

28th Bomb Wing, Ellsworth AFB

October 14, 2009

Public Meeting Restoration Advisory Board



**This Briefing is:
UNCLASSIFIED**





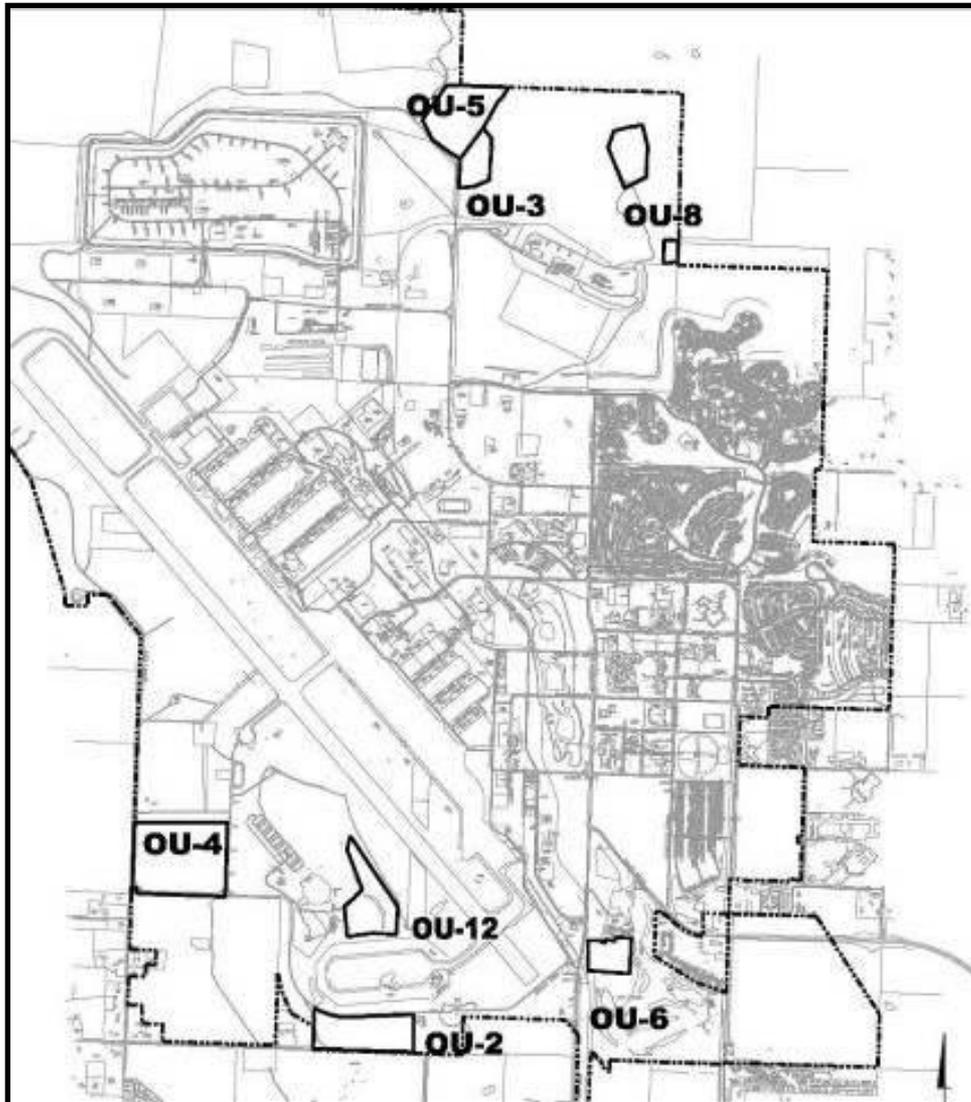
Presentation Outline



- **Status of Work**
 - **Landfills**
 - **Petroleum Release Sites**
 - **On-Base Chlorinated Plume Sites**
 - **Off-Base TCE Plume**
- **Plans for the Upcoming Year**



Landfill Sites

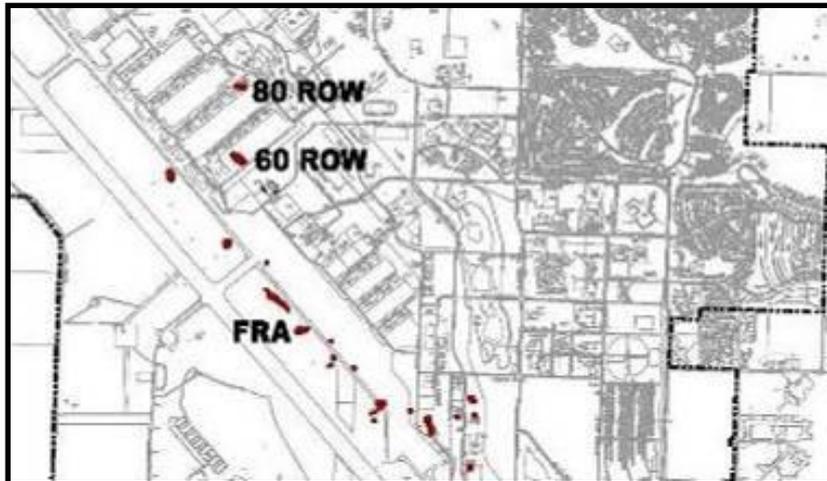


Typical Landfill (OU-8, May 2009)

- 7 operable units with soil covers that were installed in 1995 & 1996.
- Quarterly inspections indicate soil covers are in good condition.
- Test results are below standards.
- Inspections and sampling will continue.
- Inspection frequency has been revised from quarterly to semi-annually.



Petroleum Release Sites 60 Row and 80 Row



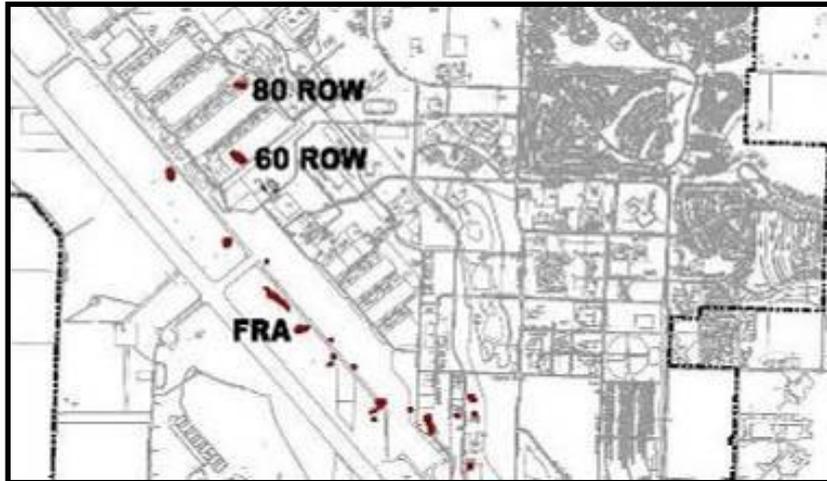
- Goal is to achieve No Further Action (NFA) from SDDENR, which requires 2 years of successful compliance monitoring.
- In 2008, 60 Row and 80 Row were treated by surfactant enhanced aquifer remediation (SEAR) to remove remnants of free product (fuel).
- No free product has been detected at 60 Row for the past 2 years.
- About 1 inch of free product was detected in one well at 80 Row, so this area was treated again using SEAR in June 2009.
- No free product has been detected at 80 Row since this second treatment.
- Periodic compliance monitoring is being done at both sites now.



SEAR injection in progress



Petroleum Release Sites Flightline Refueling Area (FRA)



- Goal is to achieve NFA at 7 pump houses.
- Achieved NFA at 2 pump houses (PH2 and PH6).
- 2 pump houses (PH3 and PH7) under consideration for NFA now.
- With continued successful monitoring at PH1 and PH4, these 2 sites should be under consideration for NFA next year.
- Recent sampling at PH5 suggests concentrations increasing at one location and treatment using dissolved oxygen has been recommended.
- NFA at PH5 may be delayed for up to 2 years from now pending treatment and follow-up compliance monitoring.





On-Base Chlorinated Plumes – In-situ Reductive Treatment (IRT)



1 treatment zone at the Small Arms Range.

10 treatment zones at BG04. Reinjection scheduled at 2 zones this fall.

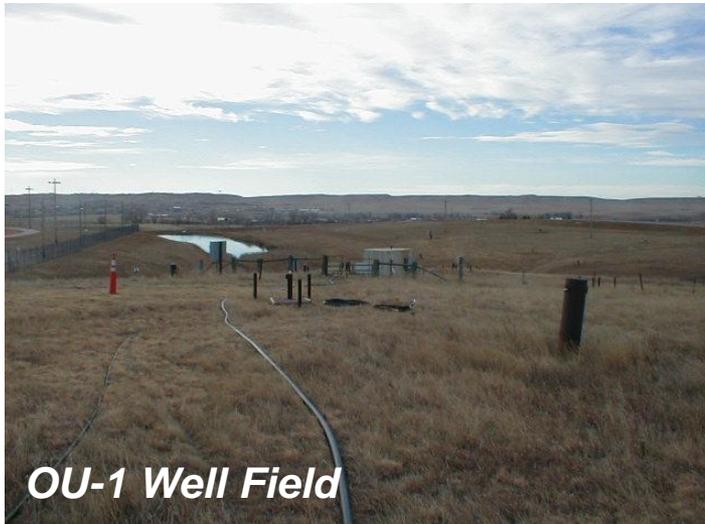
6 treatment zones at the Twining/Risner and BG05.

8 treatment zones at the Pride Hangar / South Docks Main. Reinjection scheduled at 1 zone this fall.

14 treatment zones at the OU-1, OU-2, and OU-4. Reinjection scheduled at 5 zones this fall.



Operable Unit 1 (OU-1)



OU-1 Well Field



OU-1, Treatment Trailer in Background

- OU-1 has a mixed contaminant source area (chlorinated solvent and petroleum).
- Groundwater and SVE systems removed large amount of contaminant mass between 1996 and 2005, but recovery rates have declined significantly since 2005.
- Optimization since 2006:
 - Added borings and wells
 - Implemented high vacuum extraction
 - Converted SVE to bioventing
 - Installed oxygen diffusers
 - Installed two IRT treatment walls
- Performance monitoring on-going:
 - No more free product (fuel)
 - Fuel and chlorinated solvent constituents are stable to decreasing at most wells
- Plan an OU-1 ROD Amendment next year to turn off active systems.



Twining-Risner Plume



Installing Well



Injection

- Collected approximately 90 groundwater samples in 2009 to better define the plume.
- Installed 3 performance monitoring wells in May.
- Injected in-situ treatment zones at three locations within the plume in September.
- Defined the extent of TCE contamination along the southern edge of the plume, and will extend one of the injection zones this October.
- Planned work before next RAB:
 - Bioaugmentation injection
 - Performance monitoring



Off-Base Plume Investigation Plan Presented at the May 2009 RAB



Purpose: Investigate the off-Base plume to determine the current TCE concentrations throughout the off-Base plume to develop an Exit Strategy that could potentially expedite the return of groundwater for beneficial re-use by landowners.

Scope: Determine current nature and extent of contamination (up to 320 direct push samples and 15 new monitoring wells).

Assess human health risks to determine what TCE concentrations in groundwater might allow various non-potable groundwater uses in all or parts of the off-Base plume through a ROD amendment.

Develop criteria for determining plume has met MCLs and evaluate alternatives to expedite beneficial re-use of groundwater.

Schedule: Field work this year and final report next year.

What to expect:

URS will contact property owners to obtain access permission for drilling and sampling using Air Force's Right-of-Entry form.

Field work will be done in phases from June until December.

Air Force and URS will update the public at the RAB meetings.



Off-Base Plume Field and Laboratory Work



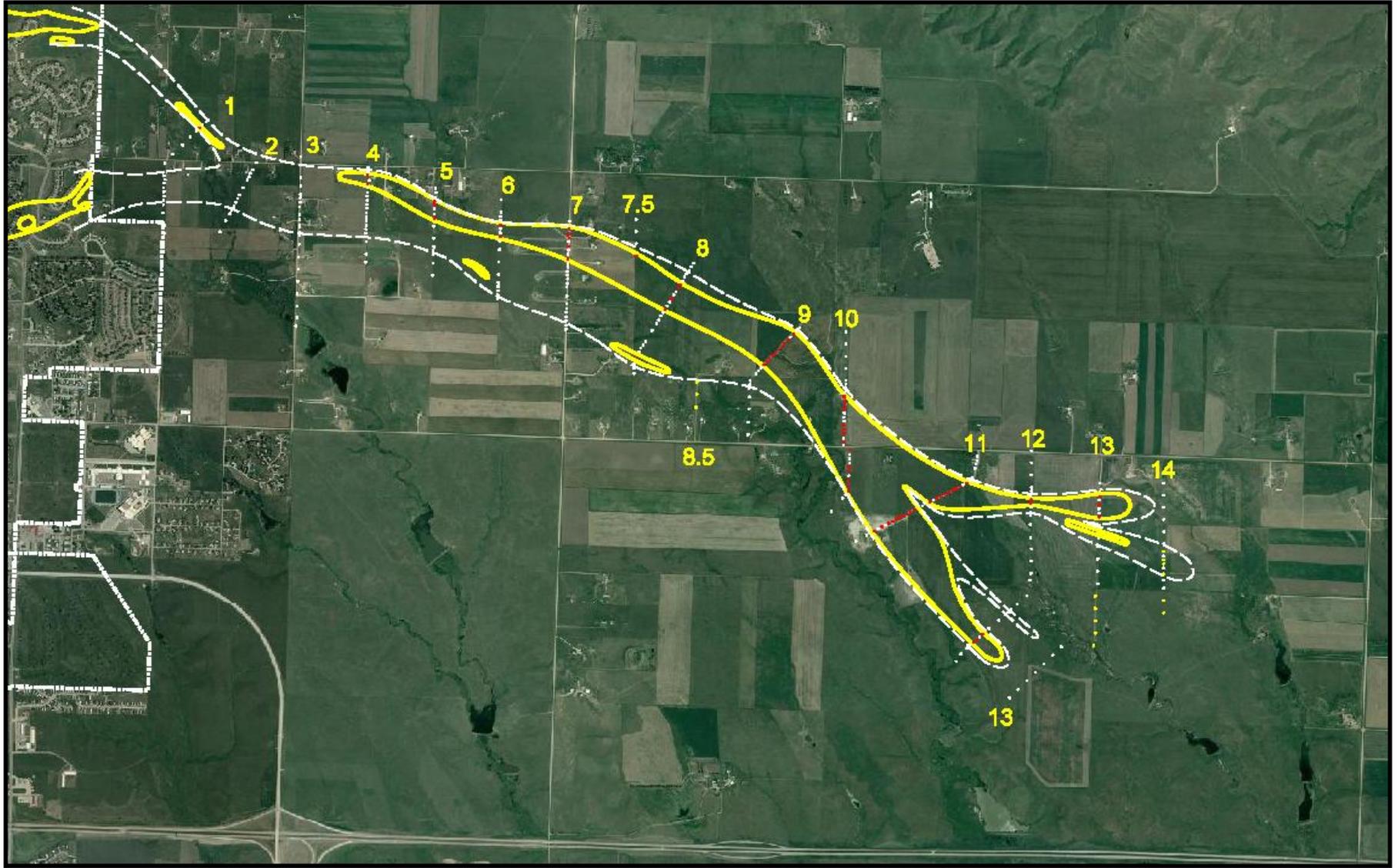
- Collected 292 groundwater samples from 317 direct push points between June 24 and September 18, 2009.
- Samples were analyzed in the on-Base lab and at an off-Base commercial lab.
- Investigation was done in 5 phases (and a 6th phase will start next week weather permitting) to optimize sampling locations.
- Started with 12 lines of sample points aligned perpendicular to the plume (“transects”).
- Expanded investigation to 14 transects to better define the end of the plume, and added 2 mid-point transects to better define the plume boundaries.
- Groundwater samples have been collected starting approximately 1/4 mile to 4-1/2 miles east of Base boundary.





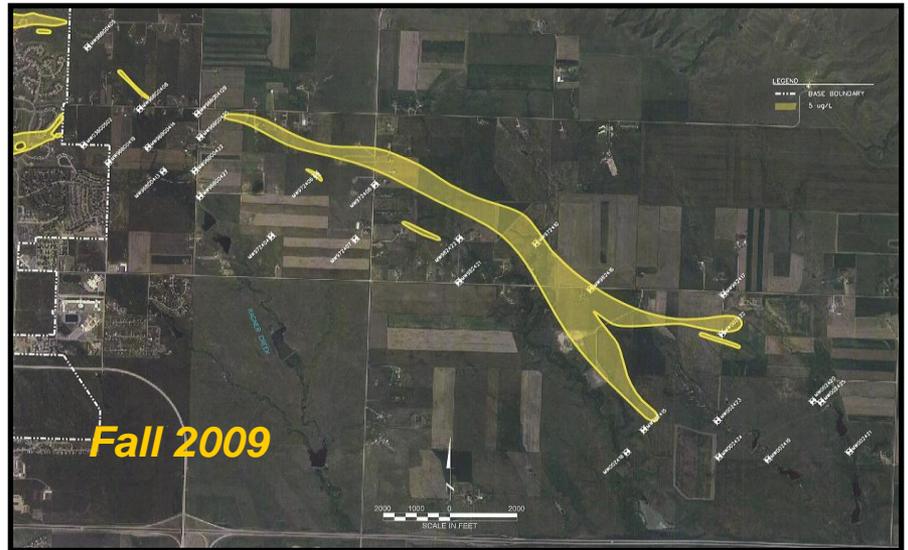
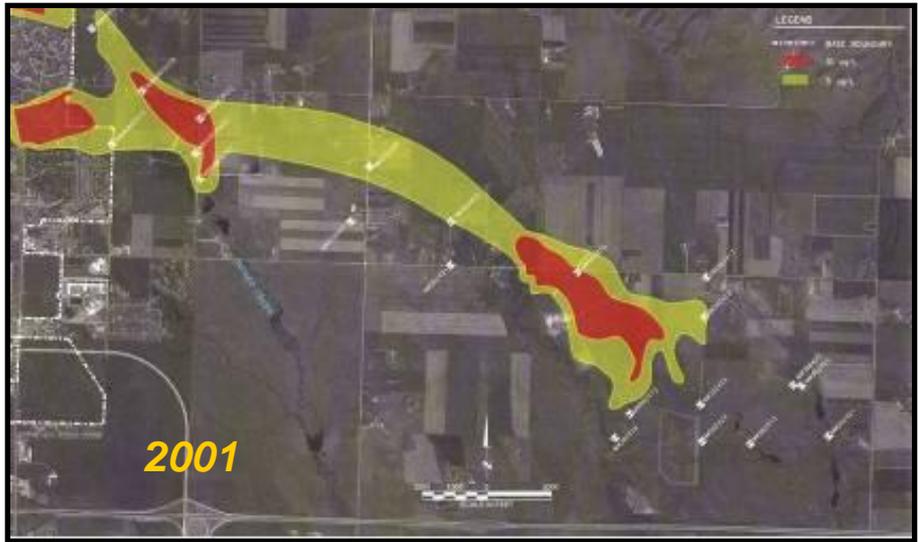
Off-Base Plume Map

Current (October 2009) Interpretation





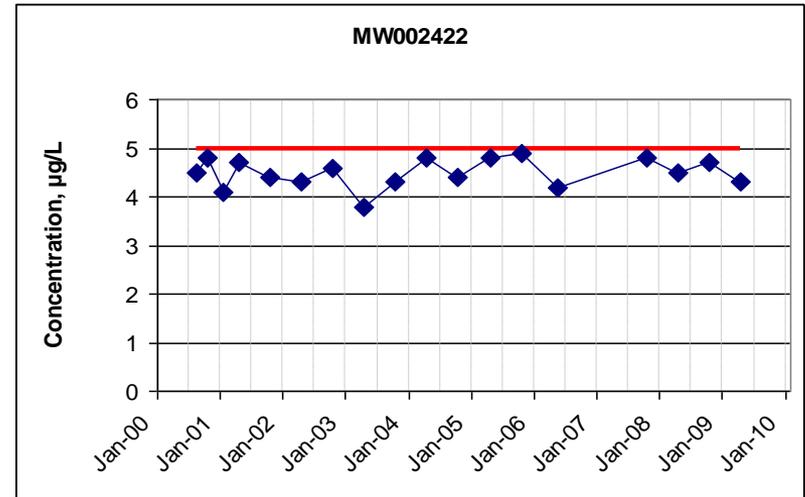
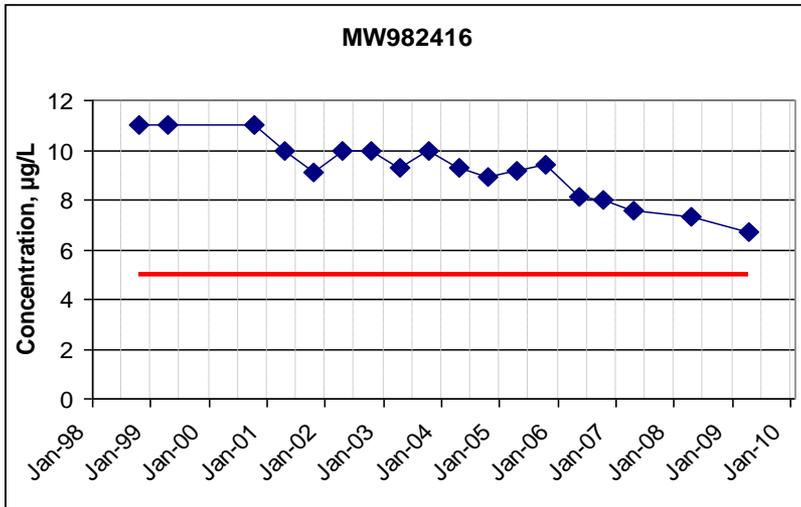
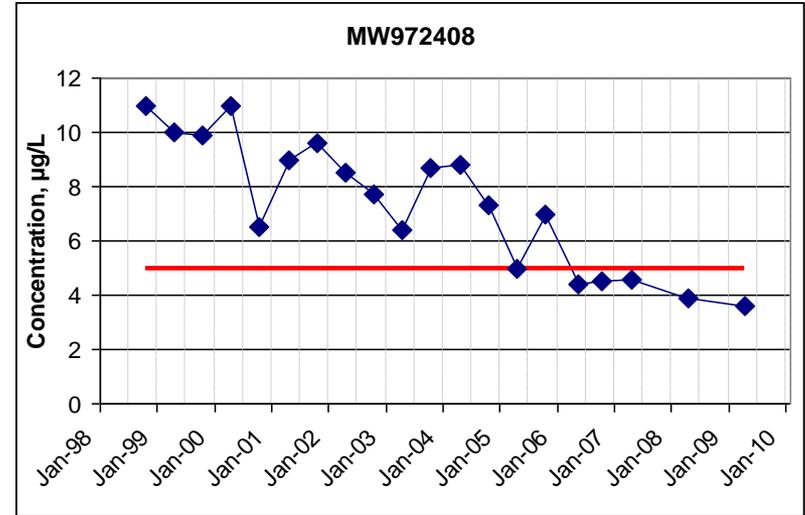
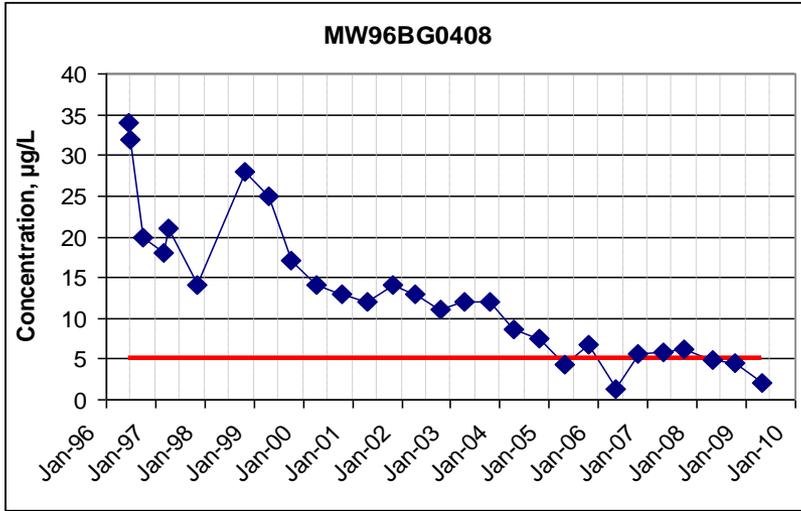
Off-Base Plume Attenuation Since Treatment Started (2001 – 2009)





TCE Trends in Off-Base Wells

Upgradient Northwest

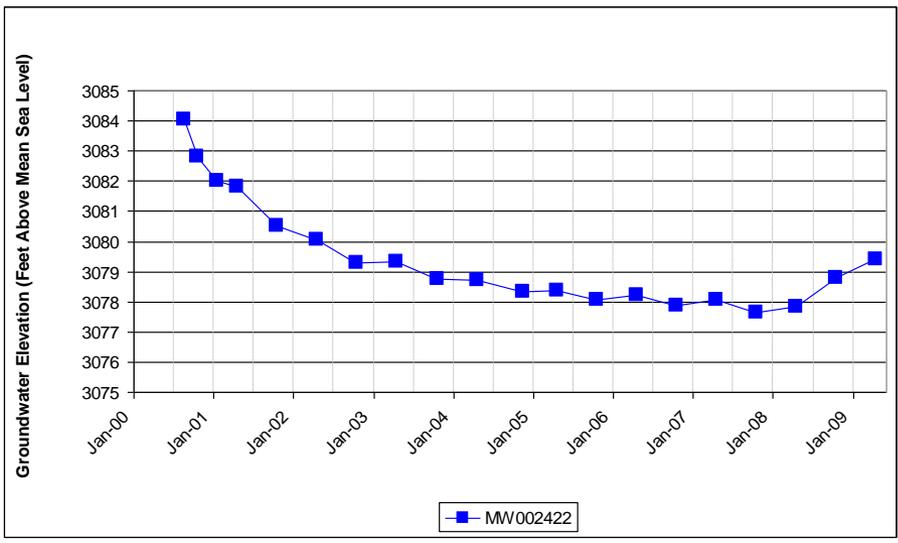
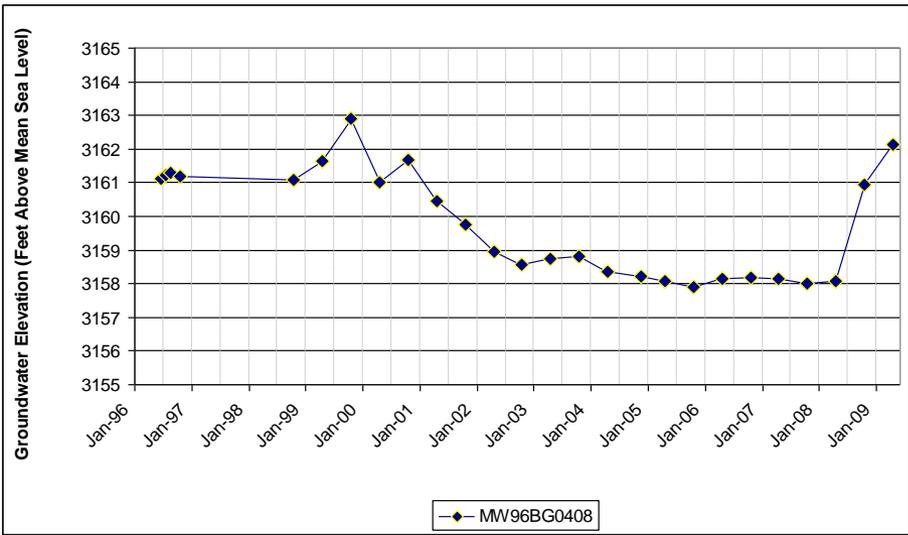


Downgradient Southeast



Water Level Trends in Off-Base Wells

MW96BG0408
Located 1/4 mile east of
Base boundary



MW002422
Located 3-1/2 miles east of
Base boundary



Upcoming Work for Off-Base Plume



- Install up to 17 new monitoring wells:
 - Obtain groundwater data of sufficient quality for risk assessment.
 - Establish permanent off-Base monitoring points at key locations for long-term monitoring of concentration trends.
- Assess human health risks to determine what TCE concentrations in groundwater might allow various non-potable groundwater uses in all or parts of the off-Base plume through a change to the ROD.
 - Exposure to contaminated groundwater and vapors during irrigation (lawn and garden watering), while running through sprinklers, and while swimming.
 - Exposure to vapors in indoor air.
- Develop criteria for determining plume has met MCLs and evaluate alternatives to expedite beneficial re-use of groundwater.
 - Concentrations fluctuate (see previous slide), so criteria are needed for a required number of samples over a specified time frame.
 - Determine if there are feasible treatment options to accelerate cleanup.
 - Evaluate options to allow non-potable use of groundwater.
- Prepare Exit Strategy Report.



Plans for Upcoming Year



Landfill Sites

- Continue routine inspection and monitoring.

Petroleum Release Sites

- Continue compliance monitoring until NFA status is granted.
- Implement dissolved oxygen treatment at PH5.

On-Base Chlorinated Plumes

- Continue performance monitoring of the 39 treatment zones and supplement existing treatment zones, as needed, based on results.
- Amend the OU-11 ROD in 2010 to shut down active extraction systems.
- Continue oxygen diffusion and bioventing in OU-1 source area until next year, then amend the OU-1 ROD in 2010 to turn off active systems.

Off-Base TCE Plume

- Install monitoring wells.
- Complete human health risk analysis for potential non-potable groundwater use.
- Evaluate alternatives to accelerate beneficial re-use of groundwater and prepare Exit Strategy Report.

All Operable Units

- Complete a **Five-Year Review** by September 2010.