale fracturing of the coal. Porosity estimates ranging from 0.02 to 0.007 were obtained for the Fruitland Formation coals from tests conducted for the Western Cretaceous Coal Seam Project (Mavor 1992). An estimate of coal porosity of 0.01 was used for modeling. This estimate also appears to match the rate of transport from the Bitsui Pit to well Bitsui-2 and has been used in the model calibration and simulations.

An elevation difference of 63 feet is calculated for the water elevation of 5,164 feet measured in the Bitsui Pit and the water elevation of 5,101 feet estimated in the alluvium at the coal subcrop. The horizontal distance between the Bitsui Pit and the coal subcrop is approximately 7,300 feet resulting in an average hydraulic gradient between the Bitsui Pit and the groundwater at the coal subcrop of 0.0086 ft/ft.

Based on the porosity and hydraulic conductivity for the coal, the groundwater velocity is estimated to be 0.069 feet per day, and it would take 290 years for water from the mine pit to flow the 7,300 foot distance through the coal from the Bitsui Pit to the coal subcrop under the San Juan River alluvial aquifer. The groundwater velocity in the undifferentiated Fruitland Formation is expected to be at least 5 times lower based on an estimated effective porosity of 5% and because of the low hydraulic conductivity estimates

based on the extent of shale and claystone within the unit and the observations from mining and exploration drilling.

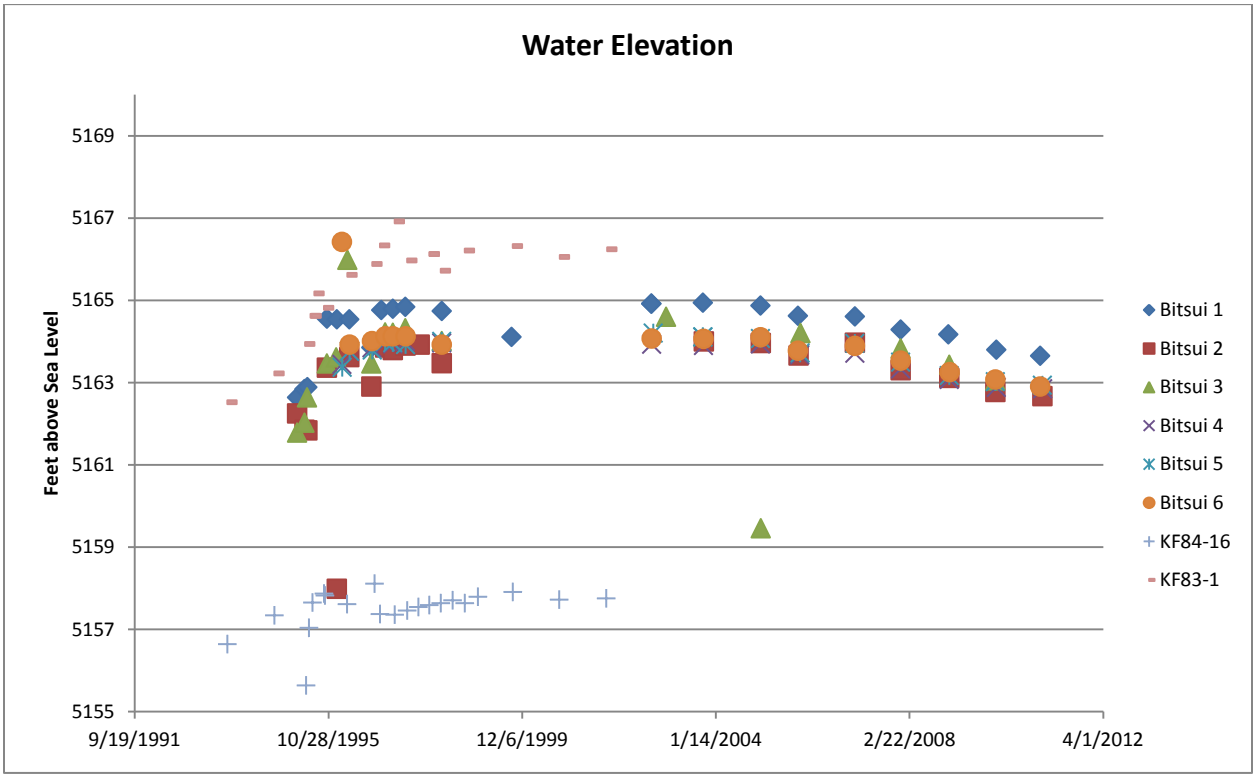

Figure 3: Water Table elevation of Select Wells in the Bitsui Pit Pre-Law Area

Groundwater Modeling

An advection-dispersion model simulation was applied to evaluate the characteristics of groundwater movement and leachate attenuation in the Area 1 Bitsui Pit. Specifically, the model considered the transport of boron, modeled as a conservative geochemical tracer, from the upgradient Bitsui CCB disposal area to the downstream Bitsui 6 spoil well. The distance between the maximum extent of the CCB disposal and the downgradient well is an approximate horizontal distance of 3 feet, or 10 meters (NTEC, 2013). Approximate concentrations of boron and other parameters of interest within this CCB disposal area are inferred by data recorded at the Bitsui 6 ash-disposal well. The groundwater gradients in the Bitsui area trend towards the northwest where discharge ultimately occurs in outcrops of the Fruitland Formation next to the San Juan River. In an effort to reduce the uncertainty and the number of variables, boron was chosen since other chemical species may degrade and attenuate considerably over time and distance.

Advection-dispersion models assume that a center of mass is traveling through the subsurface at the same speed as the average groundwater velocity (Fetter 2001). As the plume moves through the subsurface over time, dispersion effects cause it to exhibit a Gaussian normal-distribution concentration gradient, similar to a bell shaped curve. Dispersion is a function of the tortuosity in the subsurface, but in this model it was calculated based on an empirical formula. If the initial time in which transport began is known, as well as the distance the plume traveled, the groundwater velocity (pore water velocity) and hence the dispersion coefficient can be calculated iteratively.

Certain assumptions went into making the model. One primary assumption is that the aquifer is homogeneous. Additionally, since the area was reclaimed about 1975, and because extensive NAPI activity in the area didn't occur until 1980, the chemical transport is assumed to start in 1985. The assumption is based on the estimated time for the pit to become saturated, for the boron to start leaching out of the CCBs, and for the plume to start moving at any appreciable rate. The nature of the loading that created the plume is assumed to be impulse, or slug loading because it was found to support the data more accurately than a continuous load. Model parameters are shown in Table 3.

Depending on the distance assumption, the plume migrated from the source to the receiving well (Bistui 6), and different groundwater velocities can be calculated from the model. The results of the model were evaluated using two distances from the assumed point source to the downgradient well. In one case 33 feet was used since it is the distance between the maximum extent of the CCB disposal and Bitsui 6 well, and 172 feet was also used because it is the distance between Bitsui-1 (CCB well in Bitsui pit ash disposal) and Bitsui-6 (closest downgradient spoil well in the Bitsui pit). Based on the assumption that the distance between the source and downgradient well is 33 feet, a groundwater velocity of 0.6 meters/year, or about 10^{-6} cm/second, was calculated after calibrating the model to fit the breakthrough curve in the downgradient well, as shown in Figure 4. If one assumes that the distance between the source and the downgradient well is 172 feet a groundwater velocity of 3.285 meters/year, or 10^{-5} cm/second, is calculated. Because of the slow velocities involved in the groundwater transport, it is estimated to take 85 to 450 years for leachate to even reach the coal seams at the edge of the CCB and spoil disposal area of Bitsui Pit given the current conditions.

The results of the model indicate transport through the areas reclaimed with fly ash is considerably slower compared to transport through the coal seams. The model fit the data with a coefficient of determination (R squared) value of 0.96, suggesting good agreement with the data. However, there is always uncertainty concerning groundwater modeling given the simplifying assumptions. An alternative assessment approach assumes a continuous load rather than an impulse load from the ash disposal area, with down-gradient migration and attenuation in the spoil. Although this is an alternative possibility, the evidence in the literature concerning boron attenuation concludes that it remains fairly stable as it moves through the subsurface (Heebink 2001) (Manoharan 2007). In addition to this, based on the ash characterization studies, the amount of boron present within the ash is limited and most likely would have been released immediately following water-saturation as an impulse load.

The model was calculated using the following equation (Fetter 2001):

$$C = \frac{Co}{2}\left[erfc\left(\frac{L - vxt}{2\sqrt{Dlt}}\right) + \exp\left(\frac{vxL}{Dl}\right) erfc\left(\frac{L + vxt}{2\sqrt{Dlt}}\right)\right]$$

Where;

C=concentration at a specific x coordinate and time

Co=the initial source concentration

Dl=*aLvx* =longitudinal dispersion coefficient ($\frac{Length^2}{Time}$)

L=flow path length

aL=0.83(log*L*)$^{2.414}$ = the apparent longitudinal dynamic dispersivity (length)

vx=average ground water velocity ($\frac{Length}{Time}$)

t=time since movement began

Table 3: Advection Dispersion Model Input and Output Parameters

Year	1990	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010
C (g/m^3)	0.016	0.221	0.874	1.959	3.246	4.510	4.783	3.786	2.930	2.226	1.667
Co (g/m^3)	9	9	9	9	9	9	9	9	9	9	9
L (m)	10.06	10.06	10.06	10.06	10.06	10.06	10.06	10.06	10.06	10.06	10.06
vx (m/d)	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Dl (m^2/d)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
t (d)	1825	2555	3285	4015	4745	5475	6205	6935	7665	8395	9125
aL (m)	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835	0.835

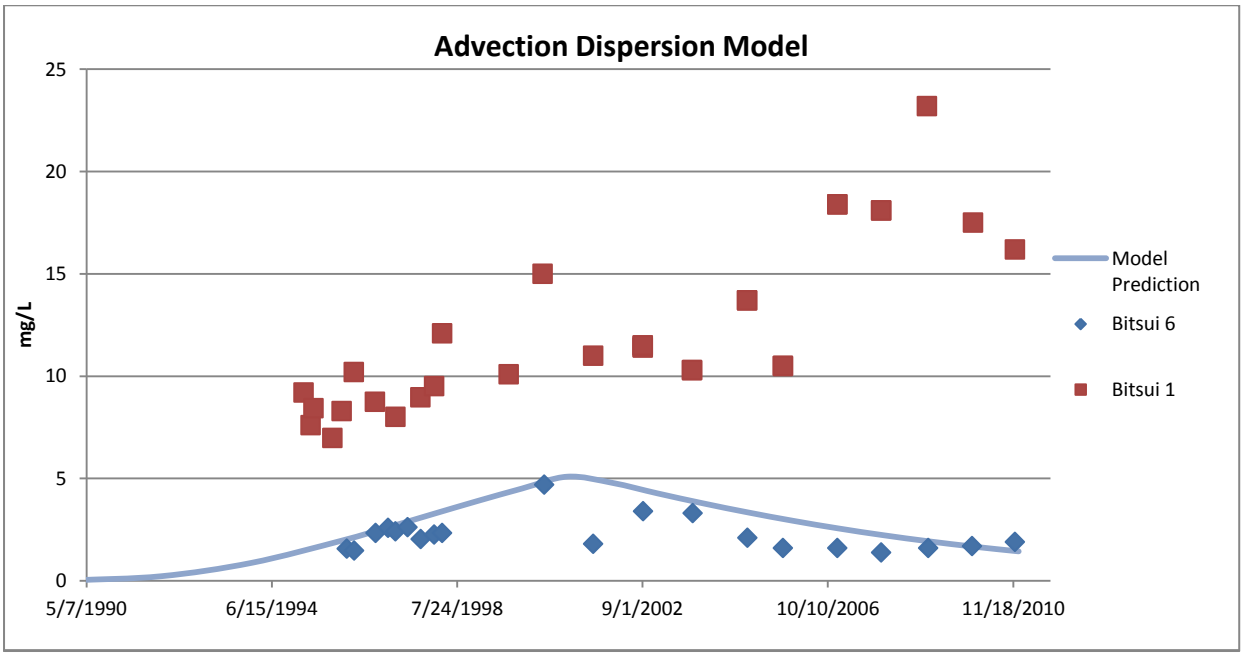

Figure 4: Advection-Dispersion Modeling of a Boron Breakthrough Curve

Conclusions

There were varying hydraulic gradients during the timeframe that was modeled. This is important to consider because hydraulic gradient is the driving force for determining groundwater velocity, particularly in unconfined conditions (Fetter 2001). The gradients varied from extremes of 0.02 ft/ft in 1996 to 0.005 ft/ft in 2008, as is seen in Figure 3. The gradients could have also been greater at the beginning of the transport sequence while the reclaimed area was becoming saturated from NAPI water; however, there is no data available for analysis. The groundwater velocity calculated from the model

represents a steady state condition in the reclaimed area where there is minimal driving force for groundwater movement.

The reclamation of the CCB disposal areas at Navajo Mine has been sufficient in part because of the natural conditions prevalent in the area and also due to placement considerations during disposal and reclamation. The data evaluated indicate negligible impacts have resulted from the CCB disposal. It is also not anticipated that any significant future effects will ensue from the CCB disposal at the Navajo Mine because of the very slow groundwater movement and the likely attenuation of contaminants of concern as they migrate through the subsurface. Therefore, OSMRE concludes that potential impacts from CCB disposal at the Navajo Mine are negligible.

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