

Final

**Meeting Minutes Transmittal/Approval**  
**Unit Manager's Meeting: 200 Aggregate Area/200 Area Operable Units**  
**2440 Stevens Center, Room 1200 Richland, Washington**  
**June 30, 1994**

FROM/APPROVAL: *Paul M. Pak* Date 8/24/94  
 Paul M. Pak, 200 Aggregate Area Unit Manager, RL (A5-19)

APPROVAL: *Paul R. Beaver* Date 11/17/94  
 Paul R. Beaver, 200 Aggregate Area Unit Manager, EPA (B5-01)

APPROVAL: *Dib Goswami* Date 9/28/94  
 Dib Goswami, 200 Aggregate Area Unit Manager, WA Dept of Ecology

Meeting Minutes are attached. Minutes are comprised of the following:

- Attachment #1 - Meeting Summary
- Attachment #2 - Attendance Sheet
- Attachment #3 - Agenda
- Attachment #4 - Action Item Status List
- Attachment #5 - 200-BP-5 Operable Unit Status
- Attachment #6 - 200-UP-1 Groundwater Operable Unit
- Attachment #7 - ERA Status as of 6-29-94
- Attachment #8 - Project Status of the 200 West Area Carbon Tetrachloride ERA
- Attachment #9 - Status of 200-ZP-1 Operable Unit
- Attachment #10 - Investigation for Carbon Tetrachloride Dense Non-Aqueous Phase Liquids Beneath the 216-Z-9 Trench

Prepared by: *Kay Kimmel* Date: 8/24/94  
 Kay Kimmel, Jim Consort GSSC (B1-42)

Concurrence by: *Joseph Zoghbi* Date: 8/24/94  
 Curt Wittreich, BHI Coordinator (H6-03)  
 JOSEPH ZOGHBI, PROJECT MANAGER - 200 AREAS



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**Attachment #1**  
**Unit Manager's Meeting: 200 Aggregate Area/200 Area Operable Units**  
**June 30, 1994**

**Meeting and Summary of Commitments and Agreements**

1. **SIGNING OF THE MAY 200 AREA UNIT MANAGER'S MEETING MINUTES:** Meeting minutes were reviewed and approved with changes. An unsigned NPL Agreement/Change form was removed.
2. **ACTION ITEM UPDATE. See Attachment 4 for status:**
  - 2AAMS.13 Open. Pending formal transmittal of the groundwater model study.
  - 2AAMS.14 Open. A transmittal date will be provided to Ecology.
  - 2AAMS.15 CLOSED 06/30/94.
  - 2AAMS.16 Open. In process.
  - 2AAMS.18 CLOSED 06/30/94.
  - 2UP1.1 CLOSED 06/30/94.
  - 2UP1.2 Open. Still in process.
  - 2BP5.1 Open.
3. **NEW ACTION ITEMS (INITIATED June 30, 1994):**

No new action items were initiated.
4. **INFORMATION ITEMS:**
  - Status 200-BP-5 Operable Unit - Dave Erb provided the status of the 200-BP-5 Operable Unit Treatability Test (see Attachment #5). He indicated the second round of sampling would be similar to the first round, with 31 wells sampled for metals, radiochemicals and physical chemistry. He noted that Technetium and Cobalt would be added to the analyte list at RCRA wells. Since injection tests are planned under well fitness-for-use activities, D. Erb requested the regulators provide approval for the use of 3,000 to 4,000 gallons of raw water. EPA (Paul Beaver) agreed to provide a response by July 1, 1994. Discussion proceeded on the pilot-scale treatability test. It was tentatively agreed to meet on July 1 from 1 - 4 pm at the EPA conference room for comment disposition on this document. Paul Beaver indicated that intrusive work, such as sonic drilling, can be done without a Description of Work (DOW) in order to meet the milestone. The treatability test is scheduled to be issued late July/early August, specific date to be set after the comment disposition meeting.
  - Status 200-UP-1 Operable Unit - Curt Wittreich provided an update on the field activities for the 200-UP-1 Operable Unit (see Attachment #6). He indicated that the groundwater quarterly monitoring is complete. He noted that the Decision Matrix provided was agreed to by the regulators in a meeting on June 28. C. Wittreich reviewed the Revised Well Construction/Sampling Program for 200-UP-1 and indicated that the bolded portion of Well UP1-3 would increase the scope of work and would require an engineering change notice to the DOW. He indicated that the pilot-scale treatability test was restarted on June 23. He indicated that analyses performed did not detect uranium.

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- ERA Activity - Paul Valcich provided an update on all Expedited Response Actions (see Attachment #7). A meeting is scheduled on July 13 from 9-noon, Room 1200, to discuss the revisions requested by the EPA on the Sodium Dichromate proposed plan. The regulators requested that the Sodium Dichromate proposed plan be issued with the Pickling Acid Crib and Riverland proposed plans. P. Valcich indicated that the River Effluent Pipelines Engineering Evaluation/Cost Analysis proposal will be provided to the Indian Nations at the same time as it is provided to the regulators.
- Carbon Tetrachloride ERA Status - Sean Driggers provided the status of the carbon tetrachloride extraction activities (see Attachment #8). He noted that wells near the Z-9 crib were operating at 1000 cubic feet per minute (cfm), although the average cfm appeared low. He also noted that wells near the Z-18 crib will undergo characterization for two weeks before extraction begins.
- Status of 200-ZP-1 - Dan Parker provided the status of the 200-ZP-1 Operable Unit (see Attachment #9). He indicated that comment responses were finalized on the treatability test plan and that a 200 NPL Agreement/Change Control form was signed. The treatability test plan is scheduled to be finalized by July 8, 1994. He noted the waste control plan will be finalized based on the 200-UP-1 plan.
  - Sampling and Analysis Plan - Bruce Ford led a discussion on responses to regulator comments on the 200-ZP-1 Sampling and Analysis Plan.
  - DNAPL presentation - Steve Trent provided the Investigation for Carbon Tetrachloride Dense Non-Aqueous Phase Liquids (DNAPL) Beneath the 216-Z-9 Trench (see Attachment #10). He noted that carbon tetrachloride was discharged from 1955 to 1973, and was a mixture of organic chemicals, totaling more than 500 metric tons. He further noted that 65% of the estimated quantity of carbon tetrachloride is still unaccounted for in the mass balance. Dennis Faulk noted that since records from those times were often poorly kept there was likely more carbon tetrachloride dumped than is recorded. S. Trent indicated that there are three approaches to DNAPL investigation. He noted the preferred method is partitioning interwell tracer tests, but indicated there are some issues to be resolved. The purgewater would probably require treatment, and a suite of tracers would need to be developed and agreed upon. EPA indicated that the DNAPL issue would be addressed in the work plan and in the interim Record of Decision.
- Next Meetings - The next meetings are scheduled for July 27 and 28, 1994.

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200-UP-2 and  
200 Aggregate Area Unit Manager's Meeting  
Official Attendance Record  
June 30, 1994

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PRINTED NAME	ORGANIZATION	O.U. ROLE	TELEPHONE
David B. Erb	WNC - B	BP-5 O.U. Coord	372-1402
GEORGE E HENCKEL III	WHE	200 Area Service Invest / Remed.	376-1994
Gary Freedman	Ecology	oum	736 3026
Richard Carlson	WHE	200 Area G.W. 003	376-9027
Consort James	Dames & Moore/MACTEC	GSSC	7463694
Beaver, Paul	ERA	U Mgr.	376-8065
Ted Worley	Ecology	ER 200 Area	736-3022
Jennifer Young	DOE-RL		373-7044
<del>Kevin Parrott</del>	Dames & Moore	GSSC	946-3690
AVI TAYAR	Dames & Moore	GSSC	946-3690
KAY KIMMEL	MACTEC	RL SUPPORT	509-946-3692
<del>MIC WITTRECHT</del>	WHE	UP-1 Tech Coord.	376-1862
P Evan Driesel	PNL	Ground-Water Surveillance	376-8341
Kevin J Parrott	Dames & Moore	GSSC	946-3690
Paul Pak	RL	UMM	876-4798
MICHAEL J GALGOUL	WHE	TECH COORD	376-2038
William E Lum II	VEGS	EPA Support	206 5936510
Jeff Ross	PRC EMI	EPA Support	206/624.2692
Dave Einar	EPA	UP-1,2 OUM	509.376.3883
Mark Wasemiller	WHE	UP-2 Tech Coord	376-9808
Tony Knepp	WHE	Geose	376-3398
D. Goswami	Ecology	OUM	736-3015
Nancy Uzemblo	Ecology	OUM	736 3014
<del>Kevin J Parrott</del>	Dames & Moore	GSSC	946-3690
AVI TAYAR	Dames & Moore	GSSC	946-3690
Diana Sickle	WHE	Program Support	372-3141

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**Attachment #3  
Unit Manager's Meeting: 200 Aggregate Area/200 Area Operable Units  
June 30, 1994**

**Agenda**

**200 Area Activities**

**200-BP-5 - D. Erb**

- \* General Status
- \* Status of treatability test plan, and schedule

**200-UP-1 - C. Wittreich**

- \* General Status
- \* Characterization
- \* Treatability Studies

**200-ZP-1 - D. Parker**

- \* Status

**ERA Activity - P. Valcich**

- \* Status
- \* Carbon Tetrachloride - S. Driggers

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## Attachment #4

**Action Item Status List**  
**Unit Manager's Meeting: 200 Aggregate Area/200 Area Operable Units**  
**June 30, 1994**

ITEM NO.	ACTION	STATUS
2AAMS.13	Transmit the 200-UP-1 and 200-ZP-1 Treatability Test Plans and Mike Connelly's groundwater modeling studies for pump and treat to the regulators. Action: Paul Pak.	Open 03/31/94.
2AAMS.14	Provide to the regulators a map identifying RCRA wells and CERCLA wells for the 200 East and 200 West areas. Action: Paul Pak.	Open 03/31/94.
2AAMS.15	Submit draft dispositions to regulator comments on the 200-BP-5 Treatability Test Plan by April 6. Action: Paul Pak.	Closed 06/30/94.
2AAMS.16	Provide a schedule describing activities that are required prior to initiating pilot scale studies in the 200-BP-5 Operable Unit by August 1994. Action: Dave Erb.	Open 03/31/94. Activities are ongoing.
2AAMS.18	Provide to the regulators a map identifying RCRA and CERCLA wells at 200 West area. Action: Curt Wittreich.	Closed 06/30/94.
2UP1.1	Provide a letter within one week to EPA and Ecology regarding the 200-UP-1 Operable Unit pilot-scale treatability test temporary suspension of treatment activities. Action: Paul Pak.	Closed 06/30/94.
2UP1.2	Develop a treatability test plan for denitrification of 200-UP-1 groundwater at laboratory and bench scales, based on the 100 Area Treatability Test Plan for Nitrate. Action: Paul Pak.	Open 05/26/94.
2BP5.1	Revise the existing Description of Work to include the use of the cone penetrometer prior to installation of new wells to better locate extraction and recovery wells. Action: David Erb.	Open 05/26/94.

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**200-BP-5 OPERABLE UNIT STATUS****June 30, 1994****D. B. Erb****\* Groundwater Monitoring Activities**

- Lab Analysis Status - 60% complete
- Data Validation Status - start mid-July
- 2nd Round Sampling Status

**\* Well Fitness-for-Use Activities**

- Well Inspections - Completed
- Production Pump Tests
- Injection Tests

**\* Drilling Activities**

- DOW comments received and draft dispositions prepared.
- KEH is preparing cost estimate & schedule.

**\* Treatability Test Plan**

- Redline and comment dispositions ready for DOE review.

**\* Treatability System Fabrication/Site Preparation**

- Site Preparation about to start
- 1st System about 1/3 done, 2nd system to start in early July.

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**200-UP-1 GROUNDWATER OPERABLE UNIT  
UNIT MANAGERS MEETING, JUNE 30, 1994**

**AGENDA**

- LIMITED FIELD INVESTIGATION
  - GROUNDWATER MONITORING STATUS
  - WELL INSTALLATION STATUS
- PILOT-SCALE TREATABILITY TEST
  - OPERATIONAL STATUS

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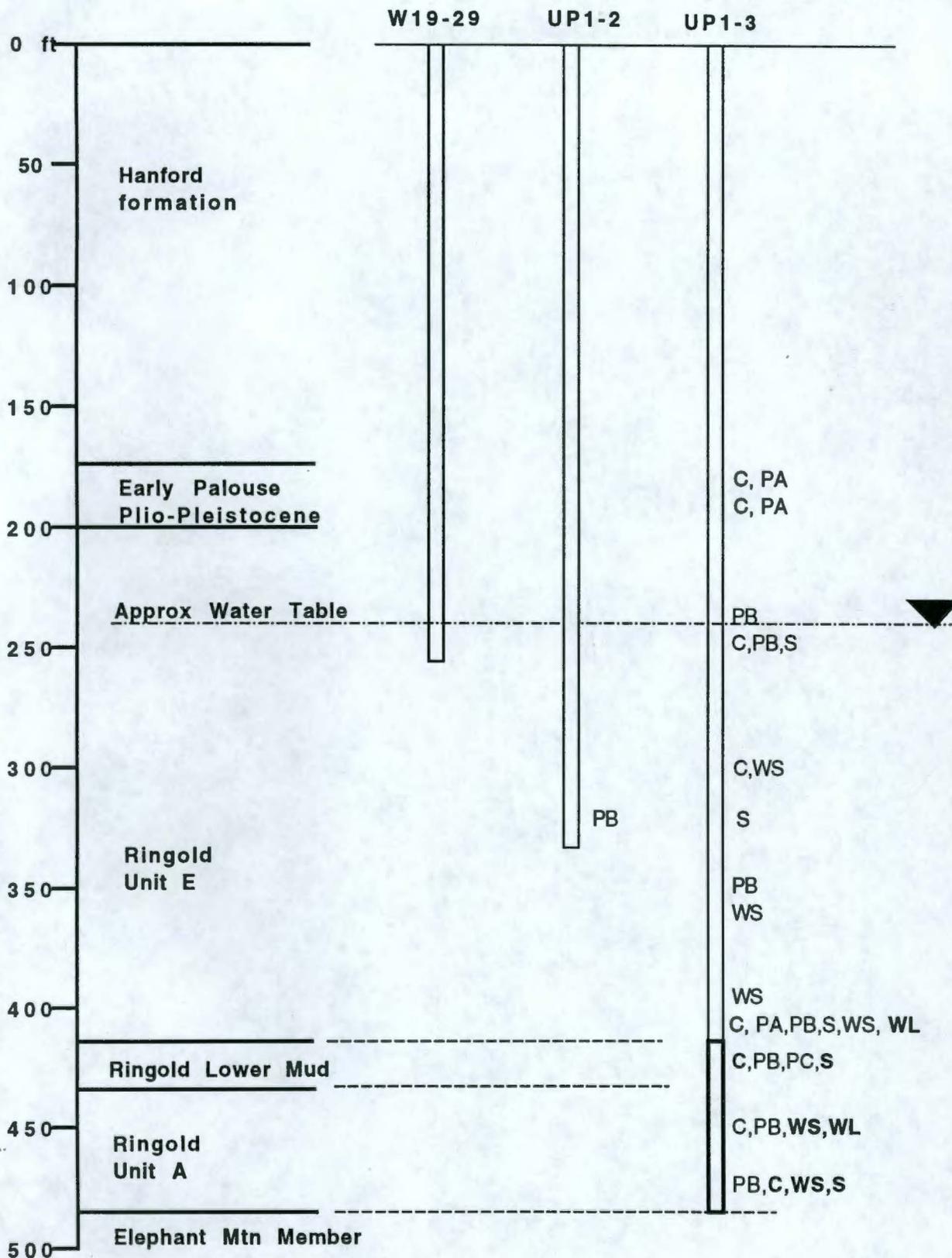
DECISION MATRIX FOR COMPLETING WELLS 299-W19-34B AND -34C

Unconfined Aquifer condition	Clean	Clean	Contaminated	Contaminated
Confined Aquifer condition	Clean	Contaminated	Clean	Contaminated
Completion scenario for Wells 34B and 34C	Backpull and grout, complete in unconfined aquifer as Well 34B; do not drill 34C	Complete in confined aquifer as Well 34C: do not drill 34B	Backpull and grout, complete well in unconfined aquifer as Well 34B: do not drill 34C	Complete both wells UP1-3 as 34C in confined and drill UP1-4 as 34B in unconfined aquifer

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REVISED WELL CONSTRUCTION/SAMPLING PROGRAM FOR 200-UP-1



PA = Physical A  
 PB = Physical B  
 PC = Physical C  
 C = Chemical

WS = Groundwater Screening  
 WL = Groundwater Lab  
 S = Slug Test

## ERA Status as of 6-29-94

### 1. Pickling Acid Crib

- Feasibility Study (FS) and Proposed Plan (PP) are going through Regulator reviews.
- Revise FS and PP per comments.
- Public comment period.
- No Further Action Record of Decision.

### 2. Sodium Dichromate

- Final Assessment Report (FA) and PP are ready for public review.
- Public comment period.
- No Further Action Record of Decision.

### 3. Riverland

- FA and PP are waiting for the ordnance survey report to finalize the documents.
- Excavated diesel contaminated soil bioremediation is complete per field screening results. Offsite lab samples are being collected for confirmation.

### 4. River Effluent Pipelines

- The EE/CA proposal is with RL for review.
- Comments are due by August 8, 1994.

**June 30, 1994 Unit Managers Meeting  
Project Status of the 200 West Area Carbon Tetrachloride ERA**

1. CCl<sub>4</sub> Extraction Data

<b>MONTHLY CCL<sub>4</sub> EXTRACTION SUMMARY</b>						
<b>Operational Period</b>	<b>VES System</b>	<b>Avg. Flow (scfm)</b>	<b>Avg. Conc. (ppmv)</b>	<b>Time (hrs)</b>	<b>System Availability (percent)</b>	<b>CCl<sub>4</sub> Extracted lbs/(kg)</b>
5/2 - 5/31	500 cfm	--	--	--	--	--
	1000 cfm	527*	376	400.0	92%	1,902 (865)
	1500 cfm	499	7,772	144.35	87%	12,764 (5,802)
<b>1994 Total</b>						<b>27,542 (12,519)</b>
<b>1993 Total</b>						<b>7,932 (3,605)</b>
<b>1992 Total</b>						<b>2,111 (958)</b>
<b>GRAND TOTAL</b>						<b>37,585 (17,082)</b>

\* - Lower than normal flow represents the influence of a two week tracer gas test conducted on well W18-252, west of the 216-Z-1A tile field.

As of June 28, over 52,000 lbs of CCl<sub>4</sub> removed.

2. Completed draft of CCl<sub>4</sub> treatment alternatives study.
3. Completed Soil-Gas Baseline Monitoring Report and Refined Conceptual Model Report.
4. Working on revision to the Wellfield Strategy report, due end of July.
5. Working on Proposed Plan to support Interim Record of Decision.

## **STATUS OF 200-ZP-1 OPERABLE UNIT**

**JUNE 30, 1994**

- o General Status - D. Parker**
  - Treatability Test Plan**
  - Withdrawal and Injection Well NPL Agreement Form**
  - Waste Control Plan**
- o Sampling and Analysis Plan Finalization - B. Ford**
- o DNAPL Investigation Strategy - S. Trent**

**INVESTIGATION FOR CARBON TETRACHLORIDE  
DENSE NON-AQUEOUS PHASE LIQUIDS BENEATH  
THE 216-Z-9 TRENCH**

**S. J. Trent**

**Westinghouse Hanford Company**

**June 30, 1994**

Attachment #10

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# AGENDA

- NEED FOR DNAPL INVESTIGATION
- INDIRECT INDICATORS OF DNAPL IN UNCONFINED AQUIFER
- DNAPL INVESTIGATION METHODS
- PREFERRED APPROACH

# NEED FOR DNAPL INVESTIGATION

## Remedial Design:

- DNAPL functions as continual source of groundwater contamination
- DNAPL zone will contain majority of mass
- Optimize remediation by containing/removing source
- Optimize monitoring program

## Refine Conceptual Model:

- Delineate nature of problem for future decision making
- Risk assessment

## Invasive Activities Near DNAPL Zone:

- Minimize spread of DNAPL which could result from invasive activities

# INDIRECT INDICATORS OF DNAPL

## Process Records:

- Large volume of carbon tetrachloride disposed to soil column (>500 metric tons)

## Aqueous Phase Concentrations:

- Groundwater concentrations approaching 1% of saturation (6000-8000 ppb)
- Long-term stability of plume "hot spot" near source area

## Soil Gas Concentrations:

- High concentrations of vapor phase within 10 ft. of water table (>10,000 ppmv)

## Depth Distribution of Aqueous Phase Contamination:

- Increasing concentrations with depth; distributed greater than 50 ft. into aquifer

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Site Hist Rank	GROUND WATER CONTAMINATION RANK					
	6	5	4	3	2	1
6	Hi	Hi	Hi	Med	Med	Med
5	Hi	Hi	Hi	Med	Med	Lo
4	Hi	Hi	Med	Med	Lo	Lo
3	Hi	Hi	Med	Med	Lo	Lo
2	Hi	Hi	Med	Med	Lo	Lo
1	Hi	Hi	Med	Med	Lo	Lo

Figure A-1. Matrix for Combining the Site History Ranking and Groundwater Contamination Ranking at Sites for Which the Potential for DNAPL Occurrence Must Be Estimated. Shaded Area Represents Ranking for Area Near the Carbon Tetrachloride Disposal Sites (adapted from EPA, 1993).

Table A-1. Definitions of the Four Composite Rankings (EPA, 1993).

<b>DEFINITE</b>	DNAPL directly encountered below the water table in soil cores and/or ground water samples.
<b>HIGH</b>	DNAPL strongly suspected based on ground water data and site history information. Proceed with site investigation and remediation plans assuming subsurface DNAPL source is present.
<b>MEDIUM</b>	Information from site history and ground water investigation indicate moderate potential for subsurface DNAPL. Important to gather additional site information regarding possible DNAPL presence. Best to proceed as if site is a DNAPL site until further investigation indicate otherwise.
<b>LOW</b>	Based on available site history and ground water information. DNAPL sources are unlikely. DNAPL potential at some sites in this category may be underestimated due to lack of information. Modify expectations if further investigations show evidence of DNAPL sources.

# DNAPL INVESTIGATION METHODS

## Three Approaches:

- Drill and Sample Characterization Boreholes
- Partitioning Interwell Tracer Tests
- Solvent Extraction Tests

# DNAPL INVESTIGATION METHODS

## Three Approaches (cont.):

- **DRILL AND SAMPLE CHARACTERIZATION BOREHOLES**
  - Drill 1 - 2 deep characterization boreholes and sample for DNAPL
  - Completed preferably as deep and intermediate depth monitoring wells
  - Additional boreholes may be needed to validate investigation

# DNAPL INVESTIGATION METHODS

## Three Approaches (cont.):

- **DRILL AND SAMPLE CHARACTERIZATION BOREHOLES**

### ISSUES

- Mobilization of DNAPL
- Limited volume of aquifer interrogated
- Collection of representative samples
- Limited application of core analysis techniques in the environmental industry

# DNAPL INVESTIGATION METHODS

## Three Approaches (cont.):

- **PARTITIONING INTERWELL TRACER TESTS**
  - **Adaptation of petroleum industry technology for enhanced recovery**
  - **Deepen two existing vadose zone wells and/or drill new extraction well**
  - **Hydraulically draw reactive and non-reactive tracer slug through DNAPL zone**
  - **Measure tracer recovery and arrival times**
  - **Large volume of aquifer interrogated**

# DNAPL INVESTIGATION METHODS

## Three Approaches (cont.):

- **PARTITIONING INTERWELL TRACER TESTS**

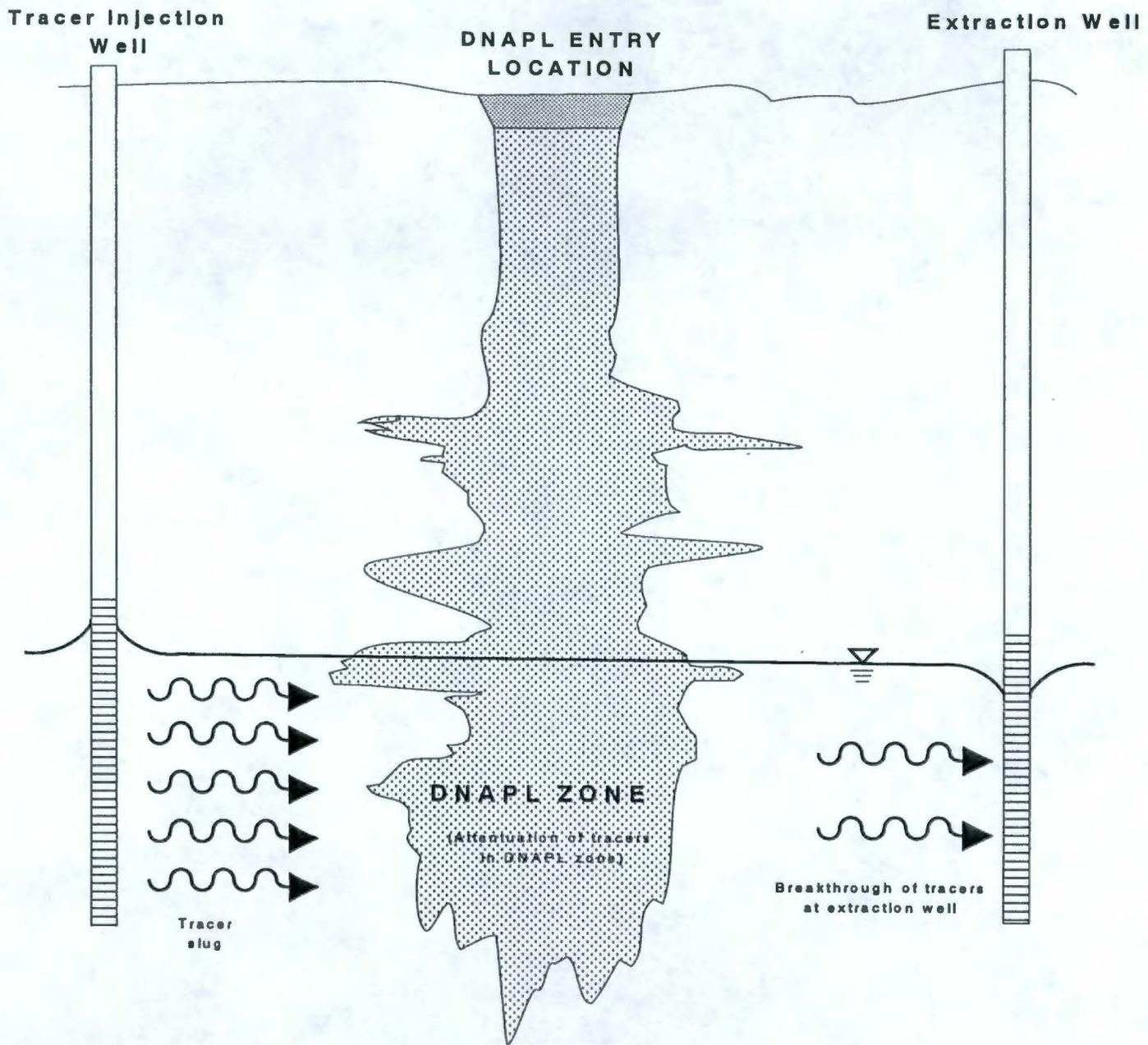
### ISSUES

- Shallow interrogation only
- Purge water
- Tracers should be environmentally sensitive
- Limited application in environmental industry

# DNAPL INVESTIGATION METHODS

## Three Approaches (cont.):

- **SOLVENT EXTRACTION TESTS**
  - **Adaptation of petroleum industry technology for enhanced recovery**
  - **"Spot" injection and extraction of solvent in new and existing wells**
  - **Sample and analyze for aqueous concentrations above solubility limit**



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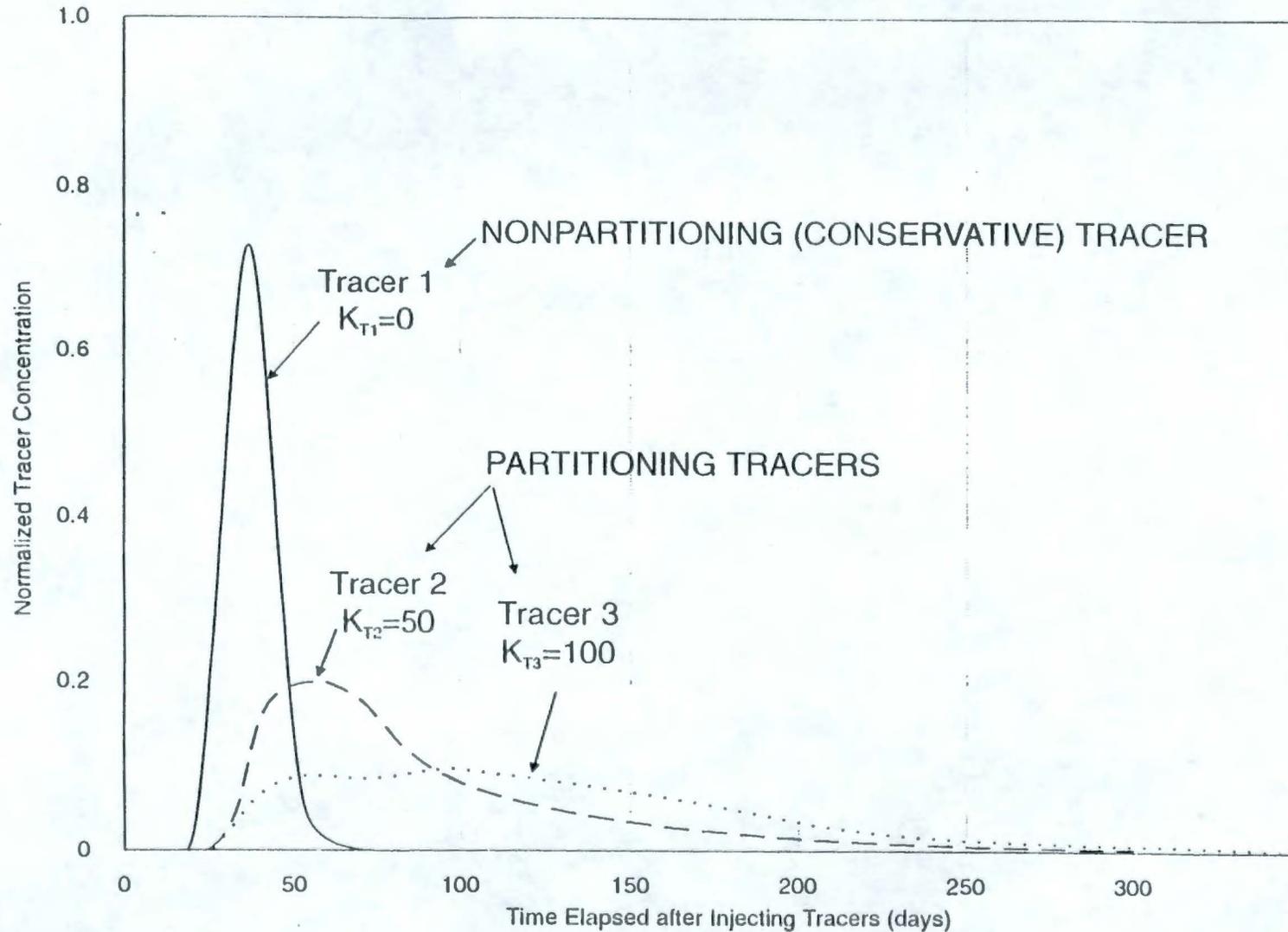


Figure 2. Example of tracer breakthrough curves at a production well showing the retardation of tracers 2 and 3 by encountering DNAPL following their injection into the Ringold Fm.

# DNAPL INVESTIGATION METHODS

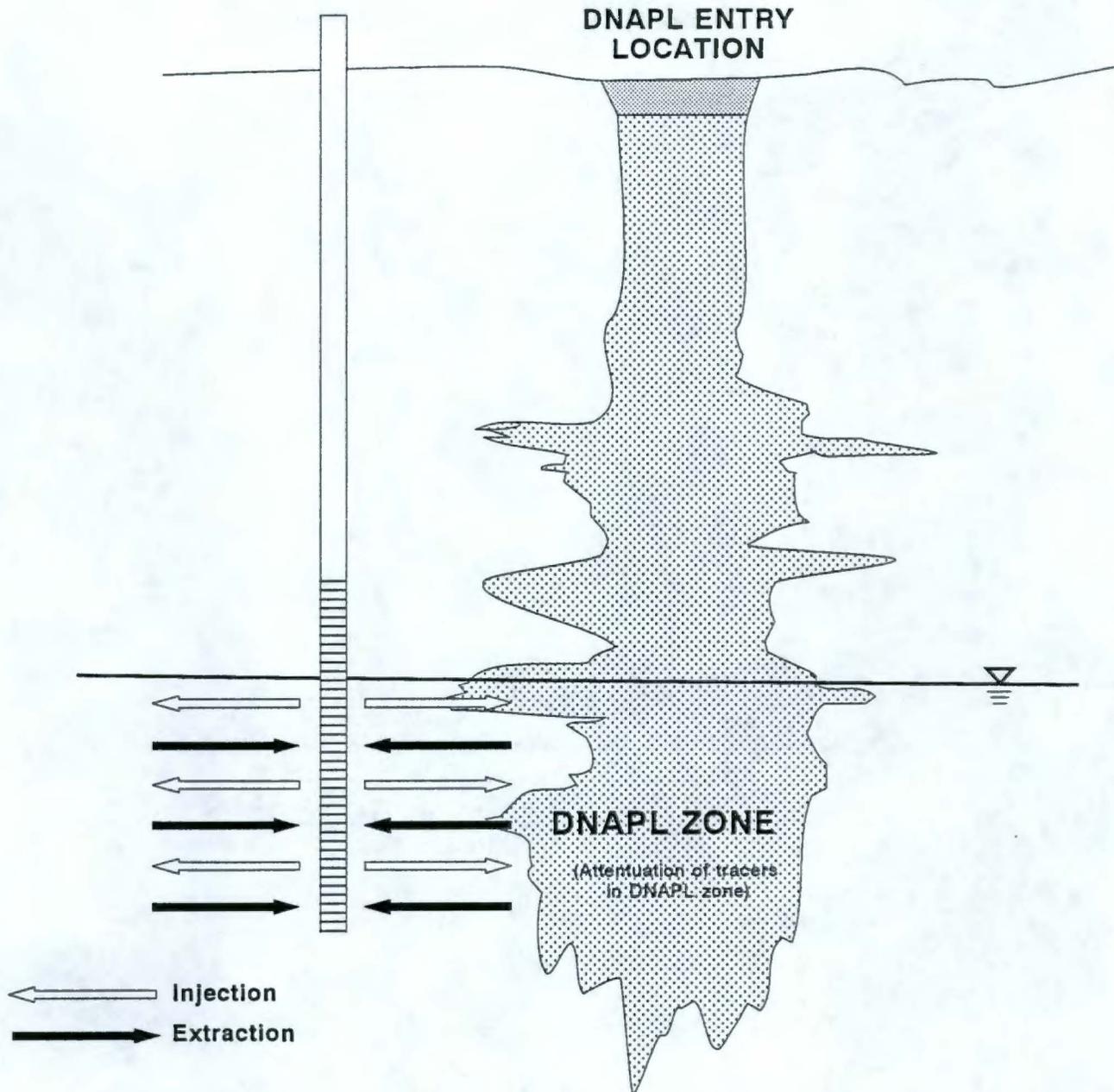
## Three Approaches (cont.):

- **SOLVENT EXTRACTION TESTS**

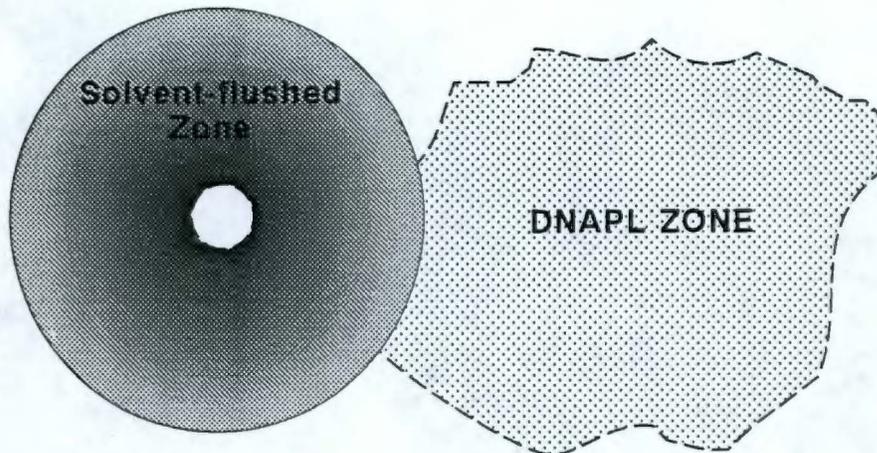
### ISSUES

- Limited volume of aquifer interrogated (greater than core sampling)
- Dependent on availability of wells to access subsurface
- Acceptance of solvents for environmental characterization and remediation use
- Potential for complexing of carbon tetrachloride with TRU
- Limited application in the environmental industry

Solvent  
Injection/Extraction Well



Plan View



# **PREFERRED APPROACH**

## **PARTITIONING INTERWELL TRACER TEST**

### **BASIS:**

- **Large volume of aquifer interrogated relative to other methods**
- **Definitive test for DNAPL and volume estimate (within zone of influence)**
- **Low risk for disturbing DNAPL zone and potential co-contaminants**
- **Cost effective relative to drilling deep borehole(s)**
- **Ability to collect other hydraulic parameters needed for remedial design**
- **Capability to monitor remediation if removal of source is determined feasible**

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# PREFERRED APPROACH

## PARTITIONING INTERWELL TRACER TEST (cont.)

### SCOPE:

- Deepen two vadose zone wells and complete as small diameter groundwater extraction wells; OR
- Deepen one vadose zone well and complete as small diameter groundwater injection well, and install new groundwater extraction well
- Determine appropriate suite of tracers and corresponding partition coefficients
- Perform aquifer tests to estimate tracer breakthrough
- Conduct tracer test (3-6 month time period)

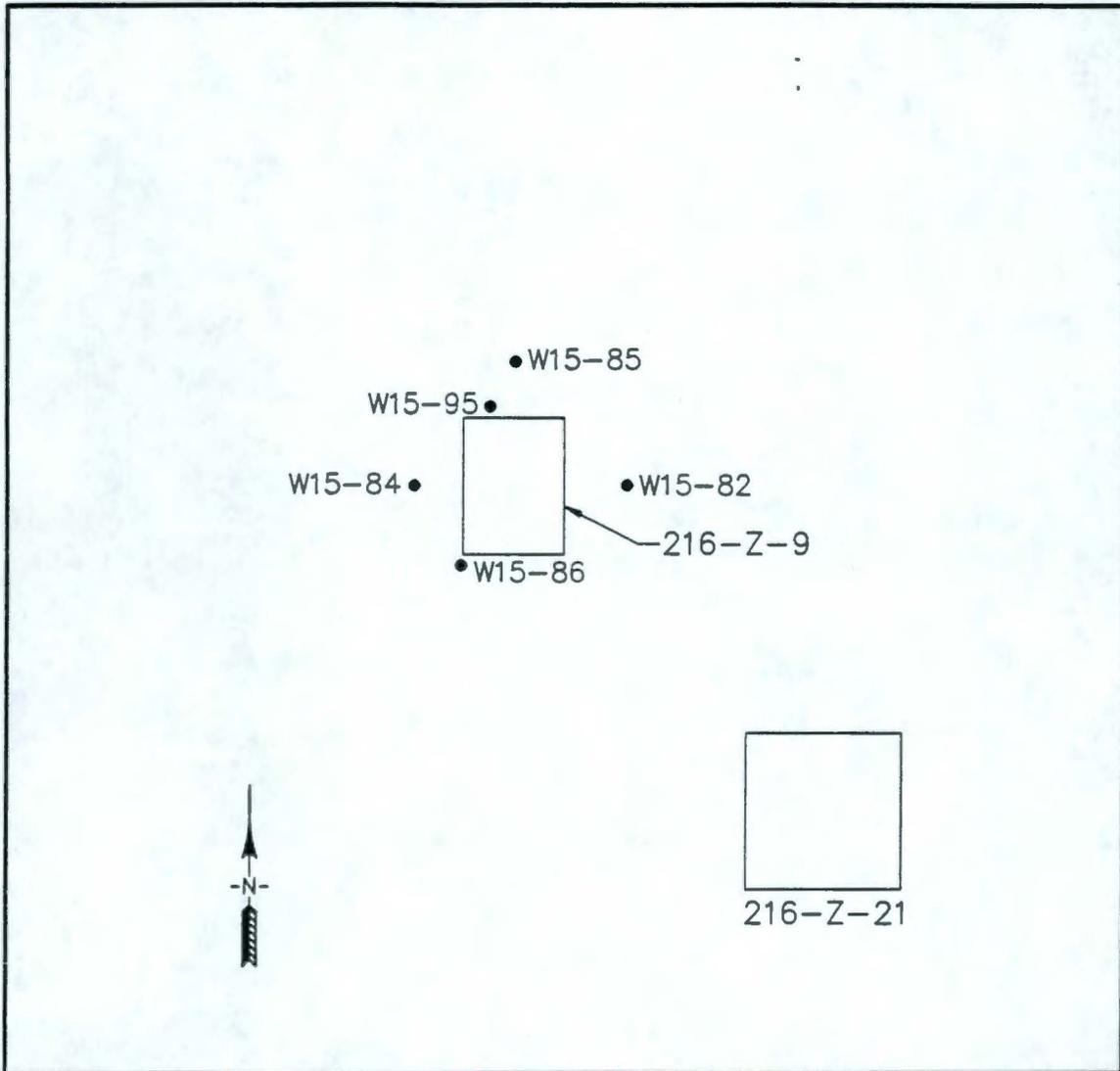
# **PREFERRED APPROACH**

## **PARTITIONING INTERWELL TRACER TEST (cont.)**

### **PRODUCTS:**

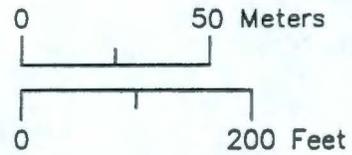
- **Delineation of DNAPL carbon tetrachloride in vicinity of 216-Z-9 (shallow portion of unconfined aquifer)**
- **Estimation of DNAPL volume**
- **Determination of key hydraulic parameters in vicinity of 216-Z-9 Trench**
- **Installation of two quality groundwater wells for extraction/injection and monitoring**
- **Capability to monitor removal of DNAPL**
- **Test facilitates groundwater remediation**

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Legend

- Possible Wells for Inter-Well Tracer Testing
- W15-82 Well Number (All Well Numbers Prefixed by 299-)
- 216-Z-9 Liquid Waste Disposal Site



## Distribution

**Unit Manager's Meeting: 200 Aggregate Area/200 Area Operable Units  
June 30, 1994**

Paul Pak . . . . . DOE-RL, ERD (A5-19)  
 Mary Harmon . . . . . DOE-HQ (EM-442)  
 Richard Person . . . . . DOE-HQ (EM-442)

Paul Beaver . . . . . 200 Aggregate Area Manager, EPA (B5-01)  
 Brian Drost . . . . . USGS, Support to EPA  
~~Jeffrey Ross~~ . . . . . PRC, Support to EPA  
*Jim Pankam's*  
 Dib Goswami . . . . . WDOE (Kennewick)  
 Larry Goldstein . . . . . WDOE (Lacey)

Lynn Albin . . . . . Washington Dept. of Health

Curt Wittreich . . . . . BHI (H6-03)  
 Joe Zoghbi (Please route to:) . . . . . BHI (H6-01)  
     M.J. Galgoul . . . . . BHI (H6-01)  
 Diana Sickle . . . . . BHI (H6-27)  
 Kay Kimmel . . . . . MAC (B1-42)  
 R. Scott Hajner . . . . . BHI (H4-79)  
 Andrea Hopkins . . . . . BHI (H4-79)  
 Tom Page (Please route to:) . . . . . PNL (K1-31)  
     Cheryl Thornhill . . . . . PNL (K1-19)      Steve Slate . . . . . PNL (K1-19)  
     Mark Hanson . . . . . PNL (K1-51)      Bill Stillwell . . . . . PNL (K1-30)  
     Roy Gephart . . . . . PNL (K1-22)      Ben Johnson . . . . . PNL (K1-78)

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Original Sent To: **ADMINISTRATIVE RECORD: 200 AAMS Care of EPIC, WHC**  
**(H6-08)** *DMC*

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Please inform Kay Kimmel (946-3692) of Mactec/Dames & Moore (B1-42) of deletions or additions to the distribution list.