TA-16-260 Outfall
Potential Release Site 16-021(c)

LANL's First CMS/CMI

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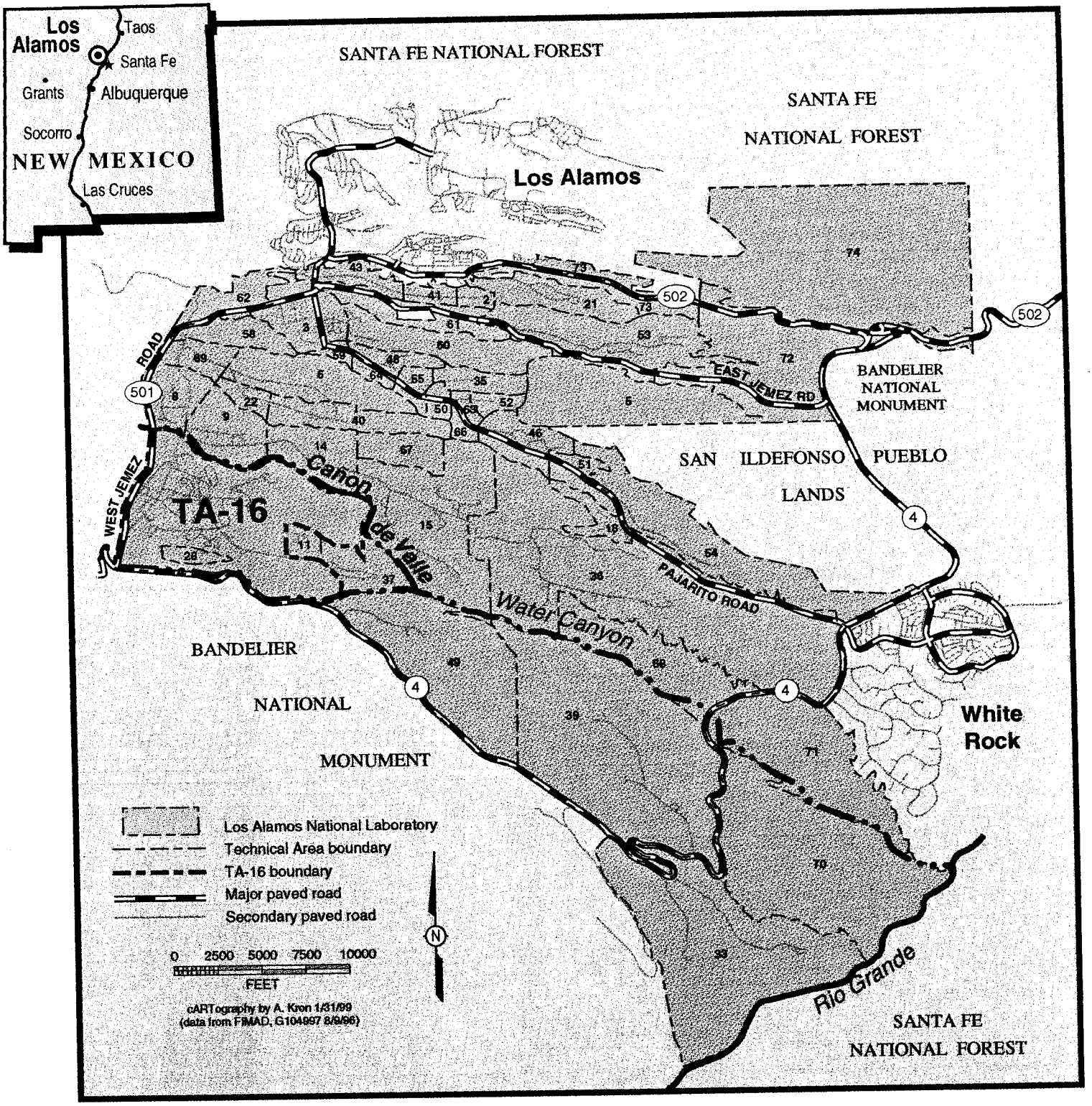
3/4/99

6152

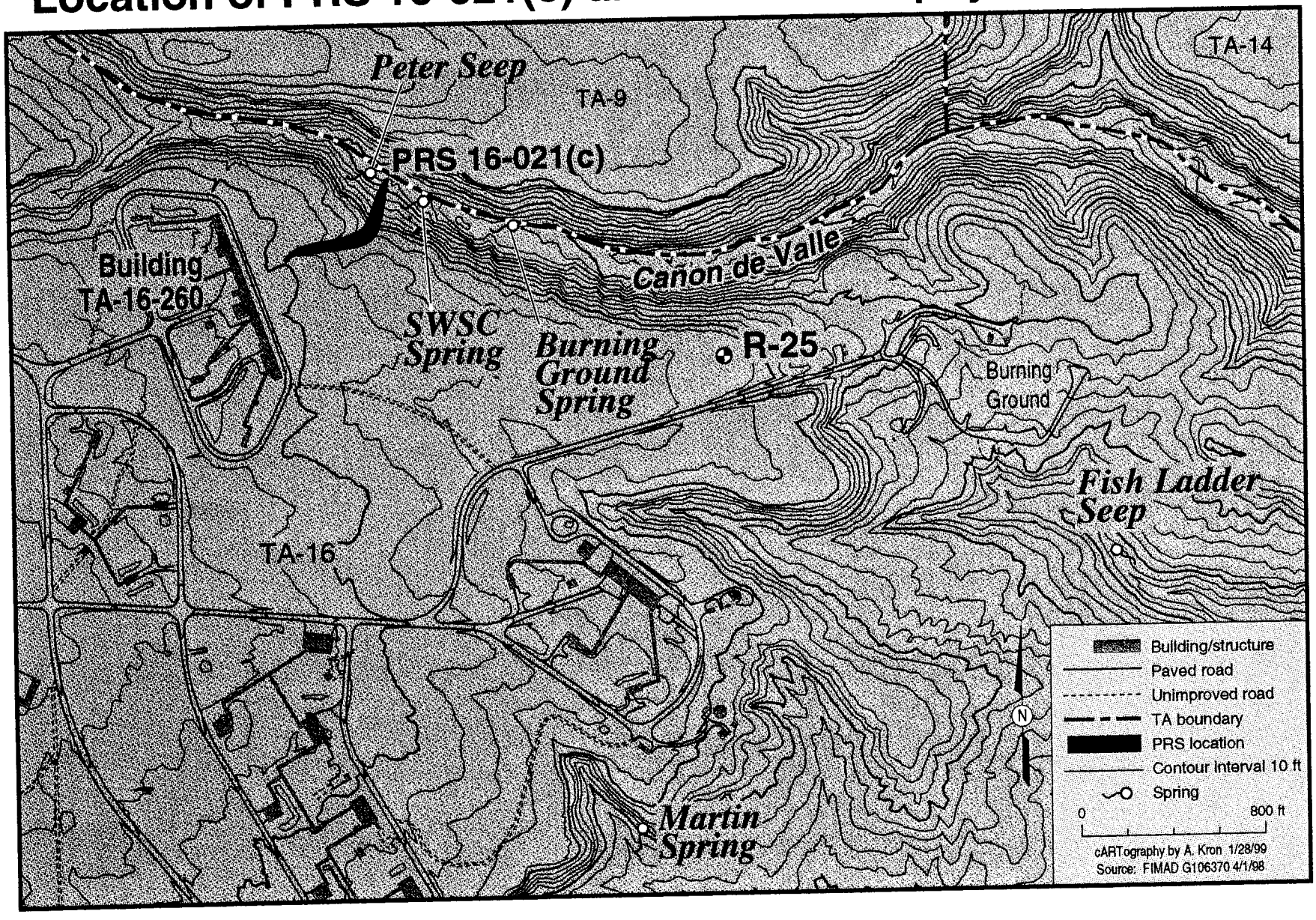
Outline

- TA-16-260 outfall background
- Previous activities
  - BMPs
  - Sampling results for outfall, springs, and Canon de Valle
- Hydrologic activities
- Ongoing CMS activities

Goal - Inform Groundwater Bureau of TA-16-260 activities in order to involve in cleanup decisions


Los Alamos
Taos
Santa Fe
Grants
Albuquerque
Socorro
NEW MEXICO
Las Cruces
SANTA FE NATIONAL FOREST
SANTA FE NATIONAL FOREST
Los Alamos
502
501
ROAD
WEST JEMEZ
EAST JEMEZ RD
BANDELIER NATIONAL MONUMENT
SAN ILDEFONSO PUEBLO LANDS
TA-16
Cañon de Valle
Water Canyon
PAJARITO ROAD
4
BANDELIER NATIONAL MONUMENT
White Rock
Rio Grande
SANTA FE NATIONAL FOREST
Los Alamos National Laboratory
Technical Area boundary
TA-16 boundary
Major paved road
Secondary paved road
0 2500 5000 7500 10000
FEET
N
cARTography by A. Kron 1/31/99
(data from FIMAD, G104997 8/9/96)

Location of PRS 16-021(c) and associated physical features



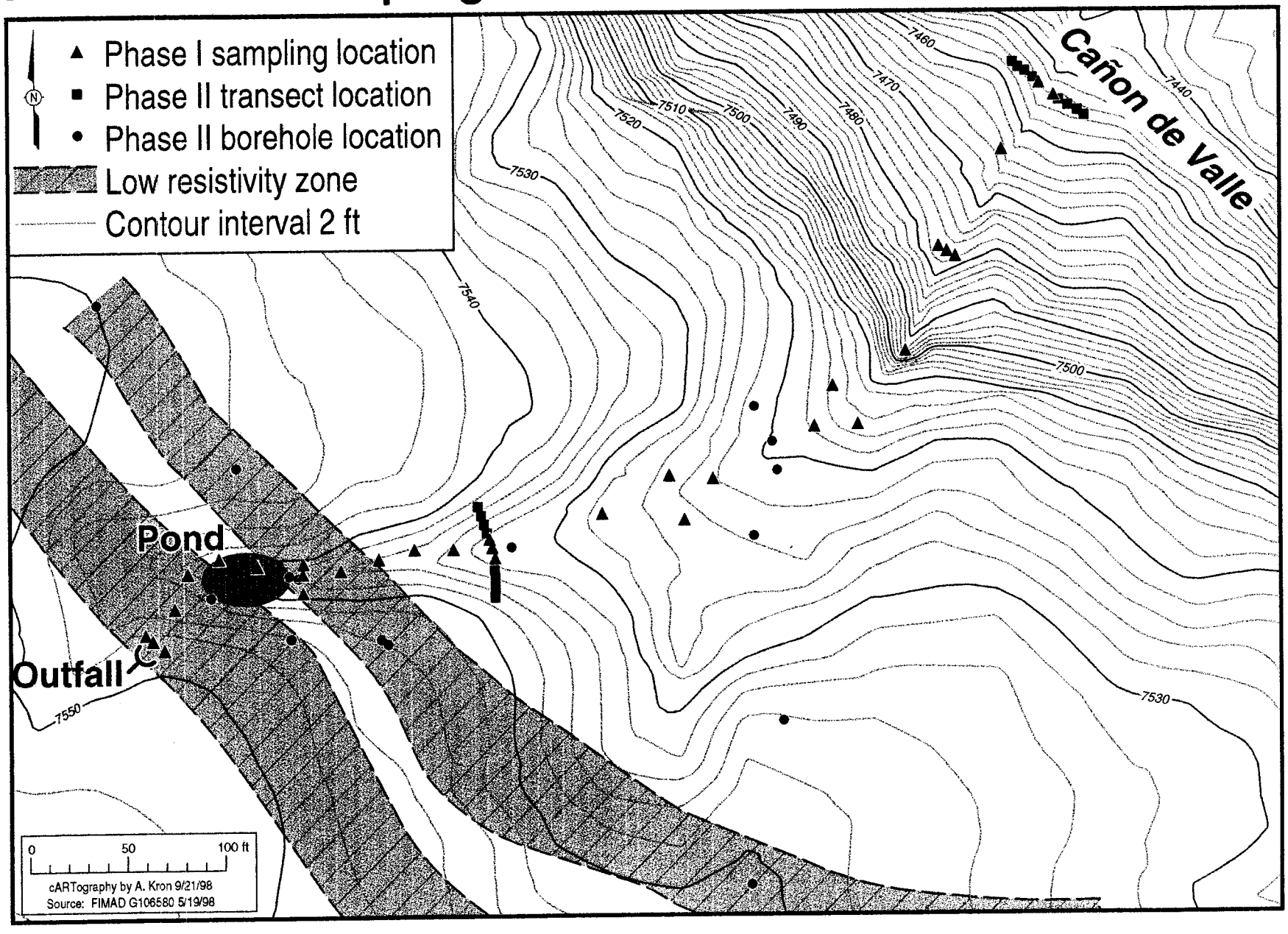
TA-16-260 (PRS 16-021(c)) Outfall Background

- TA-16-260 is LANL's HE machining facility
- TA-16-260 outfall received HE contaminated waste water from 1951 to 1996
- Primary contaminants are HE (particularly RDX) and barium
- Soil HE levels range to 20+ wt%, barium to 20 000+ ppm
- Nearby springs, seeps, Canon de Valle and perched & regional aquifers are all contaminated with HE
- Canon de Valle hosts a species identified as threatened and endangered

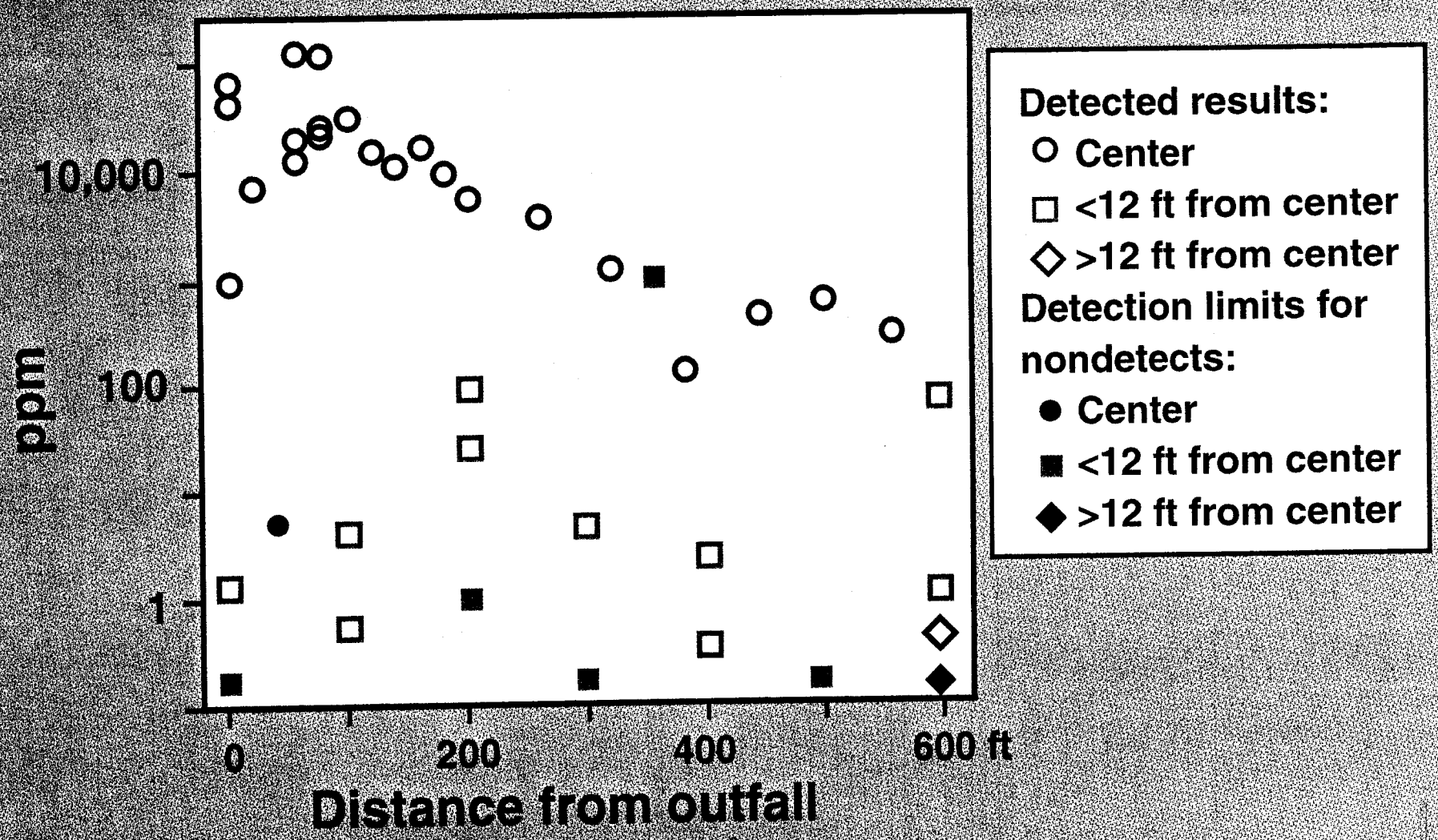
Previous Activities & Documents

- Installation of Best Management practices (1995-1998)
- RFI Work plan (1993-1995)
- Phase I sampling (1995)
- Phase I RFI Report (September 1996) *Approved by HRMB 3/98*
- Phase II Sampling (1996-present)
- Phase II RFI Report and CMS Plan (September 1998)

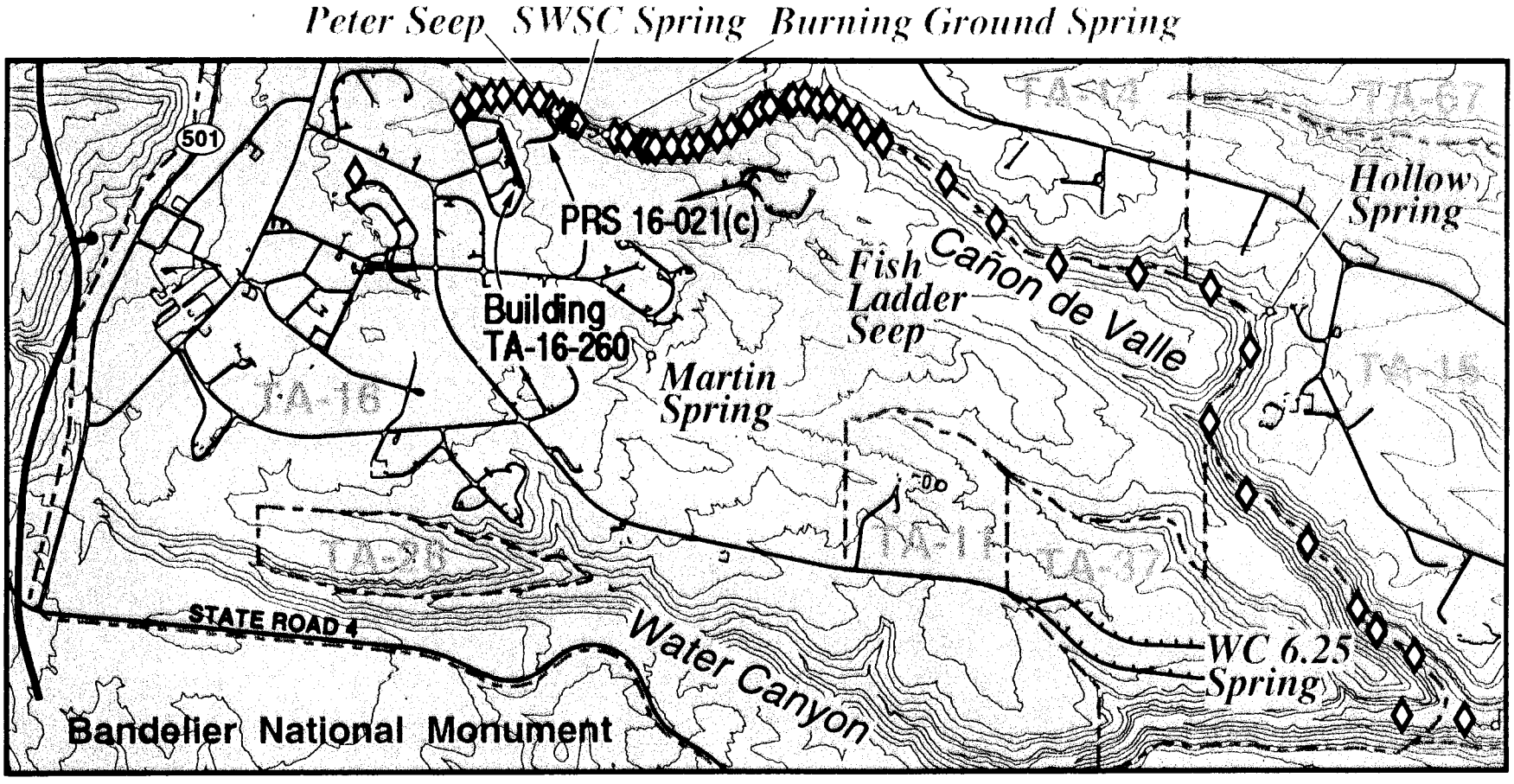
Phase I and II sampling locations for the TA-16-260 outfall



Trend plot for RDX in outfall drainage sediments



Cañon de Valle sample locations



Paved road
TA boundary
Contour interval 50 ft
Spring or seep
Pajarito Fault Zone
(bar and ball on downthrown side)

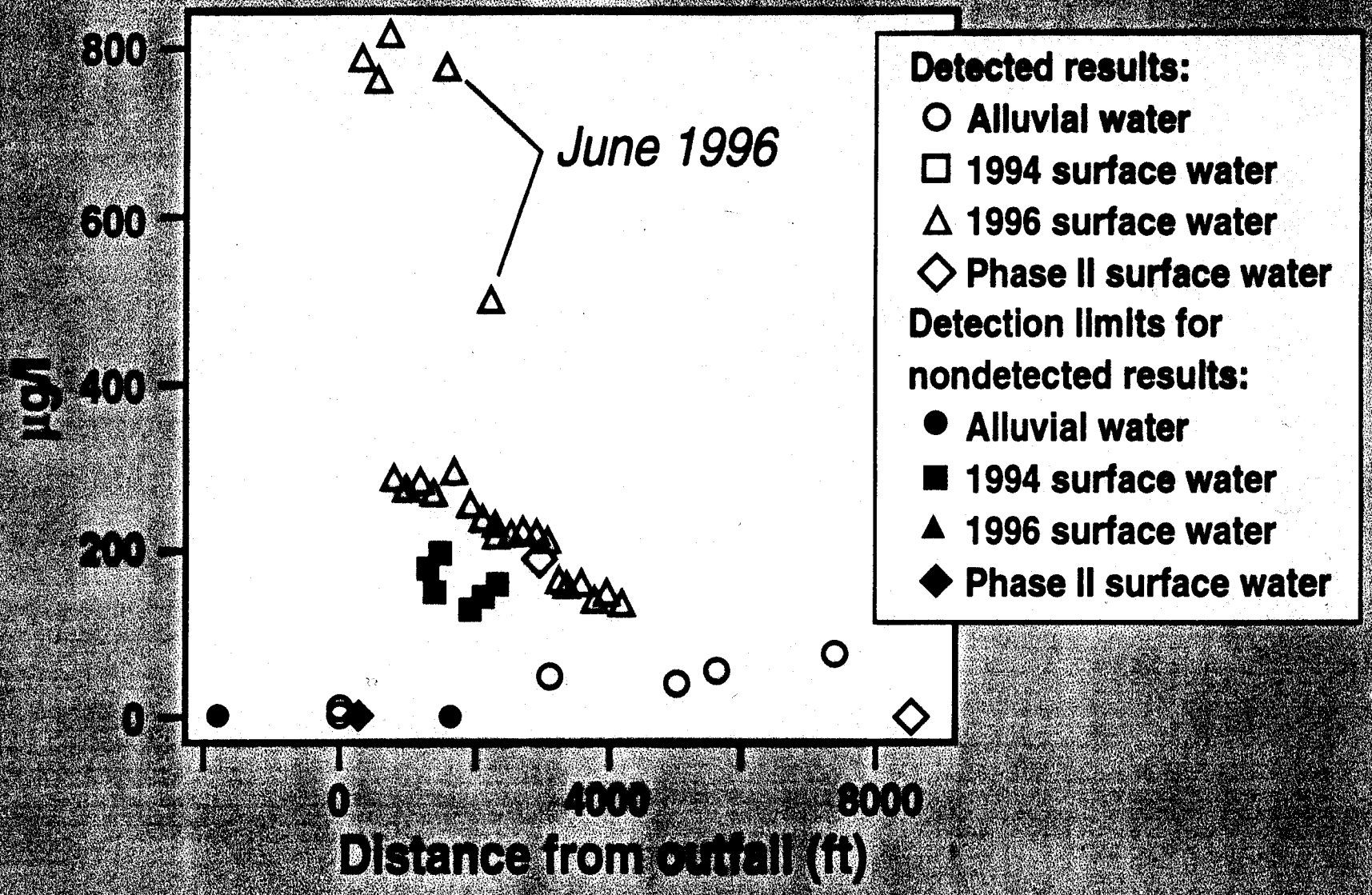
◊ Sample location

0 1000 2000 ft

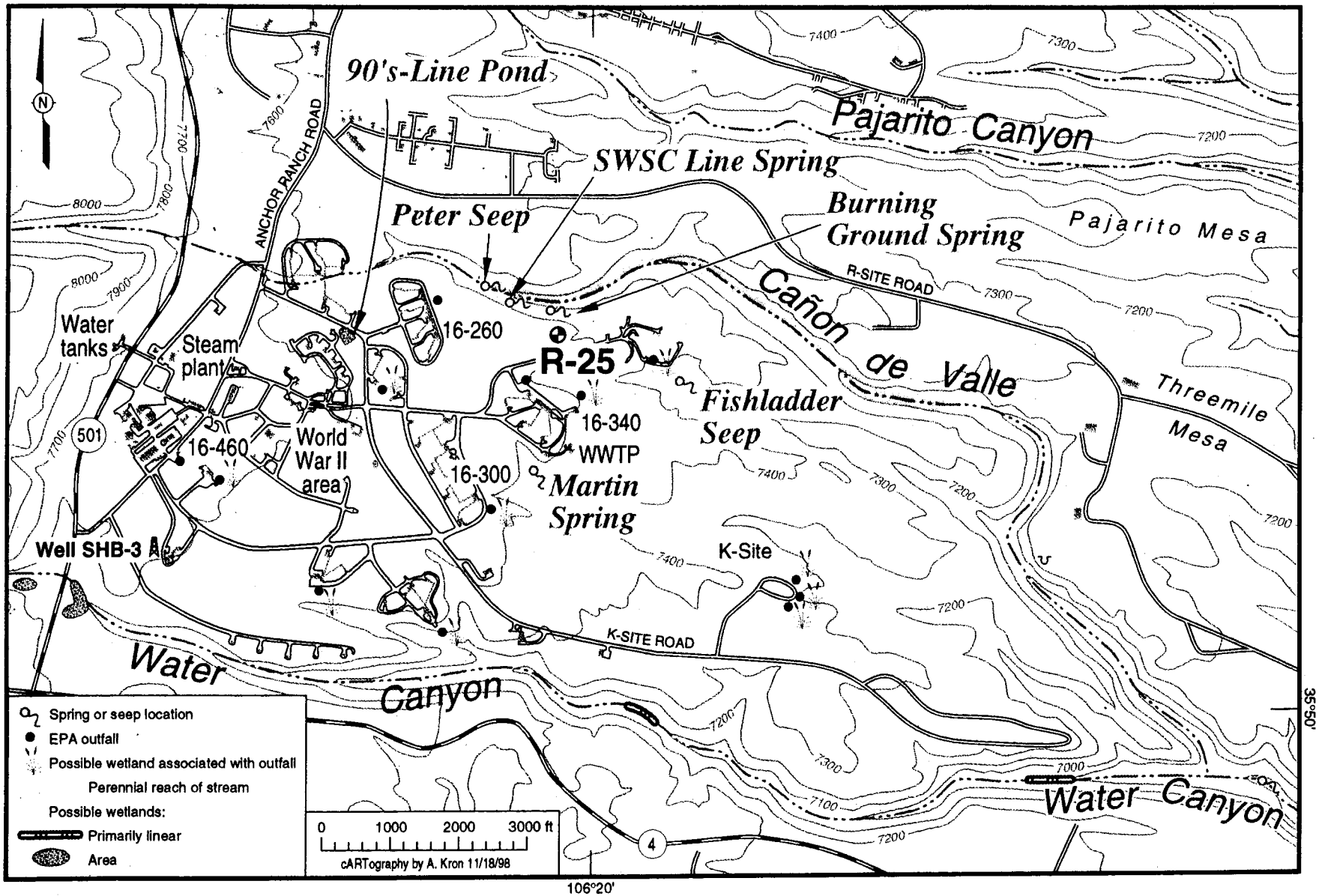
cARTography by A. Kron 1/14/99
Source: FIMAD G106370 4/1/98

N

RDX (unfiltered) in Cañon de Valle water



Spring, surface water and other water sources

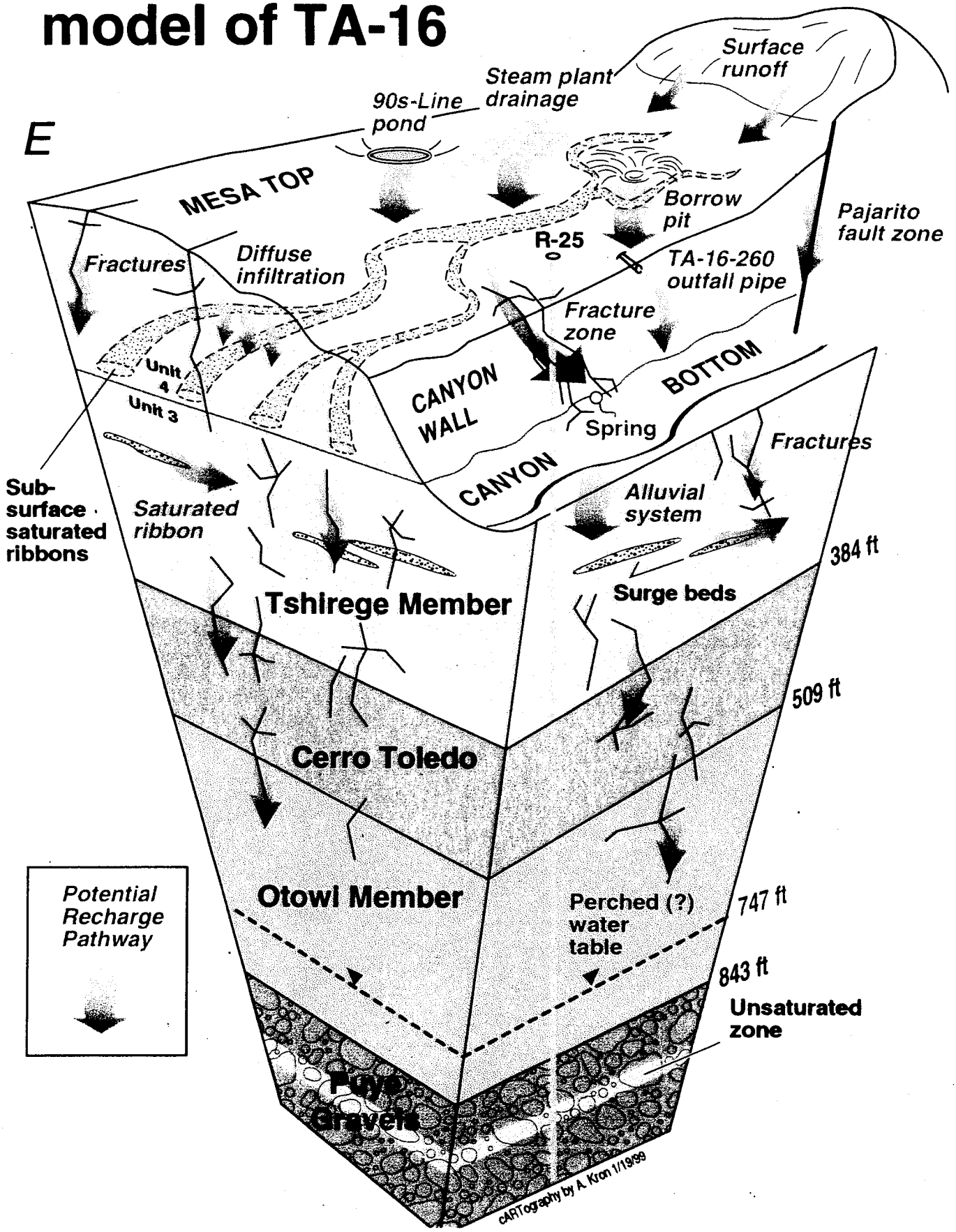


Historic Flow Rates for Major TA-16 Water Sources

Site	*Flow (M gpy)*	*Year*	*Active*
• WWTP	~ 6.6	Avg.	No
• TA-16-300*	5.3	1994	No
• TA-16-460*	3.9	1994	No
• TA-16-340*	3.6	1994	No
• Steam Plant	~ 3.1	Avg.	No
• TA-16-260***	2.5	1994	No
• Water tanks	??	NA	??
• WWII area*	??	NA	90s Ln Pd

* Potential HE source

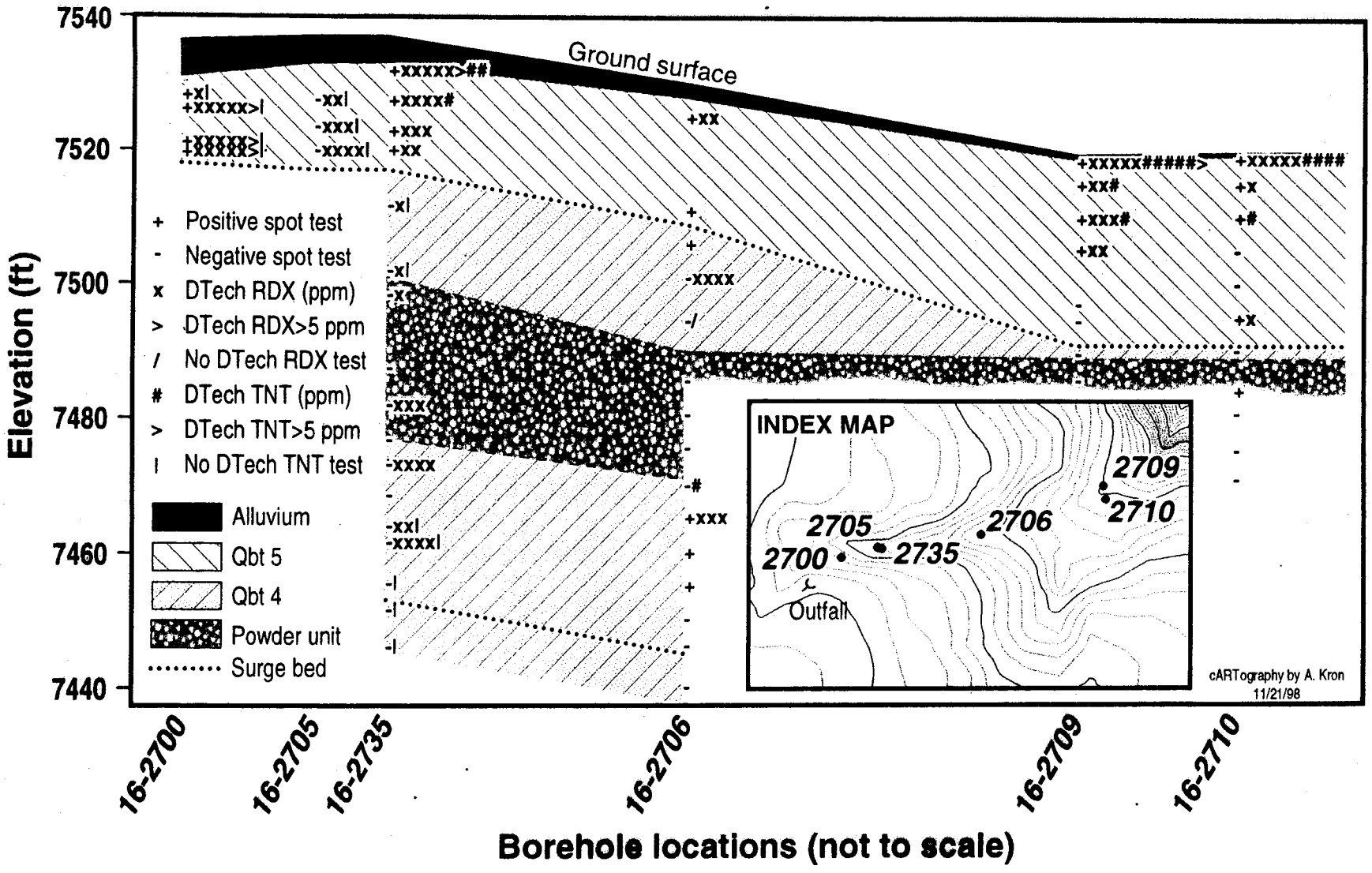
Conceptual hydrologic model of TA-16



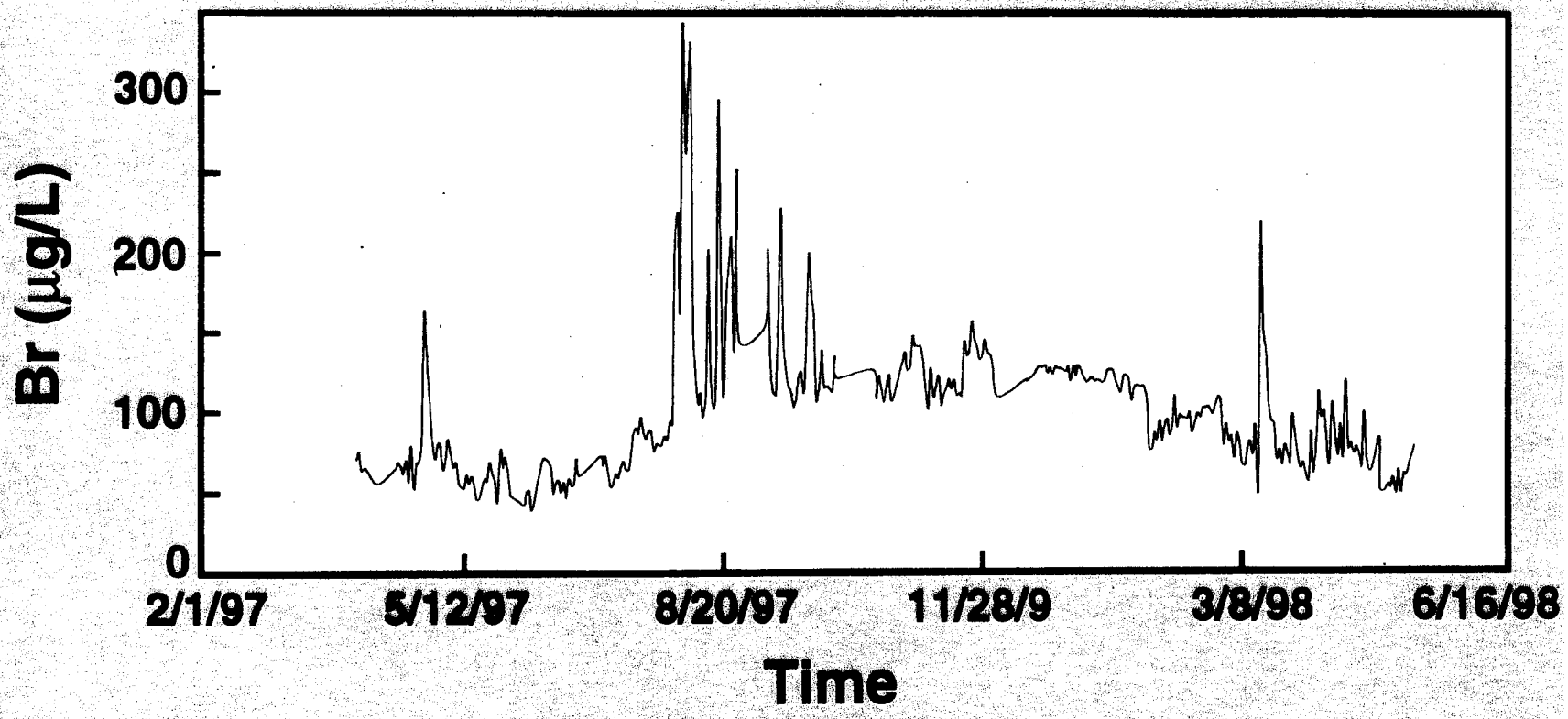
TA-16 Hydrologic Properties Summary

Borehole	Depth (ft)	Unit	θv	ρb	porosity	Ks cm/sec	welding
Bldg 300	10.5	5	7	1.73	34.9	1.40E-05	partly
Bldg 300	19	5	4	1.97	25.8	1.20E-06	partly
Bldg 300	31	4	2	1.3	51	3.80E-03	surge?
SWSC	70.5	4	8	2.13	19.8	1.70E-08	densely
90's line	90	4t	7	2.17	18	2.00E-08	densely
SWSC	89	4t	5	2.21	16.5	9.80E-09	densely
SWSC	100.5	3t	7	2.16	18.4	2.80E-08	densely
SWSC	120.5	3t	15	1.42	46.6	5.00E-04	surge?
SWSC	129.5	3	5	1.71	35.6	5.80E-05	poorly

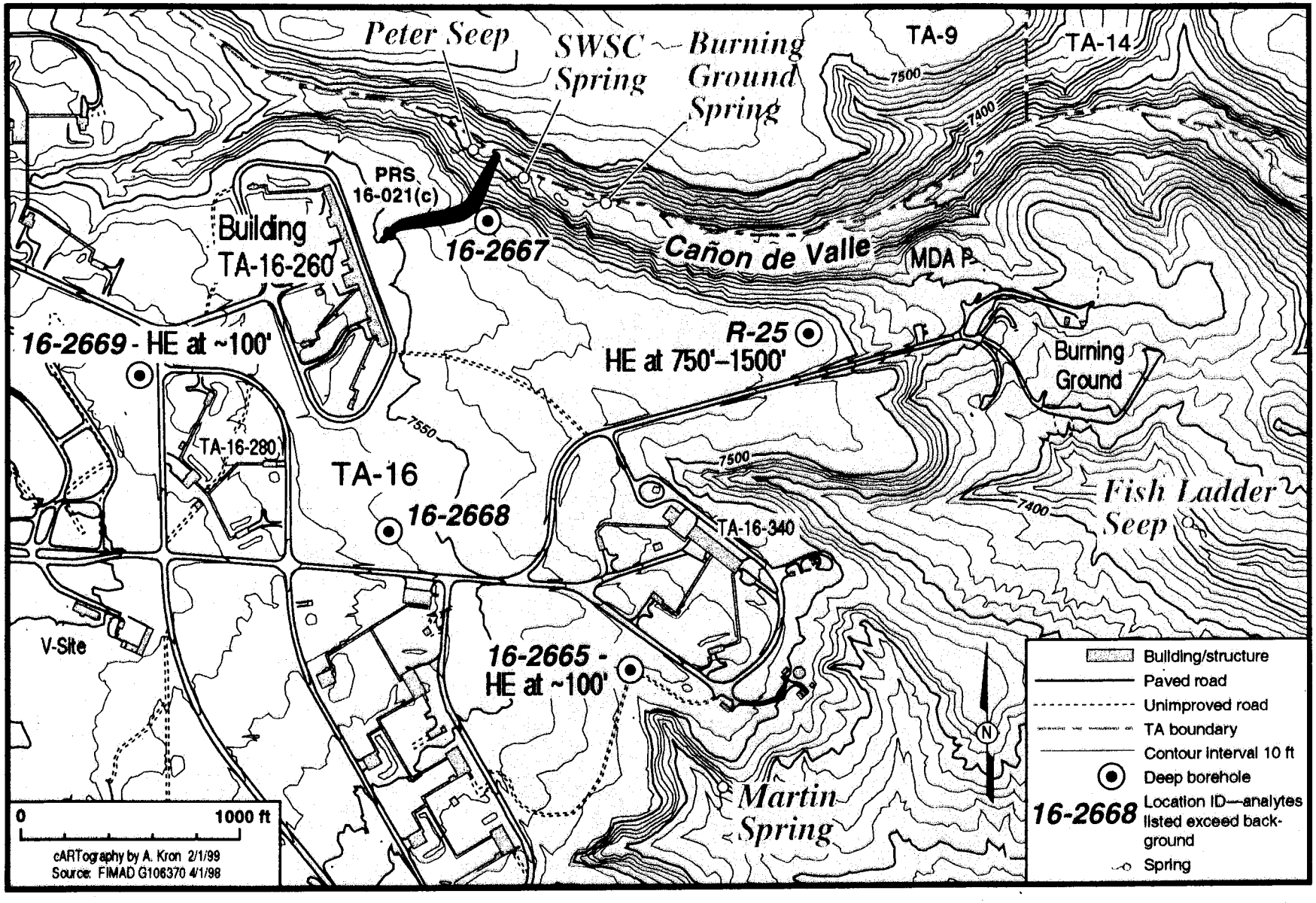
HE screening results in tuff below drainage channel



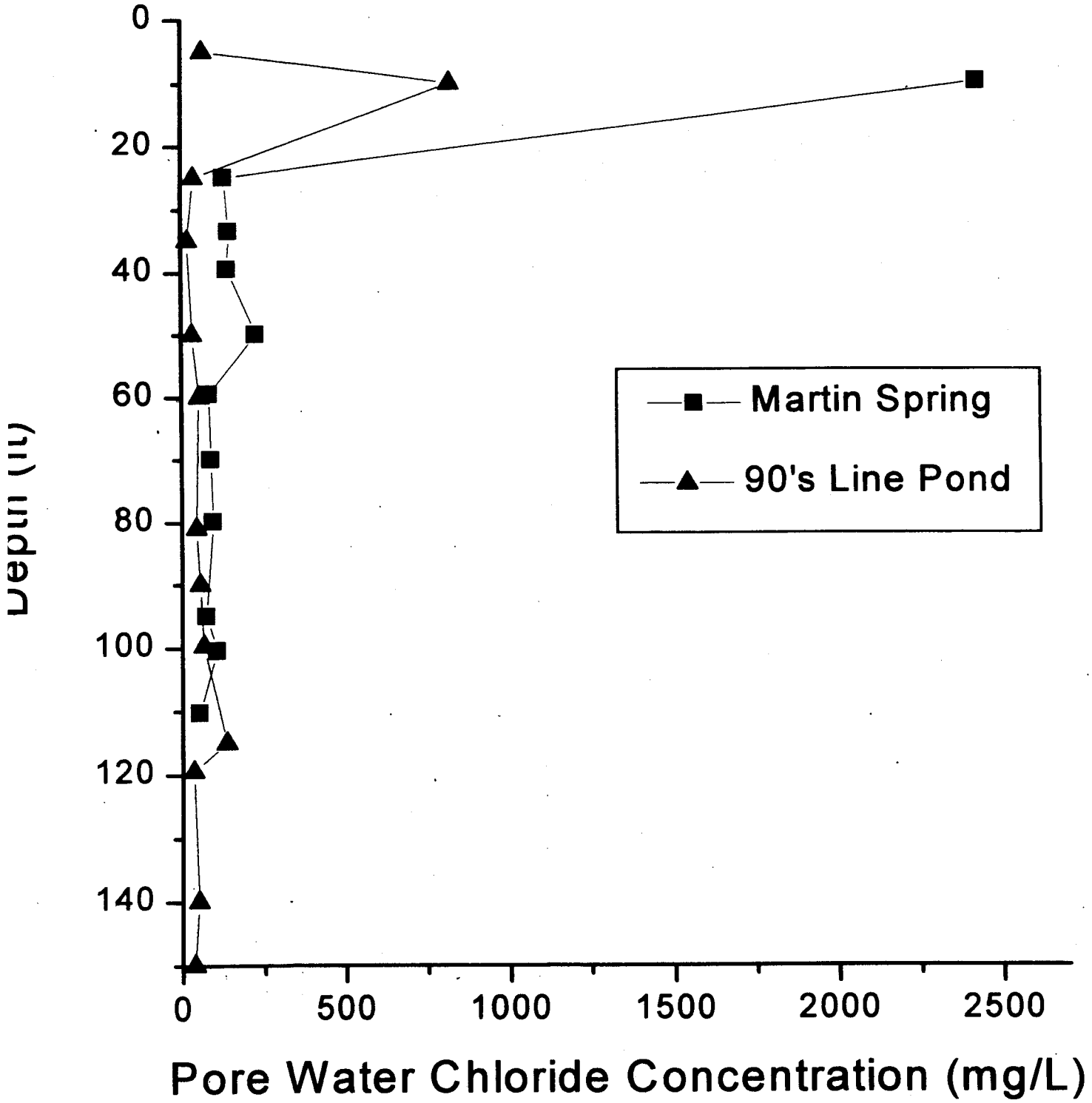
Bromide concentration vs time for SWSC Spring

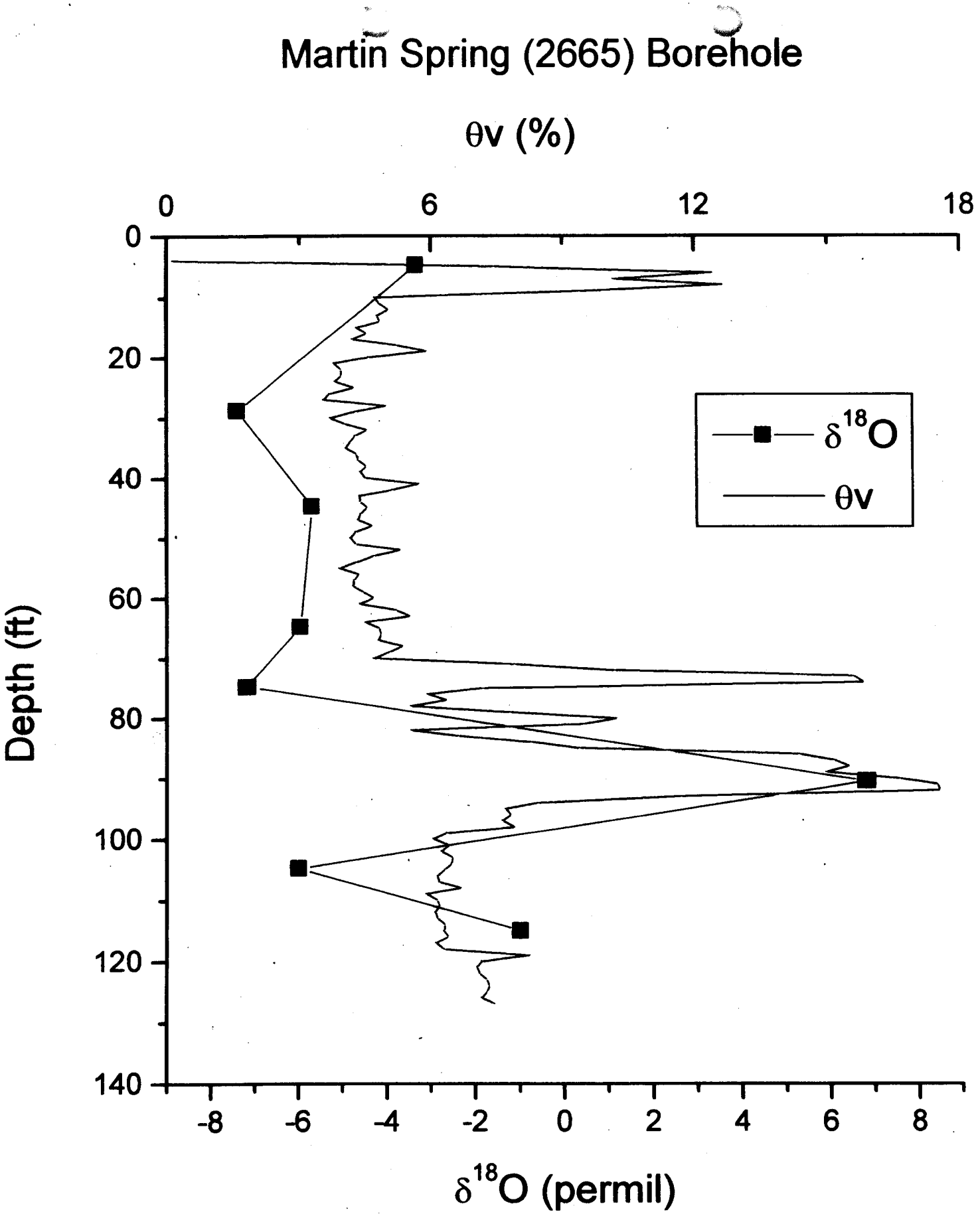


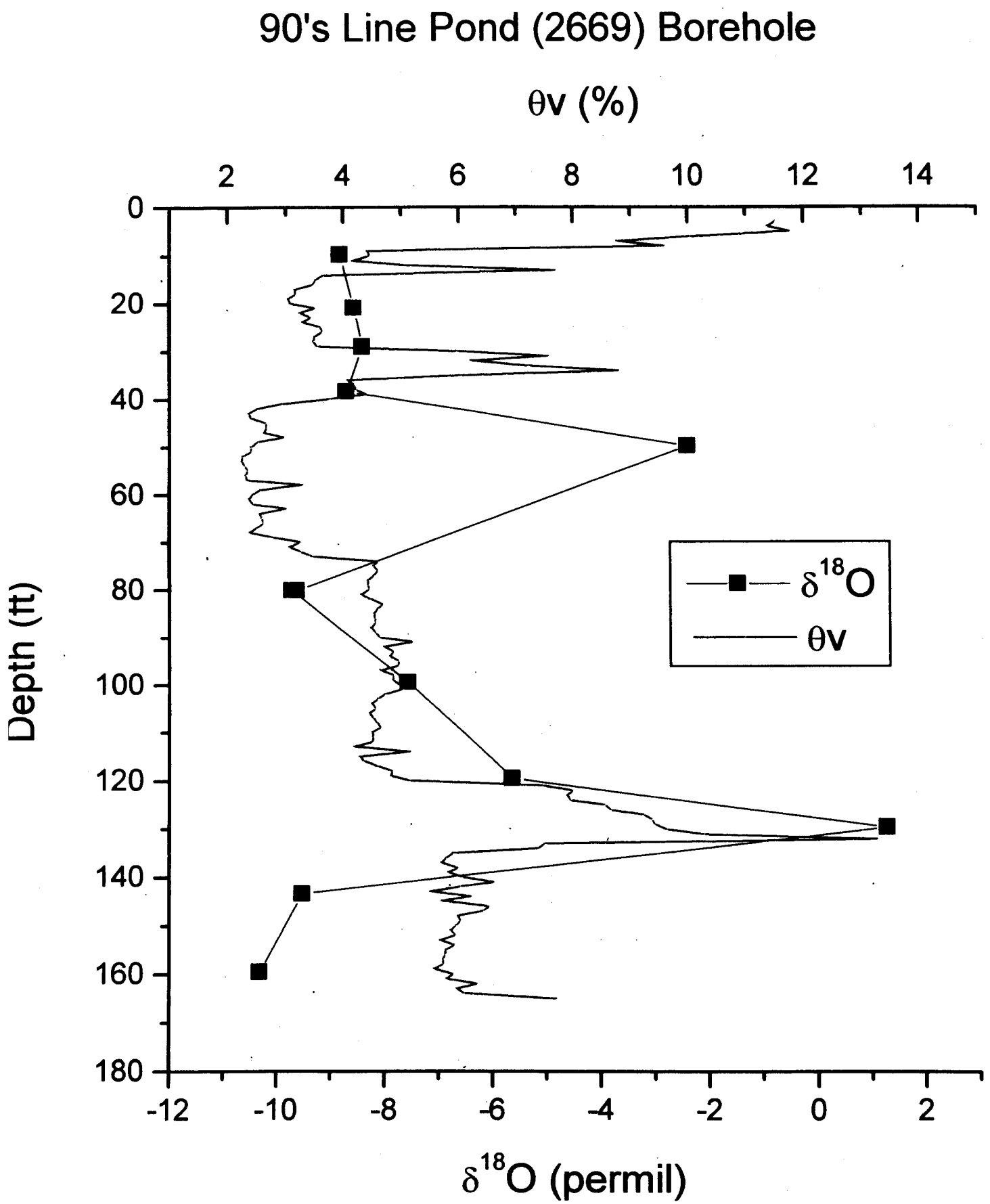
Deep boreholes showing constituents above background (in water)

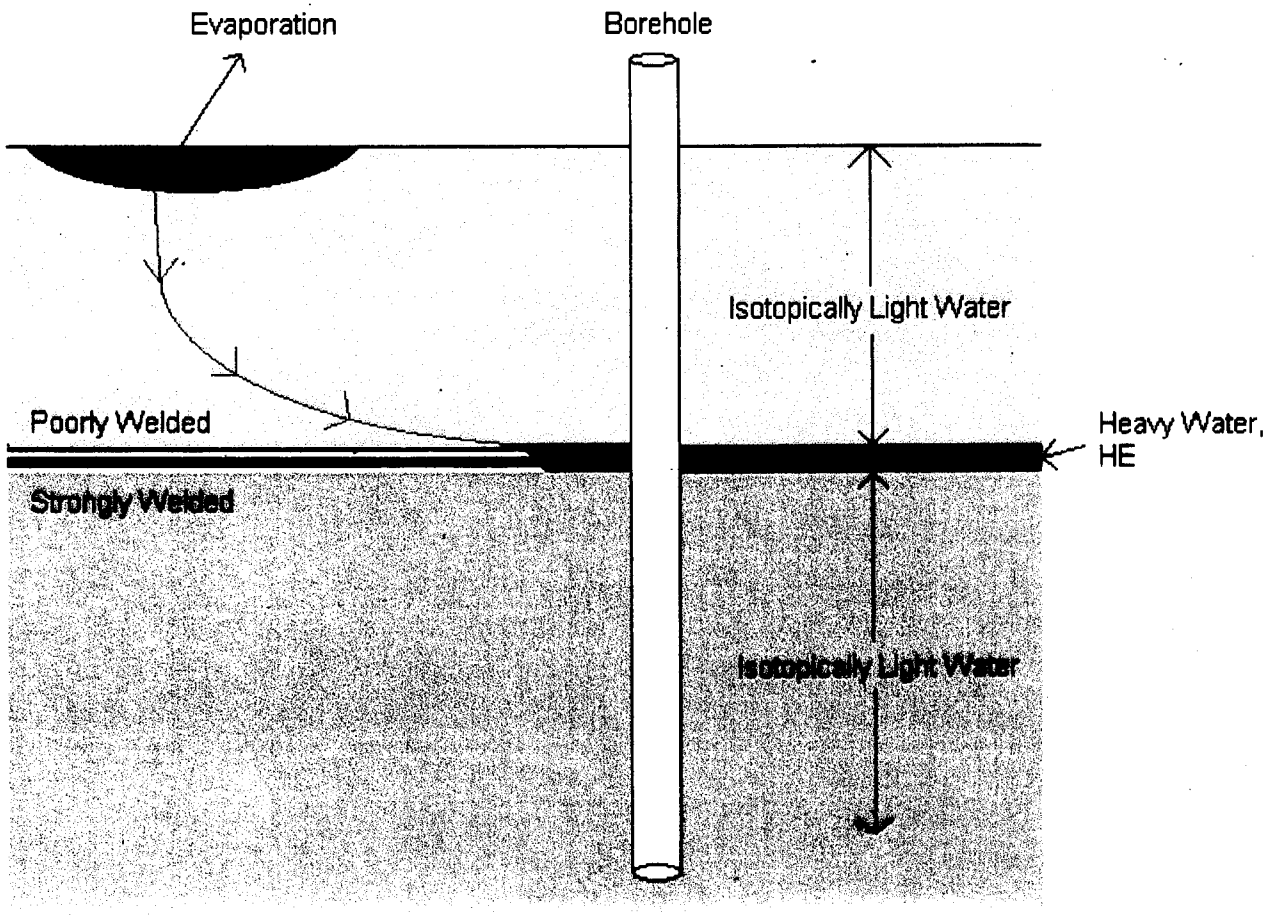


Martin Spring and 90's Line Pond




Martin Spring (2665) Borehole
θv (%)
0
6
12
18
0
20
40
60
80
100
120
140
Depth (ft)
δ18O
θv
-8
-6
-4
-2
0
2
4
6
8
δ18O (permil)


90's Line Pond (2669) Borehole
θv (%)
2
4
6
8
10
12
14
0
20
40
60
80
100
120
140
160
180
Depth (ft)
δ18O
θv
-12
-10
-8
-6
-4
-2
0
2
δ18O (permil)



Conceptual Model of saturated zone development in the Martin Spring and 90's Line Pond boreholes at TA-16.

Ongoing & Upcoming Activities

- Continued hydrologic sampling to understand contaminant pathways. R-25 results may change scope of these invesitgations.
- CMS investigations of water and soil treatment technologies through ITRD project are ongoing
- Interim Measure (IM) source removal scheduled for late 1999.
- CMS Report (including baseline risk assessment) scheduled for late 2000.
- CMI scheduled for 2001 to 2003, with continued long-term monitoring.

How Can Groundwater Bureau Help?

- LANL needs involvement in remedy selection.
- LANL needs involvement in cleanup level decisions.
- LANL needs involvement in permitting.

LANL would like to schedule a site tour during late spring 1999.

More information at:
http://erinternal.lanl.gov/Organization/RemAct.htm