

# *28th Bomb Wing, Ellsworth AFB*

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**May 18, 2010**

## **Public Meeting Restoration Advisory Board**



**This Briefing is:  
UNCLASSIFIED**





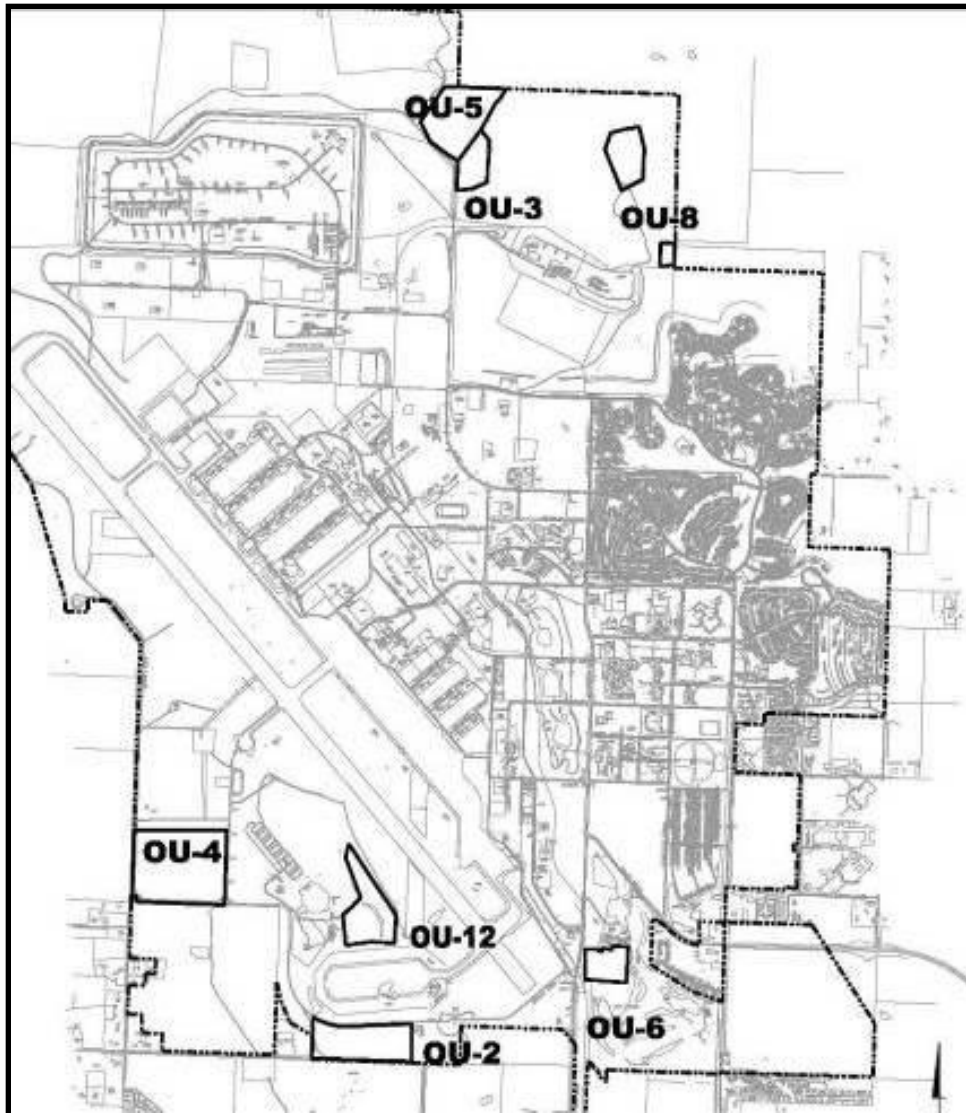
# *Presentation Outline*



- **Status of Work**
  - **Landfills**
  - **Petroleum Release Sites**
  - **On-Base Chlorinated Plume Sites**
  - **Five Year Review**
  - **Off-Base TCE Plume**
- **Future Plans**



# Landfill Sites

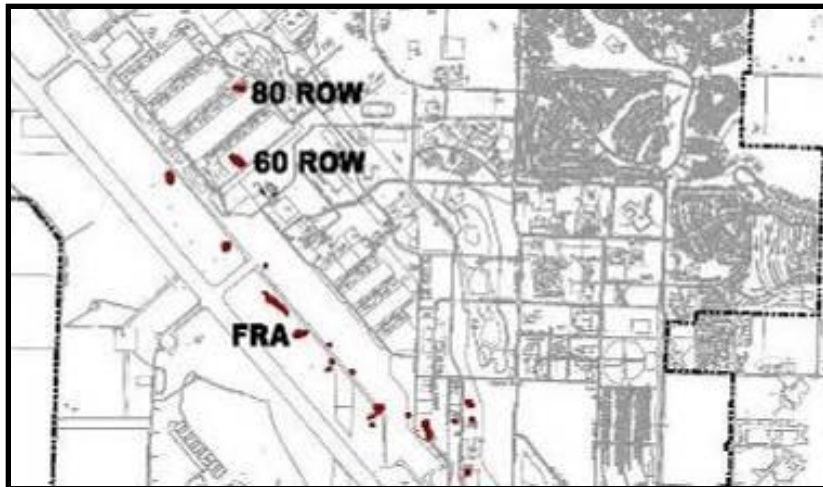


*Typical Landfill (OU-8, May 2009)*

- 7 operable units with soil covers that were installed in 1995 & 1996.
- Semi-annual inspections indicate soil covers are in good condition.
- Test results are below standards.
- Inspections and sampling will continue on a semi-annual basis.



# Petroleum Release Sites 60 Row and 80 Row



- Goal is to achieve No Further Action (NFA) from SDDENR.
- In 2008, both sites were treated using surfactant enhanced aquifer remediation (SEAR) to remove free product (fuel).
- Just completed the 2 year compliance monitoring at 60 Row. Benzene concentrations have increased, so additional testing is warranted.
- Last year, about 1 inch of free product was detected in one well at 80 Row. This area was re-treated in June 2009 and no free product has been detected since.
- Just completed the 18-month compliance monitoring at 80 Row. Pending results, NFA may be warranted or additional sampling may be required.

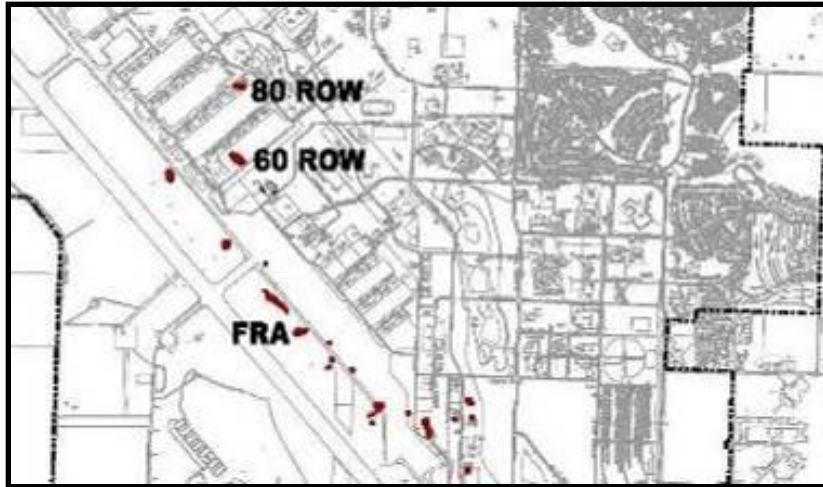


*SEAR injection in progress*





# Petroleum Release Sites Flightline Refueling Area (FRA)



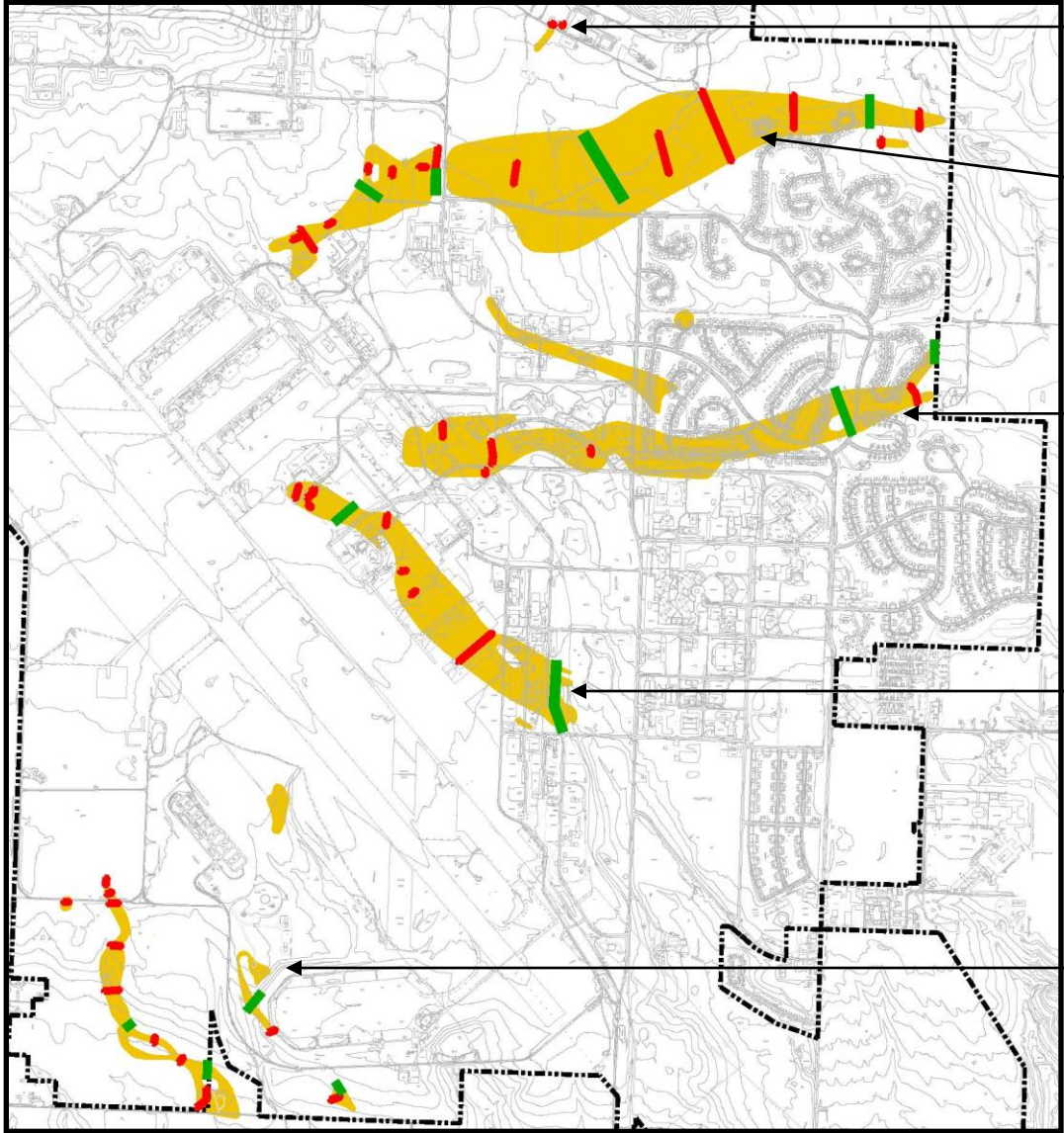
- Goal is to achieve NFA at 7 pump houses.
- Achieved NFA at 3 pump houses (PH2, PH3, and PH6).
- PH7 is currently under consideration for NFA.
- If the next sampling round (in July) at PH1 and PH4 show steady to declining contaminant concentrations, these sites will then be under consideration for NFA.
- An increasing contaminant trend has been observed at PH5. It was decided to treat this area using dissolved oxygen, which began in March. Therefore, NFA at PH5 is delayed pending treatment and follow-up compliance monitoring.



*Flightline, Pump House 1*



# 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 4 zones this summer.

6 treatment zones at the Twining/Risner and BG05. Reinjection scheduled at 2 zones this summer.

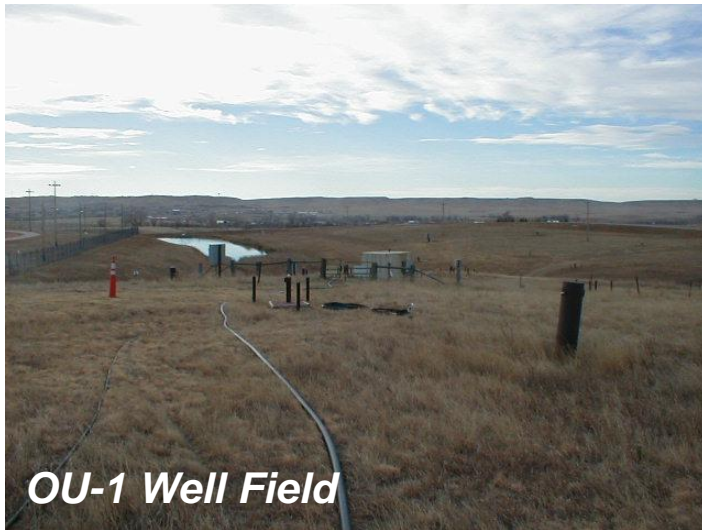
8 treatment zones at the Pride Hangar / South Docks Main. Reinjection scheduled at 2 zones this summer.

13 treatment zones at the OU-1, OU-2, and OU-4. Reinjection scheduled at 4 zones this summer.





# 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 contaminants 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
- Plan to convert the biovent to biosparge to treat “smear zone”.
- January 2010 testing found vadose zone soils were below OU-1 ROD cleanup goals. Regulatory deletion is being considered for vadose zone soils.



# Five Year Review



- Purpose - determine if remedies are protective.
- Required by Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).
- This is the third Five Year Review at Ellsworth AFB.
- It will be completed by September 30, 2010.
- Air Force, USEPA, and SDDENR participate in the Five Year Review.
- The Five Year Review report documents the following, in accordance with EPA guidance:
  - Progress since the last five year review
  - Technical assessment that addresses three questions:
    - Is the remedy functioning as intended?
    - Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?
    - Has information come to light that could question the protectiveness of the remedy?
  - Issues that affect protectiveness and performance
  - Recommendations for follow-up action
  - Protectiveness statement





# *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 Investigation



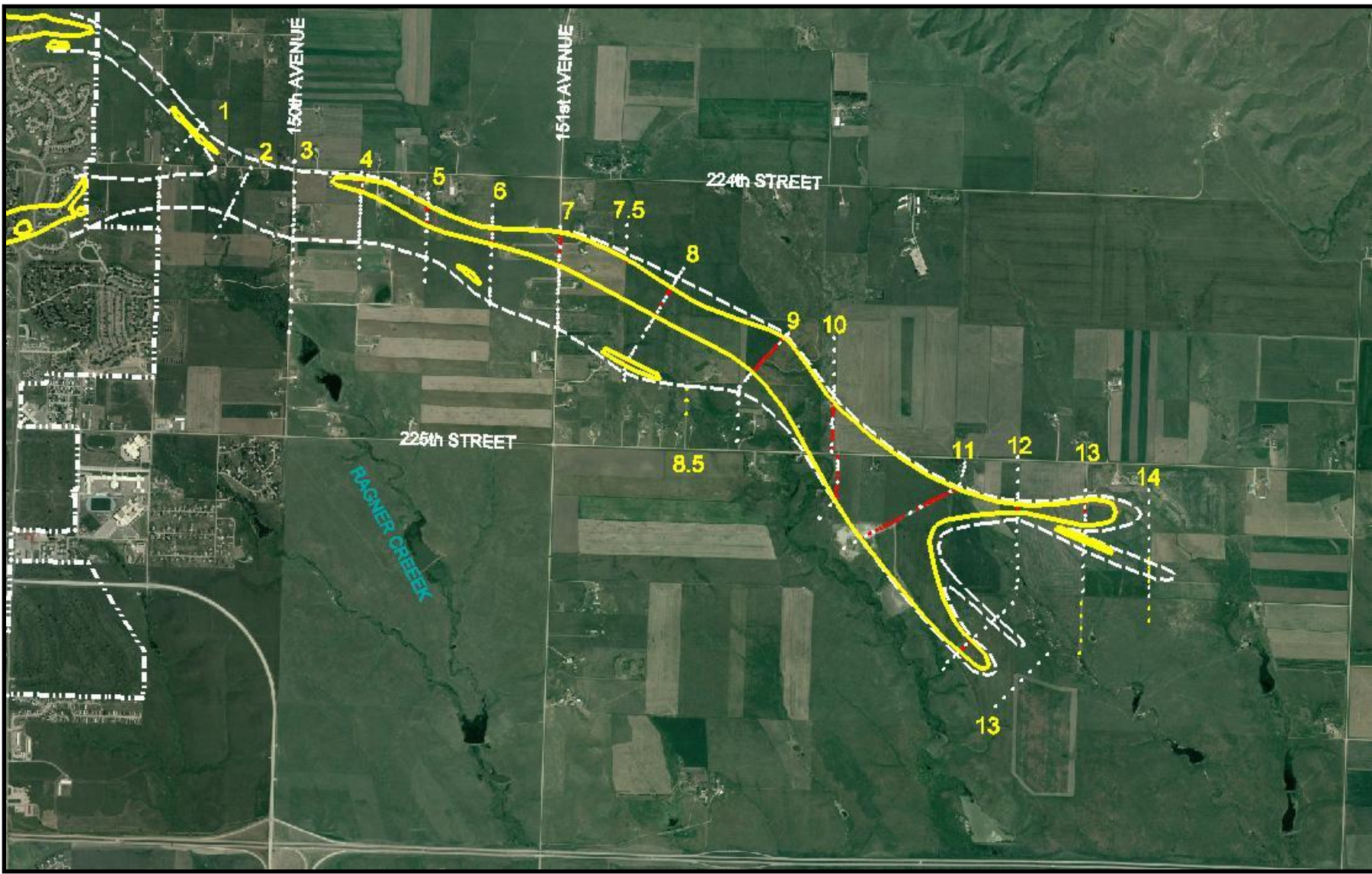
- 292 groundwater samples from 317 direct push points delineated the off Base plume.
- The results of this investigation were presented at the October 14, 2009 RAB meeting.
- Installed and sampled 19 new monitoring wells in December 2009 and January 2010.
- Established a network of 30 permanent monitoring wells at key locations to collect high quality groundwater samples for long-term monitoring of concentration trends and future decision making.
- Monitoring well results confirmed direct push investigation.





# Off-Base Plume Map

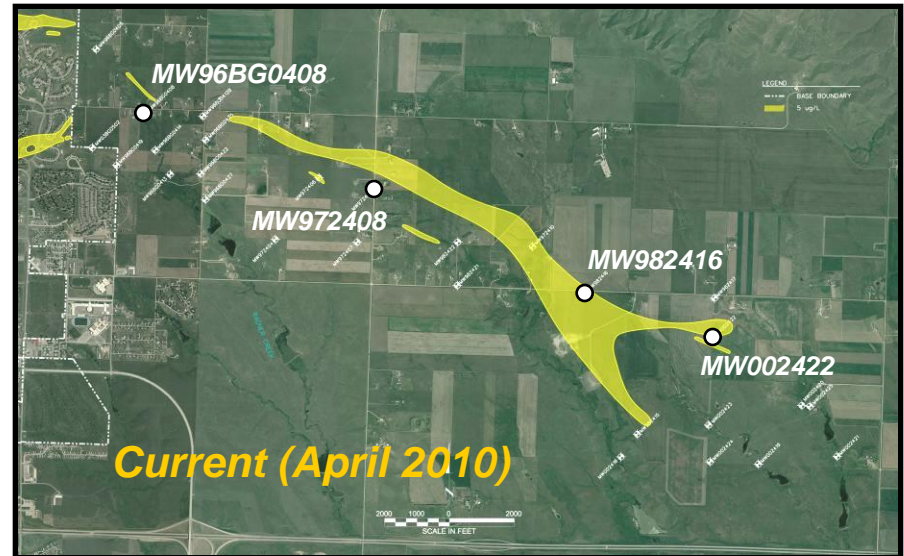
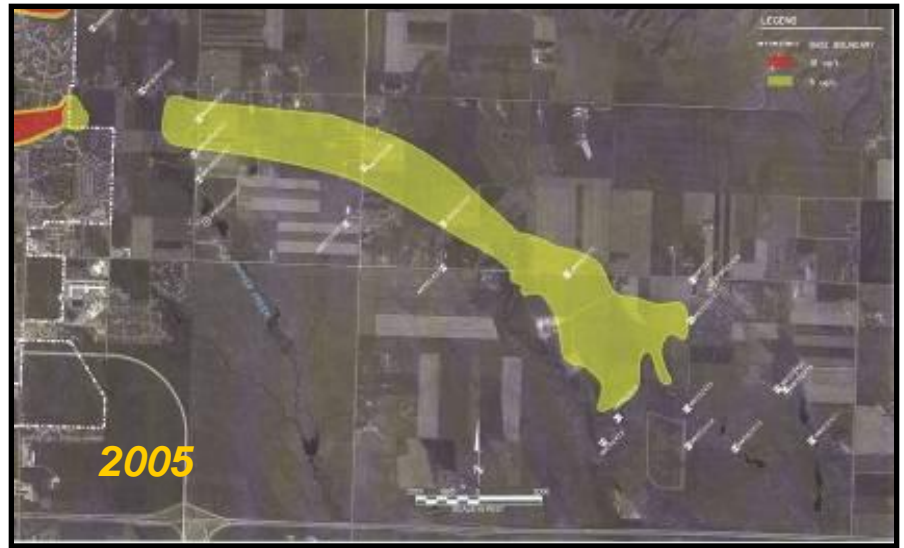
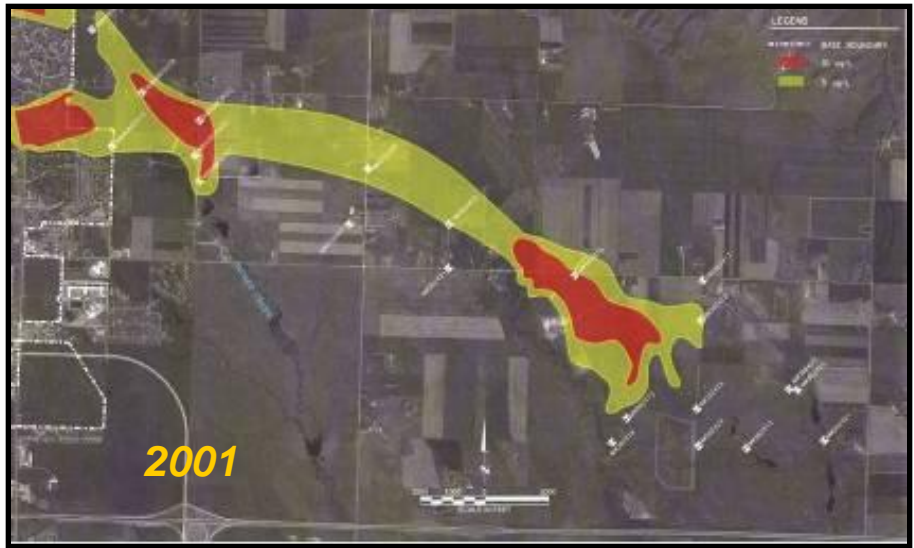
## Current Interpretation (March 2010)







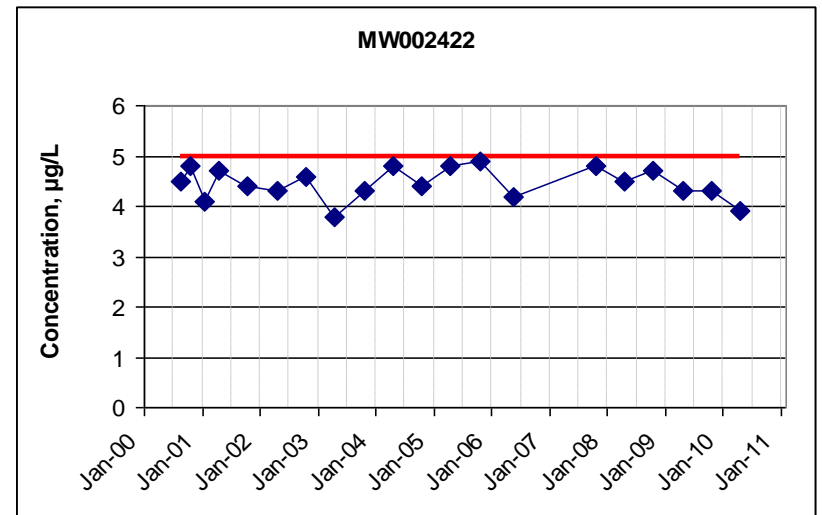
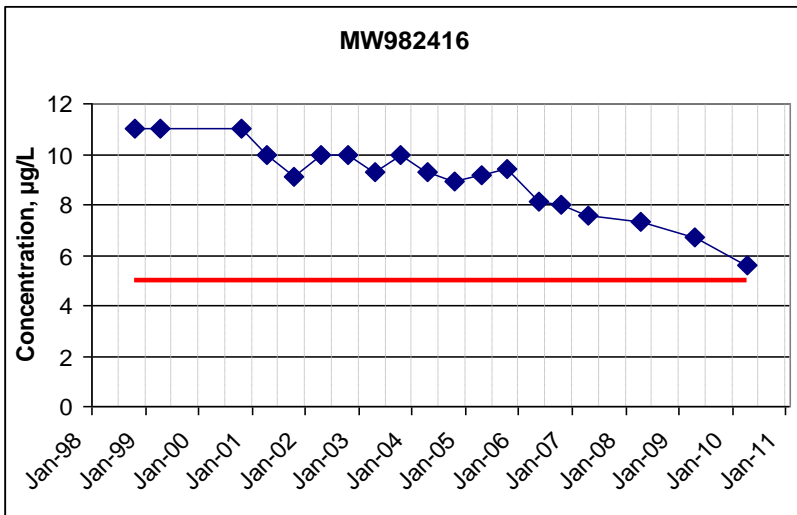
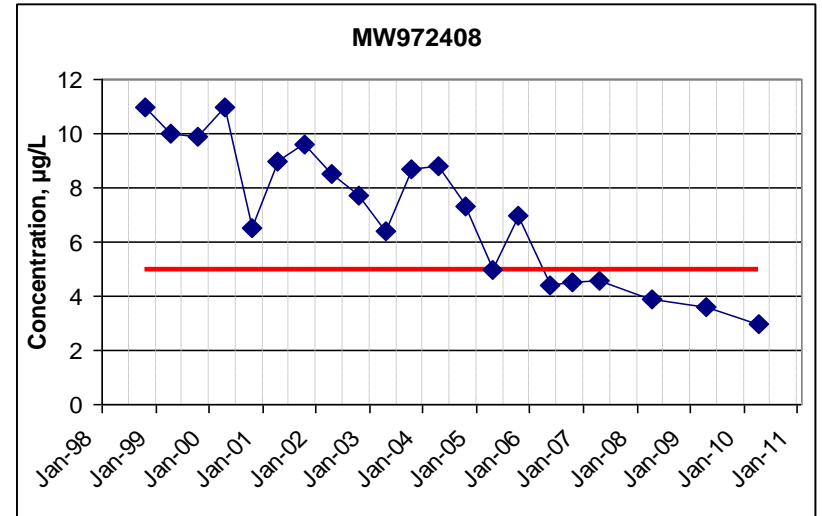
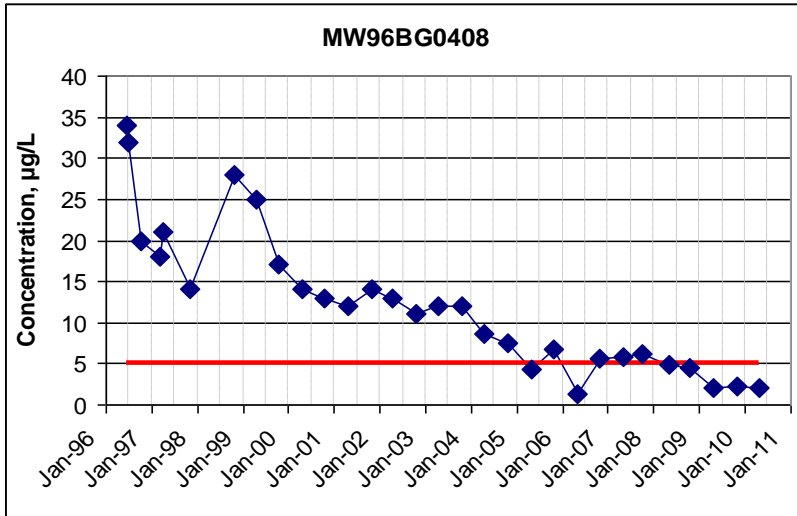
# Off-Base Plume Attenuation Since Treatment Started (2001 – 2010)





# TCE Trends in Off-Base Wells

## Upgradient Northwest

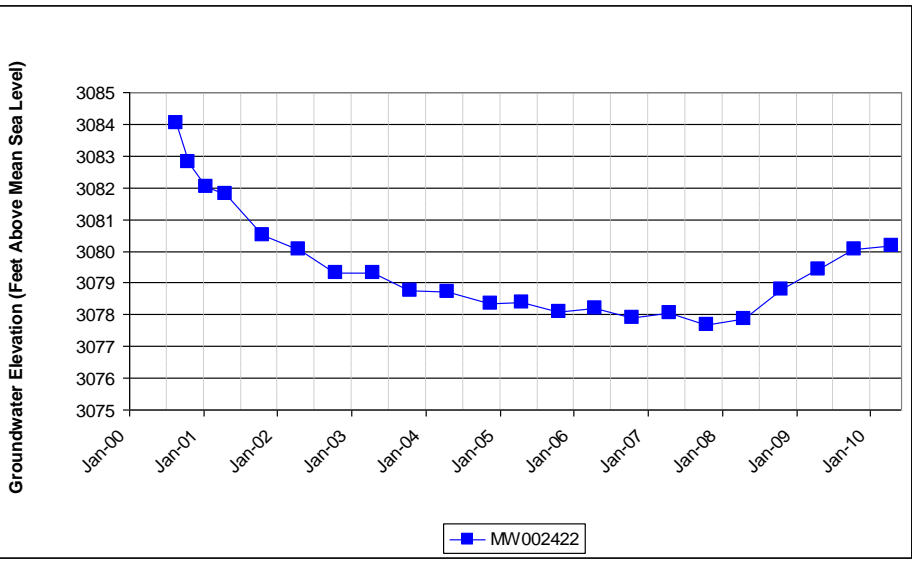
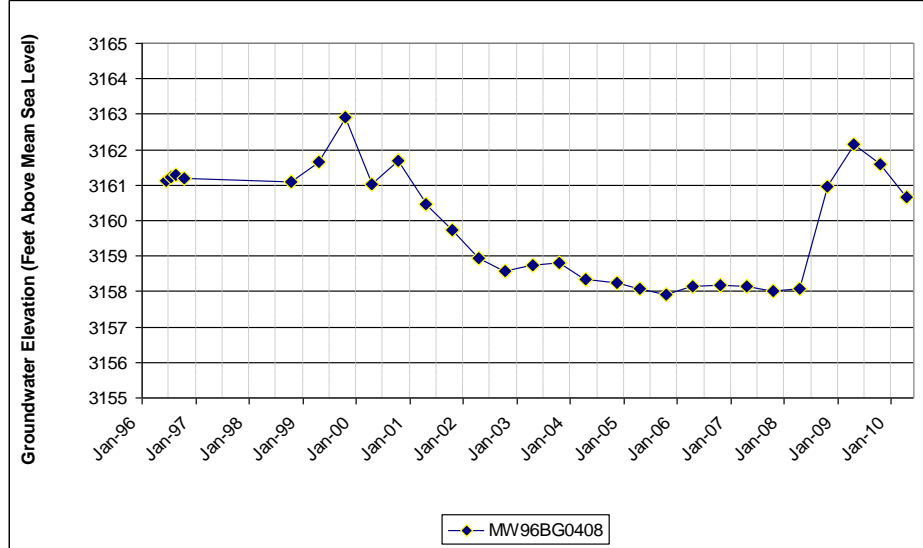


## Downgradient Southeast



# 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**





# *Draft Off-Base Plume Exit Strategy Report*



Note: Draft report still under review

1. Determine objective criteria to allow unrestricted use of groundwater
  - Characterized the plume and established a permanent monitoring well network
  - Developed monitoring criteria and decision logic for determining when unrestricted use is appropriate
2. Evaluate a process for separating the off-Base portion of the plume from the on-Base portion to accelerate the beneficial re-use of groundwater
  - Determined separation of the off-Base plume not necessary to allow water use
  - When unrestricted use is appropriate, a partial deletion process can be used
3. Evaluate the current remedy to estimate time and cost for unrestricted groundwater use
  - Remedy consists of natural attenuation, institutional controls, and monitoring
  - Estimate up to 22 years for unrestricted use (cost to be determined)
4. Develop and evaluate an alternative that would allow non-potable use of groundwater
  - Would change current remedy to allow drilling of new wells for non-potable use
  - Completed a risk assessment (discussed on next slide)
  - Determined the change to the ROD could be made by an Explanation of Significant Differences (ESD) or a ROD Amendment
5. Develop and evaluate an alternative that would substantially reduce the timeframe to achieve unrestricted use of groundwater
  - Alternative evaluated consists of treatment by pump and treat
  - Significant uncertainties and difficulties



# *Draft Off-Base Plume Risk Assessment*



- Performed a human health risk assessment to determine what TCE concentrations in groundwater might allow drilling of new wells to use contaminated groundwater for non-potable purposes, such as lawn and garden irrigation and swimming, after a ROD change.
- Risk assessment used standard EPA methodologies and conservative assumptions
- Exposure scenarios included:
  - Lawn and garden watering (adult and child)
  - Swimming (adult and child)
  - Running through sprinklers (child only)
  - TCE vapors in indoor air
- Risk calculations show that TCE concentrations below 18 µg/L would not pose an unacceptable health risk for non-potable use.
- Sampling results show that current TCE concentrations in off-Base groundwater are below the calculated risk levels.



# *Draft Short-Term Exit Strategy*



## **Process to allow non-potable use of groundwater**

- AFCEE and AF legal review of the final Exit Strategy report.
- AFCEE decision to change ROD to allow new wells.
- DOJ review of proposed decision.
- SDDENR and US EPA legal review of proposed ROD changes.
- Preparation of ESD or ROD Amendment.
- Public comment on proposed ROD changes.
- Review and signature by Air Force, US EPA, and SDDENR.
- Landowner request to drill new well for non-potable purposes.
- Preparation of new MOAs.
- Final legal review of proposed modifications to MOAs.
- Allow drilling of new wells.
- Air Force will continue to monitor off-Base plume.

## **Uncertainty**

- On 22 Mar 2010, EPA Administrator Lisa Jackson announced the US EPA's intent to develop stricter regulations for certain carcinogenic compounds, including TCE.
- Timing and impact of stricter regulations unknown - Could result in delay of decision or reversal of decision at any point in the process.





# *Future Plans*



## **All Operable Units**

- Complete the Five-Year Review by September 30, 2010.

## **Landfill Sites**

- Continue routine inspection and monitoring.

## **Petroleum Release Sites**

- Continue compliance monitoring until NFA status is granted.
- Operate and monitor dissolved oxygen treatment at PH5.

## **On-Base Plumes**

- Continue performance monitoring of the 38 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.
- Convert OU-1 bioventing to biosparge.

## **Off-Base TCE Plume**

- Address regulatory comments and finalize Exit Strategy Report.
- Begin process to allow non-potable use of groundwater.