Overview:
Tailings Facility
Groundwater Data Collection
(February 2-4, 2005 EPA Technical Meeting)

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Outline

- Summary of data collection
  - Well installations and geophysics
  - DQOs
  - Reference groundwater
  - Tailings facility groundwater
  - Questa residential drinking water
- Cross sections of Dam Nos. 1 and 4

Drilling and Well Installation

- Planned wells/piezometers/borings:
  - 6 monitoring wells
  - 3 borings planned for wells but were not installed due to absence of water
  - 7 temporary piezometers
- Additional wells/piezometers/borings:
  - 5 monitoring wells
  - 4 temporary piezometers
  - 1 confirmation boring
  - 14 drive points
  - 1 off-site monitoring well

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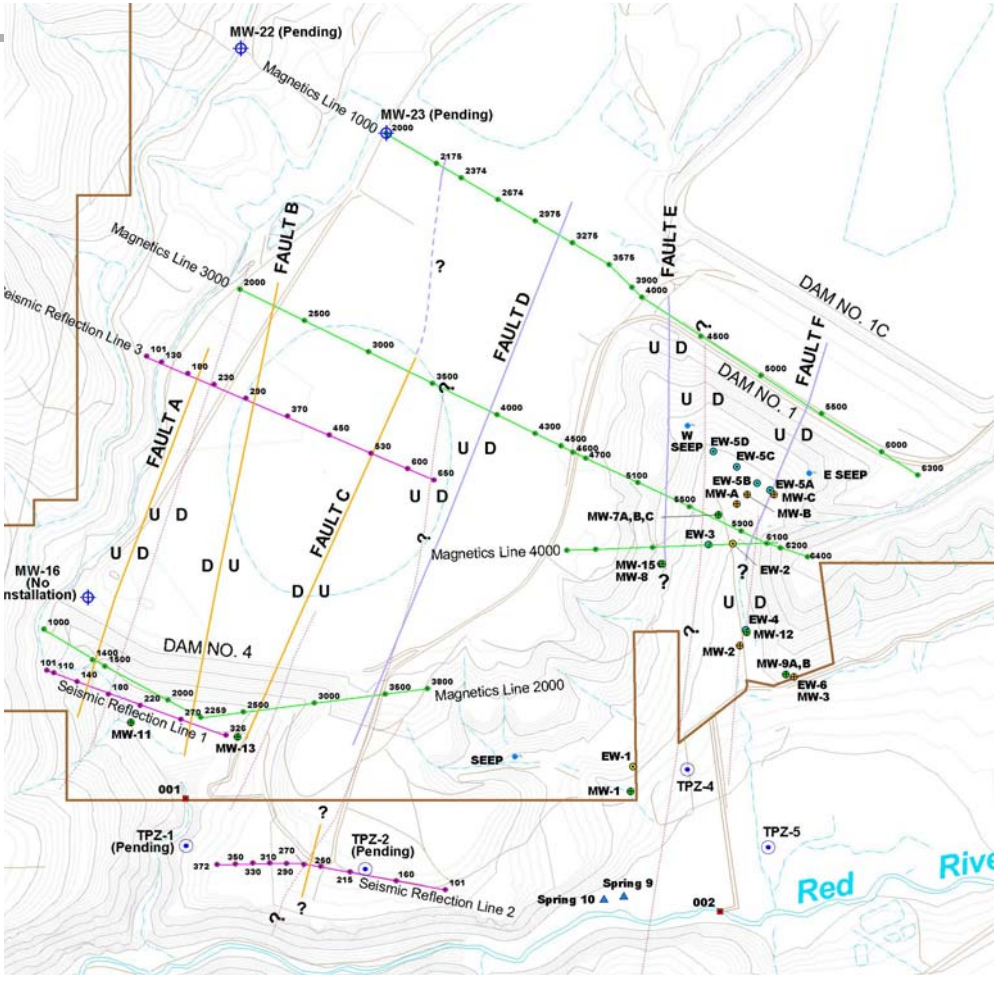
Geophysics

- 4 ground magnetics lines
- 3 high resolution seismic reflection lines
- Borehole geophysics in 2 wells



Groundwater DQOs

- Concentrations > RBSLs?
- Concentrations > State Groundwater Standards and MCLs?
- Adequately determined the nature and extent of concentrations > RBSLs?

Groundwater Sampling

- Fall 2002 though Spring 2004
- Quarterly sampling of all wells and springs
- Monthly sampling of new monitoring wells
- Additional sampling of temporary piezometers, drive points, etc., as requested

Reference Groundwater

- Upper Alluvial Aquifer (MW-21):
  - 10 total samples collected
- Basal Alluvial Aquifer (MW-20):
  - 16 total samples collected
- Basal Bedrock Aquifer (MW-22):
  - 8 total samples collected
- Samples analyzed for 25 total and dissolved metals and 18 inorganics

Cater Ranch

- One sample collected from well
- Presumed to be from basal alluvial aquifer
- Samples analyzed for 25 metals and 18 inorganics

Tailings Facility
Groundwater Exposure Areas

- 3 Groundwater Exposure Areas:
  - GW-11: small area around and downgradient of the Dry/Maintenance
  - GW-12: potential exposure area near base of Dam No. 4 (IX Plant) based on results of soil sampling
  - GW-13: remainder of tailings facility

Tailings Facility GW-12

- A well was to be installed if soil concentrations indicate potential leaching to groundwater
- However:
  - Soil sample concentrations are below soil SLC, except arsenic
  - Arsenic values within ranges found at tailings reference areas
  - Water table is ~ 200 feet below ground surface
  - No leaching of metals is expected
- No well was installed
- GW-12 area is now combined with GW-13

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Tailings Facility GW-11

- Dry/Maintenance area
- 1 upper alluvial aquifer well (MW-17)
  - 16 samples collected
- 1 basal alluvial aquifer well (MW-CH)
  - 7 samples collected
- All samples analyzed for 25 metals and 18 inorganics
- 11 samples analyzed for VOCs and SVOCs – couple of low detections of typical laboratory contaminants (e.g., acetone and phthalates)

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Tailings Facility GW-13

- Upper Alluvial Aquifer:
  - 15 monitoring wells
  - 7 extraction wells
  - Outfall 002 pumpback
  - 3 temporary piezometers
  - 14 drive points
- 180 total samples collected and analyzed for 25 metals and 18 inorganics

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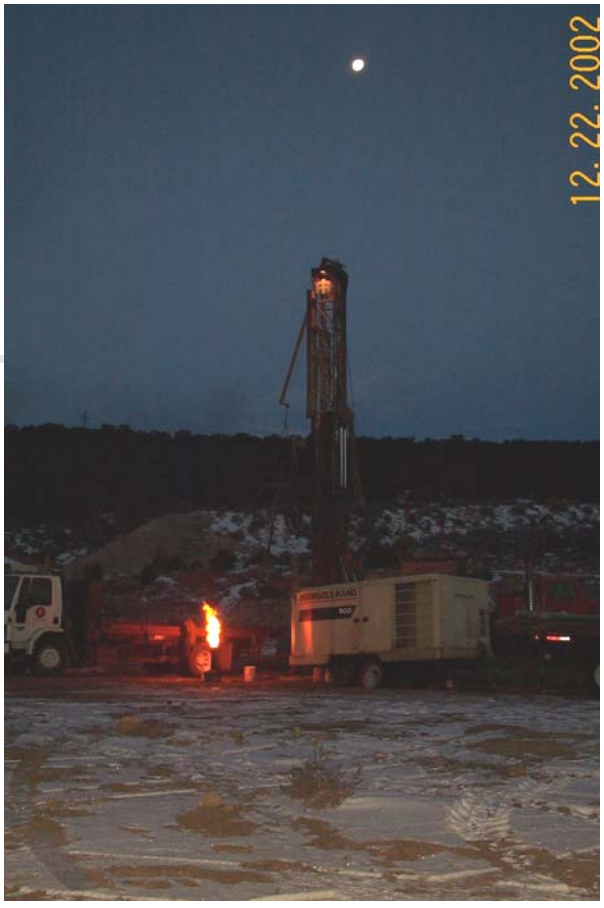
Tailings Facility GW-13

- Basal Alluvial Aquifer:
  - 3 monitoring wells
  - 1 extraction well
  - 1 temporary piezometer
- 37 total samples collected and analyzed for 25 metals and 18 inorganics

Tailings Facility GW-13



- Basal Bedrock Aquifer:
  - 7 monitoring wells
  - 1 extraction well
  - 3 temporary piezometers
- 77 total samples collected and analyzed for 25 metals and 18 inorganics

Tailings Facility GW-13

- Outfall 002:
- Sampled at 002 collection manhole and end of pipe at the river
- 12 total samples collected
- Samples analyzed for 25 metals and 18 inorganics

Tailings Facility GW-13

- Alluvial Seepage:
  - Seeps occur near the base of Dam No. 1, south of tailings and upper 003 drainage
  - 10 seeps were sampled
  - 38 total samples collected and analyzed for metals and inorganics
  - 1 sample analyzed for SVOCs, VOCs and TPH – no organics were detected

Tailings Facility GW-13

- Bedrock Seepage:
  - Seeps occur along alluvium/volcanic contact and along the river south of Dam No. 4
  - 8 seeps were sampled
  - 52 total samples collected and analyzed for metals and inorganics

Questa Residential Water South of Red River

- 2 locations (PR1 and PR2) south of Red River were sampled
- Water is from alluvial aquifer wells; sampled from household tap
- Samples analyzed for 25 metals and 18 inorganics

Questa Residential Water Near Hunts Pond

- 3 locations (PR3, 4 and 5) south of Red River were sampled as part of the Historic Tailings Spill Investigation (May 2004)
- Water was sampled from an alluvial well at each home
- 5 total samples were collected analyzed for 25 metals and 18 inorganics

GSI

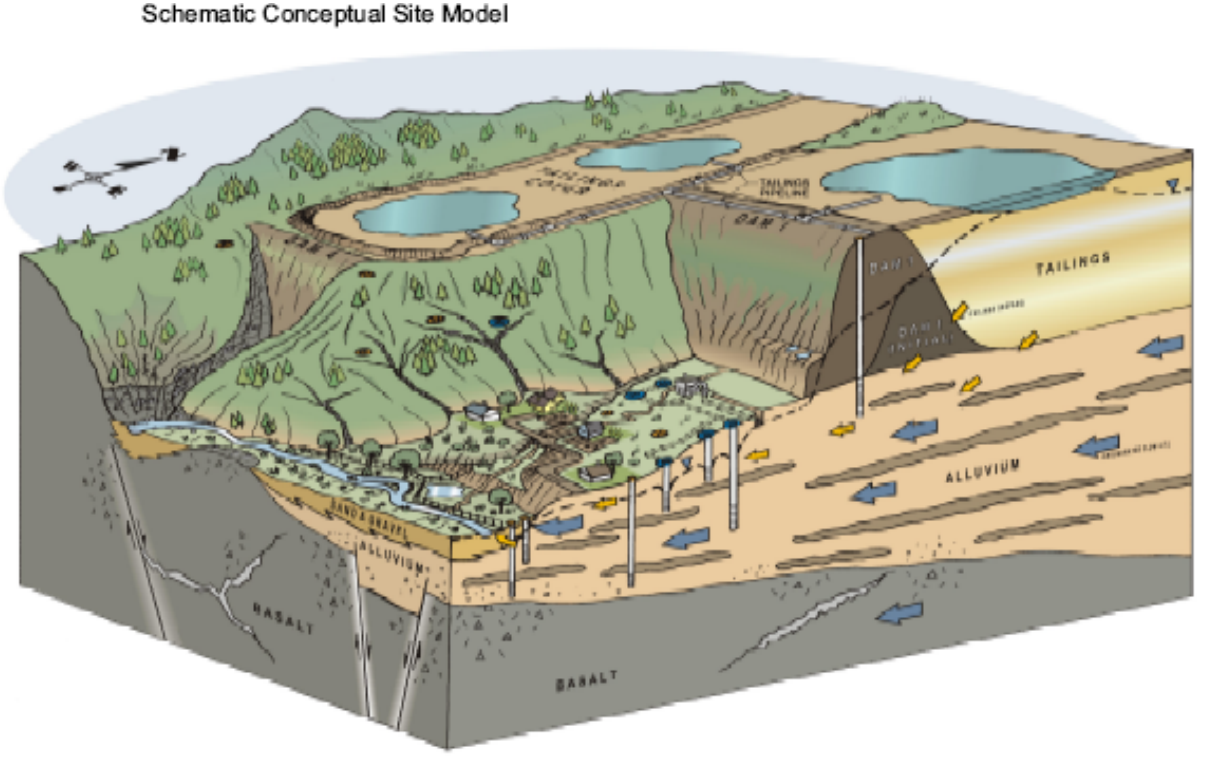
- Piezometers at LR-1, LR-8A and LR-16 were sampled as part of GSI #1 and #2 studies (October 2003 and April 2004)
- 15 samples were collected and analyzed for dissolved metals and inorganics

Data Collection Summary

- ~ 440 groundwater/seep samples were collected
- ~ 85 samples were in addition to what was planned in the Work Plan
- The collective groundwater and seep data have been used to assess the nature and extent of contamination
- Collection efforts have satisfied groundwater DQOs

Refinement of Tailings Facility Conceptual Model

EPA conceptual model presented at December 2004 Open House in Questa



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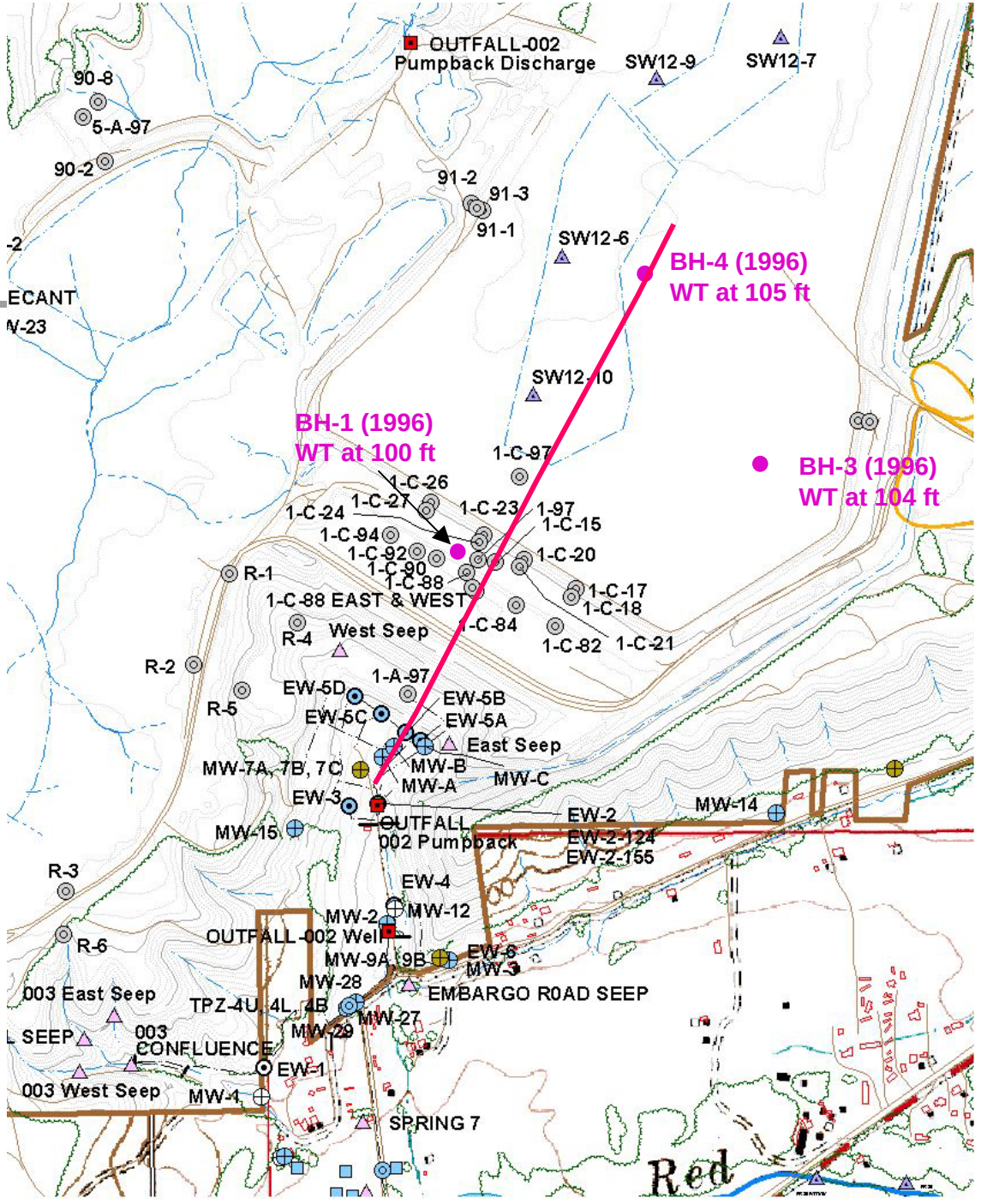
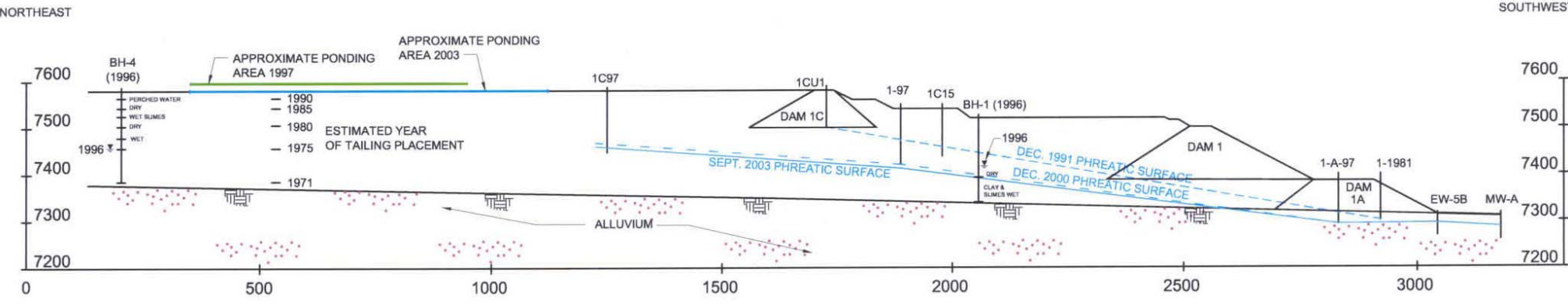
Refinement of Tailings Facility Conceptual Model

- Cross sections have been developed through Dam Nos. 1 and 4 utilizing data from:
  - Existing wells
  - Embankment piezometers and historical water levels (Vail Engineering)
  - Borehole logs through tailings (SRK 1996)

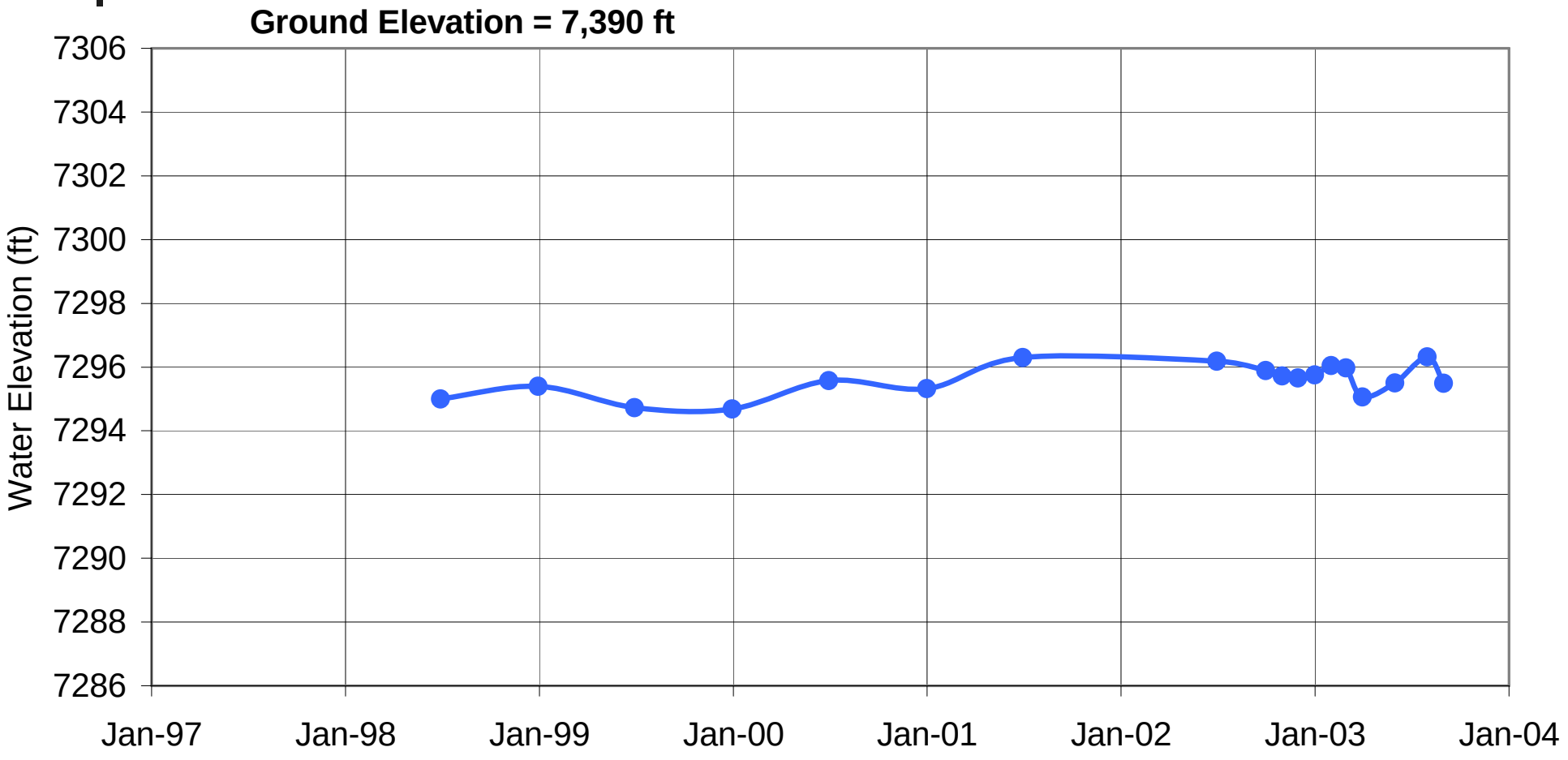
Cross Section Through Dam No. 1



Cross Section Through Dam No. 1



Piezometer 1-A-97



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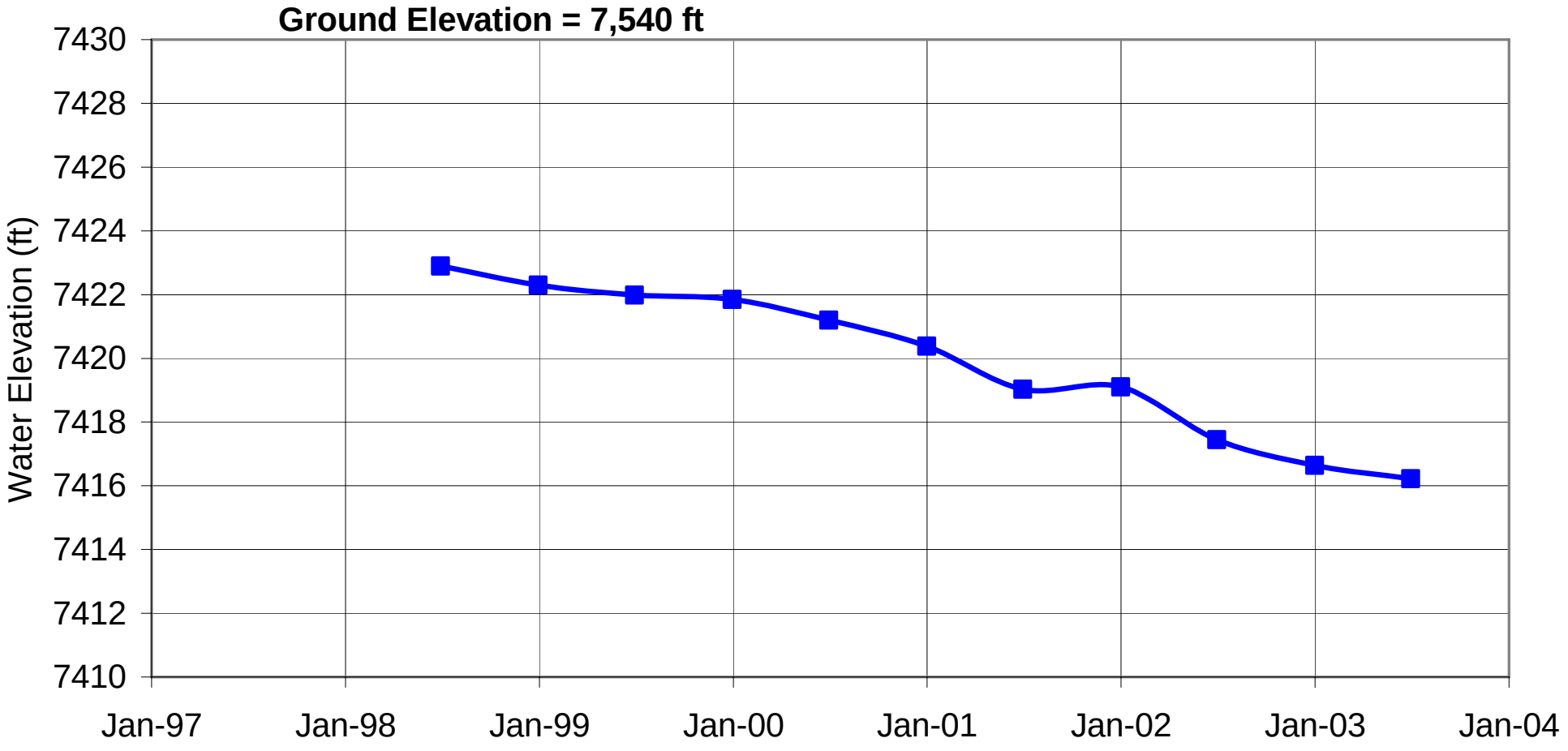
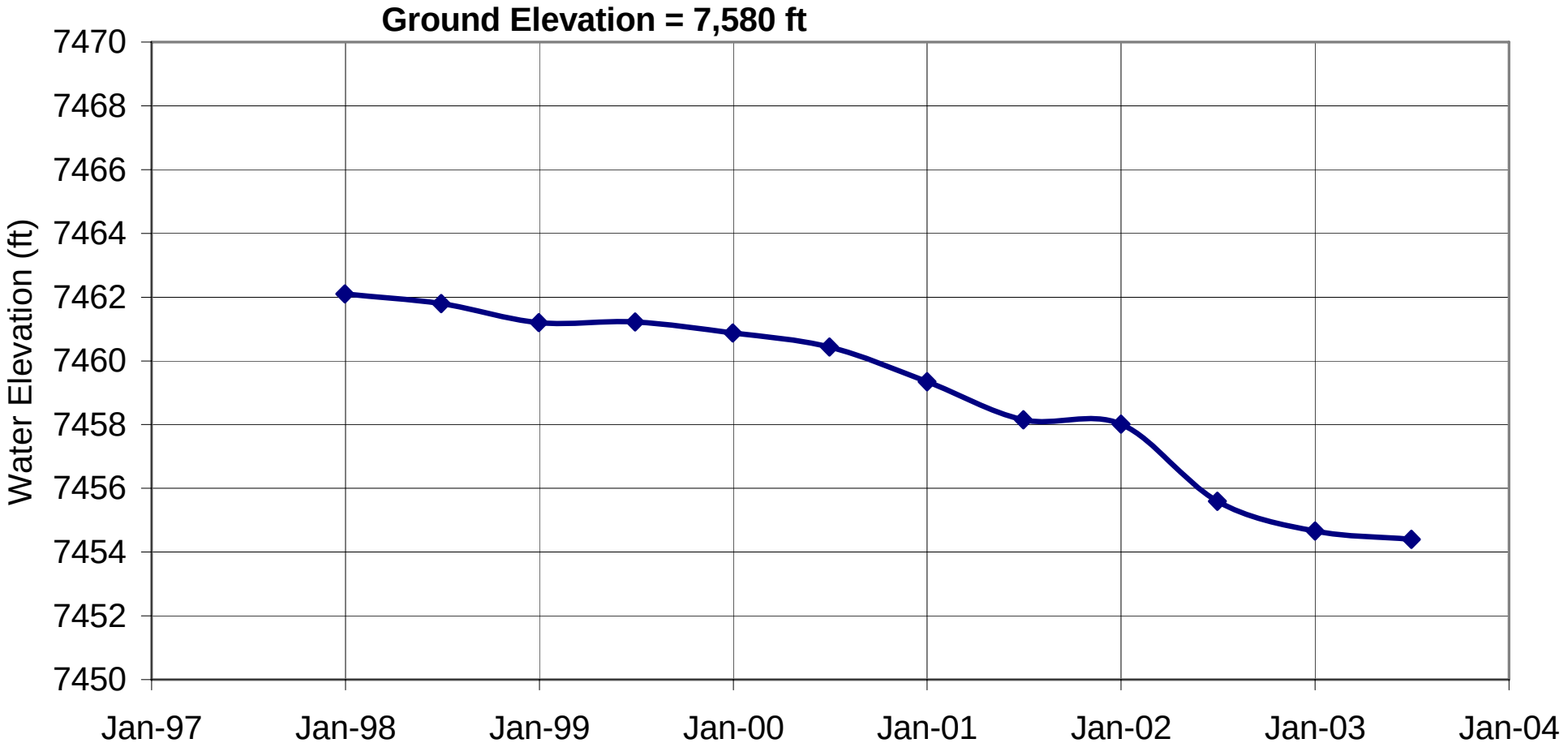
Piezometer 1-97



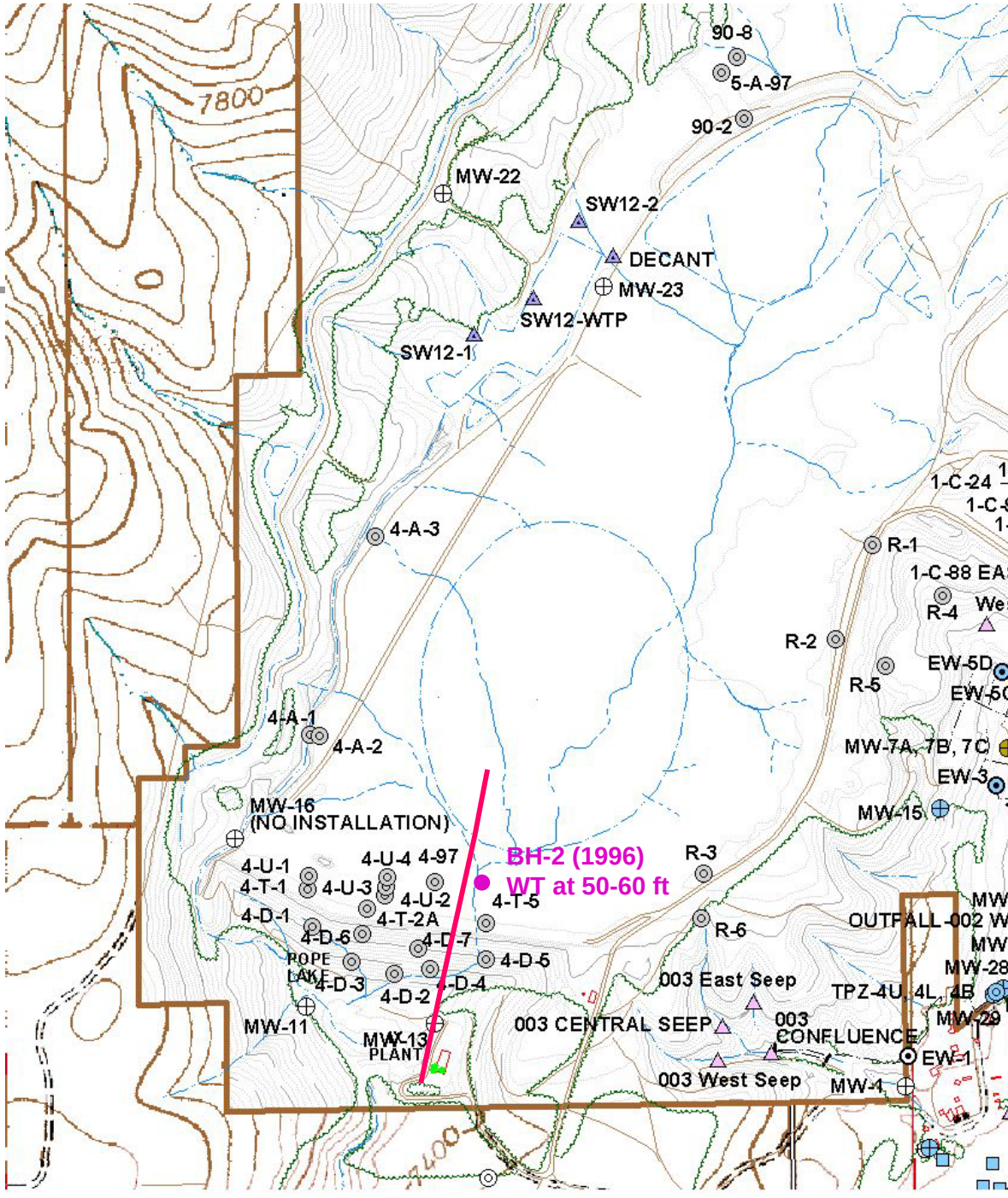
Piezometer 1-C-97



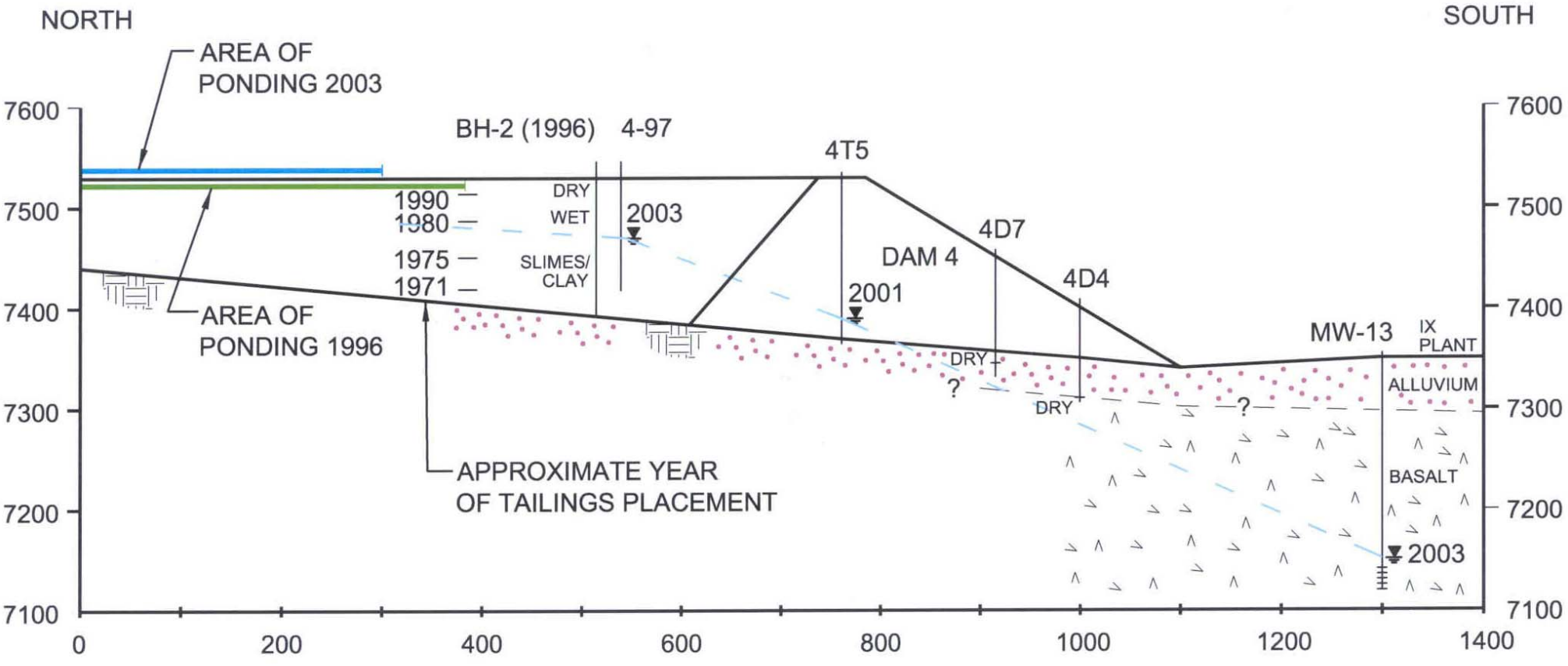
Summary - Dam No. 1

- Phreatic surface within the dam has been decreasing for past 14 years (since 1991)
- Borehole logs do not indicate a continuous saturation zone below the impounded water
- Instead, seepage is most likely discontinuous and perched by low permeable slimes and clay

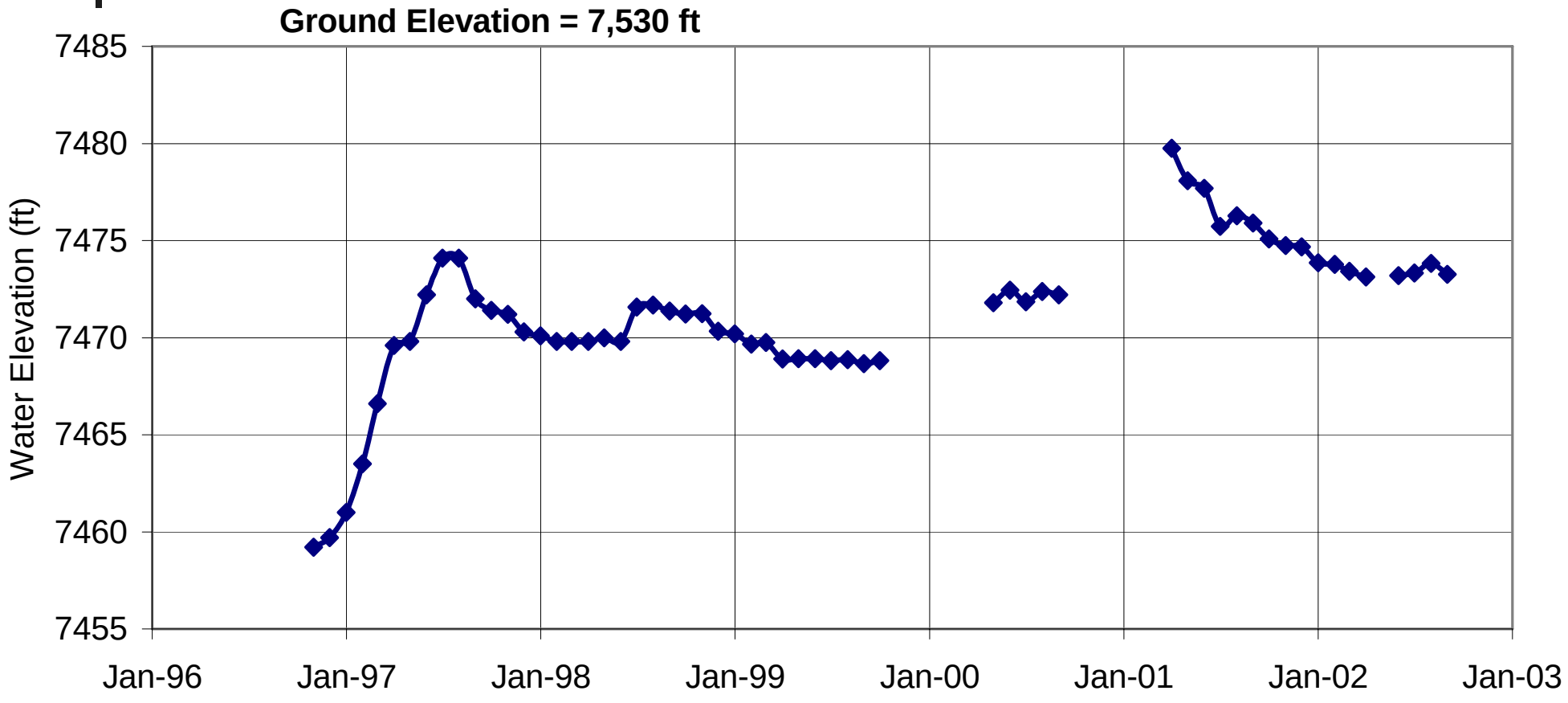
Cross Section Through Dam No. 4



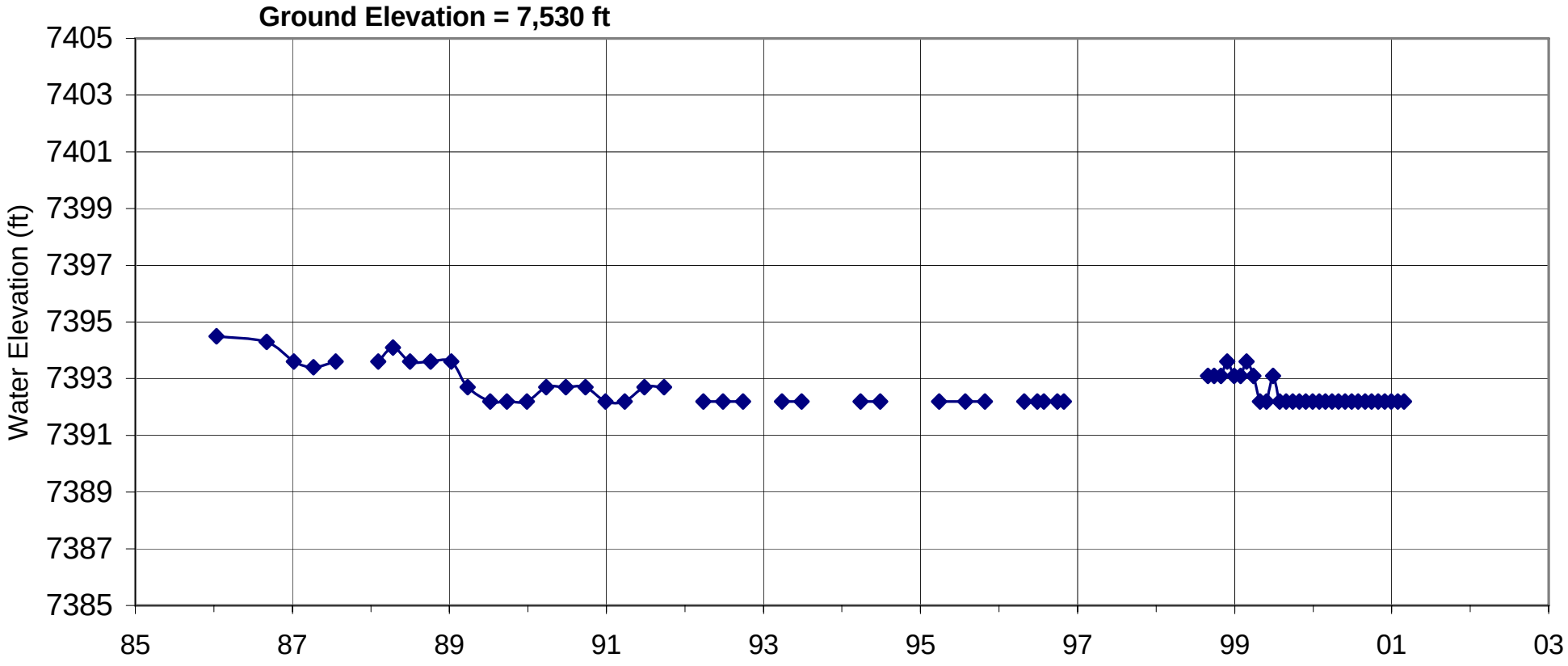
Cross Section Through Dam No. 4



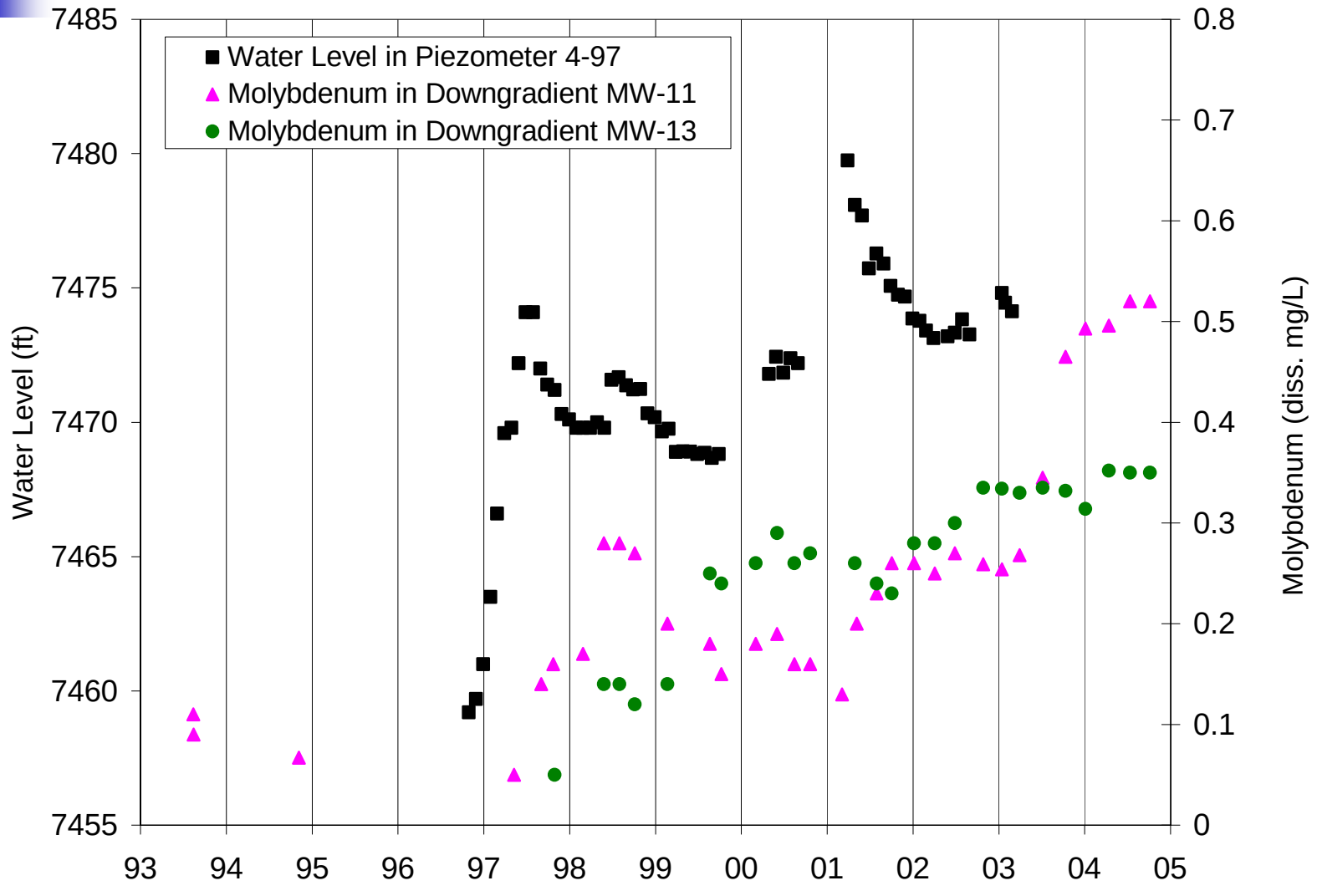
Piezometer 4-97



Piezometer 4T5



Relationship Between Water Levels and Molybdenum



Summary - Dam No. 4

- Water levels upstream of the dam rise and fall in response to water impounded near the dam
- The water level within the dam has remained relatively constant over time
- This suggests that seepage movement is vertical at the upstream face of the dam

Summary - Dam No. 4

- Like Dam No. 1, seepage is most likely discontinuous and perched by low permeable slimes and clay
- Molybdenum concentrations downgradient of Dam No. 4 appear to lag peak water levels by 1 to 3 years