Fort Detrick Remedial Investigation/Feasibility Study

Status Update

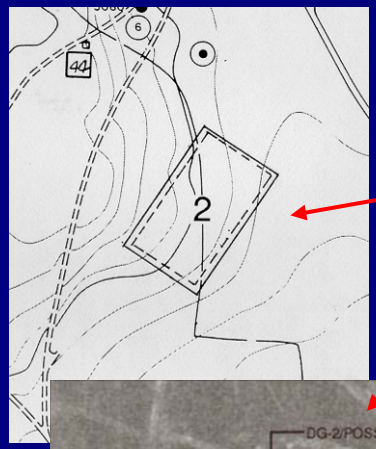
Fort Detrick Restoration Advisory Board Meeting
4 January 2007
Fort Detrick, Maryland

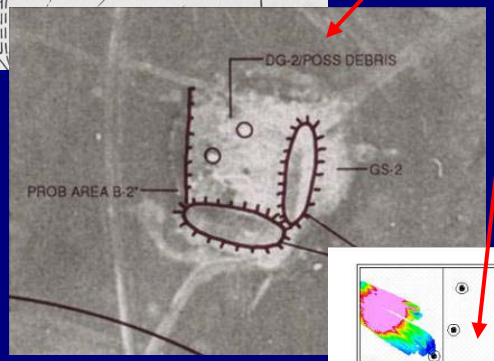
Status Update Discussion

- Area B Former Disposal Sites
  - Area B-2 (FTD 50)
  - Area B-3 (FTD 51)
  - Area B-6 (FTD 69)
  - Area B-8 and the Trenches North of B-8 (FTD 70)
  - Area B-10 and B-10 Grove FTD (71)
  - Area B-11 (FTD 49)
  - Area B-18
- Area B Five Sites (formerly Close-out Sites)
  - B-Ammo
  - B-20 North
  - B-20 South
  - B-Grid
  - B-Skeet
- Area B Groundwater
- Area A Long Term Monitoring

Area B Former Disposal Sites

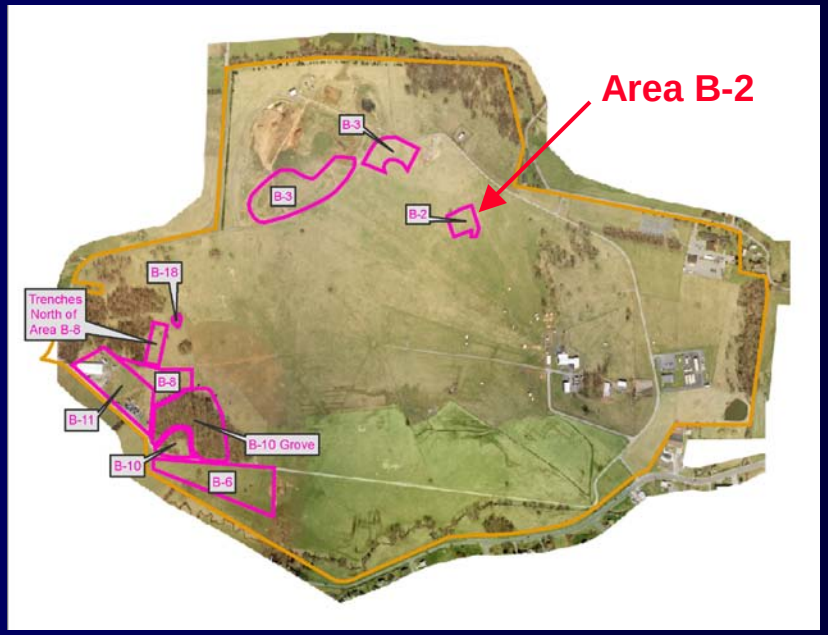
Area B Former Disposal Sites
Area B-2 (FTD 50)

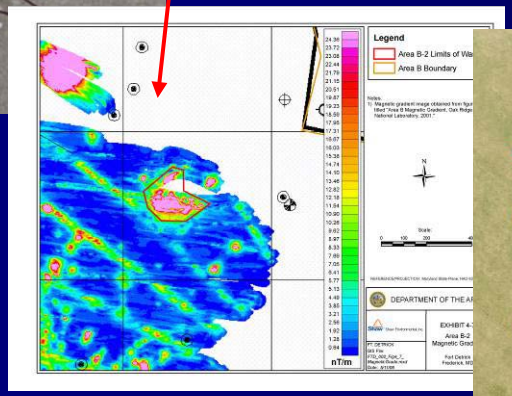


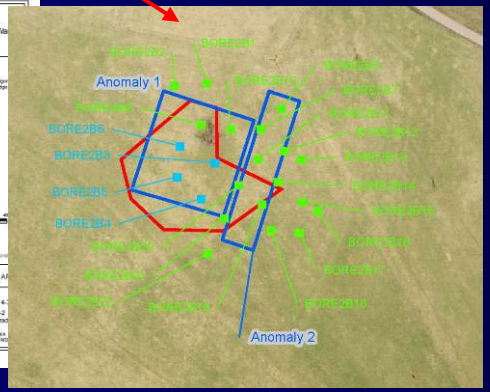


Area B-2 Limits of Waste Disposal determined through analysis of:

- **Historical maps**
- **Aerial photography**
- **Geophysics**
- **Soil borings**



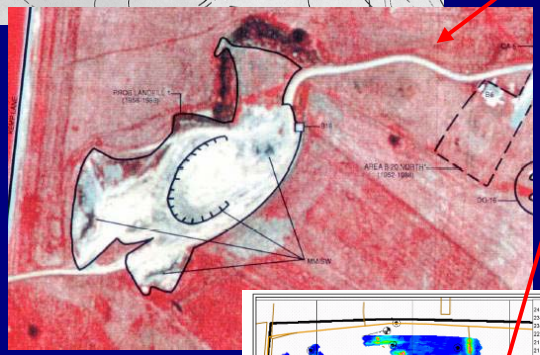


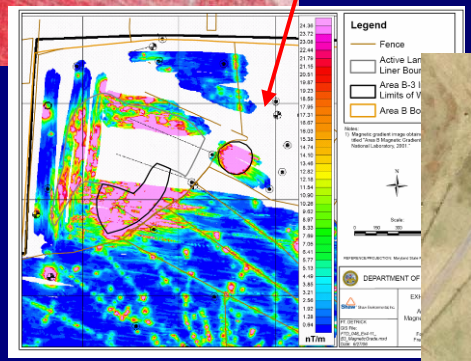


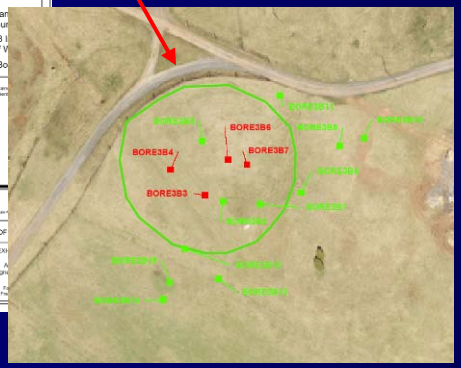
Area B Former Disposal Sites
Area B-2 (FTD 50)

- ✓Draft RI/FS submitted to MDE 12 July 2006
- ✓MDE Comments Received 17 August 2006
- ✓Document finalized October 2006
- Proposed Plan is under Army Review for Landfill Cap as the Remedy
- Public Comment Period and Record of Decision in early 2007
- Landfill Cap design in 2007
- Landfill Cap installation in 2008

Area B Former Disposal Sites
Area B-3 (FTD 51)

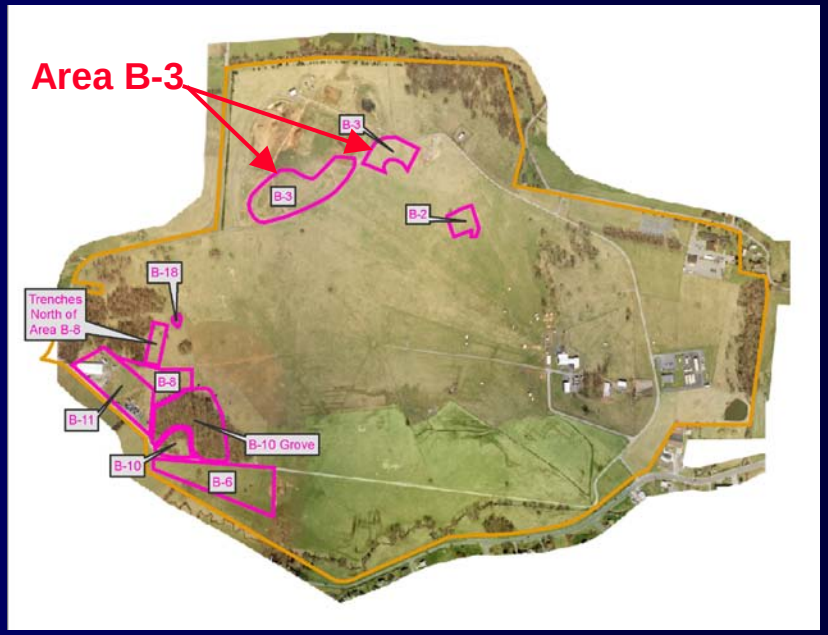






Area B-3 Limits of Waste Disposal determined through analysis of:

- Historical maps
- Aerial photography
- Geophysics
- Soil borings



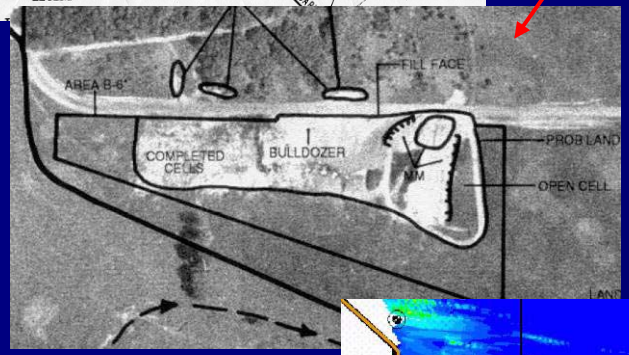
Area B Former Disposal Sites
Area B-3 (FTD 51)

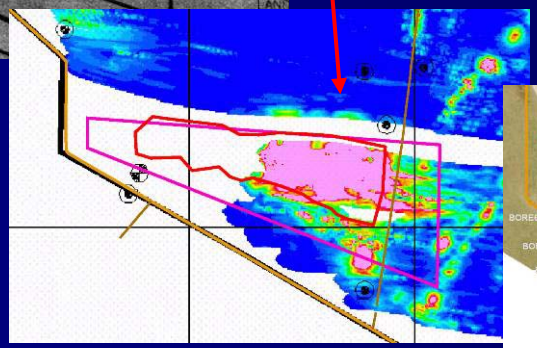
- ✓ Draft RI/FS currently under Army Review
- RI/FS to be submitted to MDE in February 2007
- Proposed Plan and Public Comment Period in early 2007 for Landfill Cap as the remedy
- Record of Decision in 2007
- Landfill Cap design in 2007
- Landfill Cap installation in 2008

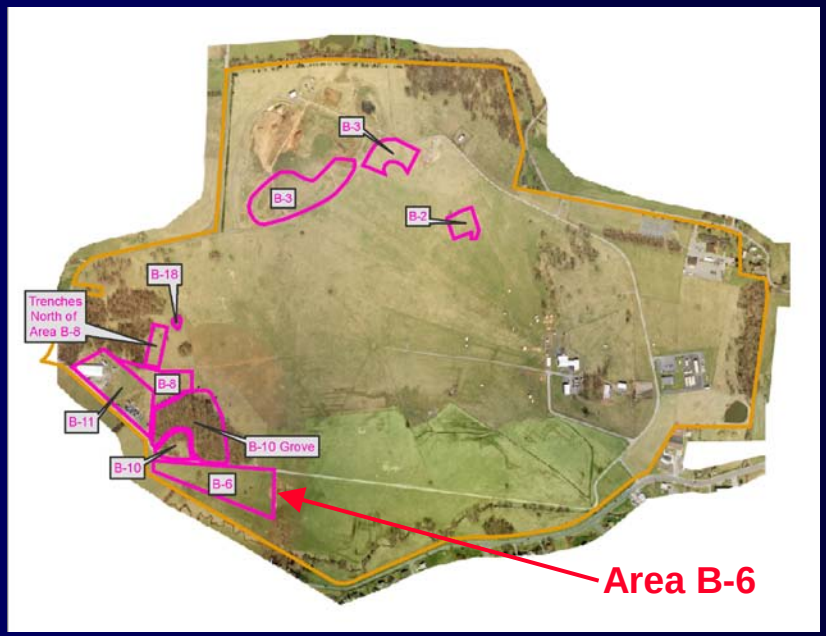
Area B Former Disposal Sites
Area B-6 (FTD 69)

Area B-6 Limits of Waste Disposal determined through analysis of:

- **Historical maps**
- **Aerial photography**
- **Geophysics**
- **Soil borings**







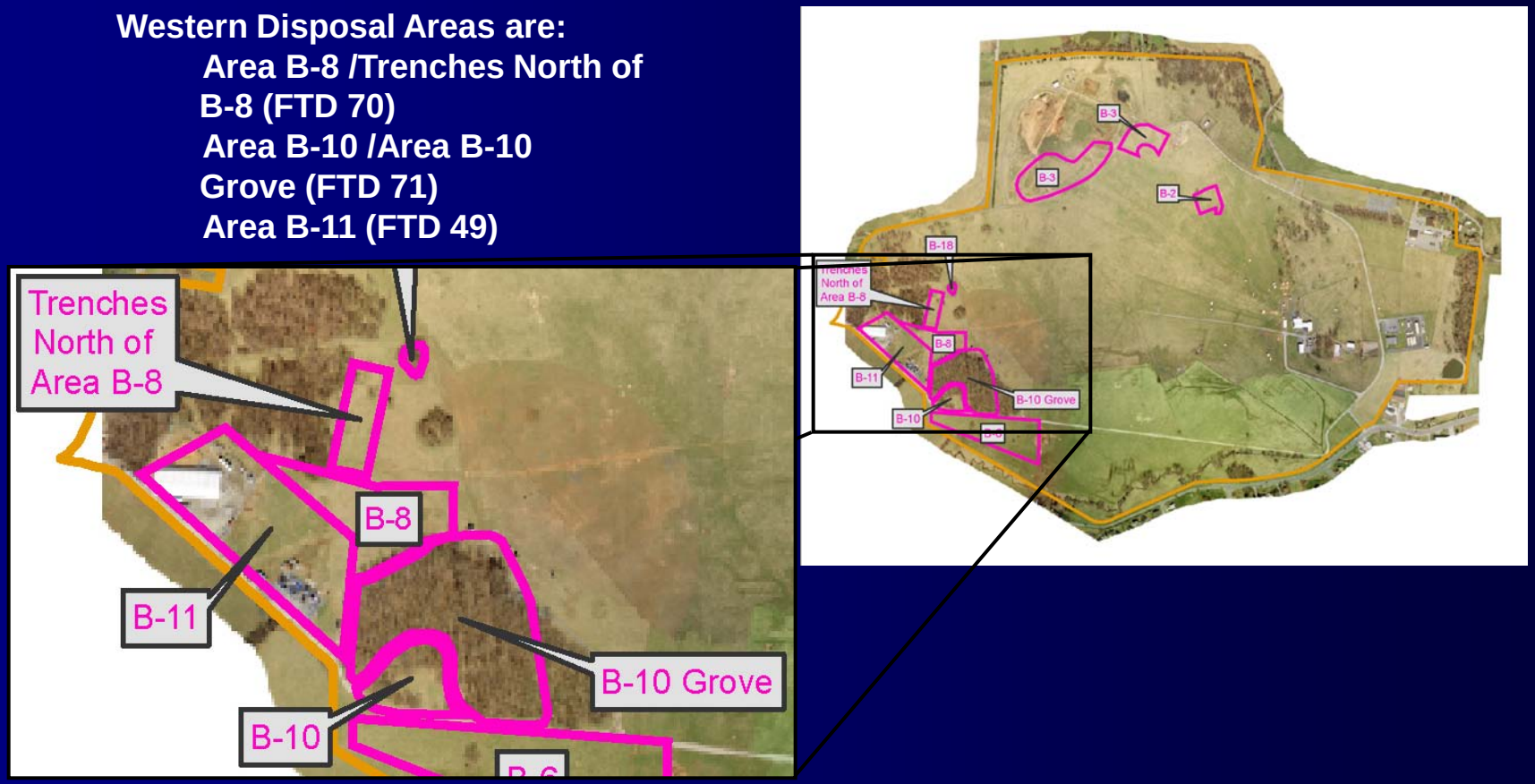
Area B Former Disposal Sites
Area B-6 (FTD 69)

- ✓Draft RI/FS submitted to MDE 24 October 2006
- Currently awaiting MDE comments
- Document expected to be finalized February 2007
- Proposed Plan and Public Comment Period in early 2007 for Landfill Cap as the remedy
- Record of Decision in 2007
- Landfill Cap design in 2007
- Landfill Cap installation in 2008

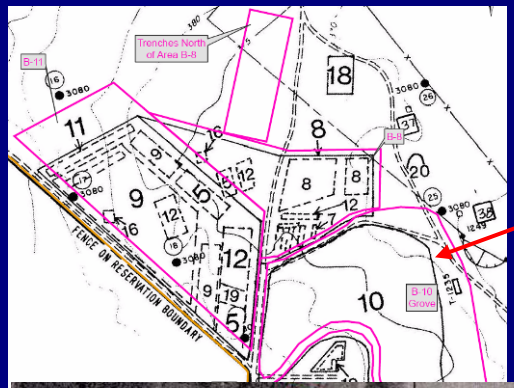
Area B Former Disposal Sites
Western Disposal Areas

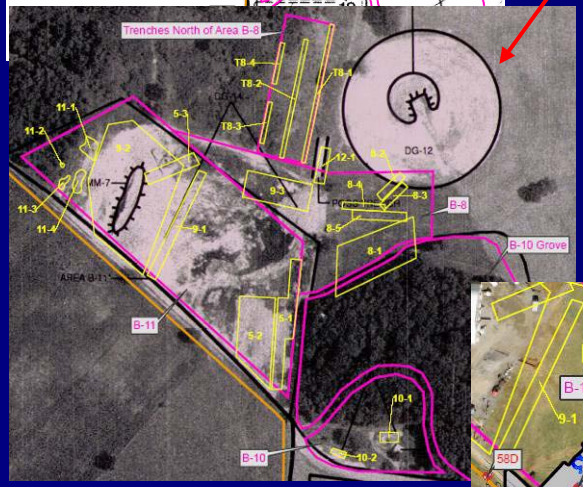
Western Disposal Areas are:

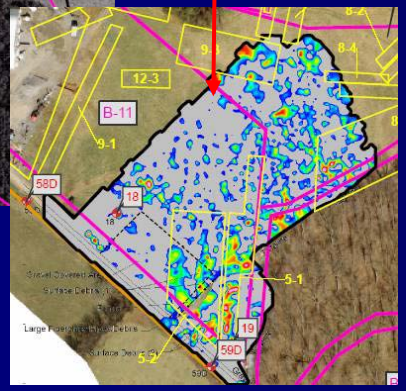
- **Area B-8 /Trenches North of B-8 (FTD 70)**
- **Area B-10 /Area B-10 Grove (FTD 71)**
- **Area B-11 (FTD 49)**

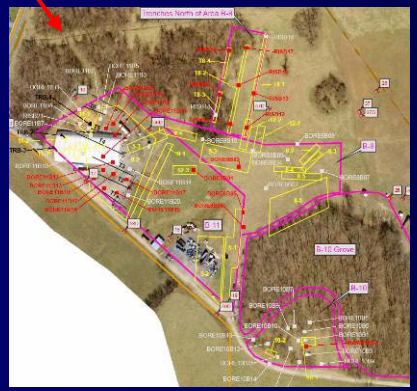


Area B Former Disposal Sites
Western Disposal Areas



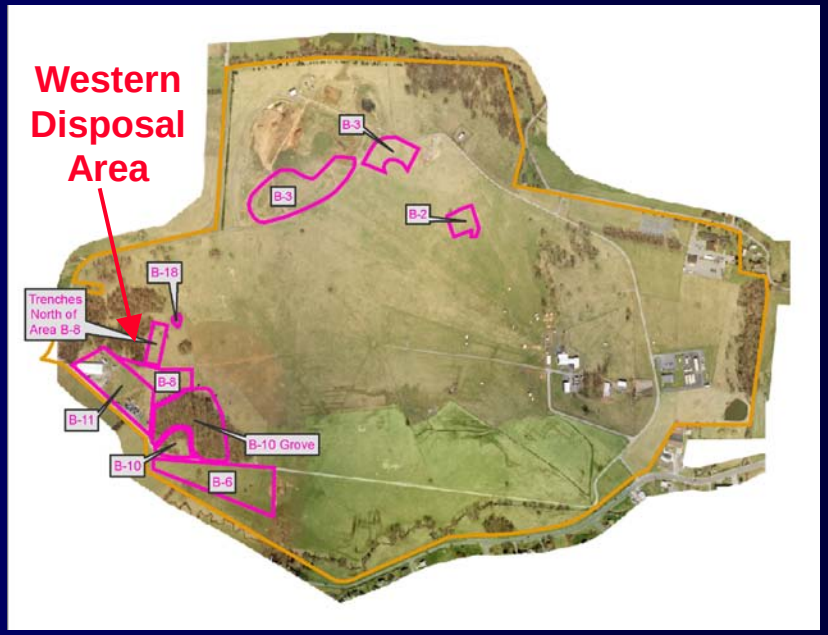






Limits of Waste Disposal determined through analysis of:

- **Historical maps**
- **Aerial photography**
- **Geophysics**
- **Soil borings**



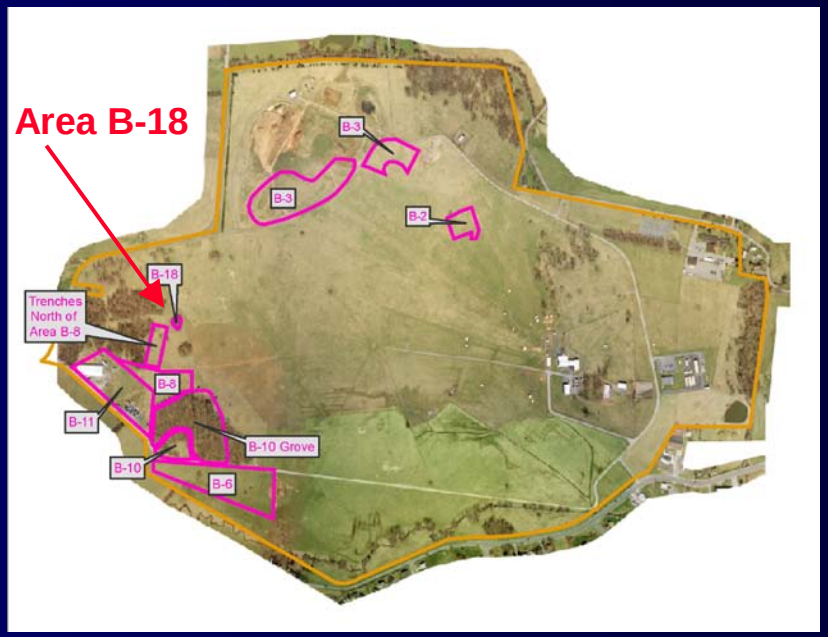
Area B Former Disposal Sites Western Disposal Areas

✓Draft RI/FS submitted to Army for review 10 November 2006

- RI/FS to be submitted to MDE in January 2007
- Proposed Plan and Public Comment Period in early 2007
- Record of Decision in 2007
- Landfill Cap design in 2007
- Landfill Cap installation in 2008

Area B Former Disposal Sites
Area B-18 (Former Sinkhole)

- ✓Draft Site Inspection Work Plan currently being developed
- Site Inspection work plan to be submitted to MDE in January 2007
- Field Work in April 2007



Surface metal debris will be removed and geophysical investigation will be performed to verify that there is no buried waste

Area B Five Sites
(Close-out Sites)

Area B Five Sites

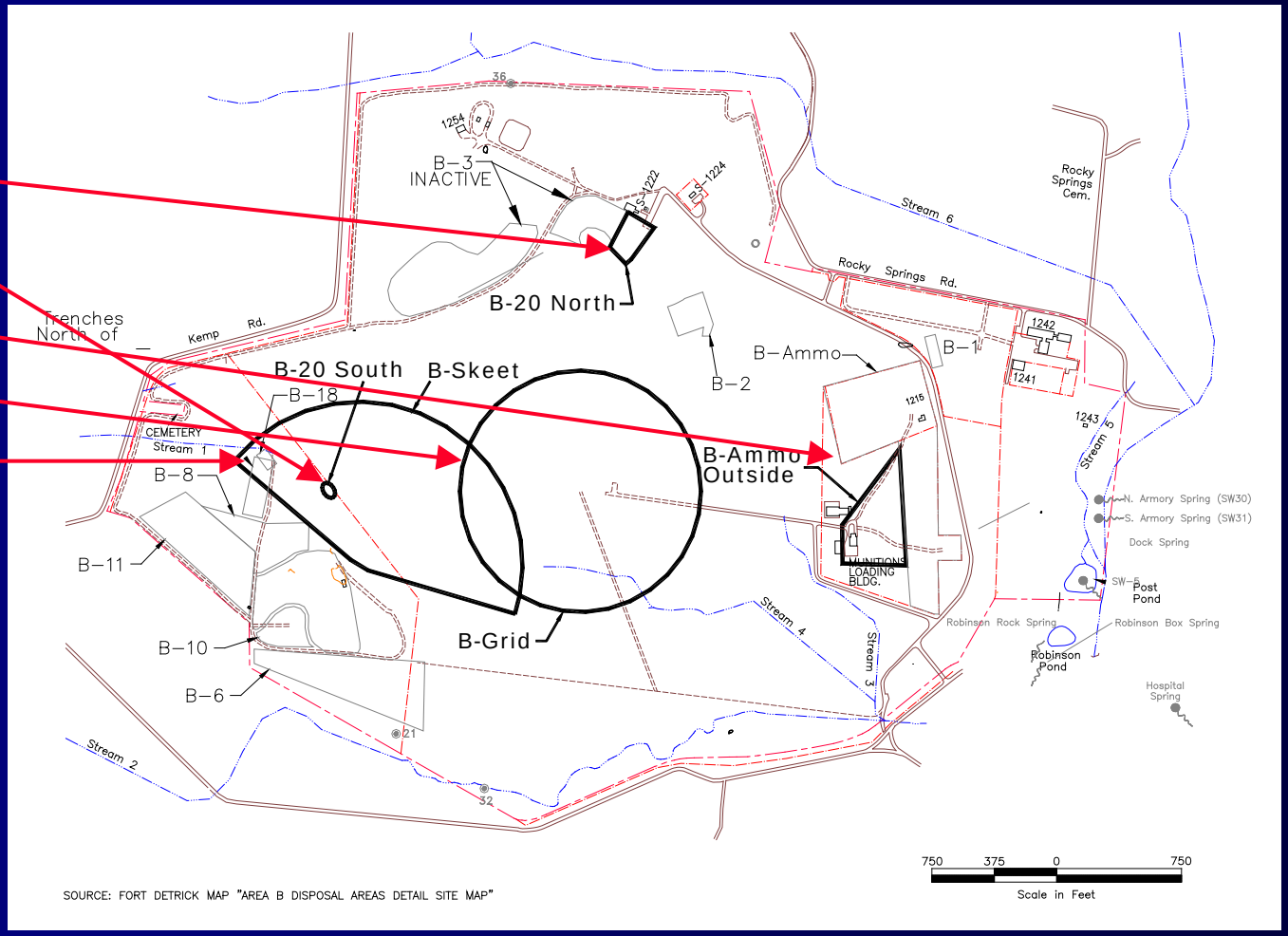
B-20 North

B-20 South

B-Ammo

B-Grid

B-Skeet



Area B Five Sites

- Remedial Investigation Report was finalized for the 5 Area B Sites:
  - B-Ammo
  - B-20 North
  - B-20 South
  - B-Grid, and
  - B-Skeet
- Report indicated no unacceptable risks to human health and the environment
- No Action Decision Document is being drafted

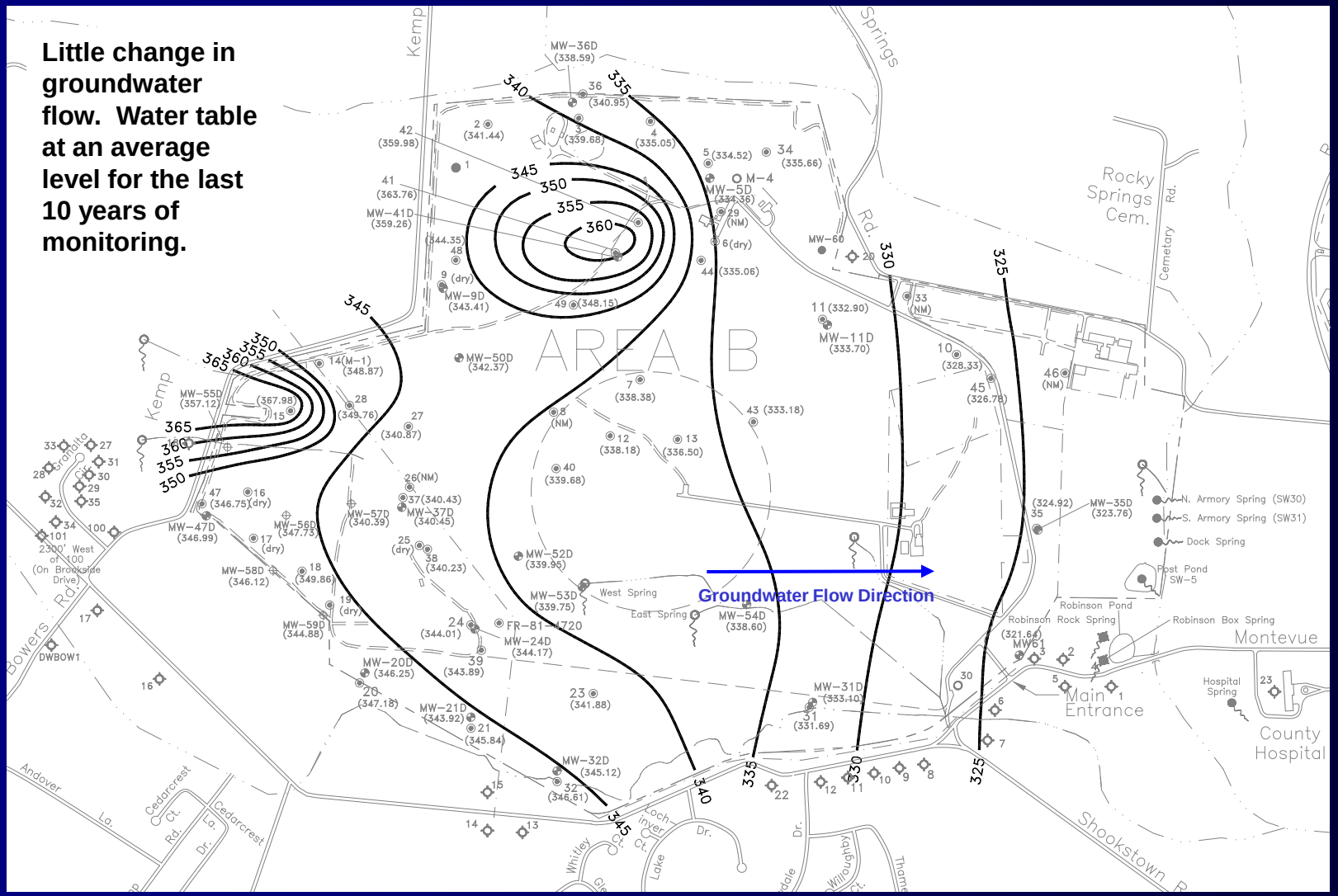
Area B Groundwater

Area B Groundwater Monitoring

- Periodic sampling conducted September 2006
  - Data presented on next slides
- Periodic sampling conducted December 2006
  - Data currently under analysis and evaluation
- Next sampling event scheduled for March 2007
- Remedial Investigation/Feasibility Study to be developed in early 2007

Area B Groundwater Contours September 2006

Little change in groundwater flow. Water table at an average level for the last 10 years of monitoring.



Area B PCE Concentrations September 2006

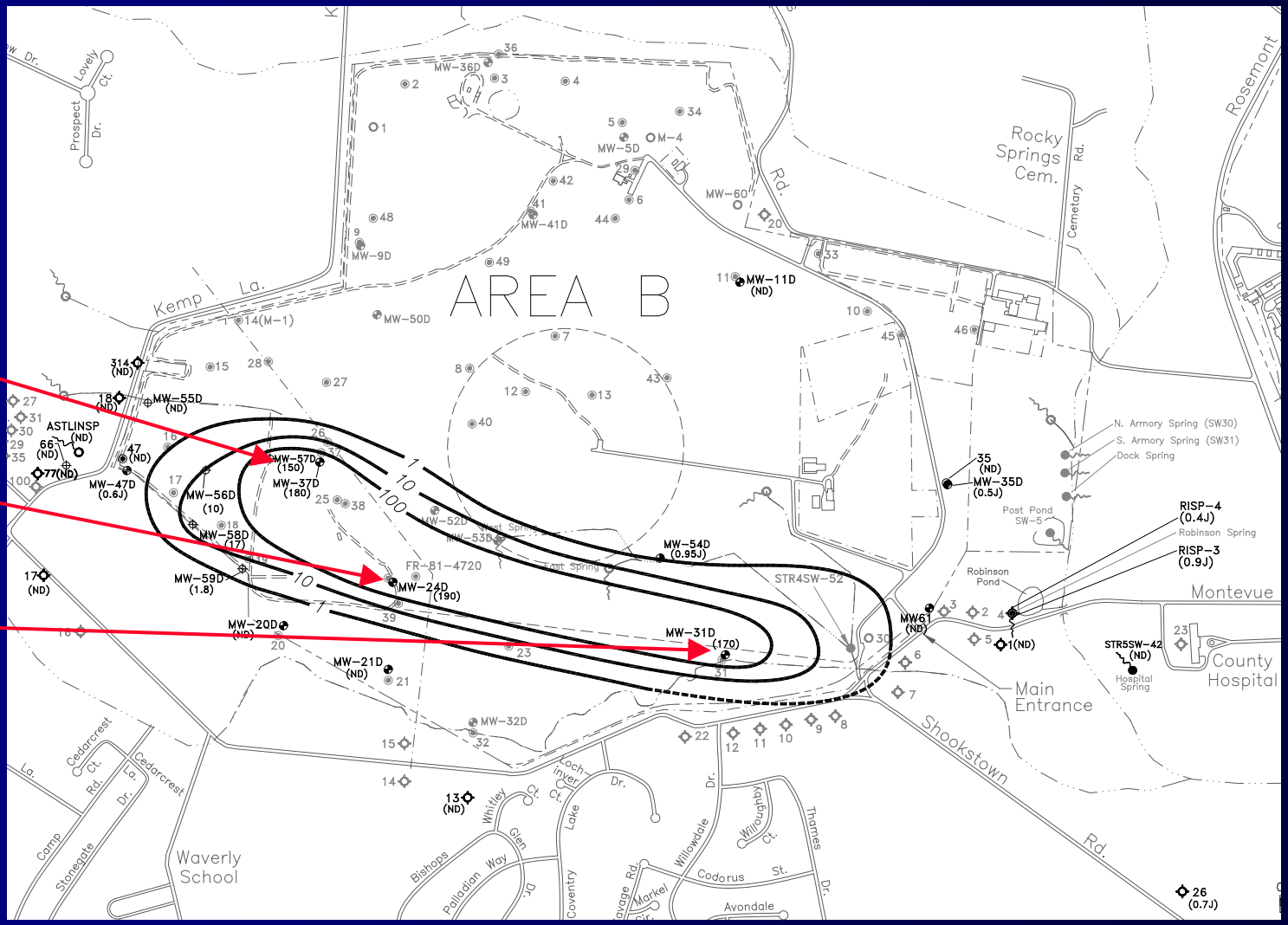
Extent of PCE plume relatively unchanged from June 2006.

There is an overall decreasing trend in most wells.

BMW57D
Aug 98 – 200,000 µg/L
Sep 06 – 150 µg/L

BMW24D
Nov 99 – 23,000 µg/L
Sep 06 – 190 µg/L

BMW31D
Jan 99 – 10,000 µg/L
Sep 06 – 170 µg/L



Area B TCE Concentrations September 2006

Extent of TCE plume relatively unchanged from June 2006.

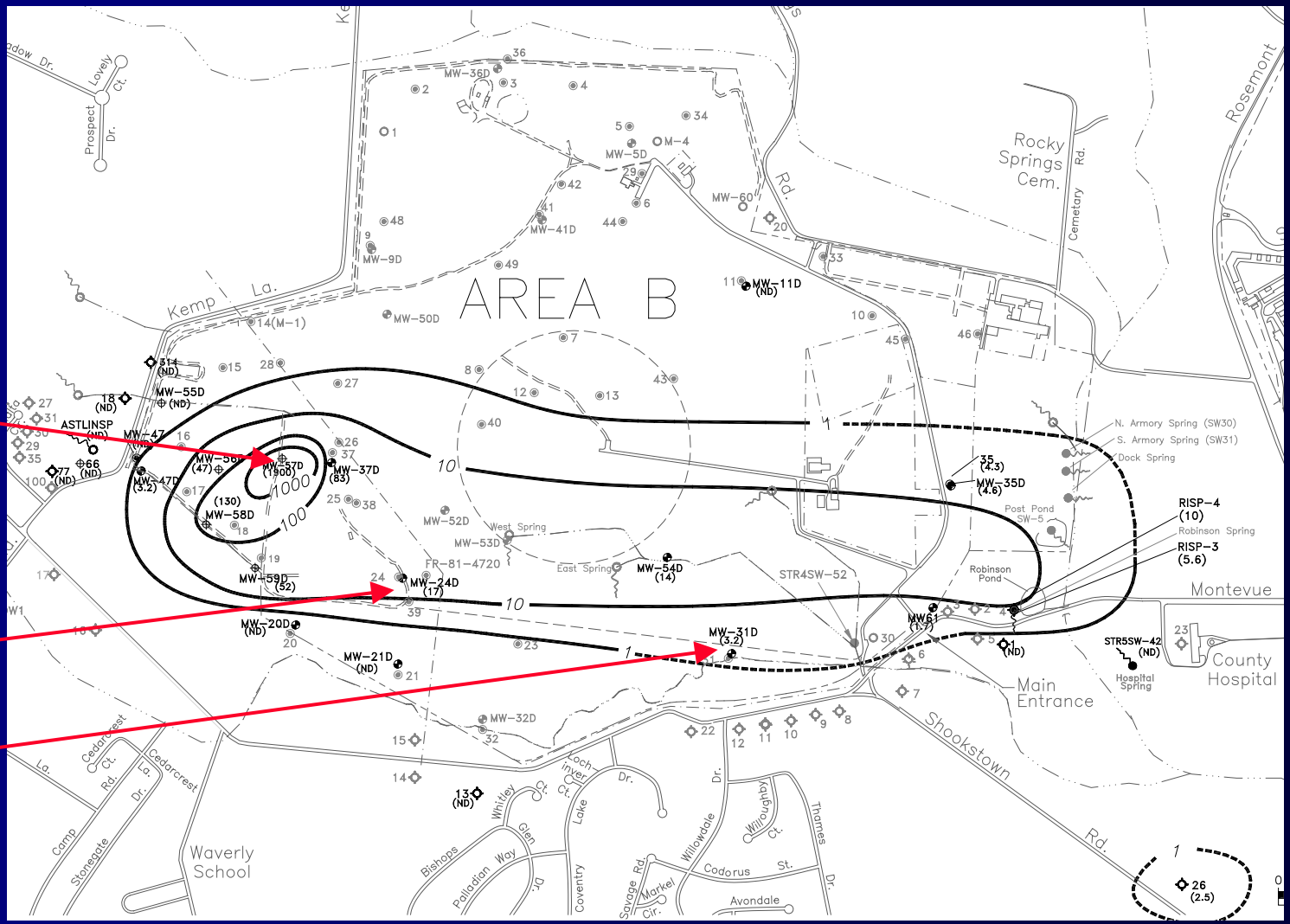
TCE Concentrations increasing near the source due to biodegradation converting PCE to TCE.

BMW57D
Aug 98 – 800 µg/L
Sep 06 – 1,900 µg/L

TCE Concentrations decreasing in other parts of the plume

BMW24D
Aug 98 – 70 µg/L
Sep 06 – 17 µg/L

BMW31D
Jan 99 – 300 µg/L
Sep 06 – 3.2 µg/L



Degradation of PCE

- Tetrachlorothene (PCE) and trichloroethene (TCE) contaminants in ground water can be biodegraded by naturally occurring anaeorobic bacteria. This occurs when the anaerobic bacteria take electrons from small organic compounds (the "electron donors") and produce H_2. The dechlorinating bacteria use the electrons in the H_2 to replace a chlorine atom in TCE/PCE.

- If the site soil and ground water contain organic electron donors, this process can proceed until all of the chlorine atoms are removed, and TCE is dechlorinated completely via dichloroethene (DCE) and vinyl chloride (VC) to ethene gas, a harmless end-product.

PCE C_2Cl_4 → **TCE** C_2HCl_3 → **DCE** $C_2H_2Cl_2$ → **VC** C_2H_3Cl → **Ethene** C_2H_4

Area B Groundwater (FTD 72) RI/FS

- Remedial Investigation
  - Identify Nature and Extent of Contamination
  - Present Historical Data and Trends
  - Calculate Risk
- Feasibility Study
  - Develop Remedial Action Objectives
  - Evaluate Remedial Alternatives
    - No Action
    - Monitored Natural Attenuation
    - In-Situ Chemical Oxidation
    - Enhanced Bioremediation
- Proposed Plan/Public Comment/Decision Document in 2007
- Remedial Design in late 2007

Area A Long-Term Monitoring

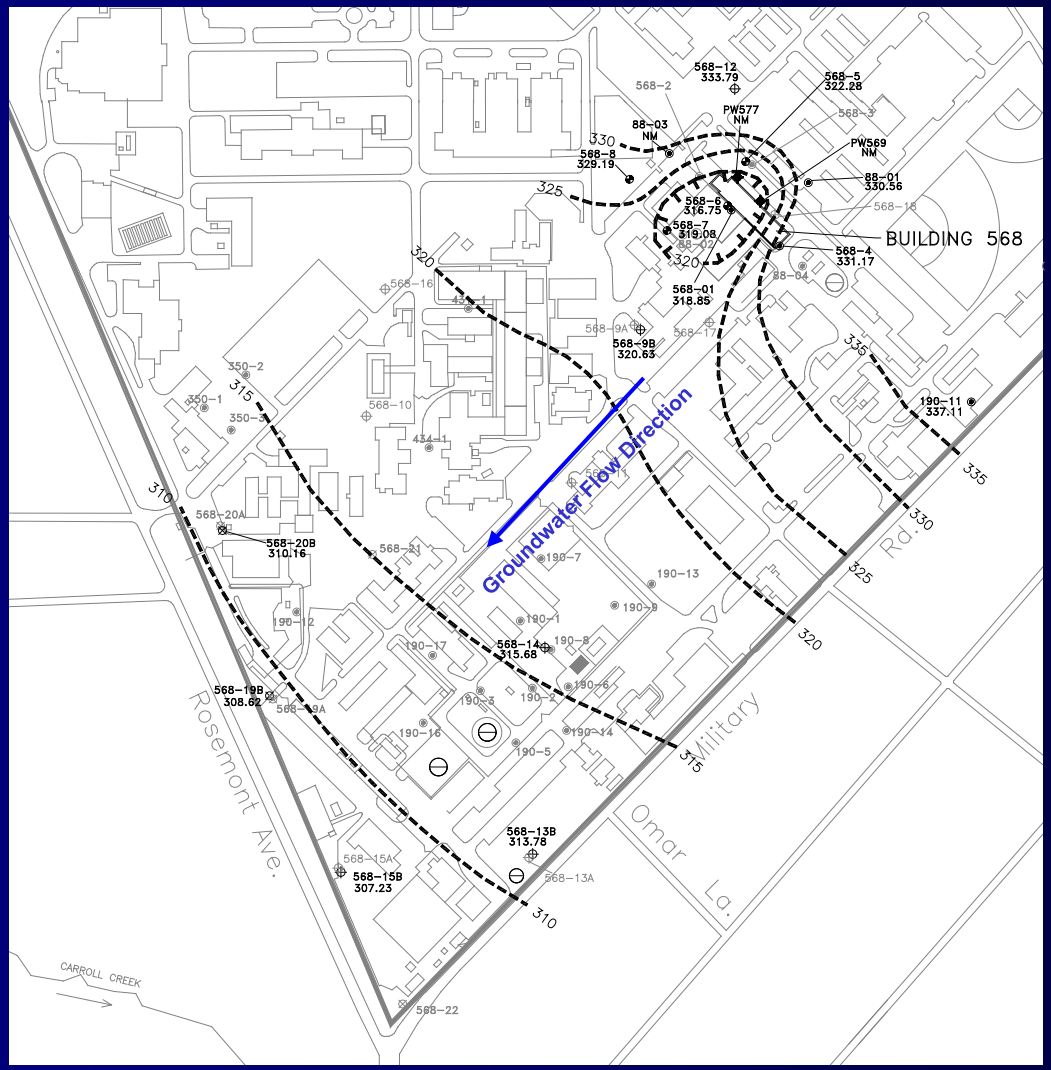
Area A Long-Term Monitoring

- Building 568 TCE Spill Site (FTD 66)
  - Long-term monitoring conducted September 2006
  - Data presented on next slides
  - Next event scheduled for March 2007
  - 5-Year Review scheduled for 2007
- Area A Water Towers (FTD 68)
  - Monitoring conducted in September 2006
  - No significant issues
  - Next event scheduled for March 2007

Area A Groundwater Contours September 2006

Groundwater flows to the southwest at the site. Pumping in groundwater from Building 568 creates a cone of depression.

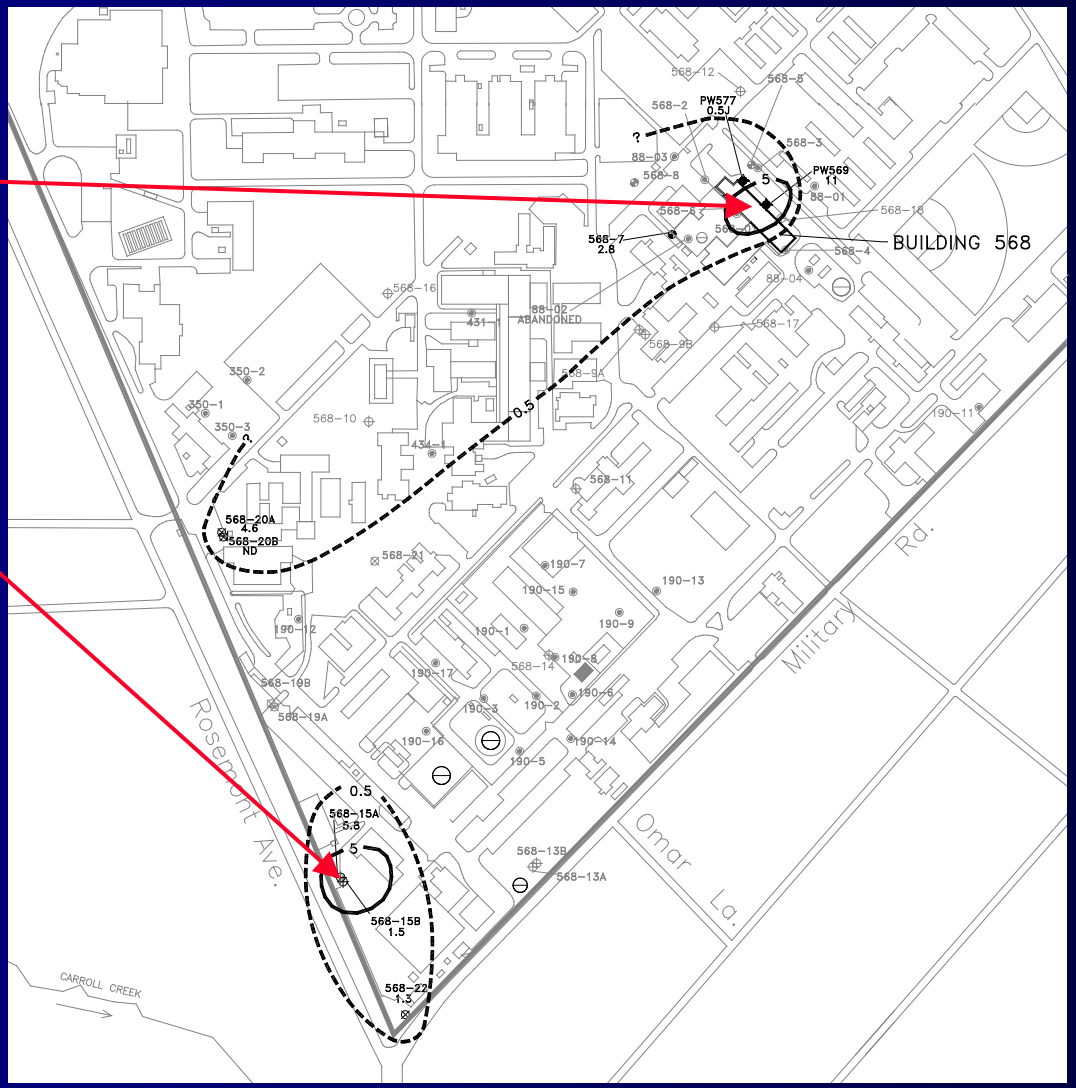
There is little change in groundwater flow since March 2006.



Area A TCE Concentrations September 2006

TCE Concentrations in the source area continue to decline.
PW569
May 95 – 800 µg/L
May 02 – 130 µg/L
Sep 06 – 11 µg/L

Slight increase observed in 568-15A
Mar 06 – 3.8 µg/L
Sep 06 – 5.8 µg/L
The MCL for TCE is 5 µg/L. If this well does not drop back below the MCL during the March 07 sampling, potential corrective actions will be considered in the 5-Year Review.



Upcoming Activities

- January 2007
  - Submit Area B-8/B-10/B-11 RI/FS to MDE
  - Submit Area B-2 Proposed Plan to MDE
  - Submit Area B-18 Site Inspection Work Plan to MDE
- February 2007
  - Submit Area B-3 Inactive RI/FS to MDE
  - Finalize Area B-6 RI/FS
  - Finalize Area B-2 Proposed Plan
- March 2007
  - Area A Long-Term Monitoring
  - Area B Periodic Sampling
  - Finalize Area B-8/B-10/B-11 RI/FS
  - Submit Area B Groundwater RI/FS to MDE
- Spring/Summer 2007
  - Finalize Area B-3 Inactive RI/FS
  - Finalize Area B Groundwater RI/FS
  - Complete all Area B Proposed Plan/Public Comment/Decision Documents
  - Site Inspection at Area B-18 and Site Closeout