



Hecla

GREENS CREEK

2010 Annual Report

Hecla
MINING COMPANY

Site 23/D



June 7, 2011

Presentation Outline

- Placement data
- Stability
 - Compaction
 - Inspections
 - Slope monitoring
- Water level data
- Precipitation data
- Water quality at internal monitoring sites
- ABA data
- General site management

2010 Satellite Photograph Site 23/D, Mill Site and 1350

Hecla
MINING COMPANY



Appendix 2 Site 23/D Conceptual Cross Section

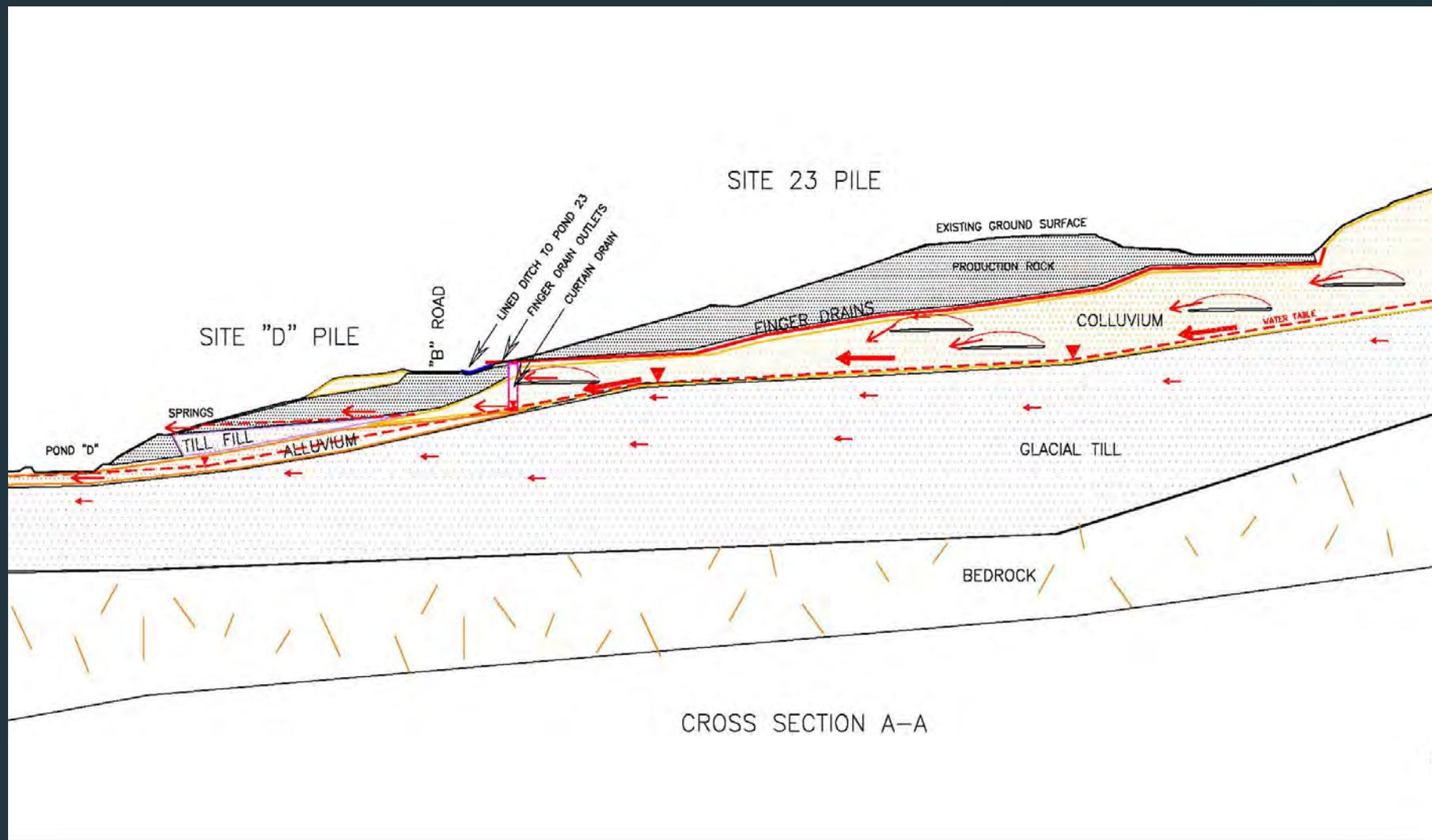


Table 3.1 Site 23 Placement Data



PRODUCTION ROCK PLACED AT SITE 23					ADDITIONAL PRODUCTION ROCK HAULED					
2010	Surveyed (cy)		Surveyed (tons)		Hauled To Tails from		From UG Truck Counts (tons)			
Date	Monthly	Cumulative	Monthly	Cumulative	Monthly	Cumulative	Class 1	Class 2	Class 3	Total
1/31/2010	0	0	0	0	1,309	1,309	1,350	0	0	1,350
2/25/2010	1,810	1,810	3,064	3,064	673	1,982	1,811	0	420	2,231
3/31/2010	0	1,810	0	3,064	965	2,947	240	630	600	1,470
4/30/2010	3,397	5,207	5,750	8,814	2,053	5,000	2,070	2,280	690	5,040
5/30/2010	0	5,207	0	8,814	1,708	6,708	240	270	3,150	3,660
6/30/2010	4,091	9,298	6,925	15,740	2,876	9,584	1,170	360	2,430	3,960
7/31/2010	0	9,298	0	15,740	2,562	12,146	1,530	0	1,800	3,330
8/31/2010	1,188	10,486	2,011	17,751	1,806	13,952	1,080	150	990	2,220
9/30/2010	793	11,279	1,342	19,093	2,074	16,026	240	1,500	690	2,430
10/31/2010	0	11,279	0	19,093	3,539	19,565	510	0	1,680	2,190
11/30/2010	0	11,279	0	19,093	656	20,221	0	0	0	0
12/30/2010	790	12,069	1,337	20,430	0	20,221	0	0	0	0
TOTAL	12,069		20,430		20,221		10,241	5,190	12,450	27,881

* No survey taken due to equipment failure or excessive snow

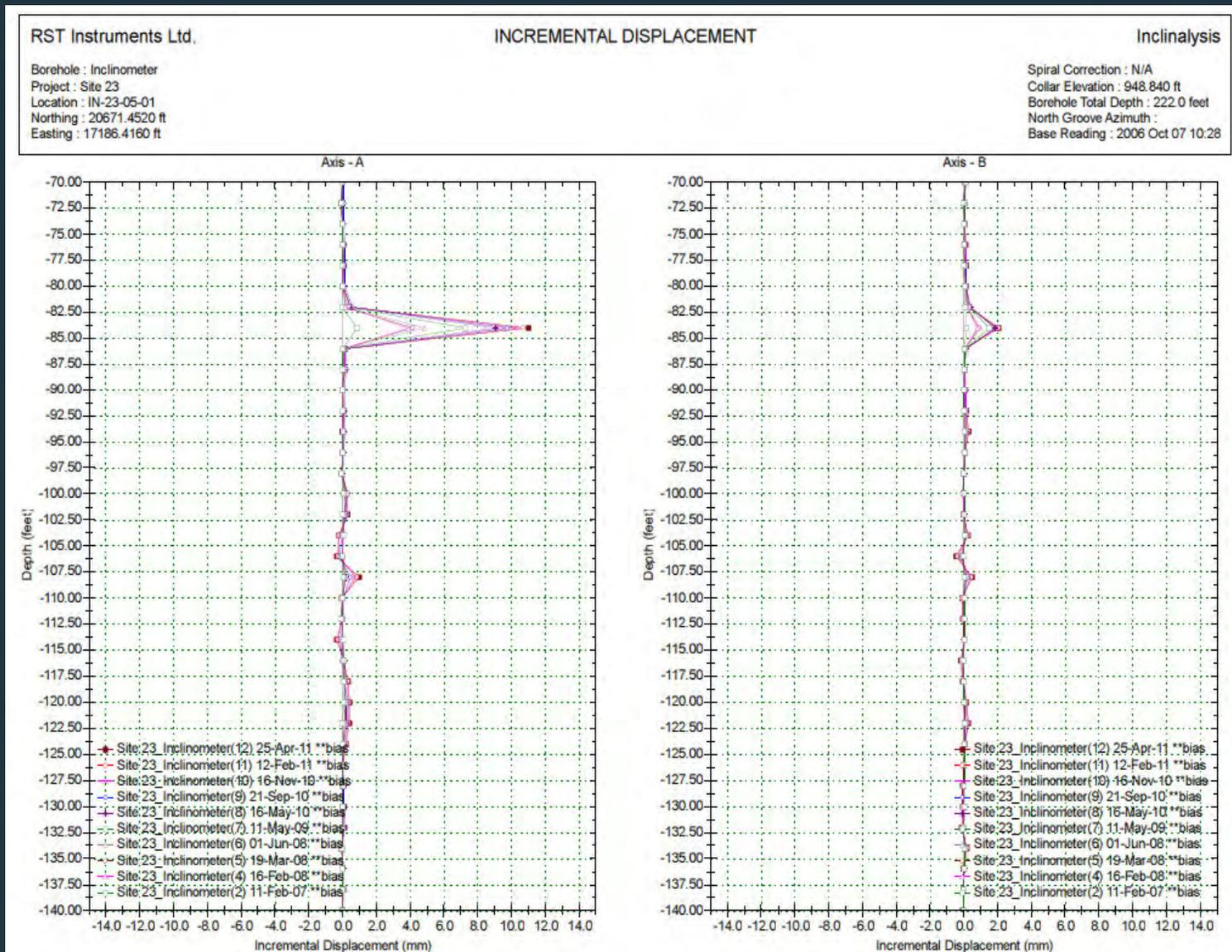
Remaining capacity ~ 546,841 cy

Current volume ~647,127 cy (1,095,115 tons)

Site 23/D Stability

- Compaction
 - Method specification includes spreading in less than 24" lifts with at least one pass with a bulldozer and four passes with a vibratory compactor
- Inspections
 - Results of operator, engineering, environmental and regulatory inspections revealed no visible signs of instability
 - No issues of non-compliance were noted in 16 USFS and 6 ADEC/ADNR inspections during 2010
- Slope monitoring
 - 10 survey hubs monitored with GPS during 2010
 - No large movements were identified
 - Inclinometer readings
 - Minor creep at 80' (~3mm/yr)

Figure 3.30 Inclinometer Incremental Displacement



Site 23/D Water Level Data

- Water table is below base of pile
- Well-drained pile and foundation indicate pile stability is maximized
- Perched water tables in colluvial wedge and alluvial sands
- Braided flow paths
- Distinct seasonal pattern, especially in alluvial sands
- Silt/clay till below colluvial wedge inhibits downward water movement

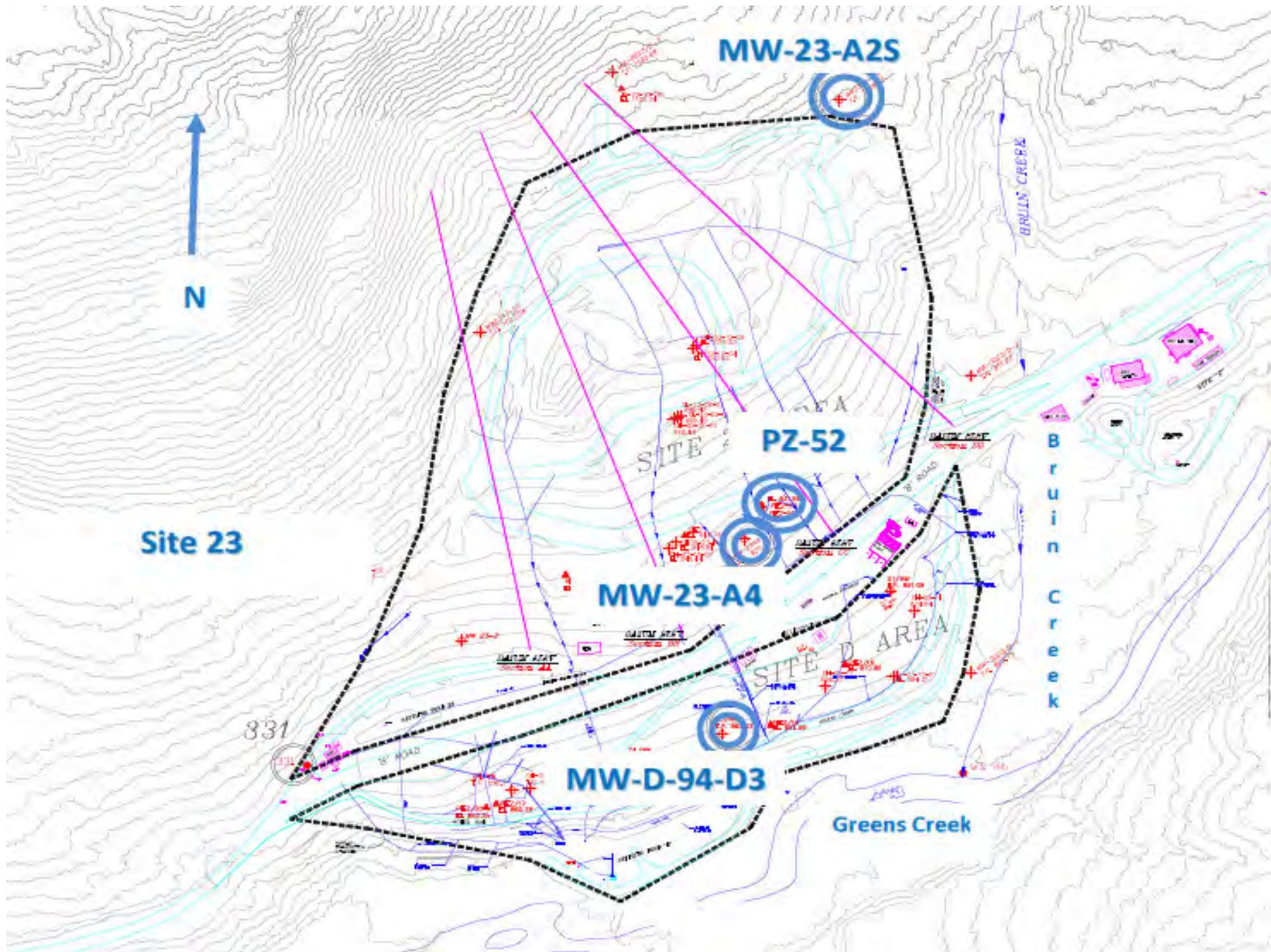


Figure 3.1 Pressure Data for Piezometer 52

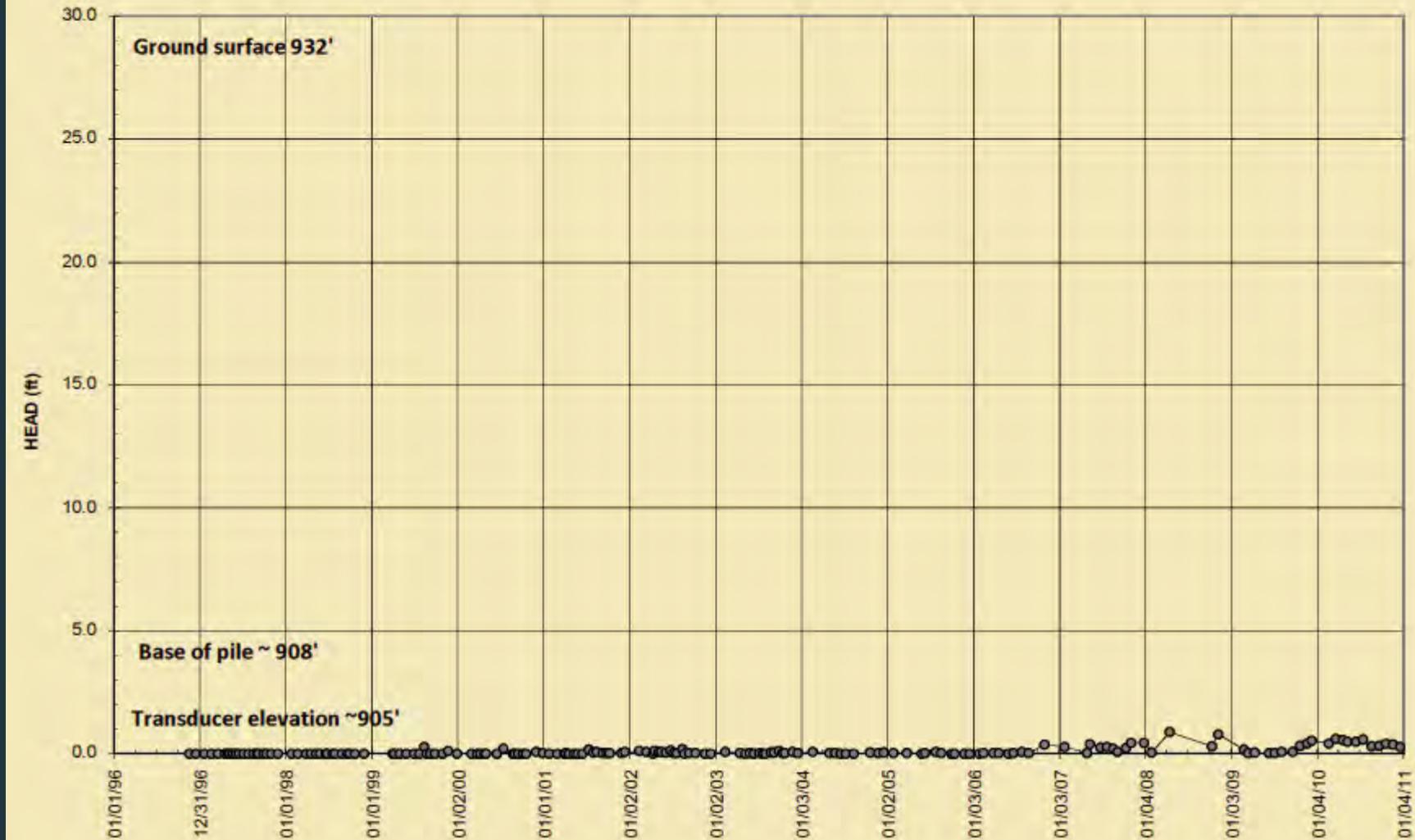


Figure 3.6/7 Water Levels MW-23-A2S/D

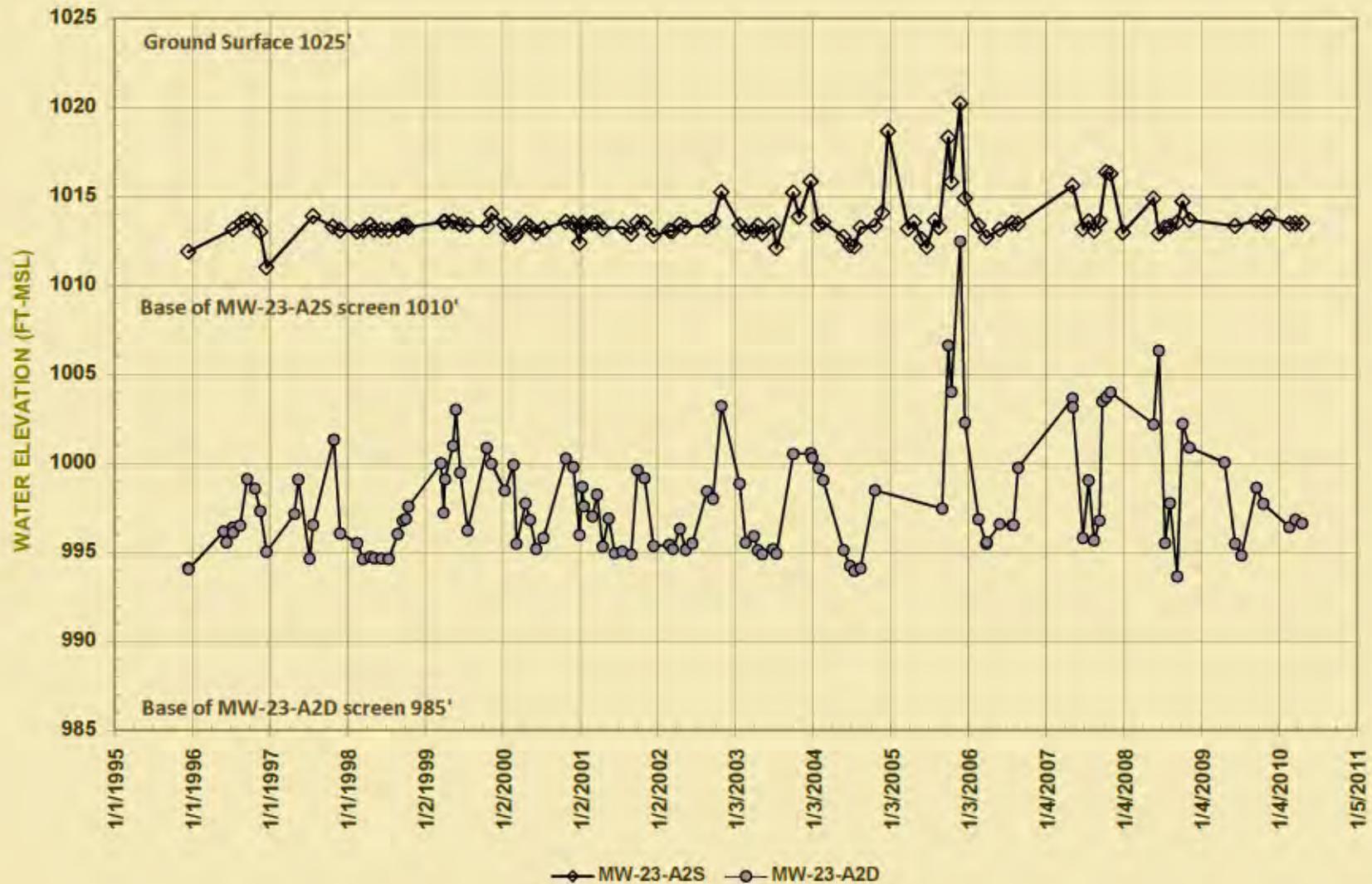


Figure 3.9 Water Level Data for Well MW-23-A4

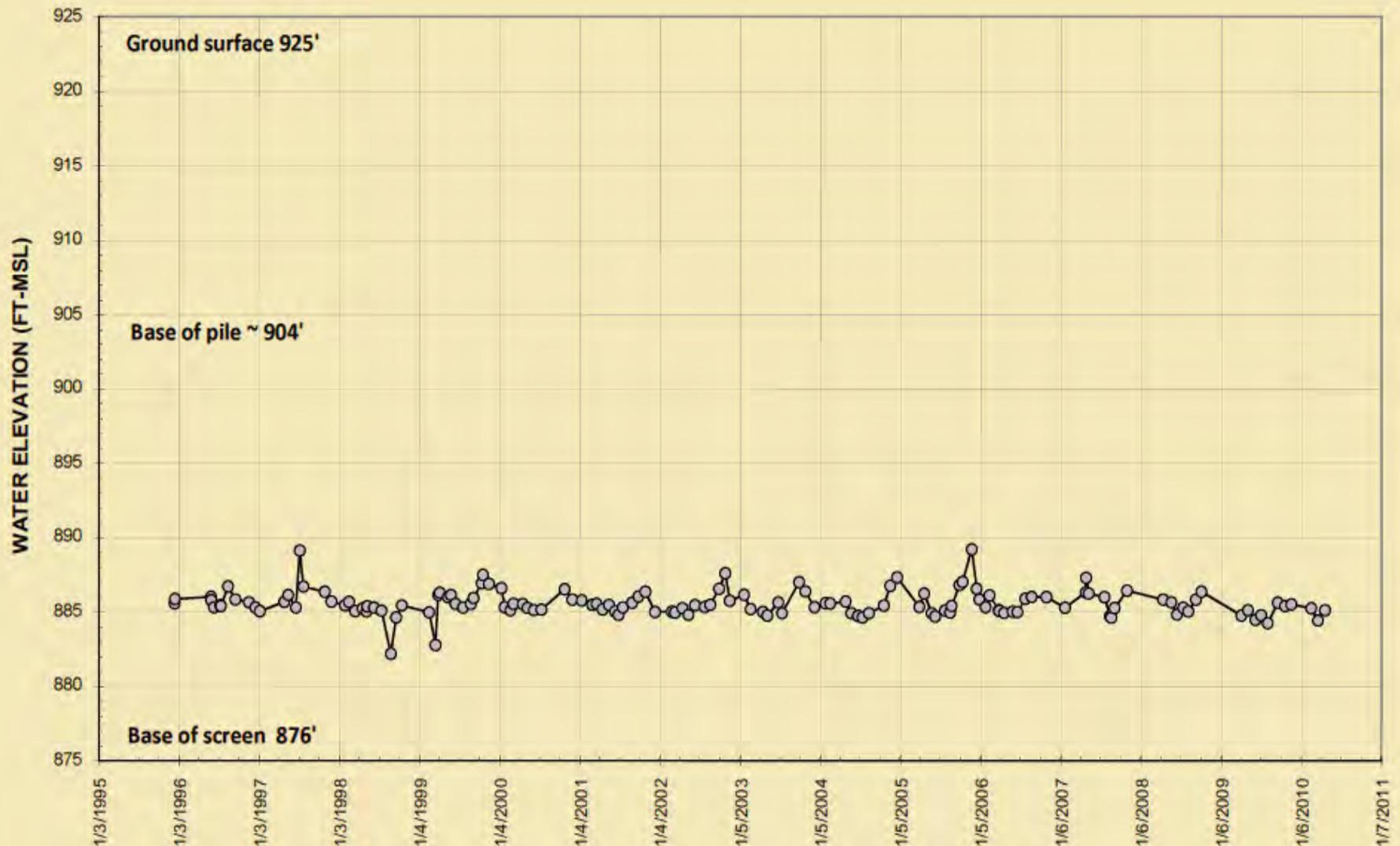


Figure 3.11 Water Level Data for Well MW-94-D3

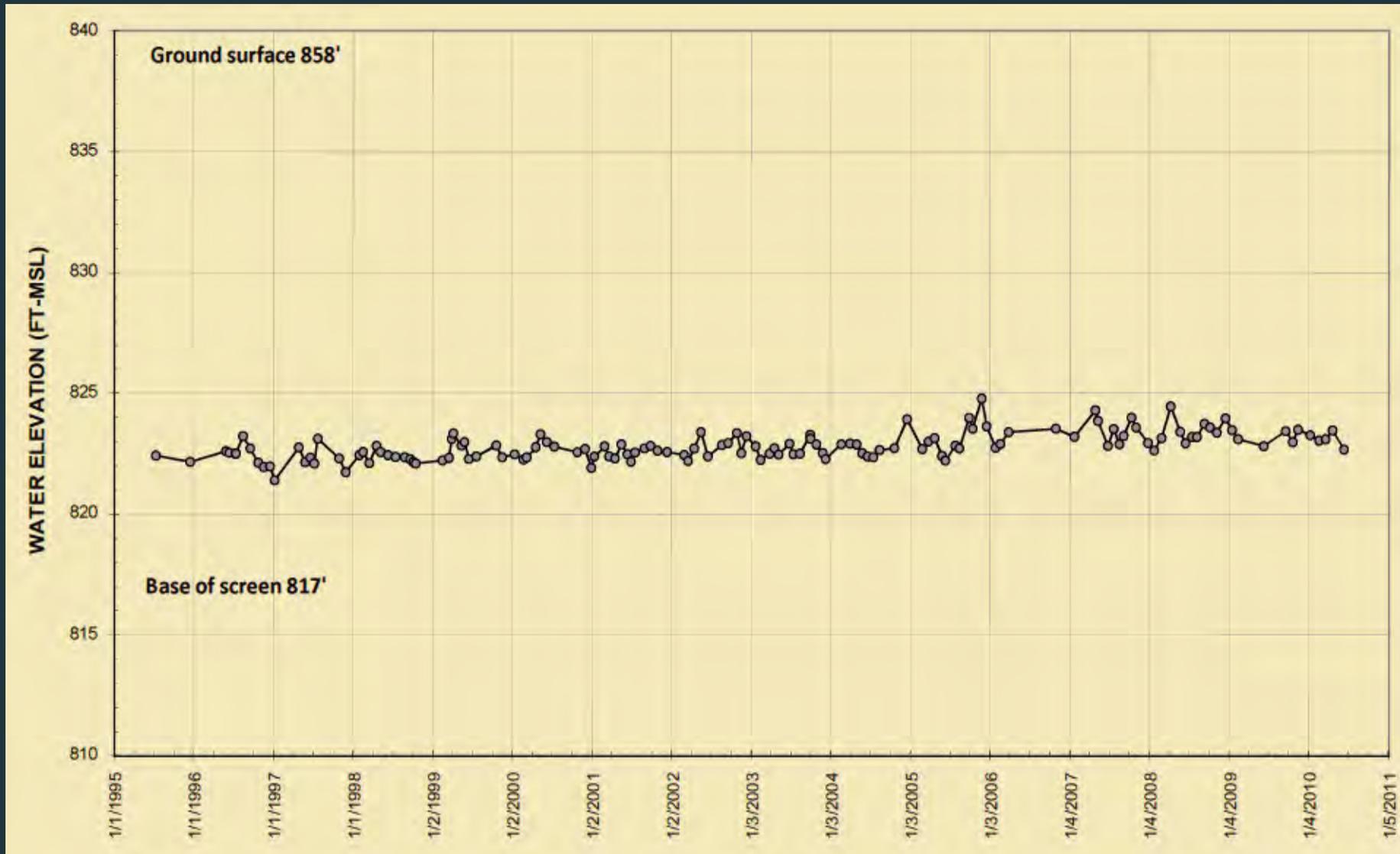


Table 3.2 Monthly Summary of Site 23/D Climate Data



Month	Avg Temp (°C)	Precipitation (in)
January	-1.04	3.57
February	1.23	2.26
March	0.67	6.73
April	3.49	2.81
May	8.66	1.57
June	9.86	4.49
July	11.15	3.25
August	12.25	5.07
September	10.00	7.44
October	4.42	11.62
November	0.16	9.59
December	-4.13	0.98
2010	4.73	59.38

Site 23/D Internal Monitoring Sites: Water Quality Data



- Internal site waters are captured, treated, and discharged per HGCMC's NPDES/APDES permit
- pH values are between 6.0 and 8.5 (high buffering capacity)
- Conductivities are between 200 and 5000 umho/cm
- Variations in conductivity reflect differences in contributions of groundwater and infiltration, seasonal fluctuations
- Zinc concentrations are variable (typically less than 5 mg/l)
- Precipitation, mixing, and sorption mechanisms determine metals concentrations

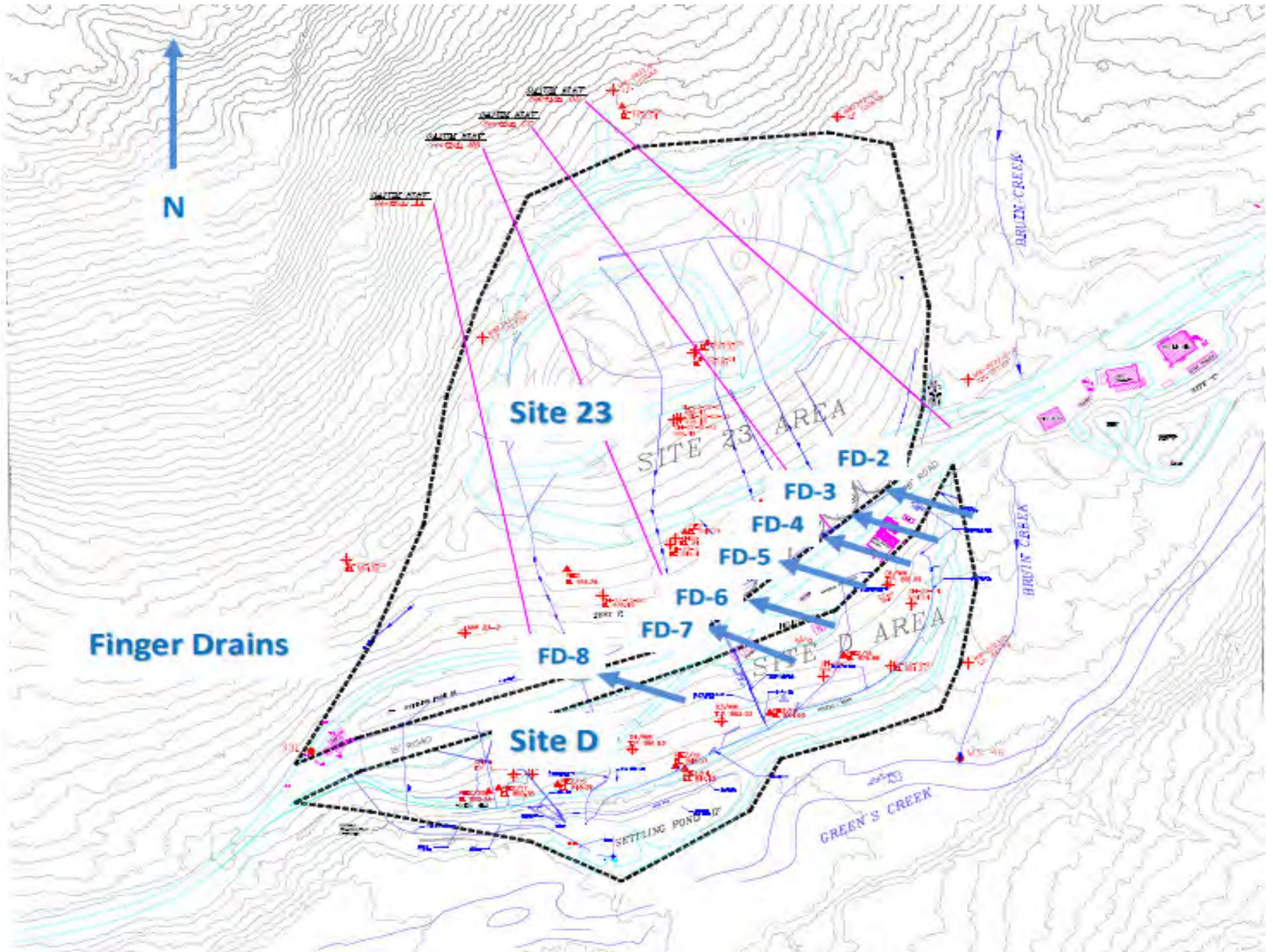


Figure 3.14a Site 23 Finger Drains pH

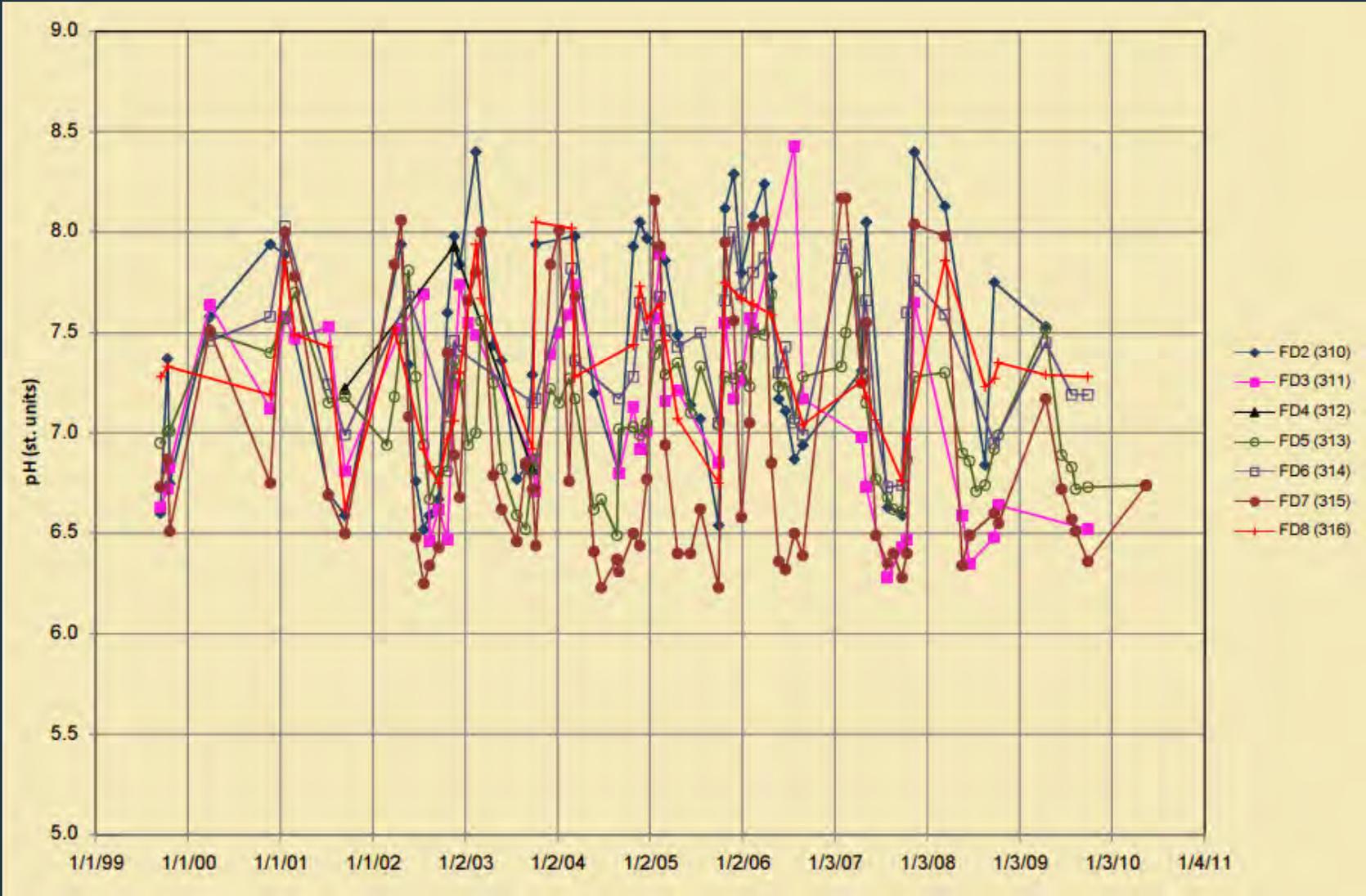


Figure 3.17a Site 23 Finger Drains Conductivity

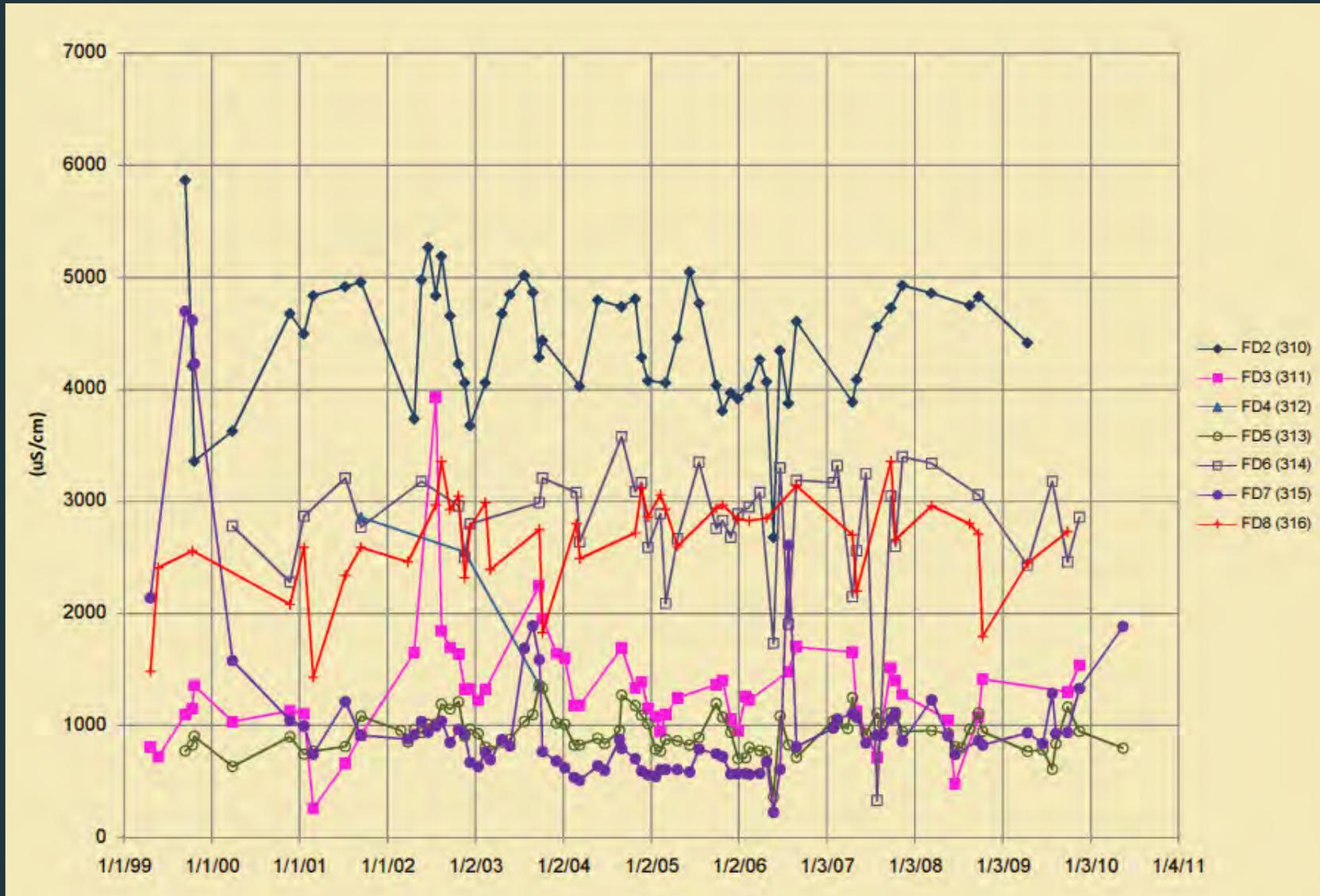
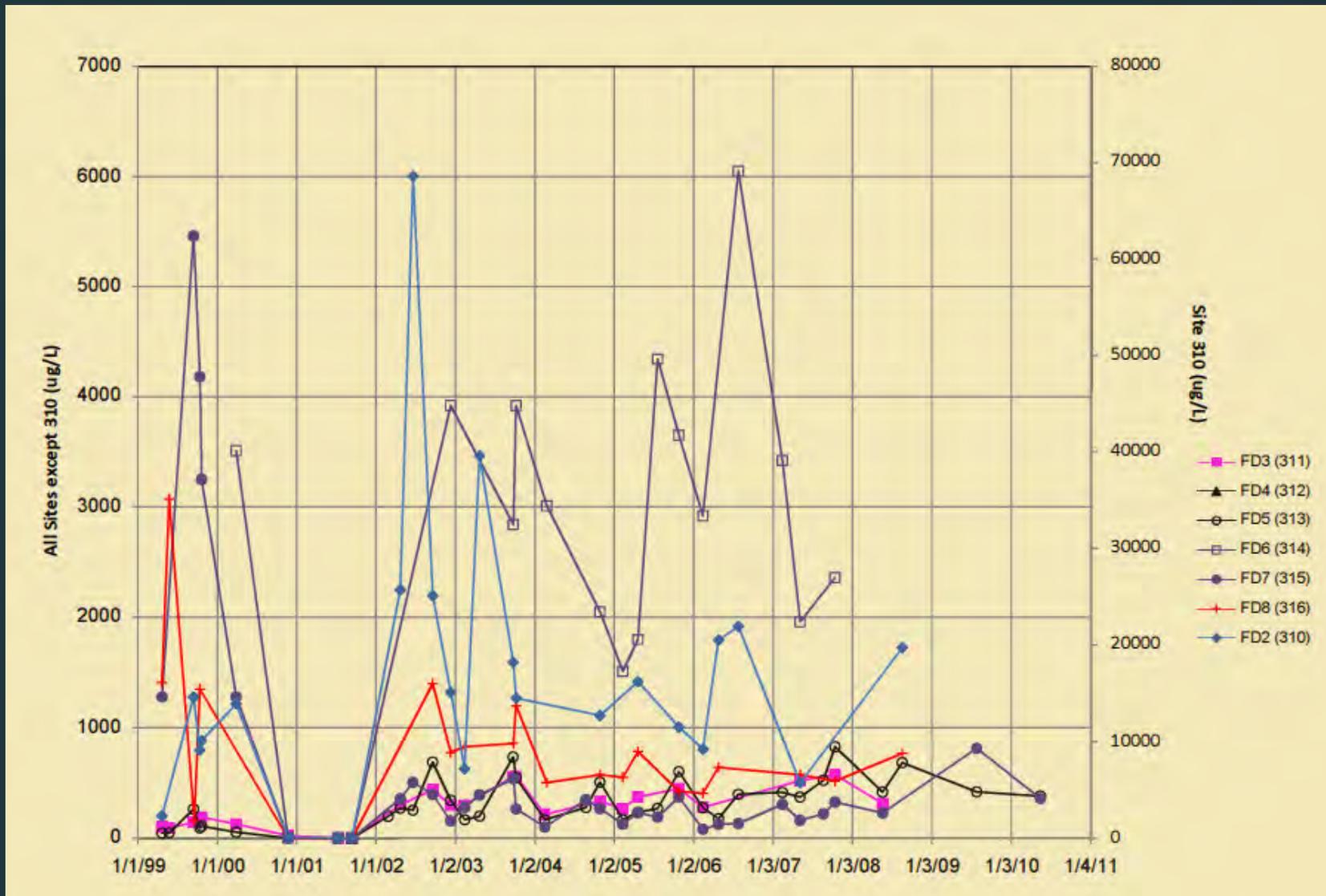
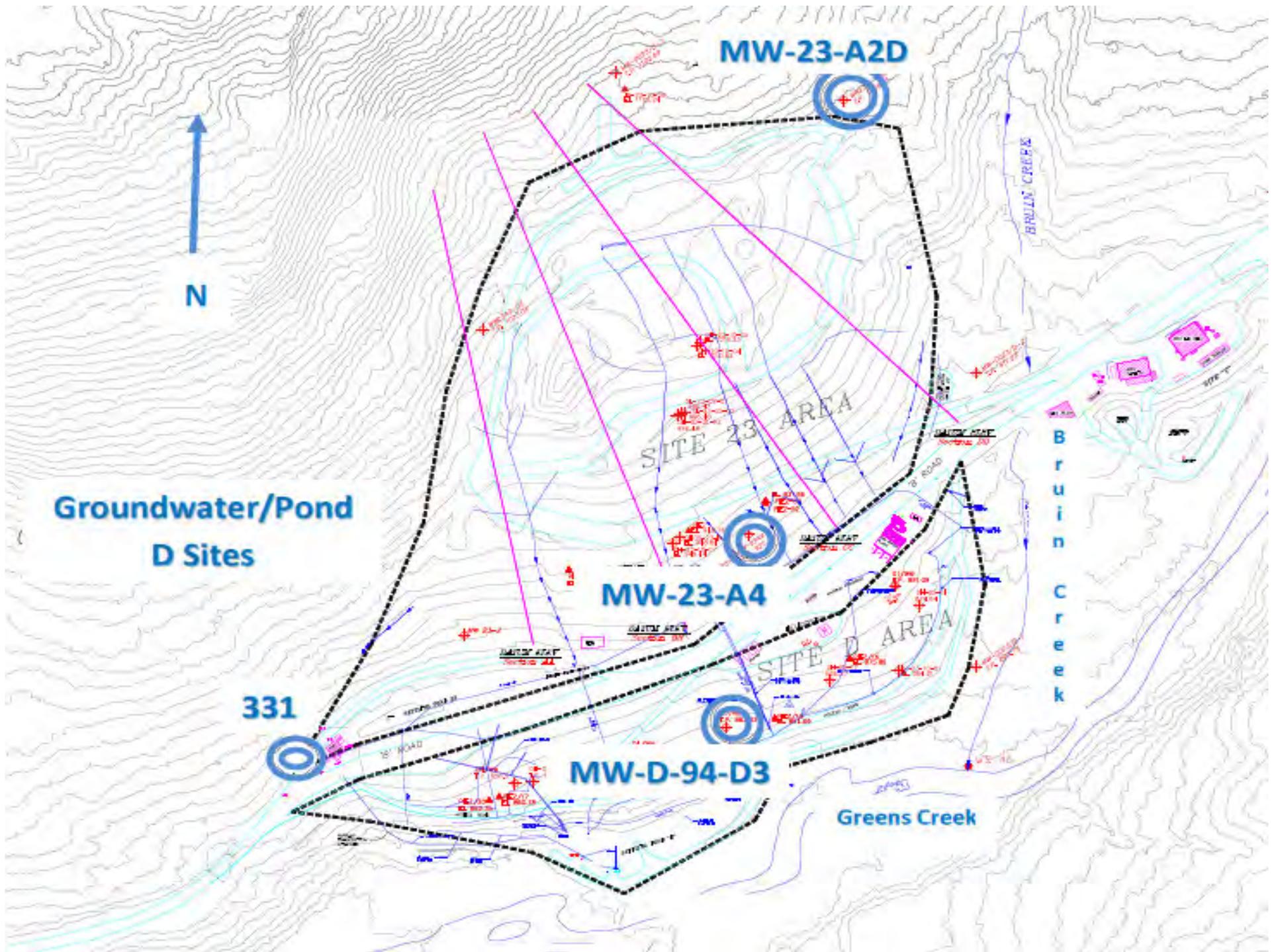


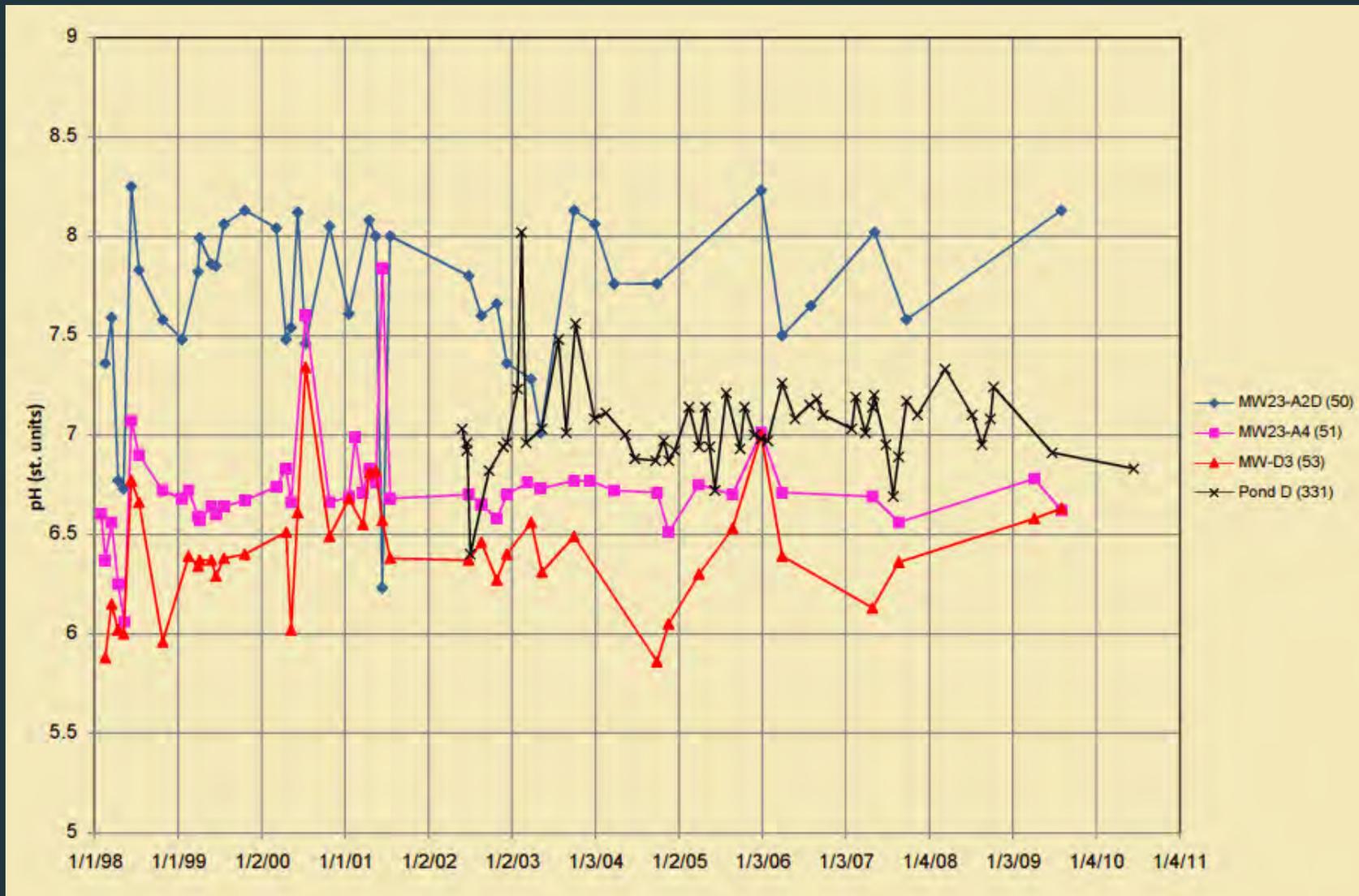
Figure 3.20a Site 23 Finger Drains Dissolved Zinc



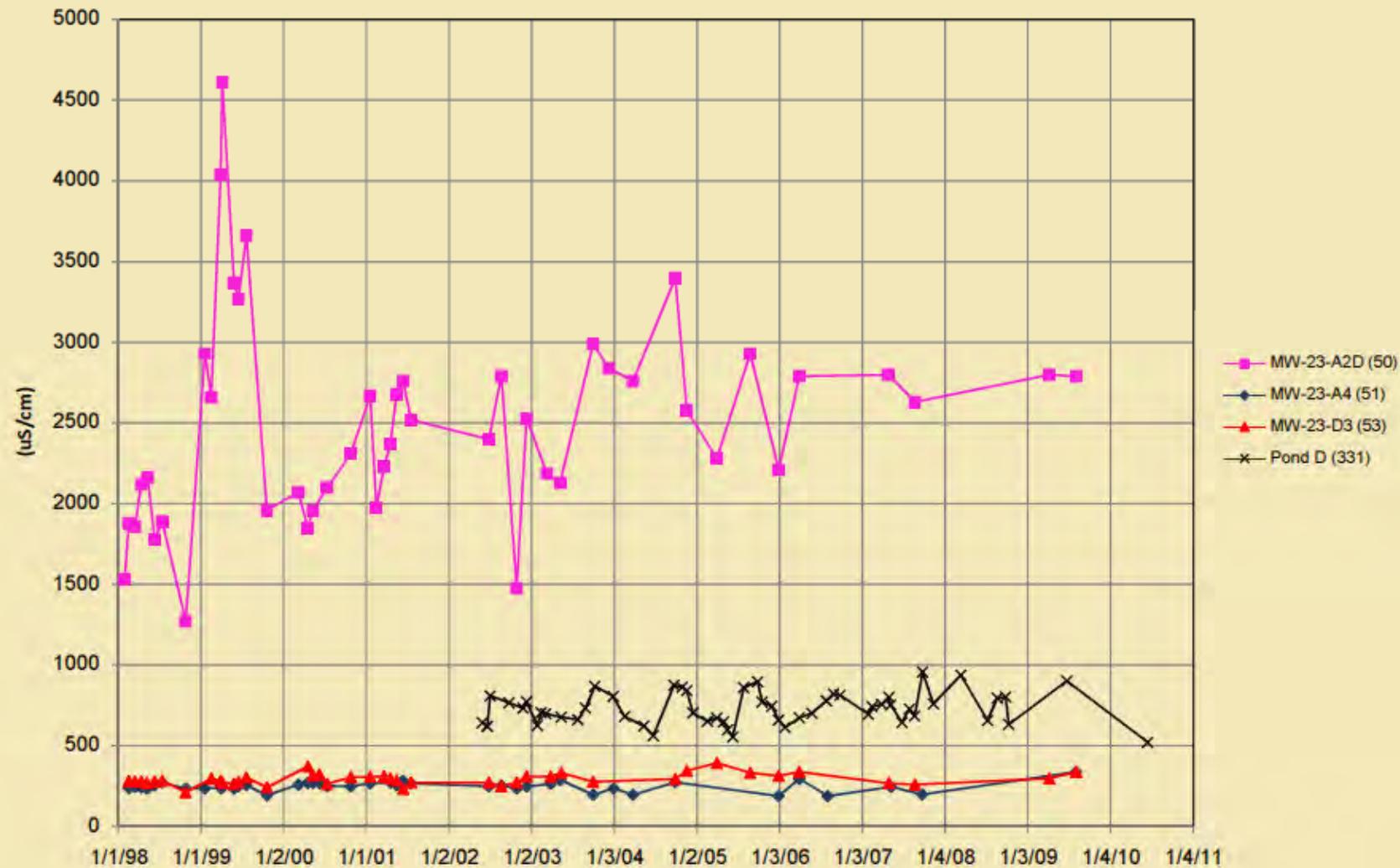


Site 23/D Wells and D Pond

Figure 3.14b pH



Site 23/D Wells and D Pond Figure 3.17b Conductivity



Site 23/D Wells and D Pond Figure 3.20b Dissolved Zinc

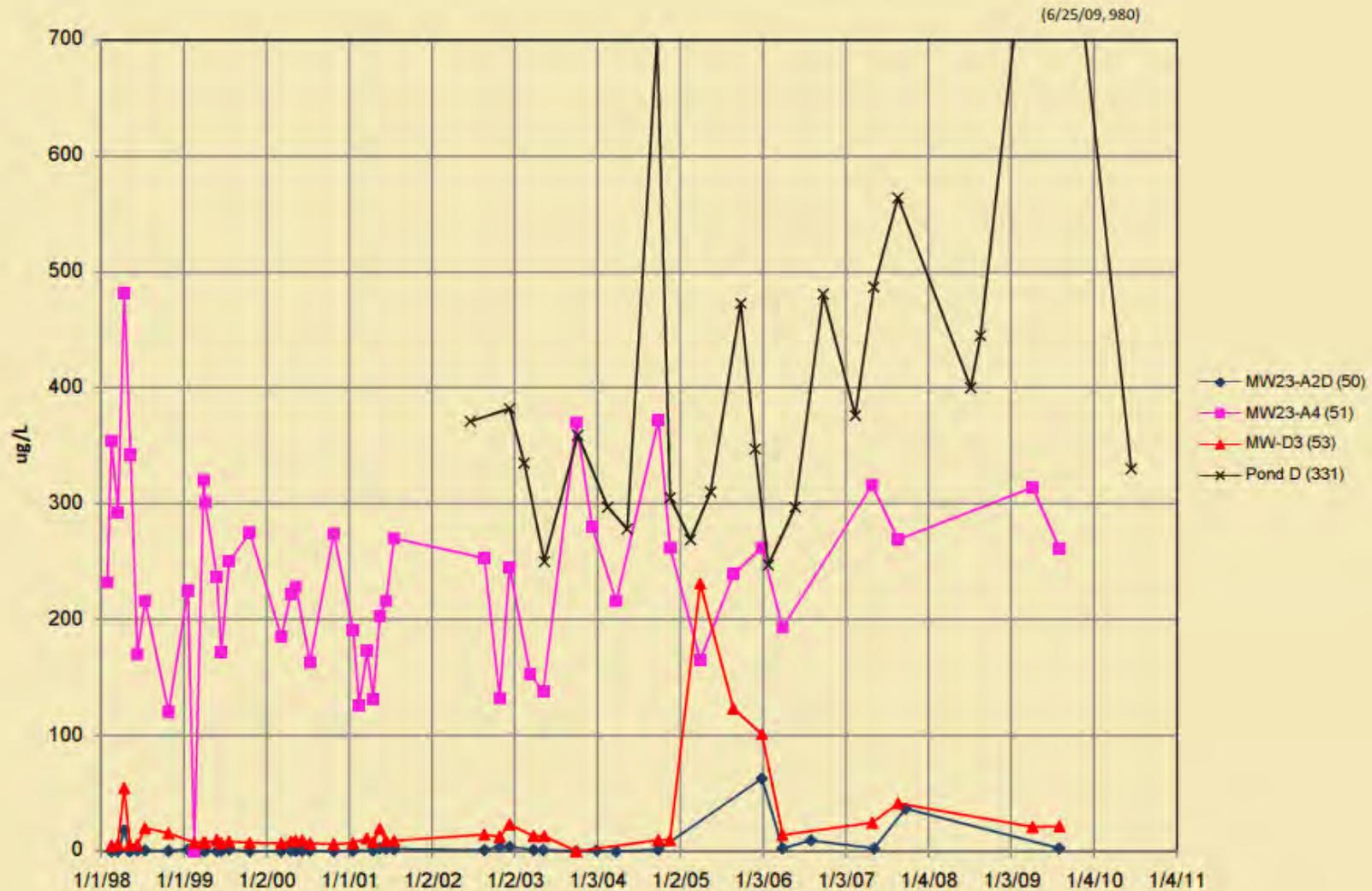
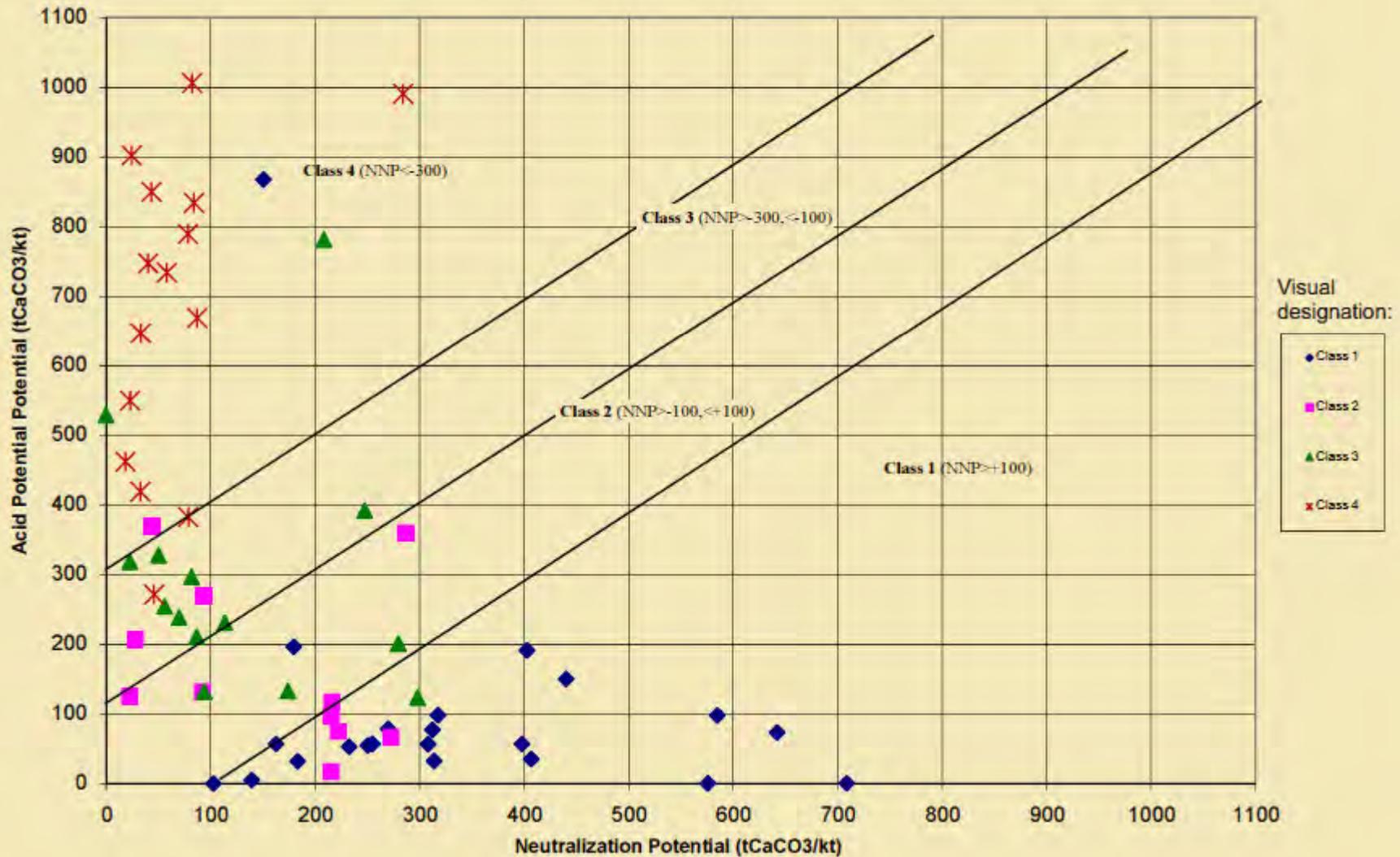


Figure 3.28 ABA Data Underground Rib Sampling



Site 23/D General Site Management



- Designated placement zones are marked on the active lift of the site and production rock is placed according to class
- Outer surfaces have at least two feet of Class 1 rock
- Class 2 and 3 rock are blended and placed in the center of the pile
- Use of interim storage area for reclamation activities
 - 1350
 - B Pond berm
 - Pipeline excavation
 - D Pond berm

Cover Design



Growth Medium

Capillary Break

Barrier Layer

Capillary Break



2 meters

Site 23 Cover Excavation

Hecla
MINING COMPANY



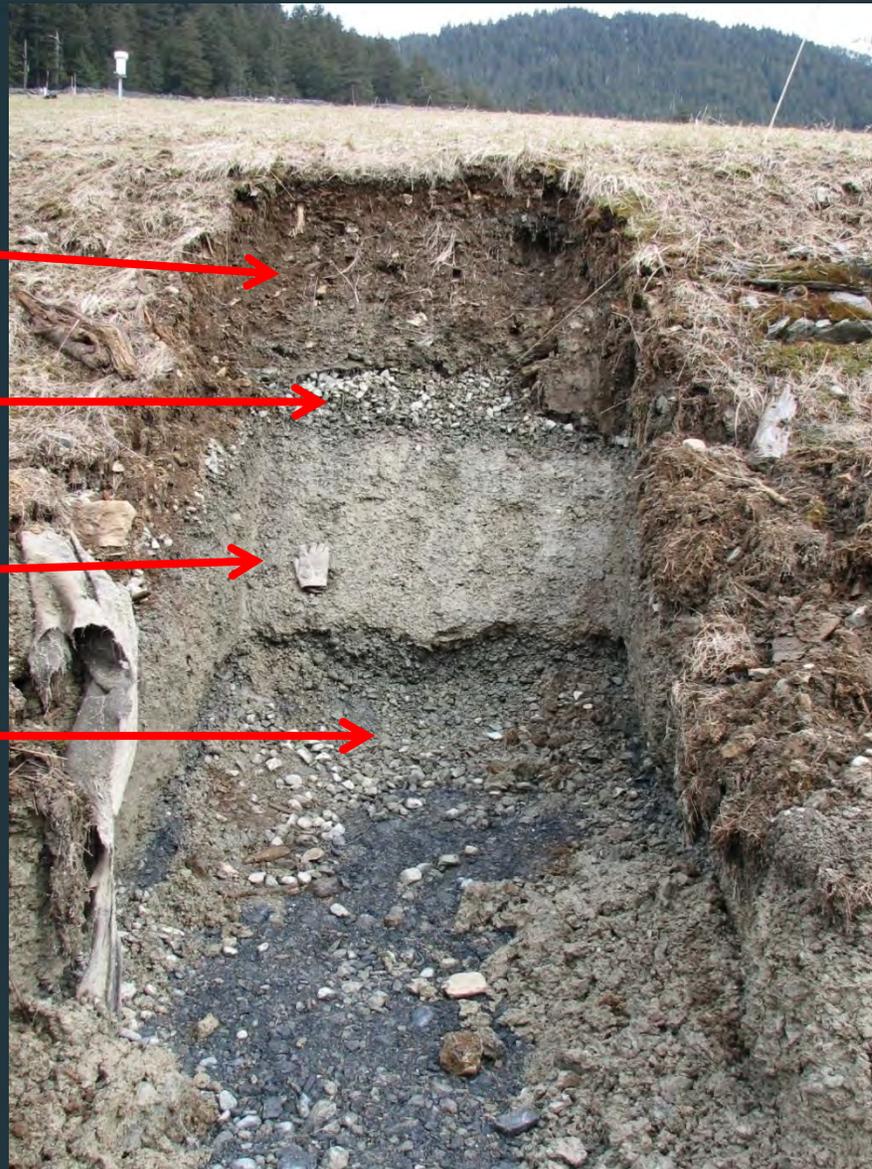
Site 23 Cover Excavation

Growth Medium

Capillary Break

Barrier Layer

Capillary Break



Cover Performance Monitoring

- Greater than 85% water saturation in barrier layer minimizes oxygen ingress
- Water percolation through barrier layer 15-20% of annual precipitation
- Barrier layer does not freeze during the winter
- Trench flow was about 70-80% upper capillary break and 20-30% growth medium. The lag time between peak precipitation and peak trench flow is about 6 hours for dry conditions and 2 hours for wet conditions
- Modeling with Hydrus-2D/3D software compares favorably with field results
- Numerical modeling of alternative cover designs indicates that the upper capillary break is necessary to maximize lateral flow and prevent buildup of head pressures in the growth medium and barrier layer
- OSU vegetation assessment recommends allowing development of native spruce/hemlock vegetation with windthrow to promote nutrient mixing and minimize erosion

D Pond Berm Replacement 2010



Site E Removal Activities 2010



960 Site Waste Rock Removal

Hecla
MINING COMPANY



960 Site Waste Rock Removal



Site 347		Before Removal	After Removal	After Removal	After Removal
Parameter	Unit	9/12/95	9/28/06	8/17/09	6/17/10
pH	st. units	6.1	7.6	7.5	7.3
Sulfate	mg/l (tot)	1300	161	230	136
Calcium	mg/l (diss)	412	64	102	64
Magnesium	mg/l (diss)	164	21	28	21
Iron	mg/l (diss)	5.5	0.2	ND	0.61
Manganese	mg/l (diss)	7.1	0.4	0.272	0.196
Zinc	mg/l (diss)	11	0.1	0.054	0.035
Lead	mg/l (diss)	0.004	ND	0.00008	ND
Nickel	mg/l (diss)	0.3	0.005	0.007	0.0015

ND – Non detectable result

1350 Removal Activities

Hecla
MINING COMPANY



1350 Removal Activities

Hecla
MINING COMPANY

