KELLY AFB
TEXAS

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 3269

KELLY RESTORATION ADVISORY BOARD
TECHNICAL REVIEW SUBCOMMITTEE
MEETING AGENDA
May 8, 2001, 6:30 p.m.
St. Mary's University, Garni Science Hall

I.	**Introduction** A. Agenda Review and Handouts	**6:30 – 6:40 p.m.**	**Dr. Lene, Comm. Co-chair**
II.	**Update on TAPP Projects**	**6:40 – 6:50 p.m.**	**Dan Zatopek, AFBCA**
III.	**Presentation on New Cleanup Technology**	**6:50 – 7:20 p.m.**	**Don Buelter, AFBCA**
IV.	**Discussion on Update of Plume Maps for Public Distribution**	**7:20 – 815 p.m.**	**William Ryan, AFBCA**
V.	**Administrative** A. BCT Update B. Spill Summary Report C. Documents to TRS/RAB D. Action Items E. Agenda/Location/Time of Next TRS Meeting	**8:15 – 8:45 p.m.**	**Dr. Lene, Comm. Co-chair**
VI.	**Adjournment**	**8:45 p.m.**	

MEETING MINUTES

KELLY AFB TECHNICAL REVIEW SUBCOMMITTEE (TRS)
TO THE RESTORATION ADVISORY BOARD (RAB)

08 May 2001, St. Mary's University
Garni Science Center
Dr. Lené, TRS Chairman

Attendance

Dr. Lené, Chairman, Community Member
Mr. William Ryan, AFBCA
Mr. Dan Zatopek, AFBCA
Mr. Armando Quintanilla, Community Member
Mr. George Rice, Community Member
Ms. Abigail Power, TNRCC
Mr. Sam Murrah Community Member
Ms. Kyle Cunningham, SAMHD
Mr. Názirite Pérez, Community Member
Mr. Scott Lampright, Community Member
Ms. Eleanor Wehner, TNRCC

I. Introduction: The meeting began at 6:40 p.m.

II. Update on TAPP Projects: Mr. Dan Zatopek, AFBCA, informed members that AFBCA was working to finalize the statements of work and the applications for four projects to be added under fiscal year 2001. The applications should be complete by the next TRS meeting. The applications will be signed by the Acting Senior Representative of AFBCA at Kelly. Once the applications are signed, TRS members will meet to discuss assignments and selection of contractors.

III. Presentation on New Cleanup Technology. Mr. Don Buelter, AFBCA, presented information on the East Kelly Pilot Study for In Situ Oxidation/Bioremediation.

1. In Situ Oxidation involves the injection of potassium permanganate to oxidize solvents in place. The process allows a one-time injection scenario and if successful, is cost effective. Testing at various sites throughout the U.S. has shown mixed results. Major concerns are aquifer geochemistry and the effect on future bioremediation.

2. Bioaugmentation involves the injection of food-grade vegetable oil, which is slightly soluble in groundwater. Pilot test results at other locations have shown a rapid initial decrease in TCE concentrations. The technology provides food to naturally occurring organisms, which are able to degrade solvents. Vegetable oil injection is also a good method for area mass reduction. At other locations, the process showed a relatively rapid collapse of the TCE plume and collapse of DCE and VC plumes over time.

Discussion:

Q: Mr. Lambert asked what kind of byproducts are left over and how much oil would be to be used for a project of this size.
A: Mr. Buelter replied that the number is unknown and will be determined later by the contractor. Injection points need to be considered according to the proximity of the source.

Q: Mr. Lambert asked if the vegetable oil would naturally stratify in water?
A: Mr Buelter said that it would stratify. However, the water column being considered is thin, and we will be injecting throughout the water column.

Q: Mr. Quintanilla asked if this process would be used to treat the entire Zone 4 plume of three miles.
A: Mr. Buelter said it would not be cost effective.

Q: Mr. Quintanilla asked why vegetable oil would be used.
A: Mr. Buelter said the vegetable oils provide "food" for the organisms and other methods degrade too quickly.

Q: Mr. Lambert asked if this technology had been used in large-scale cleanup operations.
A: Mr. Buelter said that it had not been used in large-scale cleanup operations.

Q: Mr Quintanilla asked if the water would be cleaned to drinking water standards?
A: Mr. Buelter said it would be.

Q: Mr. Quintanilla asked how long the process would take?
A: Mr. Buelter said that sampling for the pilot study would occur six to eight months after injection.

Q: Mr. Quintanilla asked how much the tests would cost?
A: Mr. Buelter said the cost would be approximately $450,000 and would be contracted over a period of months.

Q: Mr. Quintanilla asked if this would be used to treat the entire Zone 4 plume?
A: Mr. Buelter answered that it would not be cost effective.

Q: Mr. Quintanilla asked if this technology was one of the six that was presented as an option for the Zone 4 Plume?
A: Mr. Buelter replied that it was not.

Q: Mr. Lampright asked if there were any byproducts of the process?
A: Mr. Buelter replied that manganese dioxide was a byproduct.

Q: Mr. Lampright asked if the byproducts could cause any problems?
A: Mr. Buelter said a very large amount of manganese dioxide could affect the permeability of the soil.

Comment: Mr. Buelter also informed the members that additional information is available through the EPA web site and ITRC is developing a technical guide for In Situ Oxidation.

Q: Mr. Lambert asked when tests will begin and when the results would be available.
A: Mr. Buelter said testing will begin in the May – July time frame. Lab work must first be done and then field work will follow. Funding has been approved for the testing.

IV. Discussion on Update of Plume Maps for Public Distribution. William Ryan reviewed the updated plume maps and asked the members for their recommendations for developing the maps, applying information on images, and developing displays in a way that the audience could understand. The following recommendations were made:

- Use a color scale map for total chlorinated solvents
- Place a mileage scale along the bottom of the map
- Create a special map for the city council depicting the boundaries to their respective districts
- Retain the street names
- Highlight rivers and creeks in blue
- Condense metals into one map
- Use a color scale for the chlorinated solvents to depict concentration levels of 5, 10, 100, 200 ppm
- Label plumes
- Move the north arrow to allow for more room to explain technical items in the legend

- Create a box in the lower left portion of the map to explain that the map is just a general map depicting the extent of contamination, and for more specific information refer to the CMS
- Keep map size at 11"x17"
- Acknowledge RAB participation and input
- Eliminate logo
- Expand legend
- Title maps
- Limit maps to six total
- Simplify scientific terminology
- Distinguish Kelly and Lackland boundaries (not by zones)

Discussion:
Mr. Quintanilla asked when another public meeting would be held to reveal the new map information. Mr. Ryan responded that the city's review of the Zone 4 CMS would not be completed until July. Once revised and the CMS is submitted, public meetings would be held. The maps would then be presented to the RAB and to the public.

V. Administrative:

A. BCT meeting update. No meeting was held prior to the TRS, the meeting was going to be held on the following day. The meeting minutes will be forwarded.

B. Spill Report. Four spills were reported. Information is being provided to TNRCC by AFBCA in chronological order. A written spill report will be given to TRS on a monthly basis by AFBCA. Anything of significance is reported to TNRCC.

C. Documents Delivered to RAB: One document was presented to the TRS, *The Final Report on Interim Technical Memo for Zone 4*. All TRS members received a copy.

D. Action Items: There were no action items.

E. Agenda for Next Meeting: Dr. Lené reported that during the months of June and July, the classroom at Garni Science Hall would not be available for meetings. A new location for the meeting would be determined. Abbi Power offered the TNRCC conference room of the TNRCC State Office Building. Public schools and public library are to be considered. Agenda items were not determined.

F. Next TRS meeting: The next TRS meeting will take place at 6:30 p.m. on 12 June 2001. Location would be determined.

Adjournment: The meeting adjourned at 8:45 p.m.

MEETING MINUTES

KELLY AFB TECHNICAL REVIEW SUBCOMMITTEE (TRS)
TO THE RESTORATION ADVISORY BOARD (RAB)

13 February 2001, South San Antonio High School
Dr. Lené, TRS Chairman

Attendance

Dr. Lené, Chairman, Community Member
Mr. Adam Antwine, AFBCA
Mr. Dan Zapotek, AFBCA
Mr. Armando Quintanilla, Community Member
Mr. George Rice, Community Member
Mr. Sam Sanchez, SAMHD
Mr. Sam Murrah Community Member
Ms. Hilary Naab, AFBCA
Mr. Názirite Pérez, Community Member
Mr. Scott Lampright, Community Member

I. Introduction: The TRS meeting began at 6:09 p.m.

II. Review of Potential TAPP Review Subjects: Mr. Zatopek, AFBCA, asked the subcommittee to consider against what projects TAPP monies should be applied in 2001. He reported that Mr. William Ryan provided the following information on upcoming reports due this year:

1. ATSDR reports are due by the end of March.
2. Zone 4 CMS is due in April.
3. Zone 2 &3 CMS is due in April.
4. S-4 CMI Workplan is due in October.
5. 300 Area RFI is due in April.

B. Discussion:

Q - Mr. Armando Quintanilla said he thought there were six reports to be issued by ATSDR. He asked if this would cover all of them.

A - It was agreed it should cover those reports coming out the end of March.

Q - Several members asked how many reports could be reviewed with the available monies.

A - Mr. Zatopek said that once quotes were received from the bidders it could be determined how many reports could be done. He expected at least three but it was good to have four reports selected if there was enough money.

Q - Mr. Sam Murrah asked for a description of the 300 Area.

A - Mr. Antwine said it was the base industrial area.

C. The committee approved the following reports for TAPP grant funding (in order of priority);

1. ATSDR March Report
2. Zone 4 CMS
3. Zone 2 &3 CMS
4. 300 Area RFI

III. Administrative:

A. Next TRS meeting: The next TRS meeting will be at 6:30 p.m. on 13 March 2001 in Garni Science Hall, St. Mary University.

IV. Adjournment: The TRS adjourned at 6:23 p.m.

MEETING MINUTES

KELLY AFB TECHNICAL REVIEW SUBCOMMITTEE (TRS)
TO THE RESTORATION ADVISORY BOARD (RAB)

20 December 2000, St. Mary's University, Garni Science Hall
Dr. Lené, TRS Chairman

I. Introduction: The TRS meeting began at 6:45 p.m. Attachment 1 is the attendance report.

II. TAPP Review of MitreTek Shallow Groundwater Report: Mr. Mark Hemingway, Geomatrix Consultants Incorporation, presented his draft review. (see Attachment 1) He emphasized that the MitreTek report was reviewed as a "stand alone" document and none of the network of supporting documents was examined. He summarized conclusions in the MitreTek report.

A. He then offered the following observations/conclusions from his review:
1. More investigation is needed to examine undiscovered contamination sources, plume migration and groundwater flow channels.
2. More data is required to confirm off-site sources.
3. Even if off-sites sources are present, the Air Force should, at a minimum, retain shared responsibility to investigate off-site plumes.

B. Mr. Hemingway sited several differences he had with the report:
1. The nature of the shallow groundwater does not preclude its potential use. The water meets state regulatory standards for potential use. It also largely meets Federal standards.
2. Although the distribution of contamination may support the presence of off-base sources of the contamination north of the base the evidence is not conclusive.
3. No off-base plumes could be attributed solely to off-base sources.
4. The Air Force should continue investigating the area.

C. Discussion:

Comment: Mr. George Rice complemented Mr. Hemmingway on the report. He also suggested including in his review document some of the figures and maps from the report, if the budget permitted.

Q - Mr. Rice asked if an outline of a basic plan to fill the data gaps could be included.

A - Mr. Hemmingway said that with the limited budget any plan would have to be very general and would be of limited use.

Comment: Mr. Mark Weegar, Texas Natural Resource Conservation Commission (TNRCC) said the data gaps had been identified and work had already started on filling them.

Q - Mr. Rice asked if there were there any evidence that the contamination was from on-base.

A - Mr. Hemmingway said difficulty is answering this question is because there were no test wells between off-base 'hotspots' and all areas of the base.

Comment: Mr. Weegar said they understand there is a city-operated waste line in the area and it is possible a past leakage could account for 'hotspots'.

Comment: Mr. Hemmingway said he was disappointed that his draft report had been given to the media. He said he considered it irresponsible to release a report that wasn't final. He recommended this be seriously considered in future activities

Q - Dr. Lené asked if it was possible to determine a one-time spill or a chronic problem.

A - Mr. Hemmingway said that would be very difficult because of the nature of the solvent creating the 'hotspot'.

Q - Dr. Lené asked Mr. Hemmingway if he could estimate the original amount of contaminant.

A - Mr. Hemmingway said that there was to many variables to calculate an estimate.

D. Dr. Lené asked that any further questions be submitted by Friday (15 Dec 00) to himself or Mr. Dan Zatopek, Air Force Base Conversion Agency (AFBCA).

III. Zone 2 & 3 Status: Mrs. Rhonda Hampton, AFBCA, provided an update on the work that has been accomplished. She highlighted the optimization of systems at site MP and throughout the zones. She also reported the Zone 2 Draft RFI will be available on 19 January 2001.

A. Discussion:

Q - Dr. Lené asked if the Corrective Measure Study (CMS) would include both zones.

A - Ms. Hampton said the CMS, due out on 15 April 2001, will include both zones.

IV. Review of Potential TAPP Review Subjects: Mr. Zatopek asked the subcommittee to consider what projects should receive TAPP monies in 2001. Several projects are holdovers from last year. Mr. William Ryan, AFBCA, said he would review upcoming deliverables for other reports that may be of interest and report to Dr. Lené.

A. The committee prioritized a current list of deliverables:

1. ATSDR Reports
2. Zone 4 CMS
3. Zone 2 &3 CMS
4. CMI S-4 Workplan

B. Discussion:

Comment: Mr. Weegar suggested the money should be used to look at documents where are being proposed rather than documents on solutions already selected.

Comment: Mr. Zatopek said the monies for TAPP grants were 'locked up' and the committee did not need to rush their decision.

V. Area 1592 Project Update: Ms. Vanessa Musgrave, AFBCA, stated that the two aboveground fuel tanks were demolished and the contractor is starting to breaking up the berm concrete. Any errant paint chips are being swept up and the area is watered down to limit dust. She did not have the schedule for the underground vaulted fuel tank removal.

A. Ms. Musgrave reported an extensive effort had been made to ensure the community was well informed about the Area 1592 project. The community outreach included to date three community bulletins, personal visits by staffers to area neighbors, media coverage and a 24/7 hotline. During one visit with a resident the windows of the home rattled. The team was able to determine on the spot that an explosives training program was being conducted at Lackland AFB. She also commented that the public could get daily air sampling results being gathered four times a day done at the fence line along Growdon Road.

B. Discussion:

Q - Mr. Weegar, TNRCC, asked when the concrete containment walls would be gone.

A - Ms. Musgrave, AFBCA, reported that approximately a fourth to one third of the concrete containment walls were broken and the rest would be removed shortly.

Q - A subcommittee member asked if the area would be used by the Edgewood Independent School District for practice fields and, if so, would that require cleanup at a higher level.

A - Ms. Musgrave, AFBCA, said the land use was up to the Greater Kelly Development Authority (GKDA).

A - Mr. Weegar, TNRCC, said that currently the state is considering future use as industrial. To use the area as practice fields the cleanup may have to be done at residential use levels.

VI. Administrative:

A. Base Conversion Team (BCT) handouts were presented to Dr. Lené (see Attachment 3). Mr. Ryan reported the new off-base data requested by TNRCC is in but not validated. The data should be validated in time for the next meeting. He also said the runway joint use agreement had been signed by the Air Force.

B. Spill Summary Report: There were no reportable spills during the month of November 2000 (see Attachment 4). A spill was reported on 9 November 2000 in the 1592 fuel tank area of less than 10 gallons of JP-8. Ms. Abbey Powers, TNRCC, asked if GKDA tenants were reporting spills to the Air Force. Mr. Ryan said no.

C. Documents to TRS/RAB: There were two new documents (see Attachment 5).

D. Action Items: No Action Items.

E. Next TRS meeting: The next TRS meeting will be an abbreviated one held prior to the Special RAB meeting at 6:00 p.m. on 13 February 2001. The unconfirmed location is South San Antonio High School. The Subcommittee decided not to hold a January TRS meeting. BCA will send info packets out in lieu of a January meeting.

1. Other RAB meetings were detailed
   a) 16 January 2001 – regular RAB meeting
   b) 23 January 2001 – RAB workshop on Zone 4 shallow groundwater
   c) 31 January 2001 – Public Forum
   d) 13 February 2001 – Abbreviated TRS meeting at 6:00 p.m. to discuss TAPP grant topics. Special RAB meeting at 6:30 p.m. (Discussed with and agreed to by Dr. Lené, RAB Community Co-Chair)
   e) 21 February 2001 – Public Comment Forum on Zone 4 shallow groundwater

VII. Adjournment: The TRS adjourned at 8:30 p.m.

Attachments:

1. Attendance Report
2. TAPP Review of MitreTek Shallow Groundwater Report
3. BCT Minutes
4. Spill Summary Report
5. Documents List

MEETING MINUTES

KELLY AFB TECHNICAL REVIEW SUBCOMMITTEE (TRS)
TO THE RESTORATION ADVISORY BOARD (RAB)

20 March 2001, St. Mary's University - Garni Science Hall

I. Introduction: The meeting began at 6:35 pm.

II. Update on Area 1592 Tank Site: Mr. William Ryan, AFBCA, summarized events related to contaminated fill dirt that had been publicized in an article in the San Antonio Express-News. He said that BCA had brought in dirt from Lackland to fill and grade the tank site in mid-January. BCA assumed the dirt had been tested for all contaminants but found that it had not been after the soil arrived. BCA then ran tests and found that the dirt contained high levels of chlordane – a chemical used to eradicate termites until it was banned a few years ago. During the testing period, the soil remained at the 1592 site in piles covered with heavy plastic sheeting. It was sent back to Lackland on the 20th of February. TNRCC is now monitoring the site from which that soil was taken, and BCA is still looking for a different source of soil.

Sam Murrah said that BCA should test for nutrient content of the soil if it plans to grow anything on the site. Ryan indicated that such tests were not done because this was only to be used for fill purposes.

III. Update on TAPP Requests: Mr. Dan Zatopek, AFBCA, reviewed the priorities for TAPP requests as determined at the February 13, 2001, TRS meeting and indicated that the completed application would probably be ready in time for the April RAB meeting.

IV. Presentation on Zone 4 RCRA Facility Investigation (RFI): Mr. Mark Stoker, CH2MHill consultant to AFBCA, presented an overview of the RFI for Zone 4. He presented findings on the soil sites and then on the groundwater sites.

Regarding soils, he identified several areas within Operable Unit 1 where sampling had been completed. The investigation had established a goal of Risk Reduction Standard (RRS) #2 closure for soils for the SS051 Site in the northeast corner of East Kelly. Sampling at the MW160 site (former Underground Storage Tank facility) in the east central portion of East Kelly had established the goal of RRS#2 closure with no remediation required since soil samples were acceptable for Soil Air Ingestion (SAI) and Groundwater Protection Standard (GWP). The MW125 site, in the southeast corner of East Kelly, however, has soils with PAH concentrations exceeding GWP. He indicated that investigations had revealed contamination of the Kelly soils at that site from nearby off-base sites, the former Tropicana Refinery and the R&H spent oil processing facility. Soils at these sites had been contaminated by spills and mounded in all directions for the initial spill area. The soils moved into East Kelly at depths of 10-20 feet. Thus, the Kelly site reveals contamination only at the depth, not at the surface.

Operable Unit 2 covers groundwater contamination plumes from sites SS051 and MP. Mr. Stoker reported that the model runs now show the full extent of groundwater contamination coming from East Kelly. This is established by the fact that monitoring wells to the east and south of the defined area show non-detect levels of VOC's. The plume from SS051 corresponds to the more northern of the two plumes, as shown on the latest maps defining the extent of the plumes.

Stoker noted that the RFI is complete for Zone 4, and the Air Force is moving ahead with the Corrective Measures Study (CMS).

V. Discussion on Zone 4 RFI:

In response to a series of questions from George Rice regarding temporary borings, Walter Peck emphasized that conclusions about dry areas were not based on temporary borings or on dry borings where they were intermixed with wet wells. He said that BCA only concluded that an area was dry when supported by a combination of multiple borings and soil sampling.

In response to questions asked by Kyle Cunningham, Laura Stankosky of EPA indicated that little is known about the reasons for locating the oil refinery and spent oil processing facility at their sites. She said that both sites were abandoned and the agency must therefore piece together the picture of activities and spill incidents. The Superfund Program has done a Removal of contaminants from the sites, she indicated, and now must try to identify the Responsible Parties and get them to do as much remediation as possible.

Responding to a question from Dr. Gene Lene, Mark Stoker said that they had found no groundwater contamination plumes from those sites. Mark Weegar of TNRCC said that his agency was still working on its letter concerning off-base sources of groundwater contamination. He had heard from the Superfund Program that groundwater contaminants have been identified at either or both the R&H and Tropicana sites but needed to get more information about the off-base sources.

VI. Administrative:

A. BCT Update: William Ryan reported that the BCT had seen and discussed this same RFI presentation earlier in the day. They also discussed Compliance Plan Monitoring. BCA is proposing that its staff not analyze all samples at sites with no measures. They reviewed contamination at Site E-1, which will be covered in the CMS for Zones 2-3 sometime in June. He said BCA may have to pull back the CMS for Zone 5 to revisit technology at a spill site. Regarding Zone 4, the BCT discussed a possible pilot project for injecting vegetable oil to expedite cleaning of groundwater. He explained that vegetable oil has a slow release time, thus remaining as a source for a long period.

B. Spill Report: AFC wants to transfer this report to BCA but haven't yet produced the letter on this. Informally, Mr. Ryan indicated, they had said that there were no new spills.

C. Documents Delivered to RAB: Dr. Lene noted that the Zone 4 RFI and the 2001 Compliance Plan and Addendum had been delivered.

D. Action Items: There were no action items to report on.

E. Agenda for Next Meeting: The group wanted to have a presentation by Don Buelter of AFBCA on the vegetable oil pilot project at the next meeting. Assuming the RFI modeling would be complete by the April meeting, there would also be a presentation on this subject. The next meeting will take place at 6:30 pm on April 10 in the Garni Science Hall at St. Mary's University.

The meeting adjourned at approximately 8:15 pm.

U.S. Air Force Base Conversion Agency

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In situ oxidation /bioremediation

East Kelly Pilot Study

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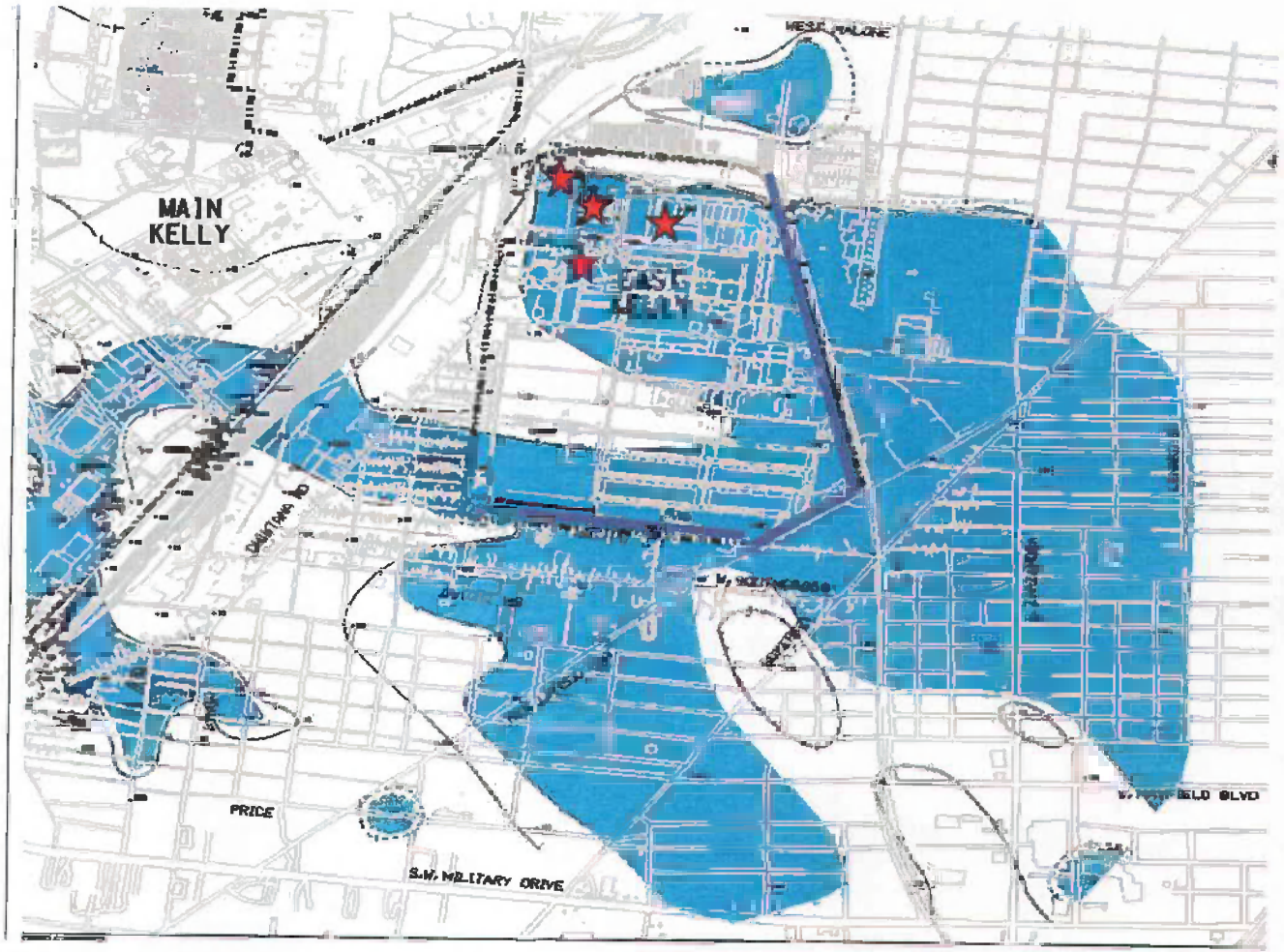
In situ test locations - E. Kelly

- **In situ Pilot Test**
  - Four preliminary locations have been identified
  - Bioaugmentation - vegetable oil
  - In situ oxidation - potassium permanganate



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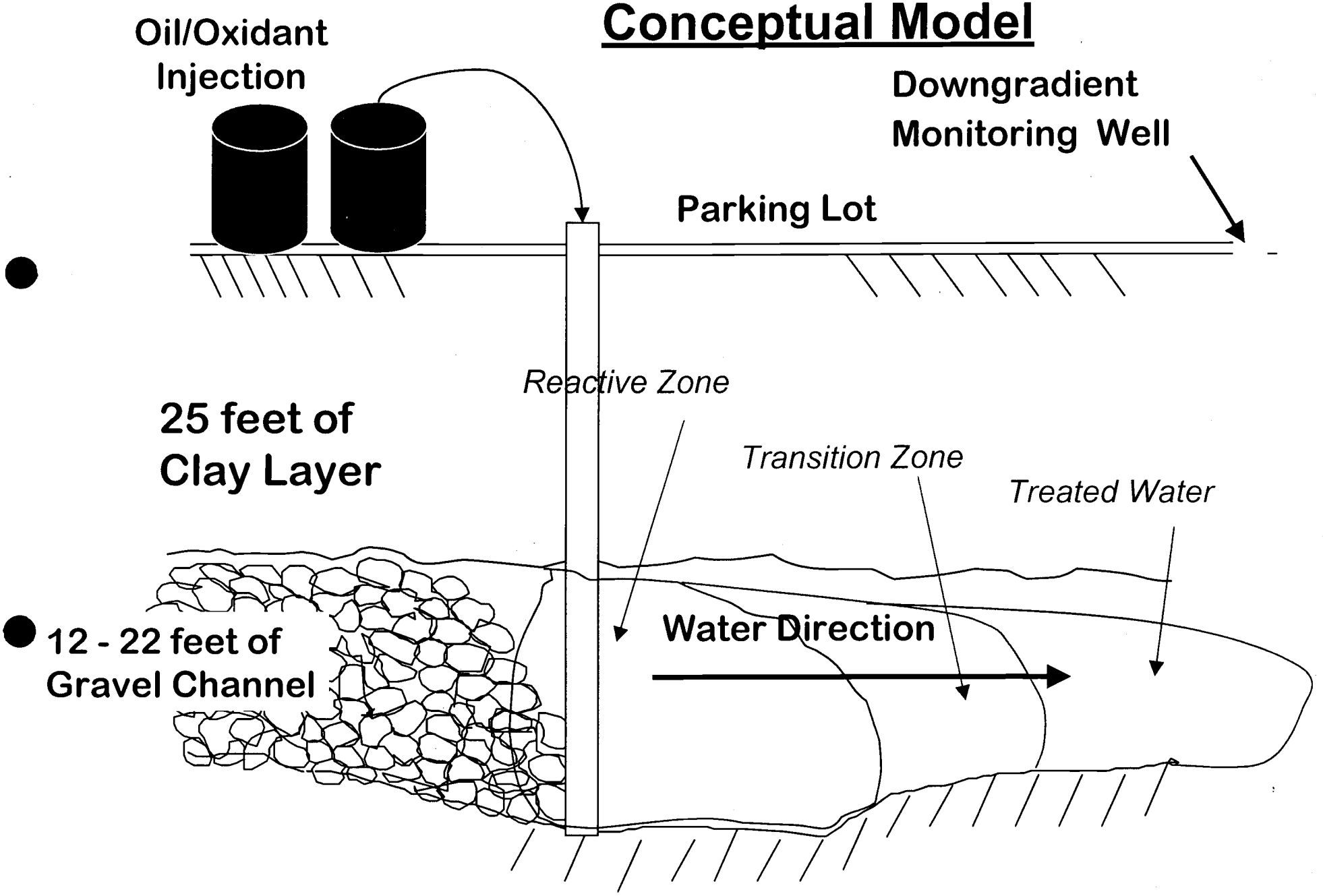
Technology Descriptions

- Vegetable Oil Injection
  - Organisms available to degrade solvents - but something is missing
  - Vegetable oil supplies "food" for organisms that allows solvents to degrade
  - Best for source area mass reduction
- In situ Oxidation
  - Permanganate is an oxidizing agent that has an affinity to organic compounds
  - Will oxidize organic materials to carbon dioxide
  - Best for source area mass reduction

Conceptual Model



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Vegetable Oil Injection

- Previous bioremediation tests have been successful at Kelly AFB
  - Continuous injection of organic material required
- Engineered Bioremediation of Chlorinated Solvents
  - Involves injection of food-grade vegetable oil which is only slightly soluble in groundwater
  - Costs $0.20 to $0.50/pound
  - Should allow a one-time injection scenario - big benefit/cost savings
  - Soybean oil is being tested at six sites in FL, UT, CA and TN

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Vegetable Oil Injection - Pilot Test Results

- Rapid initial decrease in TCE concentrations due to partitioning into oil plus biodegradation
- Rapid increase in DCE and VC concentrations show biodegradation of TCE
- Over time, decreasing DCE concentrations due to partitioning of TCE into oil and biodegradation
- Relatively rapid collapse of TCE plume
- Collapse of DCE and VC plume over time

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In situ Oxidation

- **Potassium Permanganate Treatment of Chlorinated Solvents**
  - **Involves injection of potassium permanganate to oxidize solvents in situ**
  - **Should allow a one-time injection scenario - potential cost savings, if successful**
  - **Tested at many sites throughout US, mixed results**
  - **Rebound and aquifer geochemistry are major concerns - future bioremediation?**

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Recommendations

- Review site data and conceptual model to ascertain if source and dissolved groundwater contamination can be treated
- Calculate chemical oxidant demand - Permanganate
- Calculate electron donor demand - Bioremediation
- Develop well defined pilot test objectives
- Ensure accurate performance evaluation
- Institute a program for rebound testing

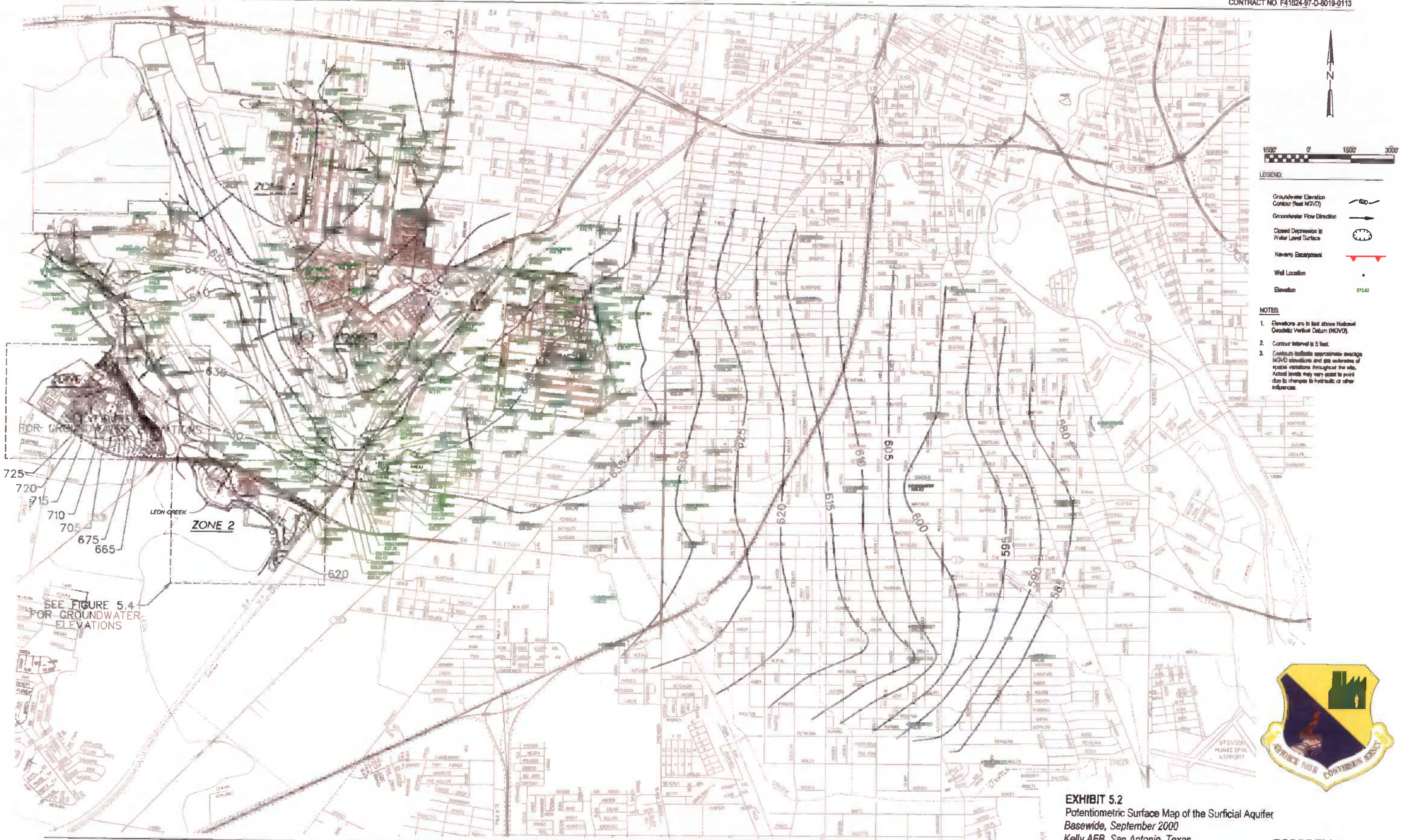
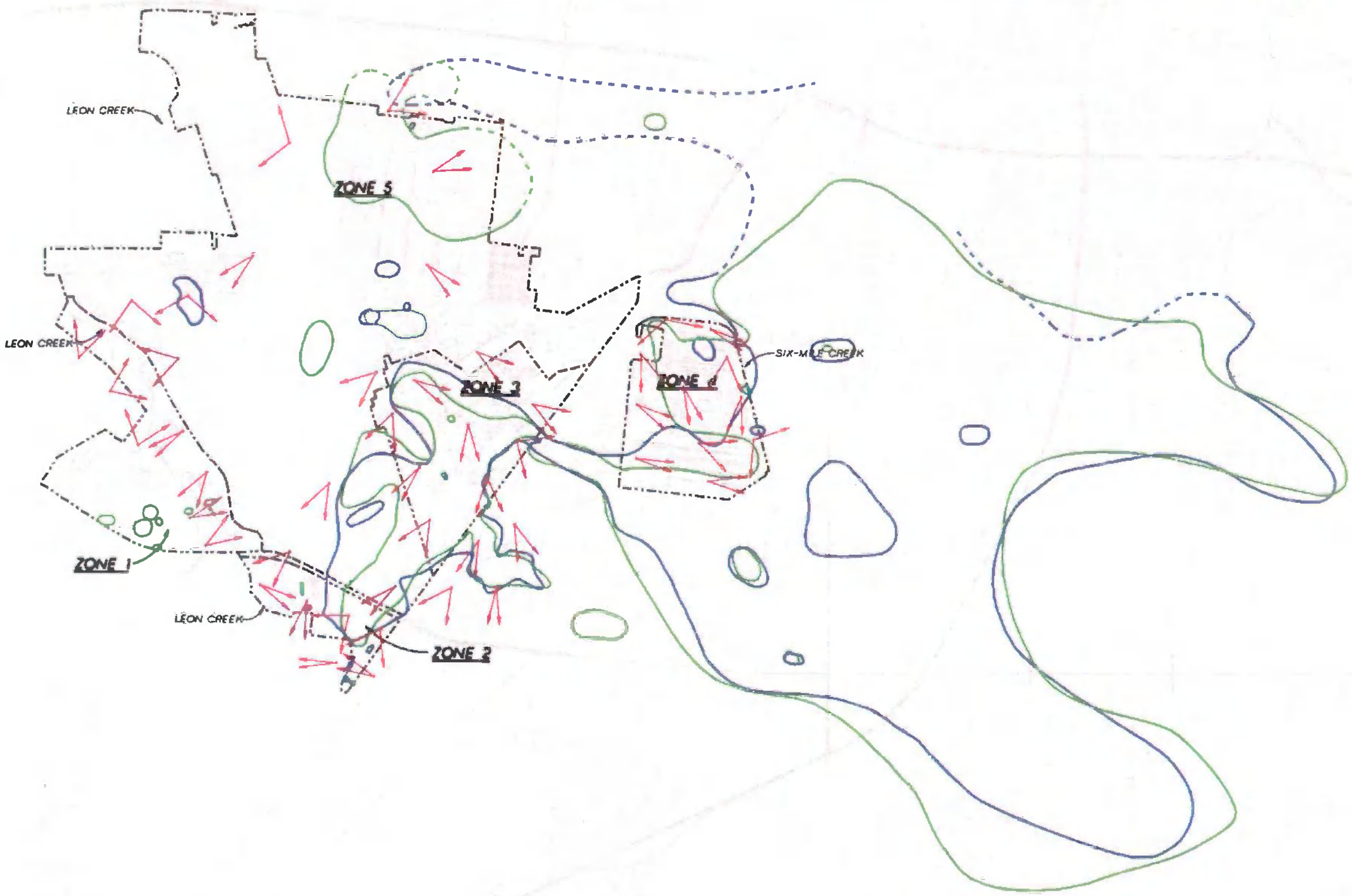


EXHIBIT 5.2
Potentiometric Surface Map of the Surficial Aquifer
Basewide, September 2000
Kelly AFB, San Antonio, Texas

CH2MHILL



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LEGEND:

- Range in Groundwater Flow Direction from March 1994 through September 1999
- Zone / Installation Boundary
- PCE Isoconcentration (5 µg/L)
- TCE Isoconcentration (5 µg/L)
- Closed Reduction in Concentration

NOTES:

1. The plume extent was generalized from and interpolated between sample locations. Information on actual conditions exists only at the specified locations.
2. All samples were collected in April/June 2000.
3. Isoconcentrations are dashed where inferred.
4. Contours are drawn at the MCL.

EXHIBIT 6.2
Extent of TCE and PCE in the Surficial Aquifer
April/June 2000
Kelly AFB, San Antonio, Texas

N

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LEGEND:

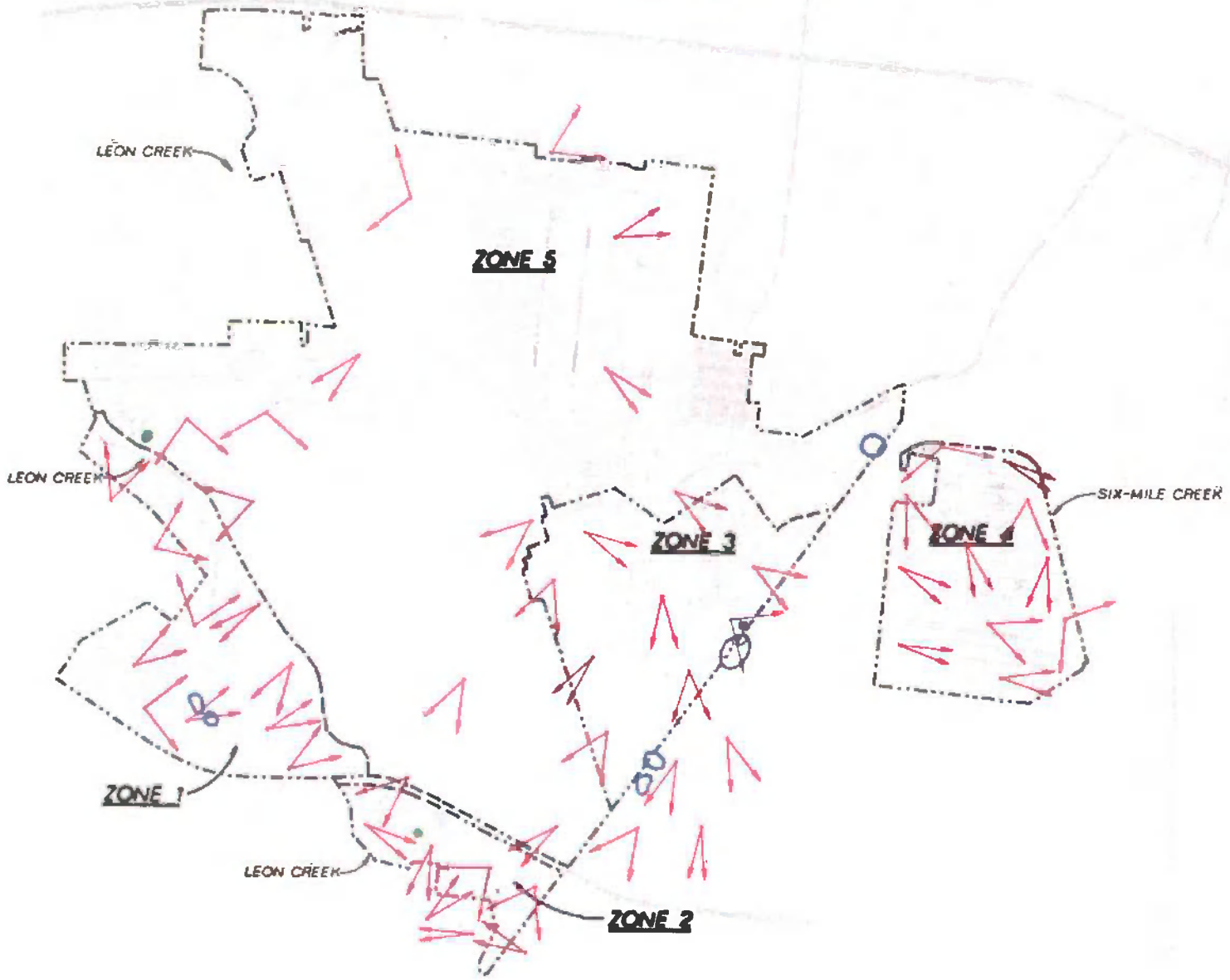
- Range in Groundwater Flow Direction from March 1994 through September 1999
- Zone / Installation Boundary
- DCE Isoconcentration (70 µg/L)
- Vinyl Chloride Isoconcentration (2 µg/L)

NOTES:

1. The plume extent was generalized from and interpolated between sample locations. Information on actual conditions exists only at the specified locations.
2. All samples were collected in April/June 1999.
3. Isoconcentrations are dashed where inferred.
4. Contours are drawn at the MCL.

EXHIBIT 6.3
Extent of Total 1,2-DCE and Vinyl Chloride in the Surficial Aquifer
April/June 2000
Kelly AFB, San Antonio, Texas

CH2MHILL



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LEGEND:

- Range in Groundwater Flow Direction from March 1994 through September 1999
- Zone / Installation Boundary
- Benzene Isoconcentration (5 µg/L)
- Chlorobenzene Isoconcentration (100 µg/L)

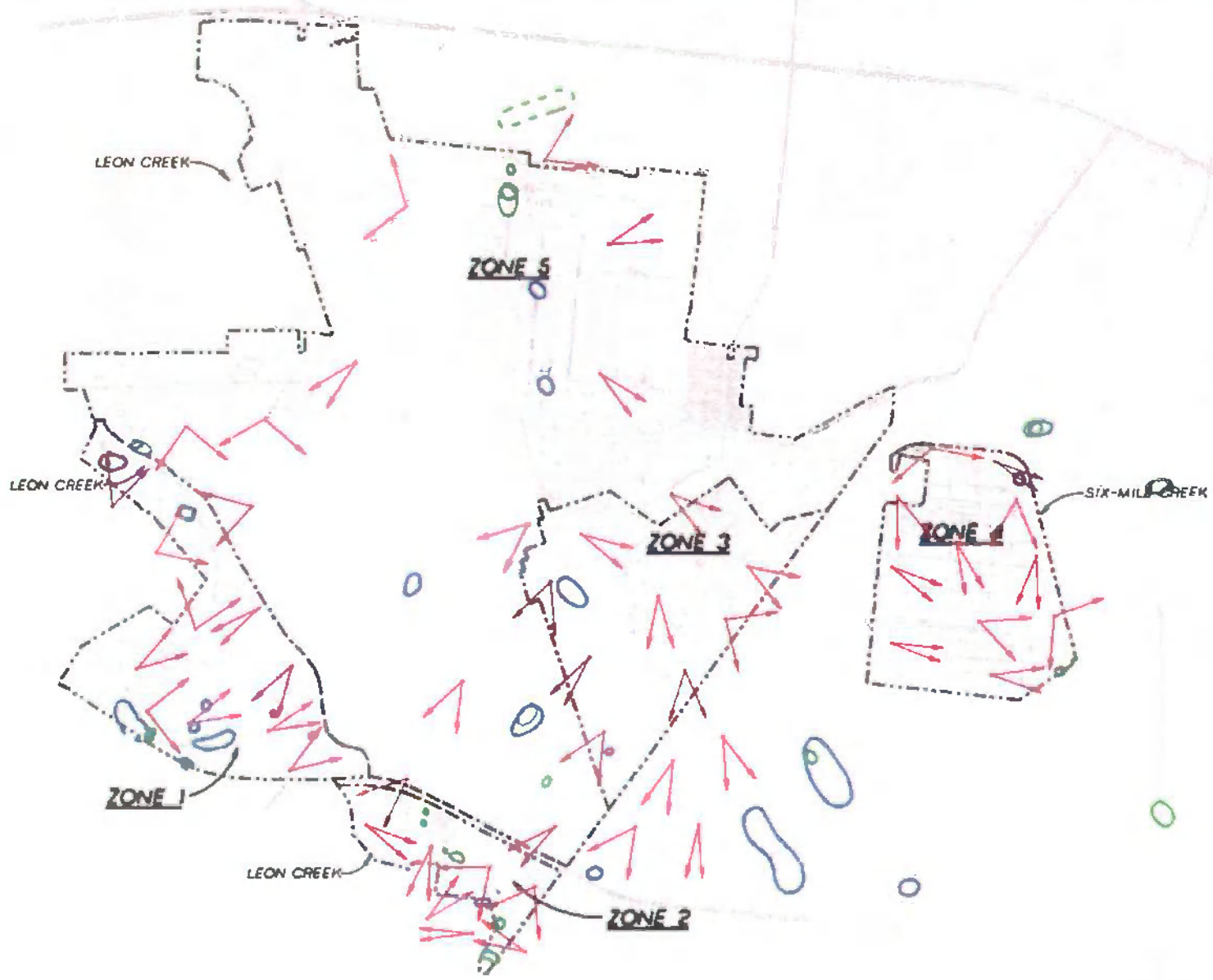
NOTES:

1. The plume extent was generalized from and interpolated between sample locations. Information on actual conditions exists only at the specified locations.
2. All samples were collected in April/June 1999.
3. Isoconcentrations are dashed where inferred.
4. Contours are drawn at the MCL.

AIR FORCE BASE CONVERSION AGENCY

EXHIBIT 6.4
Extent of Benzene and Chlorobenzene in the Surficial Aquifer
April/June 2000
Kelly AFB, San Antonio, Texas

CH2MHILL



N

1500 0 1500 3000

LEGEND:

Range in Groundwater Flow Direction from March 1994 through September 1999

Zone / Installation Boundary

Nickel Isoconcentration (100 µg/L)

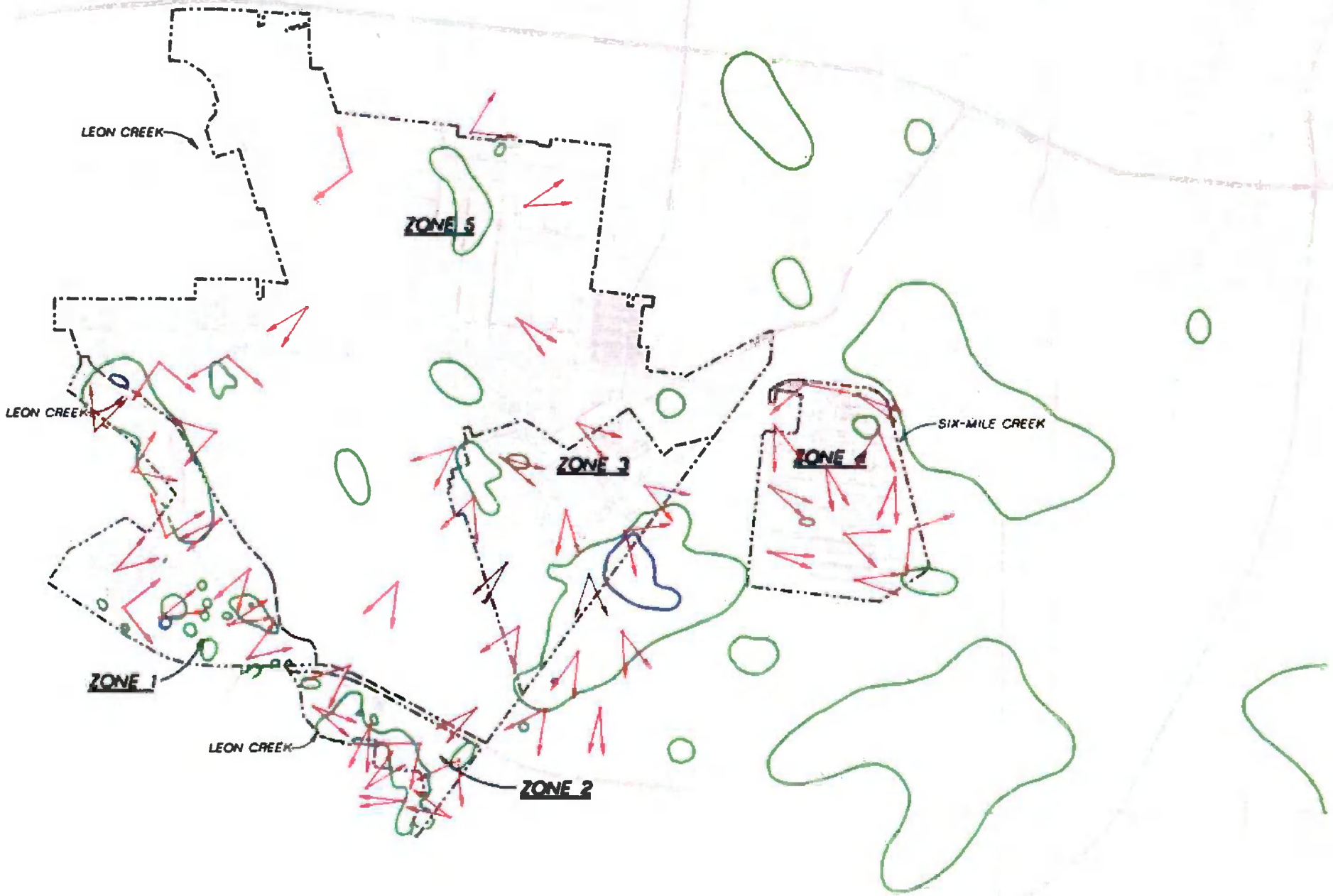
Chromium Isoconcentration (100 µg/L)

NOTES:

1. The plume extent was generalized from and interpolated between sample locations. Information on actual conditions exists only at the specified locations.
2. All samples were collected in April/June 1999.
3. Isoconcentrations are dashed where inferred.
4. Contours are drawn at the MCL.

EXHIBIT 6.5
Extent of Nickel and Chromium in the Surficial Aquifer
April/June 2000
Kelly AFB, San Antonio, Texas

CH2MHILL



-1500' 0' 1500' 3000'

LEGEND:

- Range in Groundwater Flow Direction from March 1994 through June 1999
- Zone / Installation Boundary
- Arsenic Isoconcentration (50 µg/L)
- Manganese Isoconcentration (50 µg/L)*
- Closed Reduction in Concentration

NOTES:

1. The plume extent was generalized from and interpolated between sample locations. Information on actual conditions exists only at the specified locations.
2. All samples were collected in April/June 1999.
3. Isoconcentrations are dashed where inferred.
4. Contours are drawn at the MCL.

* Manganese does not have a primary MCL. This value is a secondary standard.

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EXHIBIT 6.8
Extent of Arsenic and Manganese in the Surficial Aquifer
April/June 2000
Kelly AFB, San Antonio, Texas

CH2MHILL

BCT Meeting
9 May 2001

The meeting will be held Wednesday, 9 May 2001 in the PR Conference Room in Building 43 on Kelly AFB. The meeting is scheduled to start at 9:00.

Dates for upcoming meetings:

June 12, 2001
July 10, 2001
August 14, 2001
September 11,2001
October 9, 2001
November 13, 2001
December 11, 2001

BCT AGENDA
9 May 2001

Item #	Lead	Support	Discussion Topic	Comments	How will we know it's done?	Disposition
1.	Underwood, T.	BCT Members	Redevelopment Update	Update the BCT regarding redevelopment status at Kelly AFB.	Team receives update.	
2.	Landez, N.	SAIC	Zone 2 and 3 Topics.	Provide specifics of SPLP sampling for the 300 Area RFI Report. And discuss suggested Zone 2 and 3 program changes from Peer Review Team: 1. Installation of Interim Systems in Zones 2 and 3 (former CMI project). 2. Overall Zone 2 and 3 schedule changes.	Discussion is complete.	
Lunch (11:30 – 1:00)						
3.	Peck, W.	Stoker, M. Goodson, B.	Zone 4 RFI/CMS	Provide the status of the CMS report.	Team receives update.	
4.	Rohne, R.	CH2M Hill	Ecological Risk Assessment Update	Discuss draft final Tier 2 ecological risk report.	Discussion is complete.	
5.	Buelter, D.	Kebbell, K.	Sanitary Sewer Lines	Present preliminary results of the Phase II investigation.	Presentation is complete.	
6.	Buelter, D.	IT Corp.	IWCS Closure	Discuss results of release determination assessment.	Discussion is complete.	
15 Minute Break (3:00 – 3:15)						
7.	Westerman, B.	Irby, C.	Hydrant System Update	Provide an update on the status of the hydrant system closure.	Team receives update.	
8.	Landez, N.		Administrative Issues for Closed Sites	Discuss administrative issues to be resolved in order to close out sites.	Discussion is complete.	
9.	Ryan, W.	Buelter, D. Peck, W.	Zone Updates	Provide team with update of current activities in Zones 2, 3 4,and 5.	Team receives updates.	
10.	Ryan, W.	Weegar, M. Price, L.	List of Future Deliverables (Regulators/RAB)	Each month, provide a list of upcoming documents for review.	Team receives list of upcoming documents for review.	
11.	Ryan, W.	BCT Members	Begin June Agenda	Each month, begin to establish the next month's agenda at the end of the BCT meeting.	Team approves agenda items.	
Meeting Adjourns @ 4:30						

Kelly AFB

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BASE CLEANUP TEAM (BCT)

MAY 2001

Hydrant System Investigation and Closure Update

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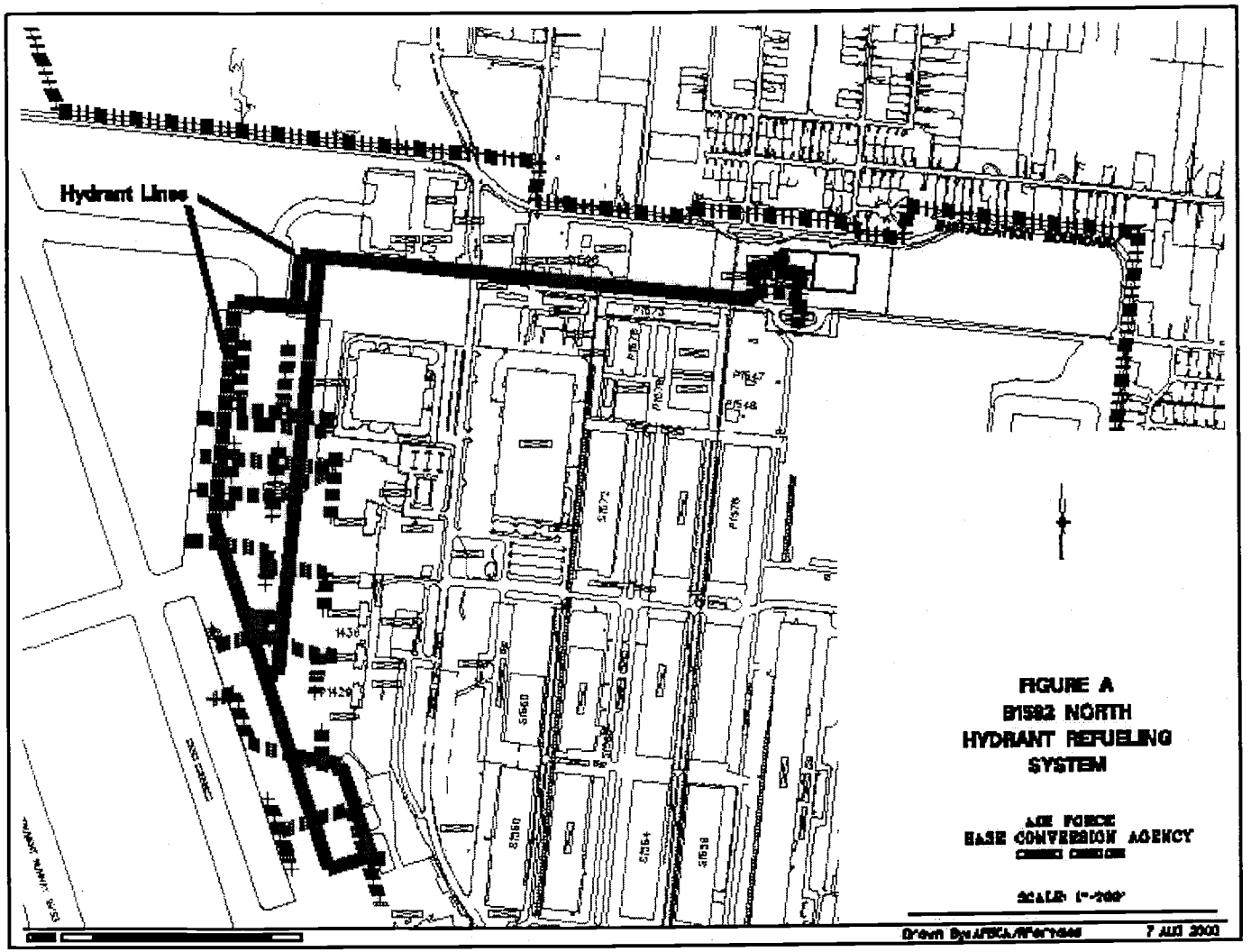
Hydrant System Investigation and Closure Update
BCT May 2001



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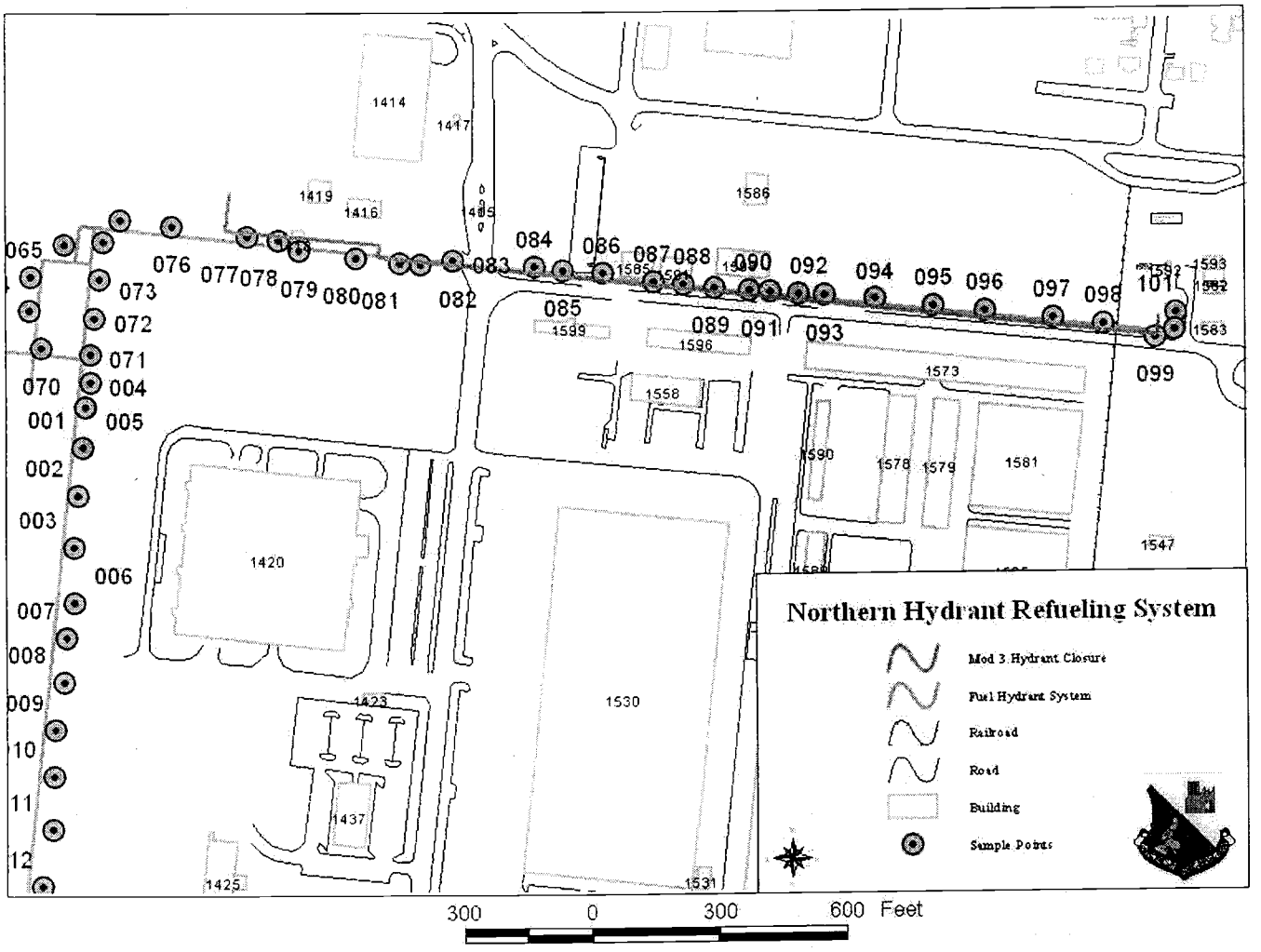
Hydrant System Investigation and Closure Update
BCT May 2001



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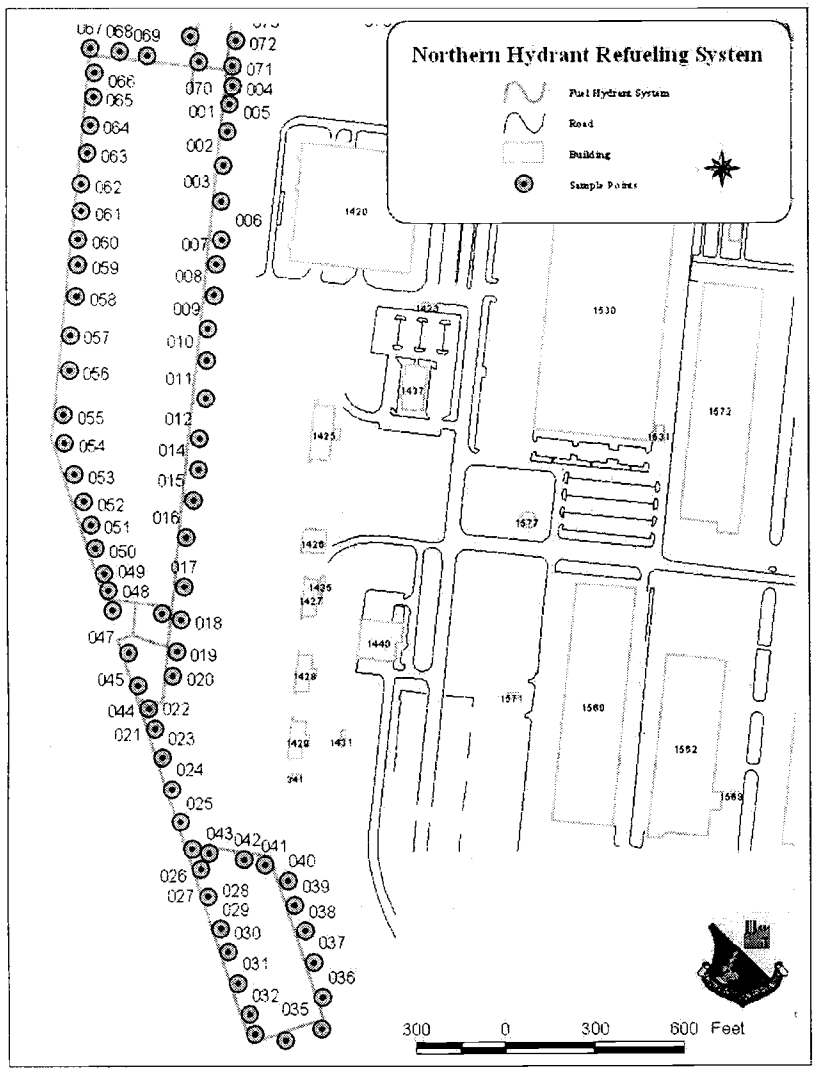

- **Summary - North Hydrant**
  - **Elevated TPH at 58 and 71**
  - **All PAH samples below action levels.**
  - **Report completed and sent to TNRCC.**
  - **Will generate an Addendum to this report for the closure of Mod 3 hydrant.**

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- **North Fuel Hydrant Investigation & Closure**
  - **Between July 6 - 8, 2000 six excavations were made to expose lines that were to be cut.**
  - **Between July 13 - 28, 2000 lines were pigged and cleaned.**
  - **Between July 24 - August 2, 2000 lines were grouted.**
  - **Sampling was conducted August 14 - 23 2000.**
  - **Elevated TPH was identified at two sample locations.**
  - **Only one TPH sample was above TNRCC screening levels, PAHs were analyzed below TNRCC action levels.**

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Hydrant System Investigation and Closure Update
BCT May 2001

■ North Fuel Hydrant Investigation & Closure

■ Sample	Depth (BGS)	Analytical Result (mg/kg)
058	8-10'	204 TPH
		0.014 toluene
		0.015 ethylbenzene
		0.012 xylenes
071	8-10'	484 TPH
		0.113 ethylbenzene
	16-17'	653 TPH
		0.066 toluene
		1.39 ethylbenzene
		0.342 xylenes

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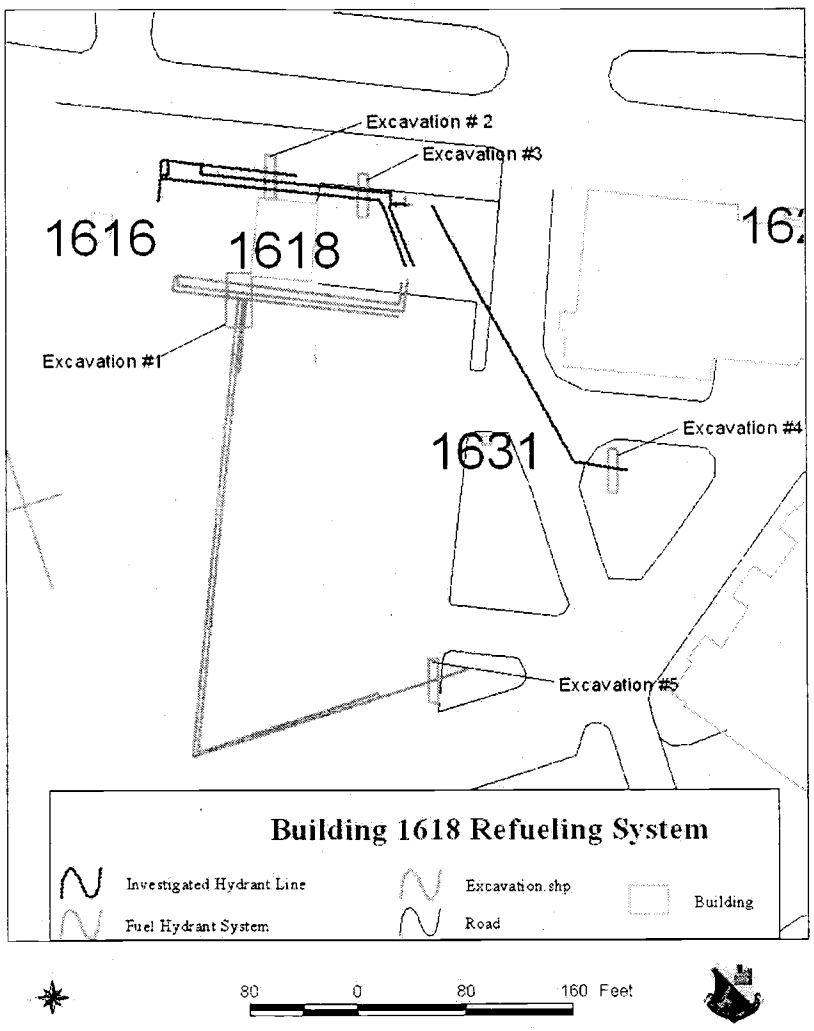
Hydrant System Investigation and Closure Update
BCT May 2001



- **Summary 1618 Hydrant**
- **Most of the system had apparently been removed or never existed.**
- **Approximately 20 gallons of water were recovered.**
- **All sample results were below screening levels and action levels.**
- **Report has been submitted to the TNRCC Petroleum Storage Tank Division.**

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Hydrant System Investigation and Closure Update
BCT May 2001

- **1618 Fuel Hydrant Investigation & Closure**
  - **On September 14 & 15, 2000 four excavations were dug to expose hydrant lines. Only two 4-inch hydrant lines were found located in excavation #1.**
  - **On January 19, 2001 the original two 4-inch hydrant lines were completely filled with grout .**
  - **On January 19, 2001 an electromagnetic survey was conducted and two more lines were found that extend under the flight line.**
  - **Excavation #5 was completed on 15 February 2001. Approximately 20 gallons of water were recovered.**
  - **Lines were cleaned with Micro Clean and water on February 16, 2001.**

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- **1618 Fuel Hydrant Investigation and Closure (continued)**
  - **Release determination sampling was performed on March 7, 2001 at 100 foot intervals approximately 4 feet below ground surface.**

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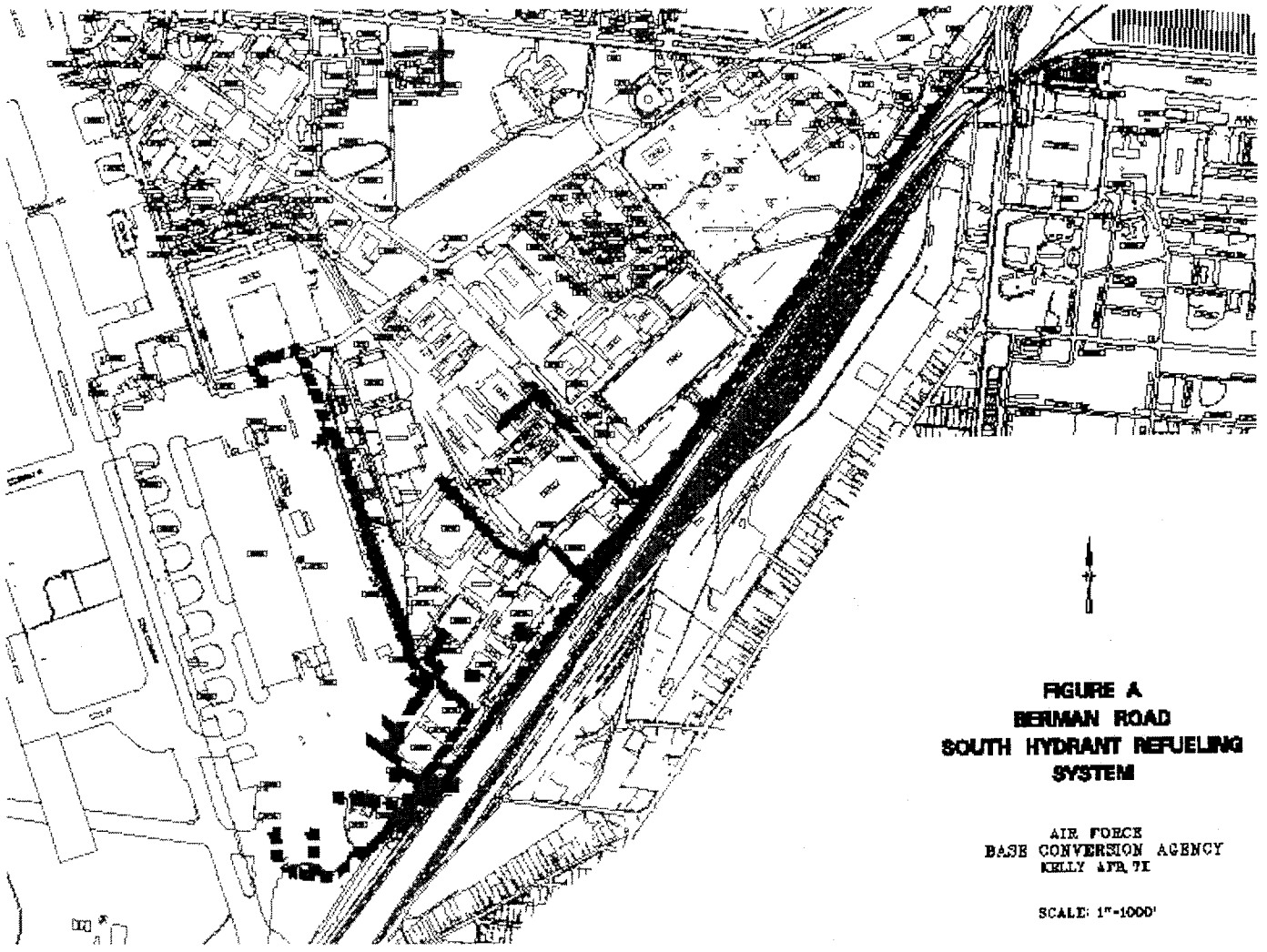

FIGURE A
BERMAN ROAD
SOUTH HYDRANT REFUELING SYSTEM

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BASE CONVERSION AGENCY
KELLY AFB, TX

SCALE: 1"=1000'

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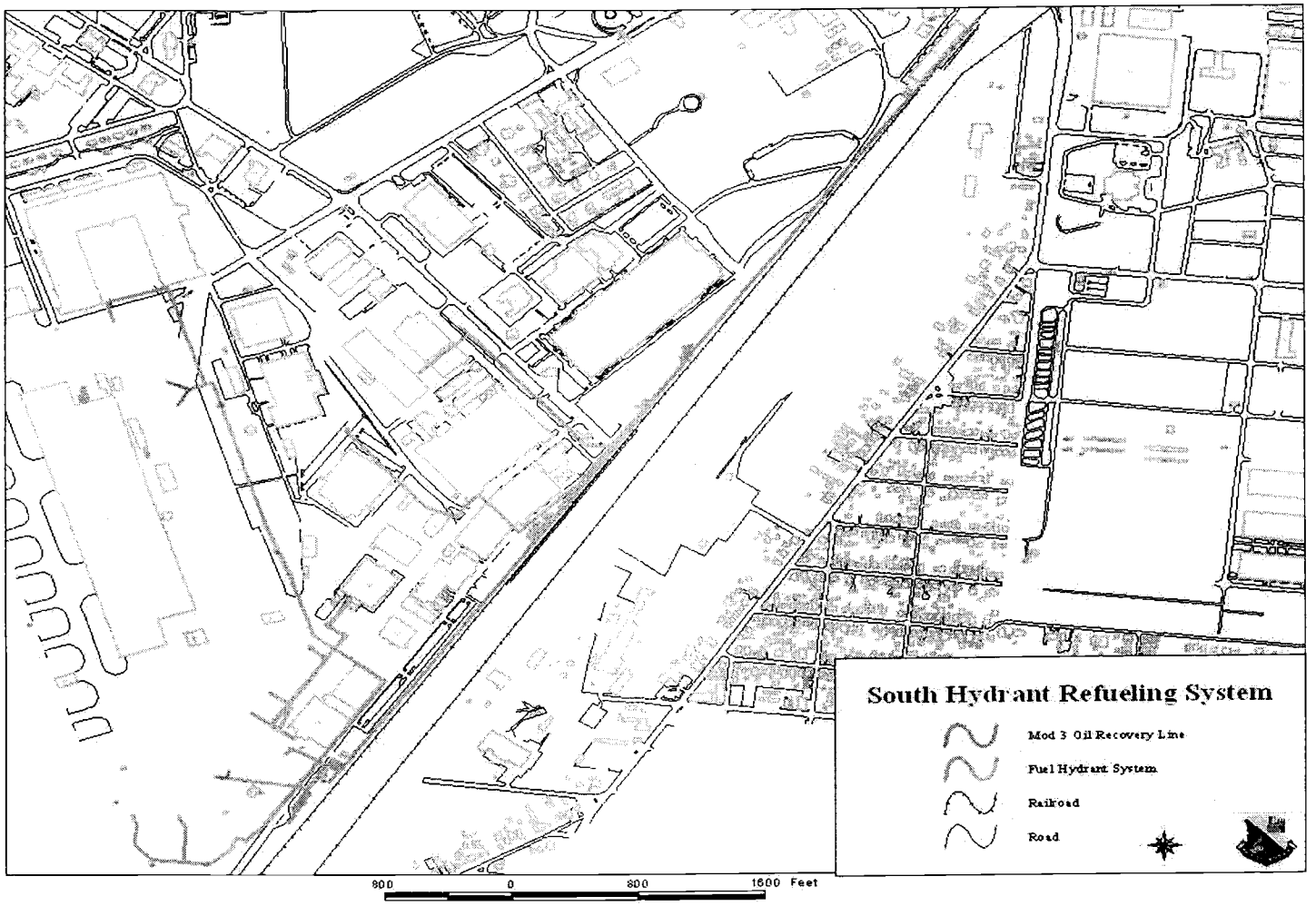
Hydrant System Investigation and Closure Update
BCT May 2001



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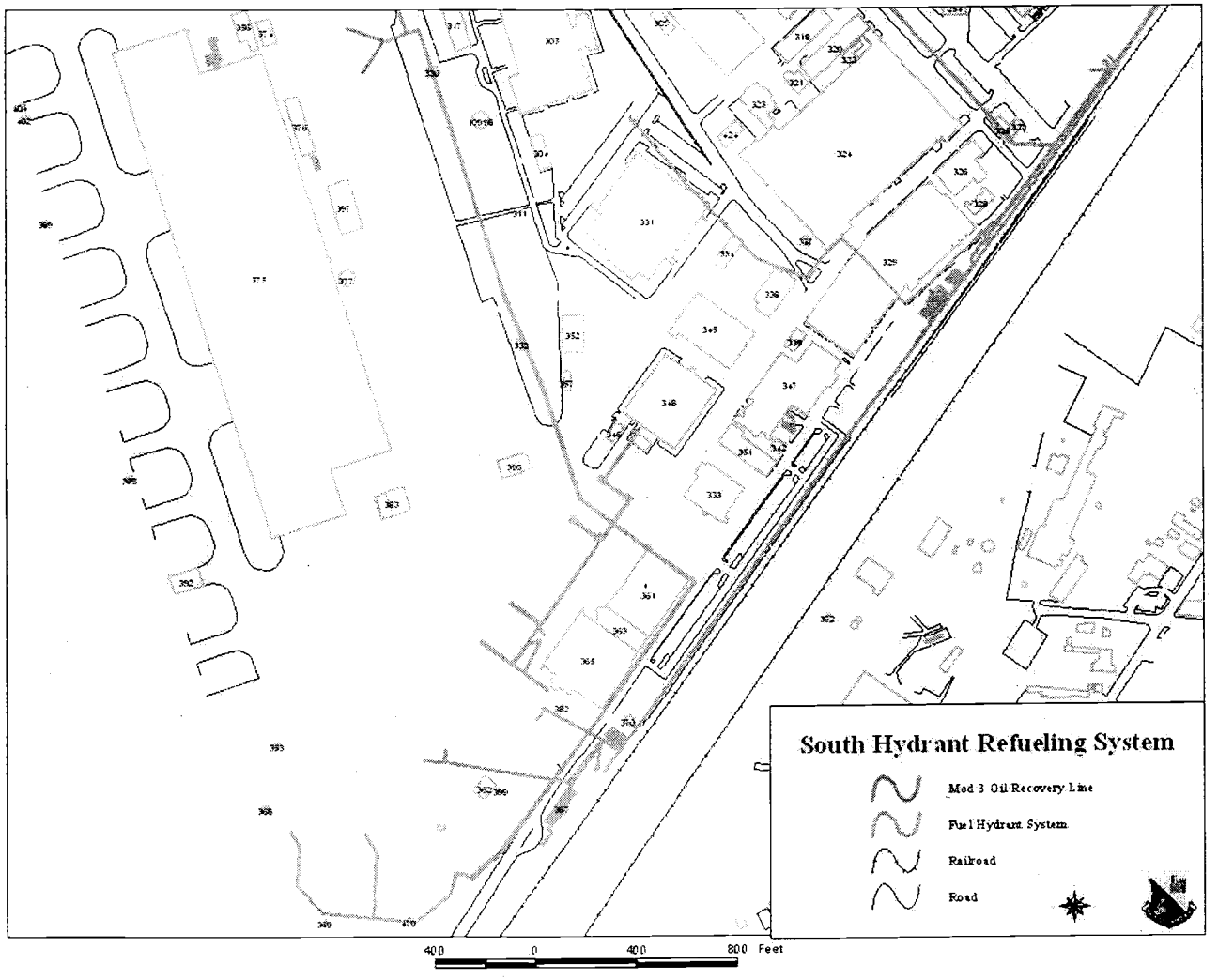
Hydrant System Investigation and Closure Update
BCT May 2001



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■ Summary - South Hydrant

- Report has not been submitted to AFBDA.
- Four areas were identified with releases of fuel to soil.
- Approximately 45 cubic yards of soil disposed.
- Addendum to the South Hydrant System Report will be generated for the results of the Mod 3 oil collection system closures.

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Hydrant System Investigation and Closure Update
BCT May 2001

Summary

- All of the hydrant system(s) investigated to date can be closed under standard LPST clean closure criteria.
- Significant portions of the hydrant system were not installed as per the engineered plans.
- The closure of the remaining hydrant system will be conducted in Mod 3 of the Contractors DO and is estimated to begin May 14, 2001.

Subject: Incident Report for 23 April 2001 - Building 301 Chromium Release

NOTIFICATION: TNRCC was notified at approximately 0915 hrs on 04/24/01, point of contact was Ms. Melissa Story.

REPORTED BY: Mr. Chuck Meshako, AFBCA/DK

DATE: 04/23/2001

TIME: 1045 hrs

TYPE: A trench created during the cleanup of a previous spill event on 02 April 1997 from the chromium scrubbers filled with rain water and began to overflow during a major storm event. This trench is approximately twenty feet long by three feet wide by two feet deep. The equipment removal contractor originally reported that the existing soil contamination in the trench was suspected of contaminating the rainwater and reported that measures had been taken to contain or recover all but a minimal amount liquid (reported to be 2 to 3 gallons). Vacuum trucks were twice used to drain the contents of the trench on 23 April 2001. The equipment removal contractor reported that they left the site for the day because they felt the hole would not fill to the point of breaching during the night.

AFBCA visited the site on 24 April 2001 at 0815 hrs. Visual inspection of the site identified that the level of potential chromium contamination in the water was indicative of a new release and probably not from existing soil contamination as previously believed. Further inspection of the site also identified a separate release of green water from a roll off container at the site. The equipment removal contractor reported that the equipment had been decontaminated prior to being placed in the roll off container. Two additional puddles of greenish water were also identified in the general vicinity although it was not clear whether the two additional puddles were the result of the leak from the roll off container or whether the trench overfilled during the night.

The contractor used absorbent pads to recover the greenish water standing on the pavement and used a vacuum truck to remove the majority of the water in the hole. A water sample was taken from the trench and two soil samples were taken from the areas in front of the adjacent storm water drains. All samples will be analyzed for RCRA 8 total metals plus Nickel. Samples are being split between AFBCA and the equipment removal contractor.

Given the presence of puddles on the pavement in the area on the morning of 24 April and the report of a "minimal amount of liquid" not being contained on 23 April, the volume of potentially contaminated rainwater that may have entered the storm drain and Leon Creek is not known.

CAUSE: Although it is not clear whether some of the potential contamination of the water in the trench is from a previous release, the degree of the greenish tint to the water would seem to be indicative of a new release. The most likely suspect is that during the dismantlement of the scrubber system a new release of chromium occurred.

The suspected release from the roll off container would appear to be from the improper decontamination of the equipment (piping) placed in the roll off container and a failure of the roll off container's liner.

LOCATION: Adjacent to Building 301 in the alley next to Building 303, Kelly AFB, TX

REQUIRED ACTION: The scrubbers are scheduled for removal on 24 April 2001. The concrete pad under the scrubbers is to be decontaminated using a pressure washer on 25 April 2001. The trench is to temporarily backfilled with sand and covered with plywood and plastic sheeting to prevent infiltration of rain water on 25 April 2001. Building 301 and the contaminated soil at the site are scheduled for removal starting on 1 May 2001. The full nature and extent of any potential soil contamination will evaluated as part of the Building 301 Removal Project once the concrete slab is removed. The contents of the leaking roll off container are to be transferred to a new lined container. Any free liquids in the roll-off are to be removed. The contents of the new roll off container are to be disposed of as hazardous waste. A follow-up written report will be sent to TNRCC Region 13. Attn: Abbi Power.

Subject: Incident Report for 11 April 2001 0630 hrs - Release of Wastewater at EPCF

NOTIFICATION: TNRCC was notified at 1430 hrs on 04/11/01, point of contact was Abbi Power at 403-4064.

REPORTED BY: Mr Chuck Meshako, AFBCA/DK

DATE: 04/11/2001

TIME: Leak discovered at 0630 hrs.

TYPE: Estimated release of 1000 to 5000 gallons of partially treated wastewater at the EPCF. Wastewater was generated from dewatering of wastewater treatment sludges that are thought to be nonhazardous. Release occurred after "Unipure" treatment system and before sock filters and final carbon filters. Impacted environmental media appear to be limited to soils within the
central EPCF complex.

CAUSE: Sock filters becamed clogged causing the tank associated with effluent of "Unipure" treatment overflowed.

LOCATION: Spill occured in the center of the EPCF area.

REQUIRED ACTION: Treatment system has been shutdown pending investigation of problem. Sample of influent will be taken to determine nature of release and need for any further response. Final report to be submitted to TNRCC Region 13, Attn: Abbi Power

Subject: Incident Report for 1115 hrs, 10 Apr - Leak from Groundwater extraction system.

NOTIFICATION: TNRCC was notified as a courtesy at 1745 hrs on 04/10/01, point of contact was Abbi Power at 821-6080 (home phone). Also notified GKDA at 1730 on 04/10/01, point of contact was Bob Rasmussen at GKDA offices.

REPORTED BY: Mr Chuck Meshako, AFBCA/DK

DATE: 04/10/2001

TIME: Leak discovered at 1115 hrs.

TYPE: Pipe leak estimated to be 210 gallons of groundwater pumped from Zone 3 bio-augmentation test plot #3. Groundwater in this area had previously undergone treatment and testing done approximately one month prior indicated minimal levels of contamination (Primarily PCE). System has been continuous circulating without treatment for approximately one month.

CAUSE: Piping believed to have been damaged by mowing equipment at 0930 hrs.

LOCATION: 100 square feet area adjacent to Building 360. Property currently under lease to GKDA.

REQUIRED ACTION: A new groundwater sample will be taken from extraction well to determine quantity of contaminants that may have been released. Follow-up written report will be sent to TNRCC Region 13. Attn: Abbi Power.

DEPARTMENT OF THE AIR FORCE
AIR FORCE BASE CONVERSION AGENCY

April 26, 2001

Air Force Base Conversion Agency
143 Billy Mitchell Blvd
Kelly AFB, Texas 78241

Texas Natural Resource Conservation Commission
Attn: Ms. Abbi Power
Region 13
14250 Judson Rd.
San Antonio, Texas 78233-4480

RE: Release of Groundwater Collection Pipe on March 29, 2001 at Kelly AFB

Dear Ms Power

On March 29, 2001, Mr. Bill Hall of this office reported a leak or Zone 3 Groundwater to your office. The following information is submitted to meet the reporting requirements for this incident.

(1) Date and time of incident: The release was reported to AFBCA Kelly at 11:30 March 29, 2001

(2) Identity and quantity of released material: 3000 gallons of untreated groundwater. Analytical results of a sample of representative groundwater are provided in the following table:

Chemical	Representative Groundwater Sample
Benzene	17
Chlorobenzene	70
Cis-1,2 Dichloroethene	580
Tetrachloroethene	780
Trichloroethene	210
Vinyl Chloride	70

All results in micrograms per liter
< Indicates constituent concentration below sample detection limit
NR Indicates test not run

Analytical Results of the Impacted Soil at the reported site

	Sample			
Chemical	001	002	003	004
Chlorobenzene	<6.2	8.2	<6.2	<6.2
Cis-1,2 Dichloroethene	<6.2	48	17	<6.2

All results in micrograms per kilogram
< Indicates constituent concentration below sample detection limit
NR Indicates test not run

(3) Cause of incident: The leak was the result of a valve box (Figure 2) damaged by lawn maintenance equipment and back-flow from the junction of active Zone 3 line and the abandoned Zone 3 "Foster Wheeler Line" (Figure 4).

(4) Extent of contamination: The spill covered an 800 sq. foot area of grass covered fill clay to a depth not greater than one foot, adjacent to abandoned ZONE 3 "Foster Wheeler Line" (Figure 1 & 2) south west of the intersection of Berman Road and Citrus Road, and north of lot 513.

(5) Contamination documentation: Samples were taken of the water and soil and submitted for analysis.

(6) Site Map & Photographs: A site map of the Kelly EPCF area and spill-sampling grid is attached as Map 1 & 2. Photographs are included as Figures 1 through 4.

(7) Analytical results: Five (5) composite soil samples were taken (Map 2) and sent to be analyzed for Volatile Organic Compounds (VOC's), Semi-VOC's, and metals. A seven-day turn around was requested for analytical results and Ms. Power concurred. Copies of the analytical results are included as attachment 3.

(8) Disposal: No disposal action has been taken. Analytical results indicate contamination levels below Texas Risk Reduction Program Tier 1 protective concentration levels (PCL's) and Risk Reduction Standard 2 levels. No further action is planned.

(9) Corrective Action: A section of the old Zone 3 (Foster Wheeler) pipeline was excavated (Figure 4) and the line cut and capped (Figure 3) to eliminate any future possibility of back-flow into the old Zone 3 pipeline. As analytical results indicate contamination levels below Texas Risk Reduction Program Tier 1 Protective

Concentration Level (PCL's) and Risk Reduction Standard 2 levels, and this property will remain under Air Force control. No further action is deemed necessary.

Please address any further questions or comments to Mr. Kenneth St. John at (210) 925-0195.

Sincerely

Chuck Meshako

CHUCK MESHAKO
Acting Chief, Environmental Compliance

Attachments:
1. Figures 1 through 4
2. Site Maps 1 & 2
3. Chemical Analysis Results

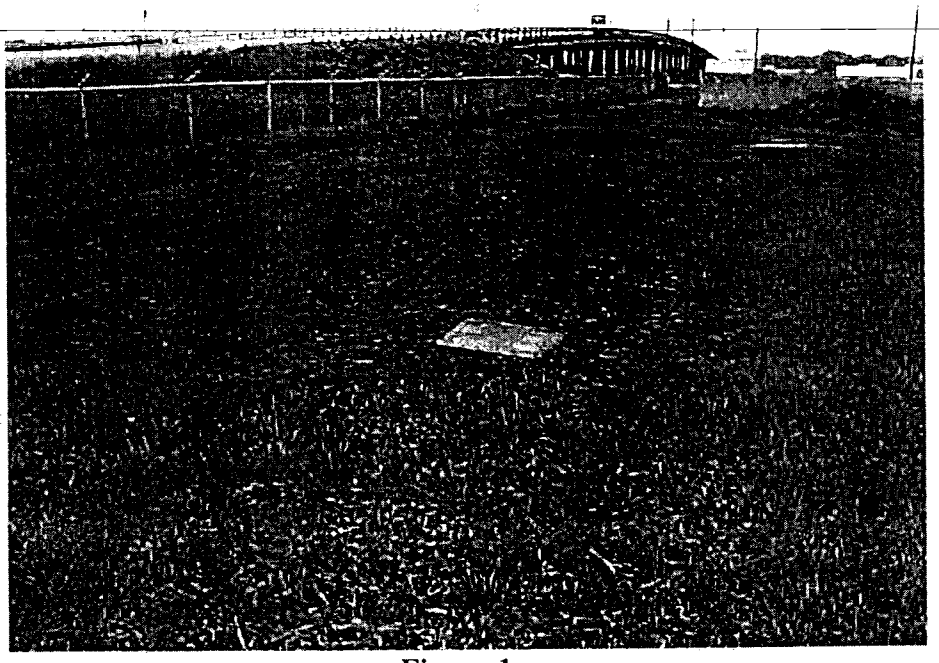


Figure 1
Abandoned Zone 3 "Foster Wheeler Line" Pipeline

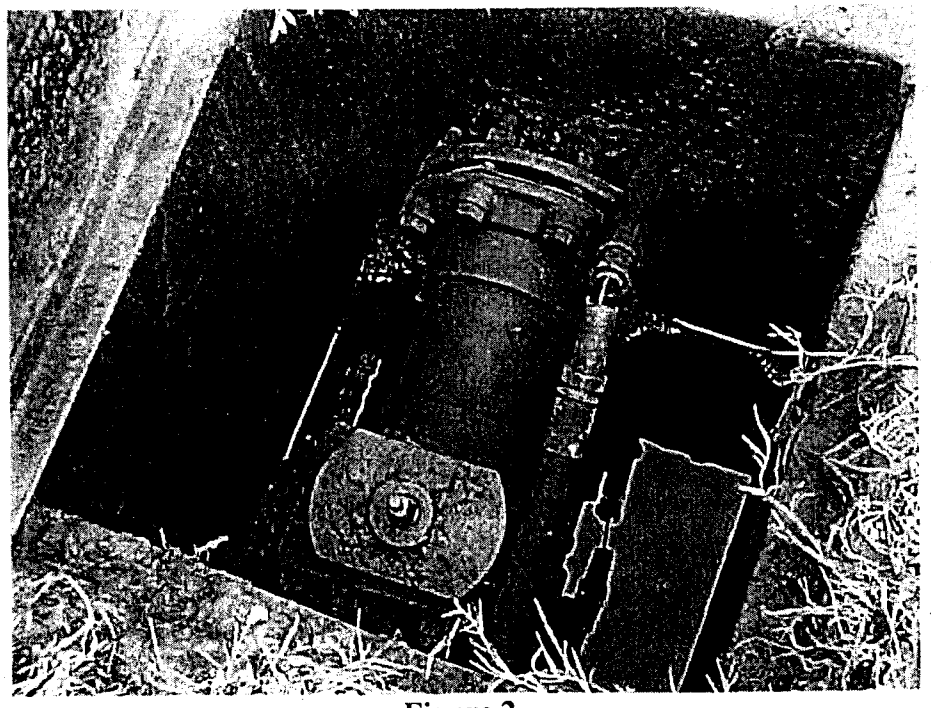


Figure 2
Abandoned Zone 3 "Foster Wheeler Line" Pipeline
Valve Box & Valve

Figure 3
Abandoned Zone 3 "Foster Wheeler Line" Pipeline
Cut and capped near Building 618

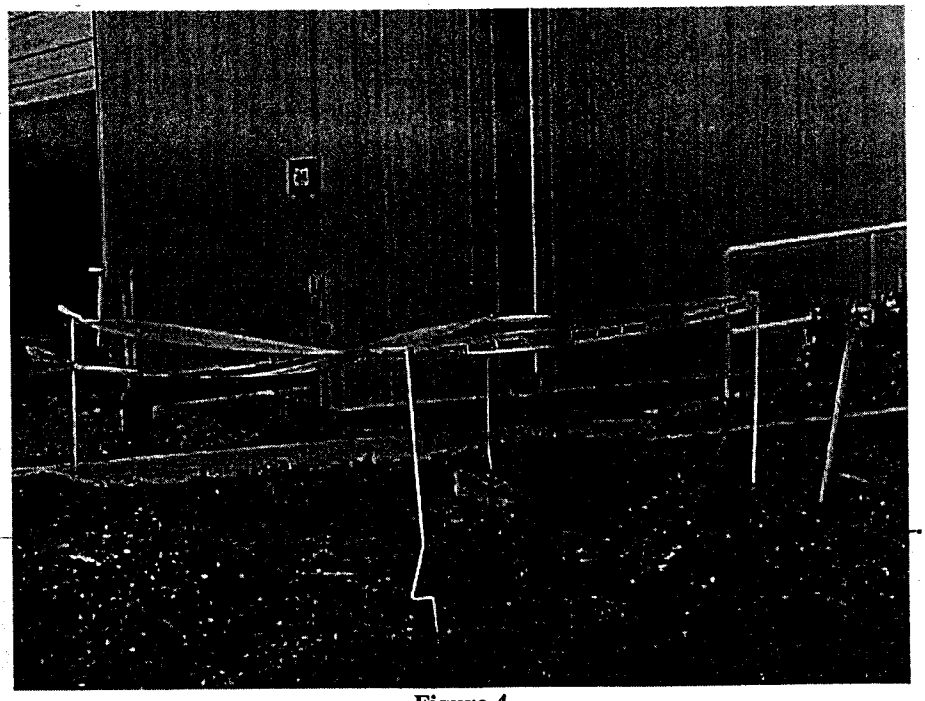
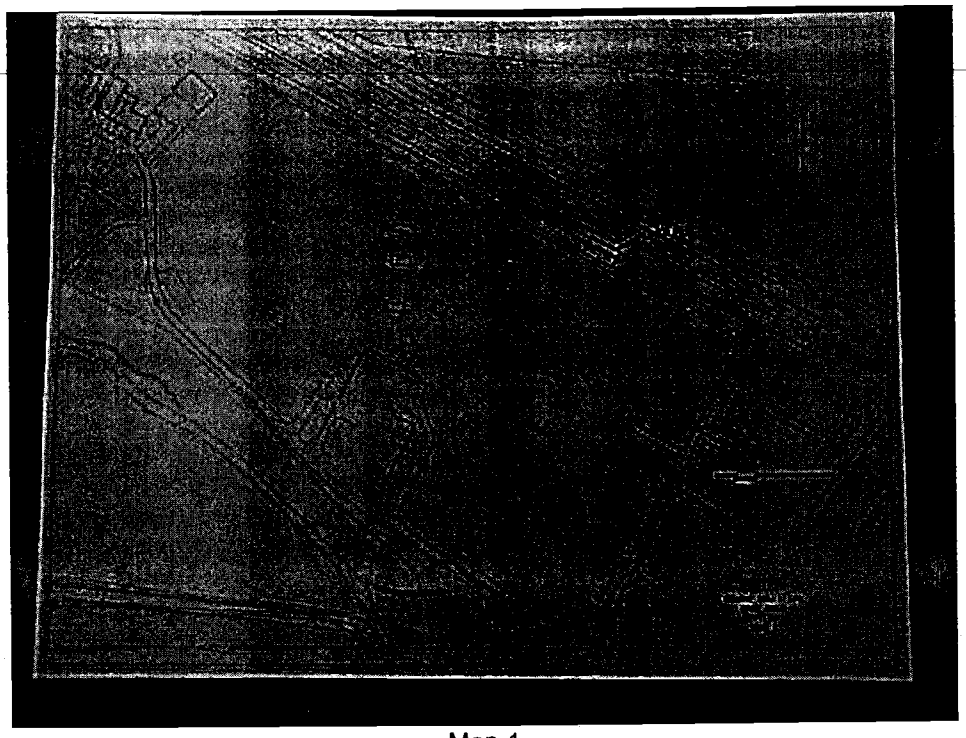
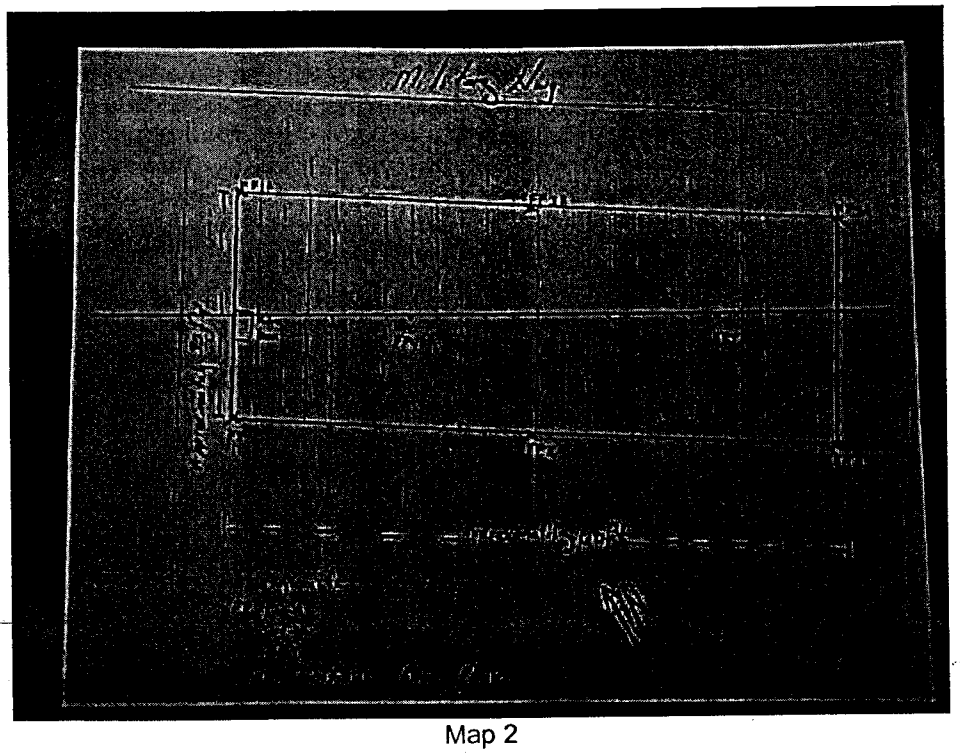


Figure 4
Abandoned Zone 3 "Foster Wheeler Line" Pipeline
Excavation



Map 1
EPCF Area



Map 2
Spill Area Sample Grid

Sanitary Sewer System
Kelly AFB

Purpose:

This discussion serves to clarify and summarize activities regarding sampling of environmental baseline sampling along the sanitary sewer system.

Background:

To begin the evaluation of soils surrounding the sanitary sewer, a desktop evaluation of potential past uses of the sanitary sewer, and also an evaluation of available soil data near the sanitary sewer in areas of concern was conducted. Two categories of pipe segments were developed:

1. Pipe segments that did not have the potential to receive hazardous substances and/or POL due to past practices. No further action required on these segments.
2. Pipe segments that did have the potential to receive hazardous substances and/or POL due to past practices. Approximately 65,000 feet of piping. Comparison to existing soil data conducted.

Existing Data:

Data were considered representative of the soils surrounding the sanitary sewer if the sample fell within a 50-foot corridor along the sanitary sewer and if the data were in the depth interval of 2 to 18 feet bls. The only targeted sanitary sewer sampling occurred near Building 1414. Large areas of pipeline have no samples taken within the corridor.

Development of sanitary sewer sampling and analysis plan:

Prior the development of a SAP, the following questions need to be answered before a project should be started:

- What is the purpose of the project?
- How will the data generated ultimately be used?
- What quality of data is needed to accomplish the goals of the project?

Development of Conceptual Site Model

EPA Data Quality Objectives Process: Statements that express the project objectives (or decisions) that the data will be expected to inform and support.

- Step 1. Concise Description of the Problem.
- Step 2. Identify the Decision. – What type of data is needed to meet the objective?
- Step 3. Identify Inputs to the Decision. – How is the data to be compared?
- Step 4. Define the Study Boundaries. – Sanitary pipe has been located. Where to sample along pipeline?
- Step 5. Develop a Decision Rule.
- Step 6. Specify Limits on Decision Errors.
- Step 7. Optimize the Design for Collecting Data. – What analytes? What type of data collection will be effective? Field or fixed based lab?

TECHNICAL MEMORANDUM **CH2MHILL**

Confirmation Notice No. 18–Phase II Evaluation of the Sanitary Sewer for Receipt of Industrial Discharges

PREPARED FOR: Don Buelter/Kelly AFB
Frank Roth/USCOE–Tulsa District
Ken Kebbell/USCOE–Tulsa District

PREPARED BY: CH2M HILL

DATE: April 2, 2001

Introduction

Kelly Air Force Base (AFB) is a closure and realignment facility, and as part of the process of closing and transferring ownership of the facility, the Texas Natural Resources Conservation Commission (TNRCC) has requested that Kelly AFB provide information regarding the condition of soils surrounding the sanitary sewer located on Kelly AFB. To begin the evaluation of the condition of soils surrounding the sanitary sewer, CH2M HILL has conducted a desk-top evaluation of potential past uses of the sanitary sewer, and also evaluated available soils data near the sanitary sewer in potential areas of concern (AOCs). The methodology used to evaluate the sanitary sewer was divided into two phases. The goal of Phase I was to separate the sanitary sewer pipe segments into the following two categories:

- **Category 1**–Pipe segments that did not have the potential to receive hazardous substances and/or petroleum, oil, and lubricants (POL) due to past practices.
- **Category 2**–Pipe segments that did potentially receive hazardous substances and/or POL due to past practices.

Pipe segments identified as meeting the requirements for Category 1 were assumed to require no further action. Pipe segments in Category 2 were identified as potential AOCs and carried forward to Phase II of the evaluation. The Phase I evaluation was conducted in January 2001, and the results were presented in the technical memorandum (TM) *Confirmation Notice No. 18–Evaluation of the Sanitary Sewer for Receipt of Industrial Discharges* (CH2M HILL, January 10, 2001). The purpose of this TM is to present the results of the Phase II evaluation of the AOCs within the sanitary sewer.

Evaluation and Results

Phase II

All line segments identified in Phase I as potentially receiving industrial type waste were carried forward for further evaluation in Phase II. The Phase II evaluation consisted of

summarizing existing soils data in the vicinity of the sanitary sewer identified as AOCs, comparing the soils data to the TNRCC Risk Reduction Standard (RRS), and determining which areas require additional investigation. Data were considered representative of the soils surrounding the sanitary sewer if the sample location fell within a 50-foot corridor along the sanitary sewer and if the data were in the depth interval of 2 to 18 feet below land surface (bls). The results of this investigation follow.

Figures 1, 2, 3, and 4 (all figures are attached) present the sanitary sewer system AOCs, and the relevant sample location available within the desired depth interval of 2 to 18 feet bls, in Zones 2, 3, 4, and 5, respectively. These figures identify the points in this specific interval that are:

- With data, yet without exceedances
- With data that exceed the RRS No. 2 standards

Table 1 presents the stations identified within the AOCs and the results of the data evaluation.

Of the 10 representative data stations in Zone 2, 1 had an exceedance to criteria, while 2 did not have any data available for evaluation. Of the 47 representative data stations in Zone 3, 18 did not have any data available for evaluation and there were no exceedances to criteria. Of the 11 representative stations in Zone 4, 9 did not have any data available for evaluation and there were no exceedances to criteria. Of the 19 representative stations in Zone 5, 2 had exceedances to criteria, while 6 did not have any data available for evaluation. It should be noted that many of the stations that did not have soil data in Table 1 had groundwater data only, soil data in the zero- to 2-foot range, or data collected from samples deeper than 18 feet.

The parameters that exceeded criteria in Zones 2 and 5 are presented in Table 2.

TABLE 1
Stations per AOC for Sanitary Sewer

Zone	Station	Comment
2	KY070MW004	has data in the 2-18 ft bls interval
2	KY070SB003	has data in the 2-18 ft bls interval
2	SS002SB052	has data in the 2-18 ft bls interval
2	SS005MW002	has data in the 2-18 ft bls interval
2	SS039MW002	has data in the 2-18 ft bls interval
2	SS039SB039	has data in the 2-18 ft bls interval
2	SS042SB119	has data in the 2-18 ft bls interval
2	SS036MW003	data exceed RRS No. 2 criteria
2	SS002MW074	no data
2	SS005SB023	no data
3	KY067SB008	has data in the 2-18 ft bls interval
3	KY071SB015	has data in the 2-18 ft bls interval
3	KY071SB016	has data in the 2-18 ft bls interval
3	KY071SB017	has data in the 2-18 ft bls interval
3	KY071SB028	has data in the 2-18 ft bls interval
3	KY071SB031	has data in the 2-18 ft bls interval
3	KY072MW026	has data in the 2-18 ft bls interval

TABLE 1
Stations per AOC for Sanitary Sewer

Zone	Station	Comment
3	KY072MW048	has data in the 2-18 ft bls interval
3	KY072SB006	has data in the 2-18 ft bls interval
3	KY072SB007	has data in the 2-18 ft bls interval
3	KY072SB008	has data in the 2-18 ft bls interval
3	KY072SB013	has data in the 2-18 ft bls interval
3	KY072SB014	has data in the 2-18 ft bls interval
3	KY072SB015	has data in the 2-18 ft bls interval
3	KY072SB016	has data in the 2-18 ft bls interval
3	KY072SB029	has data in the 2-18 ft bls interval
3	KY072SB037	has data in the 2-18 ft bls interval
3	KY072SB038	has data in the 2-18 ft bls interval
3	KY074MW003	has data in the 2-18 ft bls interval
3	KY074MW005	has data in the 2-18 ft bls interval
3	KY074MW023	has data in the 2-18 ft bls interval
3	KY074MW024	has data in the 2-18 ft bls interval
3	KY074SB001	has data in the 2-18 ft bls interval
3	KY074SB002	has data in the 2-18 ft bls interval
3	KY074SB009	has data in the 2-18 ft bls interval
3	ST048MW001	has data in the 2-18 ft bls interval
3	ST048SB002	has data in the 2-18 ft bls interval
3	ST048SB004	has data in the 2-18 ft bls interval
3	ST048SB005	has data in the 2-18 ft bls interval
3	KY062MW001	no data
3	KY072SB028	no data
3	KY072SB036	no data
3	KY072SB040	no data
3	KY074SB007	no data
3	KY074SB012	no data
3	SS037MW099	no data
3	SS037MW101	no data
3	SS037SB139	no data
3	SS037SB146	no data
3	SS037SB147	no data
3	SS037SB324	no data
3	SS044TW006	no data
3	ST006MW015	no data
3	ST006SB168	no data
3	ST008MW027	no data
3	ST008MW179	no data
3	ST008MW214	no data
4	SS052MW125	has data in the 2-18 ft bls interval
4	SS052MW160	has data in the 2-18 ft bls interval
4	SS004MW011	no data
4	SS004SB024	no data
4	SS004TW036	no data
4	SS052MW103	no data
4	SS052MW347	no data
4	SS052MW556	no data

TABLE 1
Stations per AOC for Sanitary Sewer

Zone	Station	Comment
4	SS052MW557	no data
4	SS052MW562	no data
4	SS052SB341	no data
5	KY019SB003	has data in the 2-18 ft bls interval
5	SS025SB020	has data in the 2-18 ft bls interval
5	SS025SB021	has data in the 2-18 ft bls interval
5	SS025SB022	has data in the 2-18 ft bls interval
5	SS025SB023	has data in the 2-18 ft bls interval
5	SS025SB024	has data in the 2-18 ft bls interval
5	SS025SB025	has data in the 2-18 ft bls interval
5	SS025SB027	has data in the 2-18 ft bls interval
5	SS025SB028	has data in the 2-18 ft bls interval
5	SS050MW050	data exceed RRS No. 2 criteria
5	SS050MW108	data exceed RRS No. 2 criteria
5	SS050MW109	has data in the 2-18 ft bls interval
5	SS050MW471	has data in the 2-18 ft bls interval
5	SS025MW006	no data
5	SS050MW010	no data
5	SS050MW022	no data
5	SS050MW063	no data
5	SS050MW124	no data
5	ST008MW219	no data

Note:
ft bls = Feet below land surface

TABLE 2
Stations With Exceedances for Sanitary Sewer

Zone	Station	Upper Depth	Lower Depth	Parameter	Result	Qualifier	Units	GWP-Ind	Exceed GWP-Ind?
2	SS036MW003	5	7	Aluminum	13700	J	mg/kg	10000	Yes
2	SS036MW003	5	7	Chromium, Total	16.4	J	mg/kg	10	Yes
5	SS050MW050	5	5.4	Arsenic	2.7	J	mg/kg	1	Yes
5	SS050MW050	5	5.4	Beryllium	0.57	=	mg/kg	0.4	Yes
5	SS050MW050	5	5.4	Chromium, Total	12.2	=	mg/kg	10	Yes
5	SS050MW050	5	5.4	Lead	8	J	mg/kg	1.5	Yes
5	SS050MW108	4	5	Arsenic	4.4	=	mg/kg	1	Yes
5	SS050MW108	4	5	Beryllium	0.92	=	mg/kg	0.4	Yes
5	SS050MW108	4	5	Chromium, Total	22	=	mg/kg	10	Yes
5	SS050MW108	4	5	Lead	11.9	J	mg/kg	1.5	Yes

Notes:
GPW-Ind = Groundwater protection–Industrial
mg/kg = Milligrams per kilogram

Ecological Risk Assessment

BRAC Cleanup Team Meeting
9 May 2001

Background

- Tier 1
  - Evaluate source, pathway and receptors
  - 229 Sites
- Tier 2
  - Screening level assessment
  - 31 Sites including Leon Creek
- Address TNRCC and EPA requirements
  - Work plans
  - Reviews
  - Meetings
  - Conference calls

Background

- TNRCC & EPA requirements
  - 1996, 1999, 2000 guidance
  - Background concentrations
  - Leon Creek
    - Current and future scenarios
    - Wet and dry scenarios
- Leon Creek human health risk assessment
  - 1994 EA Engineering report
  - MitreTek analysis
    - Reviewed 1994 report in light of current requirements
    - June 2001 release

Tier 2 Report Format

- TEXT
  - Sec. 1 - Introduction
  - Sec. 2 - Environmental Setting
  - Sec. 3 - Integrated Site Model
  - Sec. 4 - Summary of ERA results
  - Sec. 5 - Ecological Risk Management
- APPENDICES
  - Appx. A - Nature & Extent of Contamination
  - Appx. B - Tier 2 SLERA for Terrestrial Pathways
  - Appx. C - Tier 2 SLERA for Leon Creek
  - Appx. D - Estimation of Contamination in Leon Creek
  - Appx. E - Potential Sources of Contaminants in Leon Creek
  - Appx. F - Fate, Transport & Toxicological Profiles

PATHWAYS

- Direct contact with surface soil
- Overland flow
- Groundwater discharge from sites to Leon Creek
- Volatilization from soils

RECEPTORS (representative species)

- Leon Creek
  - Benthic macroinvertebrates
  - Fish
  - Southern leopard frog (omnivorous amphibian)
  - Raccoon (omnivorous mammal)
  - Belted Kingfisher (piscivorous bird)
- Soil
  - Least shrew (insectivorous mammal)
  - Deer mouse (herbivorous mammal)
  - Red fox (carnivorous mammal)
  - American robin (omnivorous bird)
  - American kestrel (raptor)

Results of Tier 2

SOIL

- Potential for adverse effects from naturally occurring metals and a few pesticide residues
- Aluminum, DDT-related COCs most common
- Small mammal guilds have greater risk than other representative species
- Conservative assumptions; adverse effects are highly unlikely

Results of Tier 2

SURFACE WATER

- Risk to fish and aquatic invertebrates from five metals, cyanide and two phthalates (lab contamination)
  - not adjusted to account for suspended solids
  - may not represent hazard to aquatic life
- Aquatic stages of amphibians may be at risk from naturally occurring metals under current conditions
- Mammalian feeding guilds that feed in Leon Creek are not at risk

Results of Tier 2

SEDIMENT

- 31 COCs > sediment benchmarks at background station
- Kelly AFB had same COCs, + 12 metals
- Benthic organisms may be at risk from metals, pesticides, PCBs, VOCs and SVOCs
- Background station also showed risk

Risk Management

- Alternatives
  - NFA
  - Remedial actions to
    - Eliminate pathway
    - Clean up to PCL
  - Perform Tier 3
  - ESA
- Attached list shows existing or planned remedial actions for sites showing risk
- Strategy
  - Perform existing and planned remedial actions
  - Perform Tier 3 to refine Eco PCL

Conclusions

- Potential risk exists for most sites
- Limited list of CoCs contributing to risk
- These CoCs will be addressed in a Tier 3 assessment
- Remedial actions will also address risk

Schedule

- Submit Draft Final Tier 2 Report: 29 June 2001
- Ecological Risk Meeting
  - End of June 2001
  - Ecological and Human Health Discussions

DRAFT

Table 5-1
Summary of Chemicals from Tier 2 IRP Sites Contributing to Ecological Risks at Kelly AFB
Kelly AFB – Tier II ERA

Contaminant of Concern	Aquatic Organisms in Surface Water	Aquatic Organisms in Sediment	Aquatic Organisms at the Zone of Discharge	Direct Soil Exposure to Terrestrial Wildlife
METALS				
ALUMINUM			X	X
ANTIMONY		X		X
ARSENIC		X	X	
BARIUM			X	
CADMIUM	X	X	X	X
CHROMIUM, TOTAL		X	X	
COPPER		X	X	
CYANIDE			X	
IRON	X		X	
LEAD			X	
MANGANESE			X	
MERCURY		X	X	
NICKEL		X	X	
SELENIUM			X	X
SILVER		X	X	
VANADIUM			X	
ZINC		X	X	
PAHS				
ACENAPHTHENE		X		
ANTHRACENE		X		
BENZO(A)ANTHRACENE		X		
BENZO(A)PYRENE		X		
BENZO(B)FLUORANTHENE		X		
BENZO(G,H,I)PERYLENE		X		
BENZO(K)FLUORANTHENE		X		
CHRYSENE		X		
DIBENZ(A,H)ANTHRACENE		X		
FLUORANTHENE		X	X	
FLUORENE		X		
INDENO(1,2,3-C,D)PYRENE		X		
NAPHTHALENE		X	X	
PHENANTHRENE		X	X	
PYRENE		X		
VOCS				
1,2-DICHLOROBENZENE			X	
BIS(2-ETHYLHEXYL)PHTHALATE	X		X	
CHLOROBENZENE			X	
CIS-1,2-DICHLOROETHYLENE			X	
DI-N-BUTYL PHTHALATE			X	
TOTAL 1,2-DICHLOROETHENE			X	
TRICHLOROETHYLENE (TCE)			X	
PESTICIDES				
ALPHA-CHLORDANE		X		
BETA BHC (BETA HEXACHLOROCYCLOHEXANE)		X		
BETA ENDOSULFAN				
DDD (1,1-BIS(CHLOROPHENYL)-2,2-DICHLOROETHANE)		X		
DDE (1,1-BIS(CHLOROPHENYL)-2,2-DICHLOROETHENE)		X		
DDT (1,1-BIS(CHLOROPHENYL)-2,2,2-TRICHLOROETHANE)		X		
P,P'-DDD		X	X	X
P,P'-DDE		X		X
P,P'-DDT		X		X
DIELDRIN		X		
ENDRIN		X		
GAMMA-CHLORDANE		X		
HEPTACHLOR			X	
HEXACHLOROBENZENE		X		
PCBS				
PCB-1254 (AROCHLOR 1254)		X		
PCB-1260 (AROCHLOR 1260)		X		

NOTES:

1) Risks are based upon HQs >1 for detected chemicals in the media listed above.

2) Chemicals are not considered a risk in a given medium if the concentration at all IRP sites was below the corresponding background for the same medium.

3) Risks due to HQs > 1 for non-detects and for chemicals without detection limits are not included on this table. They are addressed in the uncertainty analysis of Appendices B and C as a data gap.

DR

TIER 2 SUMMARY

RANK	SITE/ZOD	DRIVERS			REMEDIAL ACTION		TIER 3	REMARKS
		BKGRND	ECO	HH	IN PLACE	PLANNED		
	GROUNDWATER [1]							
	522/IWCS 300 Area/Zone 3 ZOD	Y	Y	Y	Groundwater collection/treatment/ SVE		Y	CS-2 North Bank, 522 SVE
	CS-3 ZOD	Y	N	Y		Groundwater collection/treatment/ Cap	Y	
	D1/149th ZOD	Y	N	Y		Cap	Y	
	D2/1100 ZOD	Y	Y	Y	Groundwater collection/treatment	Cap	Y	
	D-3 ZOD	Y	Y	N		Cap	Y	
	D-4 ZOD	Y	N	Y	Groundwater collection/treatment	Cap	Y	
	D-5 ZOD	Y	N	Y	Groundwater collection/treatment	Cap	Y	
	D-8 ZOD	Y	Y	N	None	None	Y	
	FC-2 ZOD	Y	Y	Y	None	None	Y	
	S-9 ZOD	Y	Y	Y	None	None	Y	
	SOIL [2]							
	CS-2 Upland Area	N	Y	N	SVE	None	Y	
	D-4 Upland Area	Y	Y	Y	None	Cap	Y	
	E-1 Upland Area	Y	Y	N	None	TBD	Y	
	E-3 Upland Area	N	Y	N	SVE	None	Y	
	FC-2 Upland Area	N	Y	N	BioVenting	None	Y	
	IWTP Upland Area	N	Y	N	None	None	Y	
	OT-1 Upland Area	N	Y	N	Soil Removal	None	Y	
	S-3 Upland Area	Y	Y	N	None	None	N	
	S4-A Upland Area	Y	Y	N	None	None	Y	
	S-9 Upland Area	N	Y	N	None	None	Y	
	SA-2 Riparian Area	N	Y	N	None	None	Y	Possible fill
	SA-2 Upland Area	N	Y	N	None	None	Y	Possible fill
	SA-3 Upland Area	N	Y	N	None	None	Y	
	SD-1 Upland Area	N	Y	N	None	None	Y	Possible fill
	SD-2 Upland Area	N	Y	N	None	None	Y	

(1) Reference Table 5-7
(2) Reference table 5-5

EPCF and SA-4 are recommended for elimination from Tier 2

U.S. Air Force Base Conversion Agency

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Zone 2 and 3 Interim Corrective Measures Implementation (ICM-I)

MBPB20026010 ICM for Zone 2 and 3 SWMUs
MBPB20027454 ICM for Zone 2 and 3 IRP Sites

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As of: 02/19/01

1

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Zone 2 and 3 ICM
Scope and Purpose

- **Scope: Installation of interim systems as selected in the Zone 2 and 3 Interim Corrective Measures (ICM) or Focused Feasibility Studies (FFS).**
- **Purpose: Construction activities within these projects will contain primary sources that contribute to the Zone 2 and 3 commingled groundwater plume.**
- **CERCLA & CAP Requirements: An ICM report will be produced prior to installation of the system to meet the Compliance Plan requirements. In order to satisfy CERCLA requirements, a public meeting, proposed plan, and decision document will also be completed. Regulatory review for ICMs are not required under the Compliance Plan. If a formal review is requested, the construction schedule may be impacted.**

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Zone 2 & 3 Schedules

- **Site E-1 - Interim System Installation (Meeting in May)**

Internal Draft (CMS)	Peer Review	FFS	Public Involvement	Award ICM -I	Interim Installation
30 Jun 01	31 Jul 01	28 Sep 01	15 Oct - 15 Nov 01	30 Dec 01	1 Apr - 30 Jun 02

- **Zone 2 & 3 - Interim System Installations (B/301, B/360, EPCF)**

FFS	Public Involvement	Award ICM-I	Interim Installation
28 Sep 01	15 Oct - 15 Nov 01	30 Dec 01	1 Apr - 31 Dec 02

- **Compliance Plan Requirements**

B/301 Sampling	Submit Zone 3 RFI	Submit Zone 2 & 3 CMS	Submit Zone 2 & 3 CMI WP
Jul/Aug 01	30 Nov 01	30 Jan 02	30 Sep 02

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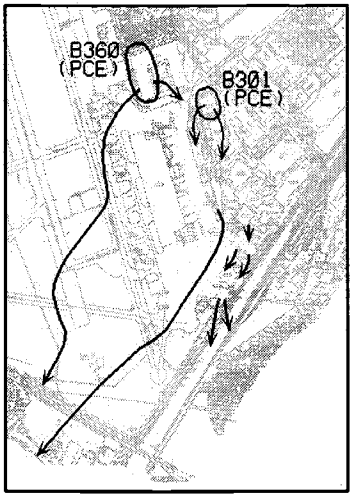
Zone 2 and 3 ICM Plume Flow Path



Groundwater flow

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Zone 2 and 3 ICM
Building 360 ICM Alternatives

- **Groundwater Alternatives**
  - Bioaugmentation
  - **Permeable Reactive Barrier**
  - Pump & Treat
  - Slurry Wall around the Building

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Zone 2 and 3 ICM
Building 301 ICM Alternatives

- **Soil**
  - Limited excavation
  - Soil Vapor Extraction
- **Groundwater**
  - Pump & Treat
  - **Permeable Reactive Barrier**
  - Slurry Wall around the building

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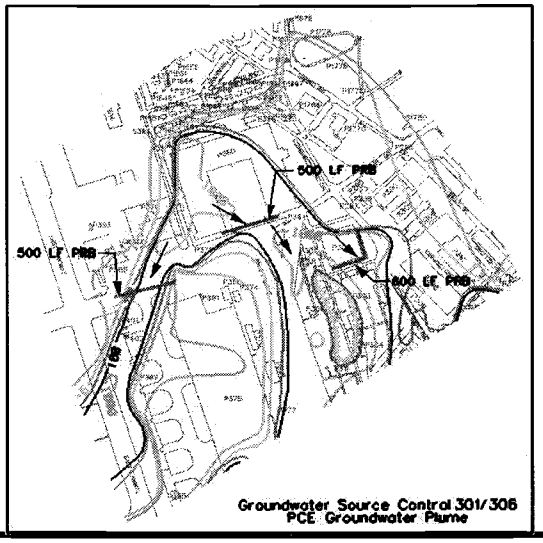
Zone 2 and 3 ICM
Building 301 & 360

Note: The ICM evaluation has not been completed. This is an example of one potential option.



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Zone 2 and 3 ICM
EPCF Alternatives

- **Alternatives**
- **Soil**
  - **Excavation of High Chromium (if necessary)**
- **Groundwater**
  - Upgrade existing pump and treat
  - **Install PRB**

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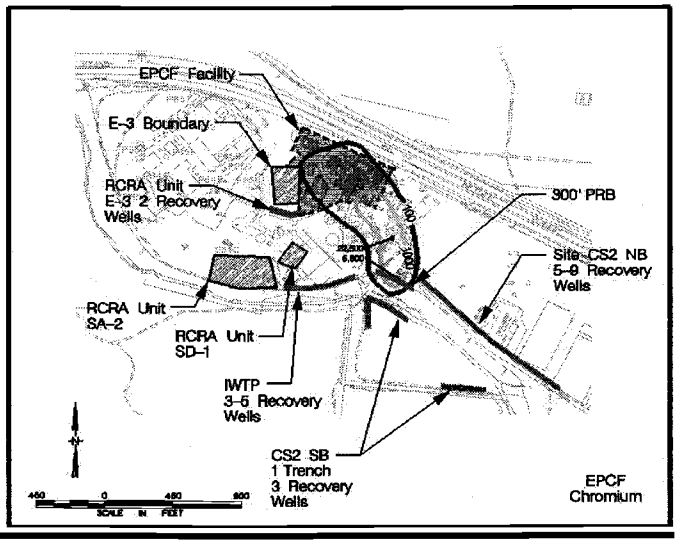
Zone 2 and 3 ICM EPCF Area

Note: The ICM evaluation has not been completed. This is an example of one potential option.



As of: 02/19/01

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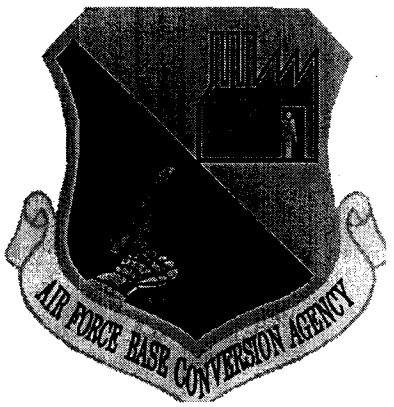
9

ZONE FOUR OVERVIEW

Walter Peck
Zone 4 Project Manager
AFBCA/DK
Kelly AFB, Texas



Current Status Summary

- Zone 4 RFI Report
  - Eco Risk Assessment
  - Human Health Risk Assessment
- CMS Interim Technical Memorandum
- Zone 4 Corrective Measure Study
- Zone 4 CMI Workplan

Zone 4 RFI

- RFI submitted for review - Feb 01
- ECO Risk Assessment - Feb 01
- Comments received on both from EPA are currently under study
- Awaiting comment by TNRCC
- Human Health Risk Assessment is currently expected approximately May 18

CMS Interim Tech Memo

- Originally envisioned as a "take home" version of the material presented at the Jan and Feb public meetings.
- Now ready for distribution - regulators' copies are available at this meeting
- Simultaneous distribution is being made to requestors and others by the Public Affairs Office
- Contains information as of Feb 01.

Zone 4 Corrective Measure

- Currently approximately 90% complete
- Includes refinements to the modeling presented previously, including evaluation of the "on-base" source areas
- Will show somewhat improved clean-up time for many of the solution sets
- Release will be at the conclusion of the City of San Antonio's independent evaluation
- Considering both technical factors and public inputs, options offering off-base treatment in areas of higher concentration appear to be the most satisfactory

CMI - Workplan

- First phase of contract has been awarded. Remainder expected early in FY 2002
- Operational plans currently underway
- Preliminary field work and data gathering expected during the summer of 2001
- Balance of work to be scheduled IAW regulatory approval or other inputs

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE