039092

Environmental Restoration Contractor **ERC Team**

Meeting Minutes

Job No. 22192
Written Response Required? NO
Closes CCN: N/A
OU: 200-ZP-2
TSD: N/A
ERA: CCl4
Subject Code: 4170

SUBJECT 200-ZP-2 Rebound Study DQO Workshop

TO Distribution

FROM V. J. Rohay VJR 11/20/96

DATE November 13, 1996

ATTENDEES

V. J. Rohay H9-11
J. R. Freeman-Pollard H9-12
R. K. Tranbarger H9-12
R. W. Ovink H9-03
B. H. Ford H0-02
S. O. DeLeon H9-12
M. A. Buckmaster H0-19
A. C. Tortoso H0-12
G. R. Chiaramonte H9-12
D. A. Faulk B5-01

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Attendees

Document and Info Services H0-09

A meeting on the above subject was held on October 31, 1996, at Sigma II, Husky Room. The agenda is included as Attachment 1.

Virginia Rohay provided an overview of the history of soil vapor extraction operations at the 200-ZP-2 Operable Unit and the project documents completed in FY 1996 (Attachments 2 and 3). Virginia then reviewed the proposed purpose, schedule, and objectives of the Rebound Study and the types of wells and probes available for soil vapor sampling at the vapor extraction sites.

Three different methods of collecting soil vapor samples were discussed:

- Portable Sample Pump
- Soil Vapor Extraction (SVE) Systems (existing systems)
- Barometric Pressure (natural vapor flow from wells)

It was decided that the preferred method to sample the soil vapor was using the portable sample pump, which can be used to collect vapor samples from relatively discrete depths at specific locations in the soil. The barometric pressure fluctuations, which naturally pump vapor samples from wells, will be used to collect additional vapor samples. It was acknowledged that the contaminant concentrations in soil vapor samples collected using either method might be affected by barometric pressure fluctuations. The SVE systems will be used to collect soil vapor samples before and after periods of concentration rebound.

Roger Ovink then lead the discussion of the DQO Checklist (Attachment 4) and the DQO interview issues. Policy issues and technical issues were addressed separately. The issues and the DQO workshop comments are summarized below.

Policy Issues:

1. Why is November 4, 1996 the SVE system shutdown date?
   - SVE systems are costly to operate during winter months because of water condensate
   - Union/worker labor resource schedules, which are prepared in advance, are based on a 11/4/96 shutdown date
   - Multi-year plan reflects 11/4/96 shutdown date

2. What is the enforceable schedule/milestones for SVE system restart?
   - Less costly to operate SVE systems in spring/summer months
   - Multi-year plan reflects 3/97 restart date
   - Agree to resume operations by April 30, 1997
   - Need TPA Class III Change Package to ensure restart

3. The DQO process is occurring "out of sync" with planned operating changes
   - Acknowledged

4. Who decides/approves changes in SVE system operations (e.g., shutdown, studies, restart)?
   - EPA authorization is primary
   - Under Superfund, DOE also has authorization

5. What is the most cost effective SVE system operation (data inputs/criteria)?
   - EPA/DOE want the SVE system operations to be optimized for cost-efficiency

6. What are the SVE system shutdown criteria (clean? protective? final remedy?)
   - Ongoing issue (Issuance of a Record of Decision)
   - EPA/DOE need to address this issue
   - Rebound study results will be useful in these discussions/decisions

7. What decisions will the rebound study data support?
   a. How much carbon tetrachloride is available for extraction using SVE?
   b. What might be expected with pulsed/intermittent system operations (weekly, monthly)?
   c. Provide information to address final remedy selection (what system, how to operate, costs)
   d. Enhance current system operations (optimize, efficiency)
   e. What is the source distribution at the site?
   f. What is the groundwater influence (groundwater-to-vadose flux and vadose-to-groundwater flux)?
      -link to current monitoring plans
      - no new wells
   g. Support DOE/EPA discussions related to identifying and achieving cleanup goals
   h. Vapor plume control status/success
   i. Identify data gaps that need to be filled to identify and support final remedy

Technical Issues:

1. Well selection logic/criteria
   - More detail/better rationale needed in test plan text (where, why, uncertainties)

2. Sampling frequency
   - Every other day (due to volume/logistics) for first 10 working days; four locations two times/day
   - Frequency after first 10 working days will be contingent on data from first 10 days
   - Frequency to be discussed with DOE and EPA at 11/13/96 meeting

3. COCs (plus supporting information such as barometric pressure)
   - Carbon tetrachloride, chloroform (same as currently monitored at SVE systems)

4. Sample collection protocols
   - No changes from current draft test plan

5. Sample analysis
   - Field screening using B&K (same as currently used at SVE systems)
   - Daily calibration with standard
   - One duplicate for every 20 samples for sampling method repeatability (5% of total)
   - Laboratory confirmation not required for the purpose of this study

6. Data management (HEIS, etc)
   - Current SVE system extraction/operation data not in HEIS
   - Current SVE system extraction/operation data located in project files

7. Statistics/Uncertainties
   - Sampling design for this study should reflect a scoping effort
   - Statistical approach to sampling design not necessary for test plan purposes or data uses
   - Data uncertainty/analysis will include statistical analysis where appropriate but will likely be limited to max/min/mean and data presentation alternatives (graphs, tables, etc.)

8. Cost information for rebound study
   - Will be provided to DOE/EPA on 11/13/96 but will not be included in test plan

9. Schedule for revising test plan
   - Revised test plan will be provided to DOE/EPA at 11/13/96 meeting

The following Agreement Statements were made at the DQO workshop:

1. SVE system shutdown on November 4, 1996 is approved contingent on a Class III Milestone Change Package signed by November 15, 1996. Package will indicate that normal operations will resume no later than April 30, 1997.

2. EPA concurrence is required for operational changes for this 200-ZP-2 ERA; the rebound study falls under this purview.

3. EPA expects no new wells to be drilled for the rebound study.

4. Rebound Study sampling will begin on November 4, 1996 and will follow the draft test plan sampling approach.

5. A revised Test Plan will be delivered to DOE/EPA on November 13, 1996. The document will be a Rev. 0 and will incorporate the technical comments resolved in this meeting and the technical comments submitted by BHI on 10/24/96.

The following Action Items were assigned:

1. Arlene Tortoso, Mark Buckmaster, and Linda Mihalik will draft the Class III TPA change package, including EPA concurrence, startup date, objectives, etc. Complete by November 13, 1996 for Dennis Faulk review. Sign by November 15, 1996.

2. Virginia Rohay, Rhett Tranbarger, Jhivaun Freeman-Pollard, and Bruce Ford will address groundwater/vadose flux and determine if the test plan information can support this data use.

3. Sample data collected for the first 7 working days will be discussed at the November 13, 1996 meeting, which will be held from 8:00 a.m. to 11:00 a.m. in the Sigma II Husky Room.

4. Mark Buckmaster will provide rebound study cost information to EPA on 11/13/96.

5. Virginia Rohay will provide the revised Test Plan to Dennis Faulk and Arlene Tortoso on 11/13/96. The revised test plan will include a section describing EPA and DOE responsibilities.

200-ZP-2 REBOUND STUDY DQO MEETING AGENDA

October 31, 1996

- 200-ZP-2 ERA - History (V. Rohay)
  - overview

- 200-ZP-2 ERA - FY 96 Documents (V. Rohay)
  - overview

- 200-ZP-2 ERA - Rebound Study (V. Rohay/R. Tranbarger)
  - purpose
    to obtain data to optimize future operational activities
  - schedule
    11/04/96 - 02/28/97

- 200-ZP-2 ERA - Rebound Study Test Plan (V. Rohay/R. Tranbarger)
  - study objectives
    rate of rebound
    magnitude of rebound
    distribution of remaining carbon tetrachloride sources in different hydrogeologic units
    distribution of remaining carbon tetrachloride sources relative to the existing extraction wells

  - overview of proposed test plan activities
    well selection/modifications
    sample collection

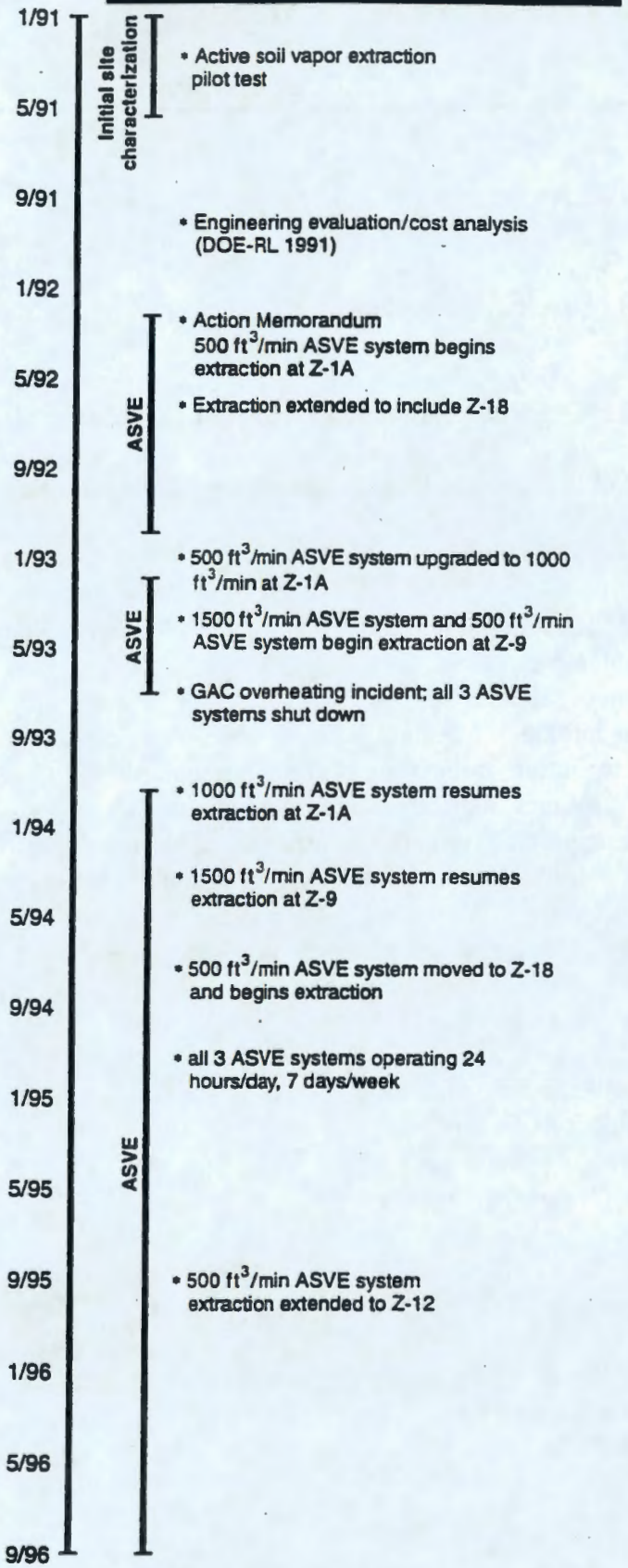
  - rationale behind the following:
    selection of wells
    sampling frequency
    sampling equipment

- 200-ZP-2 - DQO Interviews (R. Ovink/V. Rohay)
  issues

- 200-ZP-2 ERA - DQO Check List (R. Ovink/V. Rohay)
  rebound study
  ERA

- Open Discussion

200-ZP-2 Active Soil Vapor Extraction (ASVE)



HISTORY OF CARBON TETRACHLORIDE CONTAMINATION

1955 - 1973	Carbon tetrachloride disposed to soil column
Late 1970's	Drillers report smelling carbon tetrachloride and other organics while drilling wells
1984	Initial screening indicates organics, including carbon tetrachloride, in groundwater
1985	Sampling for organics in groundwater indicates widespread contamination
Late 1980's	Continued groundwater monitoring indicates concentrations of carbon tetrachloride are increasing
October 1990	DOE, EPA, and Ecology agree to consider cleanup of carbon tetrachloride at Hanford as an expedited response action under CERCLA
December 1990	EPA and Ecology request DOE to proceed with detailed planning, including non-intrusive field work, to implement the 200 West Area Carbon Tetrachloride Expedited Response Action
January 1991	Site characterization activities initiated
April 1991	Soil vapor extraction pilot test
September 1991	Soil vapor extraction identified as preferred remedial alternative for carbon tetrachloride in unsaturated zone
January 1992	EPA and Ecology authorize DOE to initiate soil vapor extraction for cleanup of carbon tetrachloride

HISTORY OF SOIL VAPOR EXTRACTION SYSTEM OPERATIONS

February 1992	Soil vapor extraction initiated at Z-1A using 500 cfm SVE system
May 1992	Soil vapor extraction extended to Z-18 using same 500 cfm SVE system
March 1993	SVE system at Z-1A/Z-18 upgraded to 1000 cfm capacity
	Soil vapor extraction initiated at Z-9 using two SVE systems, one with 1500 cfm capacity and one with 500 cfm capacity
June 1993	All three SVE systems shut down following GAC overheating incident at Z-9
November 1993	Intermittent operation (8/5) of 1000 cfm SVE system restarted at Z-1A/Z-18
February 1994	Intermittent operation (8/5) of 1500 cfm SVE system restarted at Z-9
June 1994	Intermittent operation (8/5) of 500 cfm SVE system restarted at Z-18 (moved from Z-9)
July 1994	Continuous operation (24/7) of 1000 cfm SVE system initiated at Z-1A
August 1994	Continuous operation (24/7) of 500 cfm SVE system initiated at Z-18
October 1994	Continuous operation (24/7) of 1500 cfm SVE system initiated at Z-9
August 1995	Soil vapor extraction extended to Z-12 using 500 cfm SVE system
November 1996	All three SVE systems shut down to support rebound study

FY 1996 200-ZP-2 DOCUMENTS

1. Summary of soil vapor extraction (SVE) operating data and effectiveness of SVE operations in addressing carbon tetrachloride contamination

Performance Evaluation Report for Soil Vapor Extraction Operations at the Carbon Tetrachloride Site, February 1992 - June 1995, BHI-00720, Rev. 0 (V.J. Rohay).

Performance Evaluation Report for Soil Vapor Extraction Operations at the Carbon Tetrachloride Site, February 1992 - June 1996, BHI-00720, Rev. 1 (V.J. Rohay).

2. Estimates of the zone of influence of the SVE systems

Airflow Modeling Report for Vapor Extraction Operations at the 200-ZP-2 Operable Unit (Carbon Tetrachloride Expedited Response Action), BHI-00882, Rev. 0 (V.J. Rohay and W.J. McMahon).

3. "WSU Study" to estimate vapor-soil partitioning and reasonably achievable carbon tetrachloride soil concentrations using SVE

Hanford soil Partitioning and Vapor Extraction Study, BHI-00861, Rev. 0 (D. Yonge, A. Hossain, R. Cameron, H. Ford, C. Storey).

Impact of a Low Velocity Field on Soil Vapor Extraction of Carbon Tetrachloride, M.S. thesis, Washington State University (H.L. Ford).

Adsorption and Desorption Characteristics of Carbon Tetrachloride for Hanford Soils, M.S. thesis, Washington State University (C.N., Storey).

4. Evaluation of alternative technologies for the reactivation/regeneration of granular activated carbon

Evaluation of Granular Activated Carbon Reactivation and Regeneration Alternatives for the 200 West Area Carbon Tetrachloride Expedited Response Action, BHI-00460, Rev. 0 (J.W. Green and R.K. Tranbarger).

5. Evaluation of technologies with the potential to enhance removal of carbon tetrachloride using SVE

Preliminary Evaluation of Soil-Heating Technologies for the 200-ZP-2 Carbon Tetrachloride Expedited Response Action, BHI-00880, Rev. 0 (G.J. Jackson, M.E. Todd, R.K. Tranbarger).

6. Operating procedures for the SVE systems

Design, Operations, and Maintenance of the Soil Vapor Extraction Systems for the 200 West Area Carbon Tetrachloride Expedited Response Action, BHI-00395, Rev. 0 (R.K. Tranbarger).

7. Evaluation of passive soil vapor extraction testing at the carbon tetrachloride site

Field Tests of Passive Soil Vapor Extraction Systems at the Hanford Site, Washington, BHI-00766, Rev. 0 (V.J. Rohay).

DQO SCOPING CHECKLIST

The following items will be considered by the Project DQO Team, including the Key Decision Makers, as a basis for DQO planning and project decisions. At the beginning of the DQO process, the ERC project team and the key decisionmakers will initially determine which of the checklist items apply to the project and document the rationale of their determinations. Where possible, technical staff responsibility for specific items should be assigned.

PROJECT TITLE: 200-ZP-2 Rebound Study

Aspect	Responsible Person (Lead)
1. Project assumptions (especially assumptions that could result in project failure).	Jhivaun Freeman-Pollard
a. Objective of study is to determine availability of additional carbon tetrachloride for removal using soil vapor extraction (SVE).	
b. All three SVE systems will be shutdown during study, 11/4/96 - 3/1/97.	
c. Sampling results are independent of season (sampling will be conducted from November to March).	
2. Identification of the regulatory pathway, phase, and logic (e.g., Resource Conservation Recovery Act [RCRA] pathway) (overall approach).	Linda Mihalik
a. The Rebound Study is being conducted as part of the 200 West Area Carbon Tetrachloride Expedited Response Action (ERA) in the 200-ZP-2 Operable Unit.	
b. The ERA is an interim response action conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (40 CFR 300, Subpart E); the Hanford Federal Facility Agreement and Consent Order (Part 3, Article XIII, Paragraph 38); and the State of Washington Model Toxics Control Act (Chapter 173-340 WAC).	
c. Initiation of the ERA was authorized by an Action Memorandum issued by EPA and WDOE to DOE-RL (Attachment 1).	
d. The ERA is being conducted prior to the final cleanup actions for the 200-ZP-1 and 200-ZP-2 Operable Units and, therefore, is not required to meet final cleanup standards or applicable or relevant and appropriate requirements (ARARs), although the ERA is required to be consistent with the anticipated final remedy for the affected operable units.	

e. At this time, it appears that the immediate threat posed by carbon tetrachloride in the soil has been abated. The ERA Action Memorandum did not identify specific criteria whereby decisions could be made to continue or discontinue the ERA. If the ERA is no longer achieving the original goals, shutdown of the system may be an option. The rebound study will generate data that will support this decision.

3. Identification of regulatory, legal, agreement, and statute obligations and constraints (e.g.,Tri-Party Agreement [TPA] milestones or applicable ARARs) (details of specific regulations).

Linda Mihalik

a. Per the Action Memorandum, the goal of the ERA is to mitigate the threat to site workers, public health, and the environment caused by the migration of carbon tetrachloride vapors through the soil column and into the groundwater. The ERA is a removal action taken to reduce the mass of carbon tetrachloride in the soil column beneath the 200 West Area pending the final cleanup activities associated with the 200-ZP-1 and 200-ZP-2 Operable Units. No numerical criteria were specified in the Action Memorandum to evaluate satisfactory attainment of this goal.

b. The Hanford Federal Facility Agreement and Consent Order, Rev. 4, section 7.2.4, implies that the lead regulatory agency (EPA) authority over the ERA.

c. Under the CERCLA regulations (40 CFR 300.410 and 300.415), the DOE can have authority over removal actions such as the ERA.

d. The Model Toxics Control Act Cleanup Regulation (WAC 173-340) specifies final cleanup criteria for soil and groundwater, based on future land use. However, the ERA is not a final action, so the MTCA criteria are not applicable.

e. No additional cultural or ecological laws or regulations will be invoked because no invasive activities will be conducted as part of this study.

f. All waste generated as part of this study will be handled in accordance with the existing 200-ZP-2 waste control plan. No waste will be transported to the Environmental Restoration Disposal Facility (ERDF).

g. Reusable contaminated equipment will be handled in accordance with the Hanford contaminated equipment policy.

h. Air quality regulations (WAC 173-460) establish controls for new sources emitting toxic air pollutants

4. **Development of ERC legal positions or interpretations.** — Jean Dunkirk

5. **Identification of regulatory quantitative limits (e.g., Maximum Contaminant Levels [MCLs], Model Toxic Control Act, A&B [MTCA B], Cleanup Levels).** — Linda Mihalik

a. Cleanup criteria under MTCA depend on the future land use, which has not been established.

b. The Remedial Investigation/Feasibility Study process for the 200-ZP-1 and 200-ZP-2 Operable Units will identify the final cleanup standards and ARARs that will be applied during remediation.

6. **Identification of National Environmental Policy Act (NEPA) needs and constraints (documents) (e.g. clearances, surveys impact analyses).** — Linda Mihalik

a. In accordance with DOE orders and NEPA policy, CERCLA activities do not required separate NEPA documentation. Instead, DOE CERCLA documents are required to incorporate NEPA values, such as analysis of cumulative, off-site, ecological, and socioeconomic impacts, to the extent practicable.

b. Before implementation of vapor extraction operations for remediation of the carbon tetrachloride contamination, an environmental assessment was included as part of the ERA Proposal to comply with NEPA. In February 1992, DOE-Headquarters issued a Finding of No Significant Impact in response to that environmental assessment.

c. In March 1991, DOE approved the use of a categorical exclusion under Section D of DOE's NEPA Guidelines for ERA characterization activities.

d. No invasive activities will be conducted as part of this study.

e. No cumulative or socioeconomic impacts have been identified.

7. **Identification of cultural and biological constraints (e.g. clearances, surveys).** — Linda Mihalik

a. Two cultural resource reviews conducted at the carbon tetrachloride site found no known cultural resources or historic properties: (1) Cultural Resource Review of the 200 West Carbon Tetrachloride Interim Response Action (HCRC #91-200-002); (2) Cultural Resource Review of the 200 West Carbon Tetrachloride Vapor Extraction Project (HCRC #94-200-053).

b. Portions of the 200-ZP-2 Operable Unit were surveyed for sensitive biological resources in June 1994 (#94-WHC-191). The survey identified no species of plants or wildlife that are listed as threatened or endangered in the vicinity.

8. Waste management requirements (Applicable procedures, waste acceptance criteria, Land Disposal Requirements [LDR] treatment standards). — Greg Hopkins

a. All waste generated as part of this study will be handled in accordance with the 200-ZP-2 waste control plan. No waste will be transported to the Environmental Restoration Disposal Facility (ERDF).

9. Air quality constraints — John Hadley

a. Wells, sample tubing, and sample bags will be purged to atmosphere prior to collection of the soil vapor sample.

b. Vapor samples will be vented from the analytical equipment following analysis.

10. Health physics risks, hazards and As Low As Reasonably Achievable (ALARA) needs. — Steve DeMers, Cliff St John

a. No radiological contamination is expected to be encountered as part of this study.

b. Sampling procedures are written to ensure minimal exposure of staff to hazardous substances.

11. Milestone requirements (e.g., TPA, RCRA permit, ERC project schedules). — Mark Buckmaster

a. The SVE systems are scheduled to be shutdown on 11/4/96.

12. Availability and summation of all data available historical information, waste inventories, contaminant analyses, drilling records, geophysical data, background values, monitoring measurements, ecological reports, and ranges of available data (e.g., Hanford Environmental Information System [HEIS] data, data files). — Jhivaun Freeman-Pollard

a. 200-ZP-2 ERA data is contained in the project files maintained by Document Information and Services.

b. Numerous project reports summarizing historical information, waste inventories, contaminant analyses, drilling records, geophysical data, background values, and monitoring measurements have been issued between 1991 and 1996. The SVE operational data is summarized in the Performance Evaluation Report for Soil Vapor Extraction Operations at the Carbon Tetrachloride Site, February 1992 - June 1996 (BHI-00720, Rev. 1).

13. Evaluation and summary of process knowledge (e.g., historical baselines). Jhivaun Freeman-Pollard

a. The evaluation and summary of process knowledge used to estimate original waste inventories and identify waste constituents is described in the ERA Proposal (DOE/RL-91-32, Draft B).

14. Identification of potential data uses and users (e.g., data analysis plans, models, Waste Identification Data System [WIDS], HEIS).

a. 200-ZP-2 project staff may use the data to establish the future operating strategy for the SVE systems.

b. 200-ZP-2 project staff may use the data to refine the estimates of the magnitude and distribution of the residual carbon tetrachloride inventory.

15. List of contaminants of concern (e.g., process knowledge). Jhivaun Freeman-Pollard

a. The primary contaminant of concern is carbon tetrachloride.

b. Degradation products, which may indicate the location of the remaining carbon tetrachloride, include chloroform and methylene chloride.

16. List of potential investigation method alternatives. Virginia Rohay

a. A motorized sampling pump or natural barometric pumping will be used to draw soil vapor through selected existing wells and soil gas probes to the surface for collection in sampling bags; the samples will be analyzed using a stationary instrument. The motorized samping pump will be tranported to the selected wells and probes using a four-wheel-drive vehicle.

b. A second motorized sampling pump is available as a backup.

c. In the event of mechanical breakdown, an alternative vehicle would be available from the vehicle pool.

d. Alternative sampling wells and probes are available in the event that a selected well or probe becomes inaccessible or unproductive.

e. The SVE systems will not be available on a routine basis for sample collection during the rebound study but may be used occasionally if available.

f. Dedicated sampling and analysis instruments could be installed at selected wells to automatically collect, analyze, and store data.

g. The SVE systems will be used immediately preceding and following the rebound study to collect soil vapor samples.

17. List of potential remedial design criteria and alternative data needs. — Jhivaun Freeman-Pollard

a. Not applicable.

18. Maps and diagrams.

a. Maps and cross sections showing the locations of existing wells and soil gas probes are available (Attachment 2). — Virginia Rohay

19. Cost-estimating tools and documents (e.g., cost estimating support, Micro Computer Assisted Cost Estimating System [MCACES], etc.) — Mark Buckmaster

a. Not applicable.

20. List of analytical methods and detection limits (e.g., Test Methods for Evaluating Solid Waste [SW-846], Toxic Characteristic Leaching Procedure [TCLP], field screen). — Virginia Rohay

a. Soil vapor samples collected during the rebound study will be analyzed using a Bruel & Kjaer Type 1302 photo-acoustic infrared spectrometer (B&K). B&K instruments are incorporated into the SVE system operations to monitor soil vapor concentrations.

b. The detection limit of the B&K instruments is 1 ppmv carbon tetrachloride.

c. The B&K instruments used at 200-ZP-2 are configured to analyze for carbon tetrachloride, chloroform, and methylene chloride simultaneously.

21. Risk assessment models, pathways, receptors, parameters, and fate and transport parameters. — Mark Buckmaster

a. Not applicable.

22. Radiation detection methods and detection limits. — Steve DeMers

a. Not applicable.

23. List of proposed agreements to be achieved (.e.g., issues to be resolved). Roger Ovink

a. Provided in DQO interview summary.

United States
Environmental Protection
Agency

9213541.0376

Region 10
Hanford Project Office
712 Swift Boulevard, Suite 5
Richland WA 99352

EPA

January 17, 1992

Subject: Action Memorandum for 200 West Area Carbon Tetrachloride Plume

From: Paul T. Day
Hanford Project Manager

To: Randall F. Smith, Acting Director
Hazardous Waste Division

Attached is the Action Memorandum for the Expedited Response Action (ERA) to be conducted in the 200 West Area of the Hanford Site as an interim response action pursuant to Paragraph 38 of the Hanford Federal Facility Agreement and Consent Order. The ERA proposal, prepared by the U.S. Department of Energy (DOE) has been reviewed by the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). The 30-day public comment period for this proposal expired on December 6, 1991. Comments were received, however, these comments did not influence the proposed plan of action. Responses to comments were completed on January 10, 1992.

The Action Memorandum is now ready for issuance, directing DOE to begin field work immediately. Please sign the attached Action Memorandum and forward the original to Roger Stanley for his signature. The original signed copy should be sent from Roger Stanley to me for inclusion in the Administrative Record. Upon signature, the field work can begin. All equipment and personnel necessary to initiate this action are prepared for your notice to proceed. I am sure that DOE would appreciate a fax of the final signed Action Memorandum, as field staff are anxious to get started.

I have told DOE that we will be establishing interim milestones to ensure that two additional vapor extraction units are placed on line by October and November 1992. This is several months later than proposed in the Engineering Evaluation/Cost Analysis that was issued for public comment, but it appears to be the best DOE can do within the constraints of federal procurment. DOE has not yet committed to establishing milestones on this project. EPA will initiate the change request, if necessary.

If you have any questions, please do not hesitate to contact me at (509) 376-6623. For technical questions on this project, please contact Doug Sherwood at (509) 376-9529.

Attachment

cc: Roger Stanley/Tim Nord, Ecology
Dave Nylander/Darci Teel, Ecology
Steve Wisness, DOE
Tim Veneziano, WHC

Ronald D. Izatt
Program Manager
Office of Environmental Assurance,
Permits and Policy
U.S. Department of Energy
Richland Operations Office
P.O. Box 550, A5-19
Richland, Washington 99352

Re: Action Memorandum: Expedited Response Action Proposal for 200 West Area Carbon Tetrachloride Plume

Dear Mr. Izatt:

This Action Memorandum constitutes approval of the subject Expedited Response Action. Public comments on the Engineering Evaluation/Cost Analysis (EE/CA) were received and a response has been issued by the Environmental Protection Agency (EPA). None of the public comments influenced the selection of the action to be taken or the implementation of the expedited response action proposal. Therefore, EPA and the Washington State Department of Ecology (Ecology) approve the Department of Energy's (DOE) proposal to conduct the 200 West Area Carbon Tetrachloride Plume Expedited Response Action, as described below.

I. PURPOSE

The purpose of this action is to mitigate the threat to site workers, public health, and the environment caused by the migration of carbon tetrachloride vapors through the soil column and into the groundwater. The action is an interim action taken to reduce the mass of carbon tetrachloride in the soil column beneath the 200 West Area pending the final cleanup activities associated with the 200-ZP-1 and 200-ZP-2 Operable Units.

II. BACKGROUND

Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the EPA proposed the 200 Areas (the 200 Aggregate Area) at the DOE's Hanford Site for inclusion on the National Priorities List (NPL) on June 24, 1988. In November 1989 the 200 Aggregate Area was included on the NPL.

A. Site Description

The 200 Aggregate Area is located in the middle of the 570 square mile Hanford Site approximately 20 miles north of the City of Richland, Benton County, Washington. The 200 Aggregate Area contains over 230

engineered waste disposal site and numerous hazardous and radioactive spills or unplanned release sites. For the purpose of cleanup and corrective action, the 200 Aggregate Area has been divided into 43 operable units. Sites were assigned to individual operable units based on geographic location and the source of the waste disposed. The 200 West Area portion of the 200 Aggregate Area contains seventeen operable units , including 200-ZP-1 and 200-ZP-2.

Waste sites within the 200-ZP-1 and 200-ZP-2 Operable Units received liquid wastes derived from the Plutonium Finishing Plant operations. One process performed at the Plutonium Finishing Plant was the Recuplex process. This process was used to reclaim plutonium scrap material for purification and recovery. The Recuplex process was a liquid-liquid extraction process utilizing carbon tetrachloride as the primary organic solvent. It is estimated that up to 580,000 liters of carbon tetrachloride were disposed to the 216-Z-1A Tile Field, the 216-Z-9 Trench, and the 216-Z-18 Crib between 1955 and 1973.

B. Site Characterization

A wide range of site characterization activities have been performed at the three carbon tetrachloride disposal locations and throughout the 200 West Area. For the most part, these characterization efforts focused on the migration of radionuclides through the soil column and into the groundwater. These characterization efforts can be categorized as vadose zone characterization and groundwater monitoring activities. A summary of these efforts and a description of previous characterization results is compiled in Appendix B of the ERA Proposal. Additional characterization efforts will also be undertaken as part of the ERA Project. Approval to proceed with those activities was provided in the January 10, 1992, letter from Douglas R. Sherwood to Steven H. Wisness. Other characterization activities will be undertaken as part of the DOE Technology Development Program's Volatile Organic Compounds - Arid Site Integrated Demonstration Project. EPA and Ecology expect that the Characterization Plan for this project will be provided as soon as it is available.

Results of these various site characterization efforts indicate that several contaminants of concern are present at the 216-Z-1A, 216-Z-9, 216-Z-18 disposal sites. All known carbon tetrachloride disposal sites have been designated as Transuranic Waste Sites under the DOE classification system. This classification is given to waste sites containing in excess of 100

nanoCuries (100 nCi/g) of transuranic radionuclides. Some characterization efforts have been undertaken to determine the distribution of plutonium beneath these disposal sites. Results of these investigations have confirmed that the majority of the plutonium is deposited very near the bottom of the waste site approximately 20 to 30 feet beneath the ground surface. This is well above the water table which is at approximately 200 feet.

Organic contamination on the other hand is ubiquitous throughout most of the 200 West Area. Chlorinated hydrocarbon vapors, principally carbon tetrachloride, were detected in 35 boreholes located within the three disposal sites evaluated during early 1991. The concentration of carbon tetrachloride vapor present in these boreholes ranged from less than 1 ppm to greater than 170 ppm during static (NO pumping) testing. Results obtained during static testing were influenced dramatically by changes in barometric pressure. High barometric pressure conditions appeared to reduce the concentration of carbon tetrachloride vapors present in the boreholes, while low pressure conditions enhanced natural exhalation of soil gas out through the borehole, thus increasing the level of carbon tetrachloride detected. To limit the influence of barometric pressure on the carbon tetrachloride concentrations, a pumping test was performed in two boreholes at the 216-Z-1A disposal sites. Results of these tests suggest that the ambient concentration of carbon tetrachloride in the soil were significantly higher than those measured during the static tests. Carbon tetrachloride concentrations measured during the pumping tests ranged from 180 ppm to 915 ppm. Other organic vapors identified during the soil gas analysis were chloroform and 2 butanone.

Groundwater contamination is also present throughout the 200 West Area. Carbon tetrachloride, chloroform, tetrachloroethylene and trichloroethylene have been detected in the area around the 216-Z-1A, 216-Z-9, and 216-Z-18 disposal sites. The highest observed carbon tetrachloride concentration was 7,430 ppb as compared to a Maximum Contaminant Level (MCL) of 5 ppb. The extent of carbon tetrachloride contamination beneath the 200 West Area which exceeds the MCL is approximately 6.8 square miles. Although the extent of groundwater contamination is fairly large, it appears that only about 2 percent of the total inventory of carbon tetrachloride is present in the groundwater. The remainder is thought to be in the unsaturated zone where it is migrating, both laterally and vertically.

III. THREAT TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT

A. Present Conditions

At present, carbon tetrachloride vapors are a health concern to well drillers and field sampling personnel working in the 200 West Area. Currently, these workers are required to wear supplied air systems to minimize exposure to carbon tetrachloride vapors while drilling and sampling. For most Resource Conservation and Recovery Act (RCRA) well drilling projects and future CERCLA investigation, this hazard will translate into significant cost increases and will slow completion of these projects. In addition, the migration of carbon tetrachloride vapors through the soil column represents a threat to off-site groundwater quality due to the ability of these vapors to move independent of groundwater flow direction. Several upgradient wells located approximately ten miles west of these disposal sites supply irrigation to local vineyards may also be threatened by potential carbon tetrachloride contamination if early actions are not taken.

B. Types of Substances Present

Although the primary contaminants of concern are carbon tetrachloride and transuranic radionuclides (plutonium and americium) many other substances were disposed to these disposal sites. Other organic substances include tributyl phosphate, dibutyl butyl phosphonate, lubricating oils, chloroform, methylene chloride, trichloroethylene, monobutyl phosphate, and butyl alcohol. Inorganic co-contaminants include aluminum, magnesium, calcium, sodium, cadmium, chromium, fluoride, chloride, iron, iodine, nickel, nitrate, sulfate, rubidium, and radionuclides, including cesium -137 uranium, ruthenium -106, and strontium -90.

C. Applicable or Relevant and Appropriate Requirements

The Remedial Investigation/Feasibility Study (RI/FS) process for the 200-ZP-1 and 200-ZP-2 Operable Units will identify the final cleanup standards and applicable or relevant and appropriate requirements (ARARs) that will be applied during remediation.

This ERA will be conducted in accordance with 40 CFR 300, Subpart E; the Hanford Federal Facility Agreement and Consent Order (Part 3, Article XIII, Paragraph 38); and the State of Washington Model Toxics Control Act (Chapter 173-40 WAC).

This ERA is being conducted prior to the final cleanup actions for the 200-ZP-1 and 200-ZP-2 Operable Units and, therefore, it is not required to meet final cleanup standards or ARARs, although this action is

required to be consistent with the anticipated final remedy for the effected operable units.

IV. PROPOSED ACTION AND ESTIMATED COSTS

Westinghouse Hanford Company (WHC), as the DOE contractor, prepared an EE/CA concerning technologies that were applicable for controlling the spread of carbon tetrachloride contamination in the soil column and the unconfined aquifer. An initial screening of alternatives was performed prior to the EE/CA to eliminate technologies that were not considered appropriate. The initial screening of alternatives eliminated excavation, containment, and in-situ treatment as feasible alternatives. This evaluation also identified vapor extraction as the preferred remedial technology. Prior to preparation of the EE/CA, a demonstration test of soil vapor extraction was performed in the 200 West Area to determine if this technology was effective. This technology was highly effective in recovery of carbon tetrachloride from contaminated soil. Based upon this test and the initial screening of alternatives, vapor extraction was chosen as the appropriate carbon tetrachloride recovery technology for the unsaturated zone. The EE/CA focused on the appropriate treatment technology for the recovery of carbon tetrachloride. The proposal was submitted to the EPA and Ecology by DOE for review and was amended to reflect the recommendations of the regulatory agencies. The proposal was then made available for a 30-day public comment period. Several comments were received, however, none of these comments influenced the approach or implementation of the expedited response action.

After the initial remedial alternative selection process, 19 potential alternatives were evaluated as listed in the EE/CA. The following lists those alternatives into five general groups.

A. No Action - This alternative would not mitigate the potential threat to site workers, public health, and the environment.

B. Vapor extraction with direct discharge of carbon tetrachloride. This action involves installation of the vapor extraction system and direct discharge of contaminated vapors to the atmosphere. At the projected recovery efficiency, approximately 1,000 pounds per day of carbon tetrachloride would be released to the atmosphere. This action is not protective of worker health and safety concerns and would result in increased exposure to personnel in the 200 West Area.

C. Vapor extraction with granular activated carbon recovery and off-site regeneration. This action utilizes three vapor extraction systems to remove carbon tetrachloride vapors from the soils and exhausts the vapors through canisters of activated carbon that absorb and retain carbon tetrachloride prior to release of the treated air to the atmosphere. The canisters loaded with carbon tetrachloride would then be shipped off-site for regeneration. This alternative allows for early implementation with the final treatment of the carbon tetrachloride occurring off-site at a RCRA permitted treatment facility.

The estimated cost for start up, operation, secondary waste handling and disposal for three years of operation is $3,625,000. This option minimizes the release of carbon tetrachloride vapors in the 200 West Area. This alternative is the preferred alternative.

D. Vapor extraction with on-site treatment of carbon tetrachloride vapors. This alternative utilized the same basic vapor extraction system as described in Option C, but instead of recovering the carbon tetrachloride vapors for off-site treatment, a treatment system would be installed on- site to destroy carbon tetrachloride. Several on-site treatment systems were evaluated for their potential applicability. Catalytic oxidation, incineration, and ultraviolet oxidation were evaluated as potential carbon tetrachloride destruction processes. All of these processes convert carbon tetrachloride to hydrochloric acid vapors. These processes result in the release of nearly 1,000 pounds per day of hydrochloric acid to the atmosphere. These emissions represent a potential threat to site workers, public health, and the environment. In addition, an eight to eleven month delay in implementation would be required to obtain on-site treatment capability. Costs for these alternatives ranged from $2,420,000 to $5,681,000 for start up, operation, secondary waste handling and disposal for three years of operation.

E. Vapor extraction with on-site treatment of carbon tetrachloride vapors and secondary treatment of hydrochloric acid. This alternative utilized the basic vapor extraction recovery system and catalytic oxidation, incineration, or ultraviolet oxidation for carbon tetrachloride destruction. In addition, this alternative would provide on-site neutralization of hydrochloric acid vapors through either a dry acid scrubber system or a wet acid scrubber system. The dry scrubber system would create approximately 1,900 pounds per day of calcium chloride as a secondary waste.

Assuming this secondary waste is nonhazardous this material could be disposed to a nonradioactive nonhazardous waste landfill. If a wet scrubber were used, an evaporation pond or other liquid discharge location would be required. These alternatives would generate approximately 350 tons of secondary waste or 20,000,000 gallons of dilute brine solution per year. In addition, a delay of 8 months to five years may be required to implement this alternative. Costs of these alternatives for the three year period range from $3,174,000, assuming the secondary waste is nonhazardous, to in excess of $20,000,000 for construction of a new liquid waste disposal system.

V. RECOMMENDATION

The EPA and Ecology have selected the preferred alternative as outlined in Option C of Section IV, vapor extraction with granular activated carbon recovery and off-site regeneration at a RCRA permitted facility as the approved expedited response action for the 200 West Area carbon tetrachloride plume. This action will be taken in accordance with CERCLA as amended by Superfund Reauthorization Act (SARA), and to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative records for this project and the 200-ZP-1 Operable Unit. Implementation of the vapor extraction and granular activated carbon recovery should be initiated at 216-Z-1A immediately. Implementation of this alternative at 216-Z-18 and 216-Z-9 is to begin as soon as practicable, but no later than April 1992 at 216-Z-18. Additional Tri-Party Agreement interim milestones will be established to ensure that the second and third vapor extraction systems, as described in the EE/CA, are procured and in operation by October 1992 and November 1992, respectively.

Sincerely,

Randall F. Smith
Acting Director
Hazardous Waste Division
EPA Region 10

Roger Stanley
Program Manager
Nuclear and Mixed
Waste Management Program
Washington State
Department of Ecology

cc: Administrative Record: 200-ZP-1 Operable Unit
Tim Veneziano, WHC

Figure 1. Carbon Tetrachloride Vapor Extraction Site.

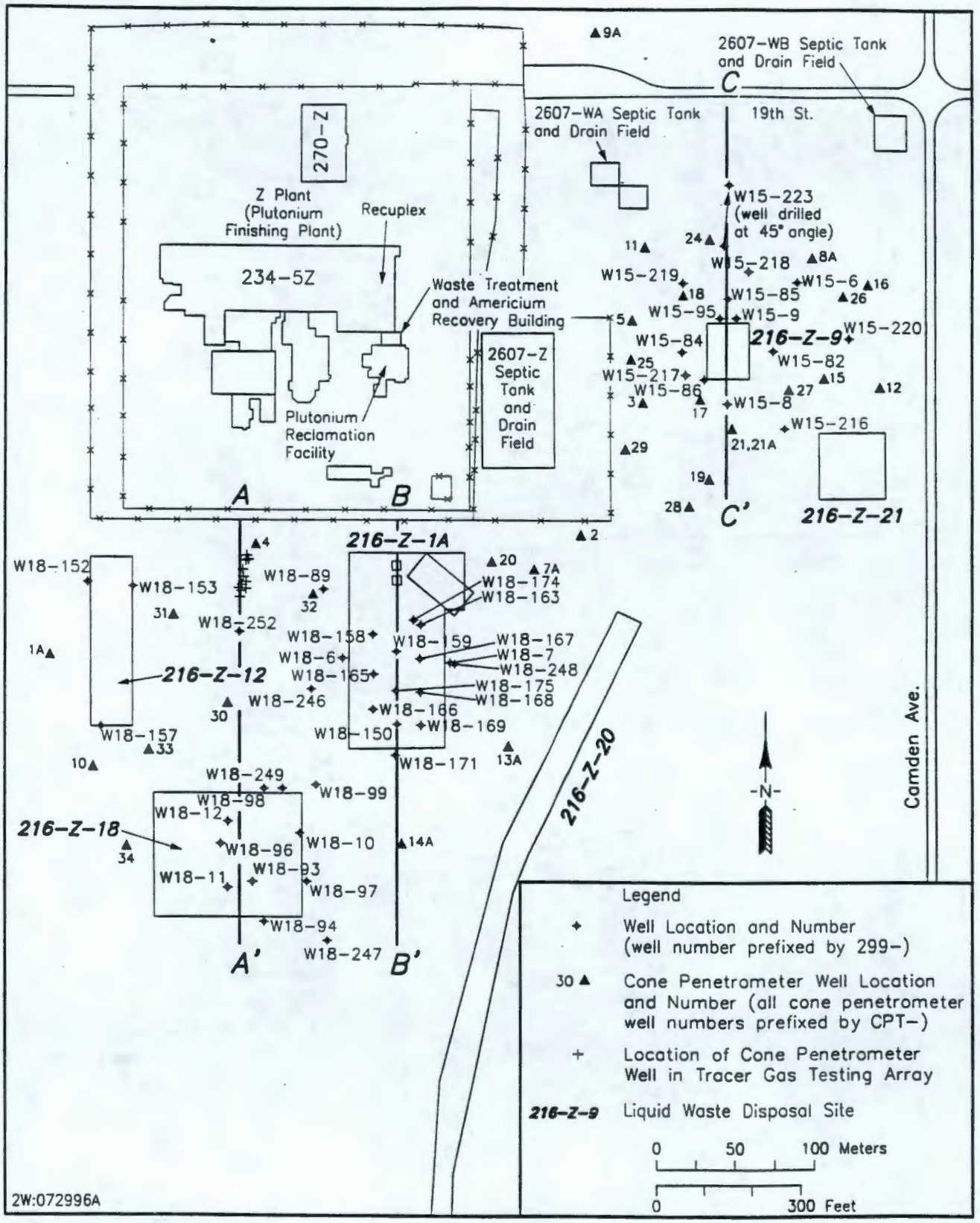
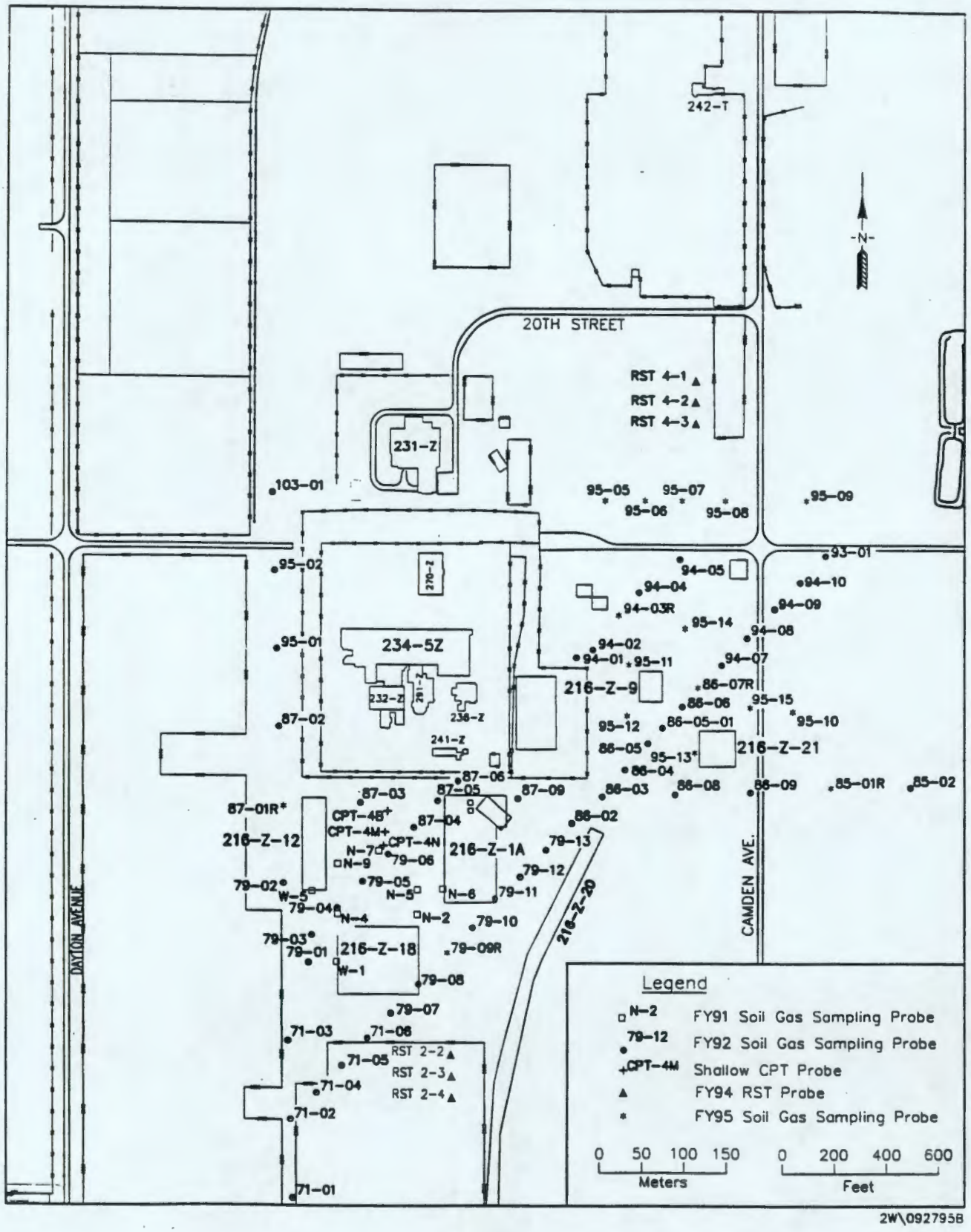
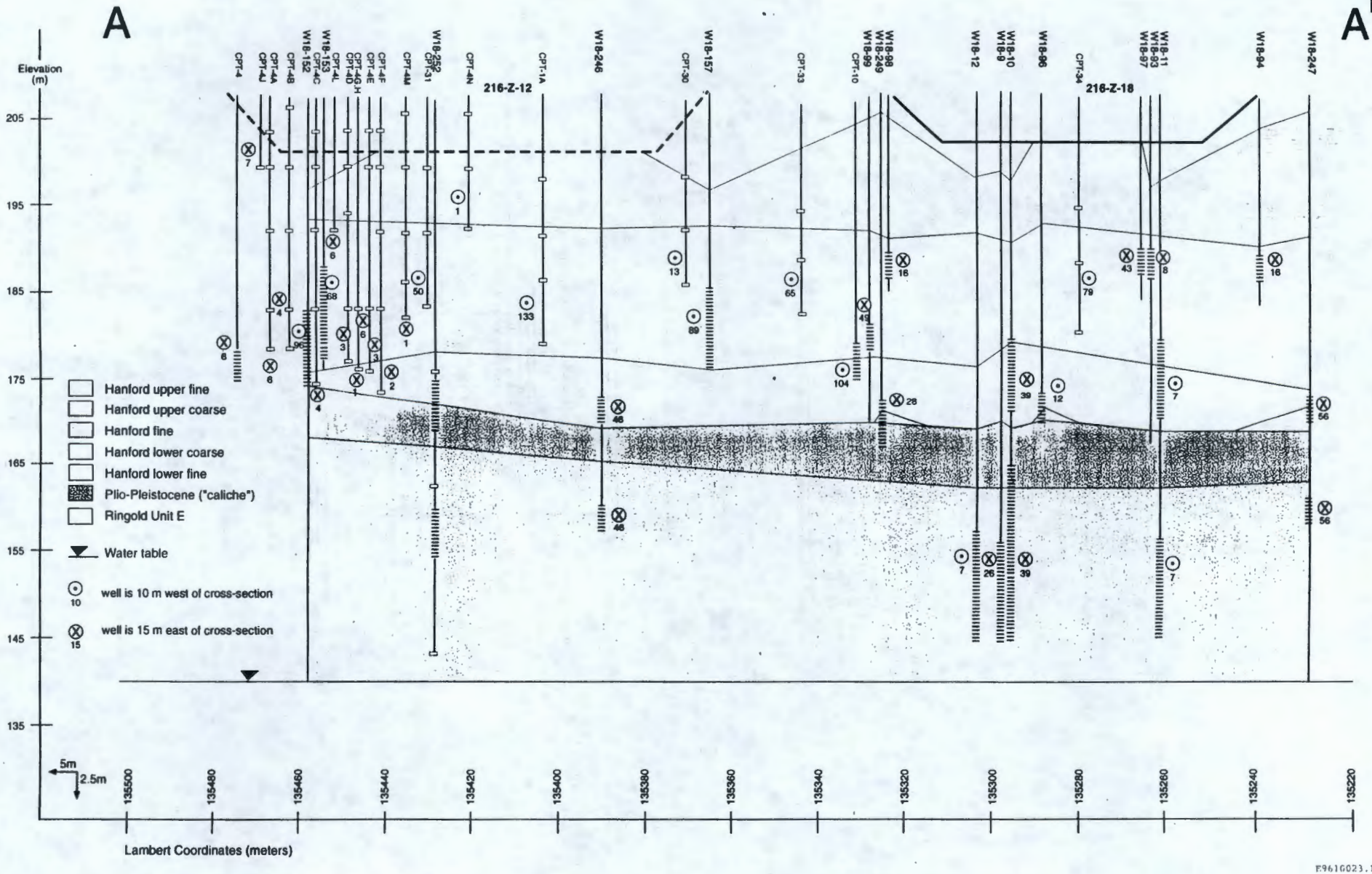


Figure 3. Location of Shallow Soil Gas Probes at the Carbon Tetrachloride Site.





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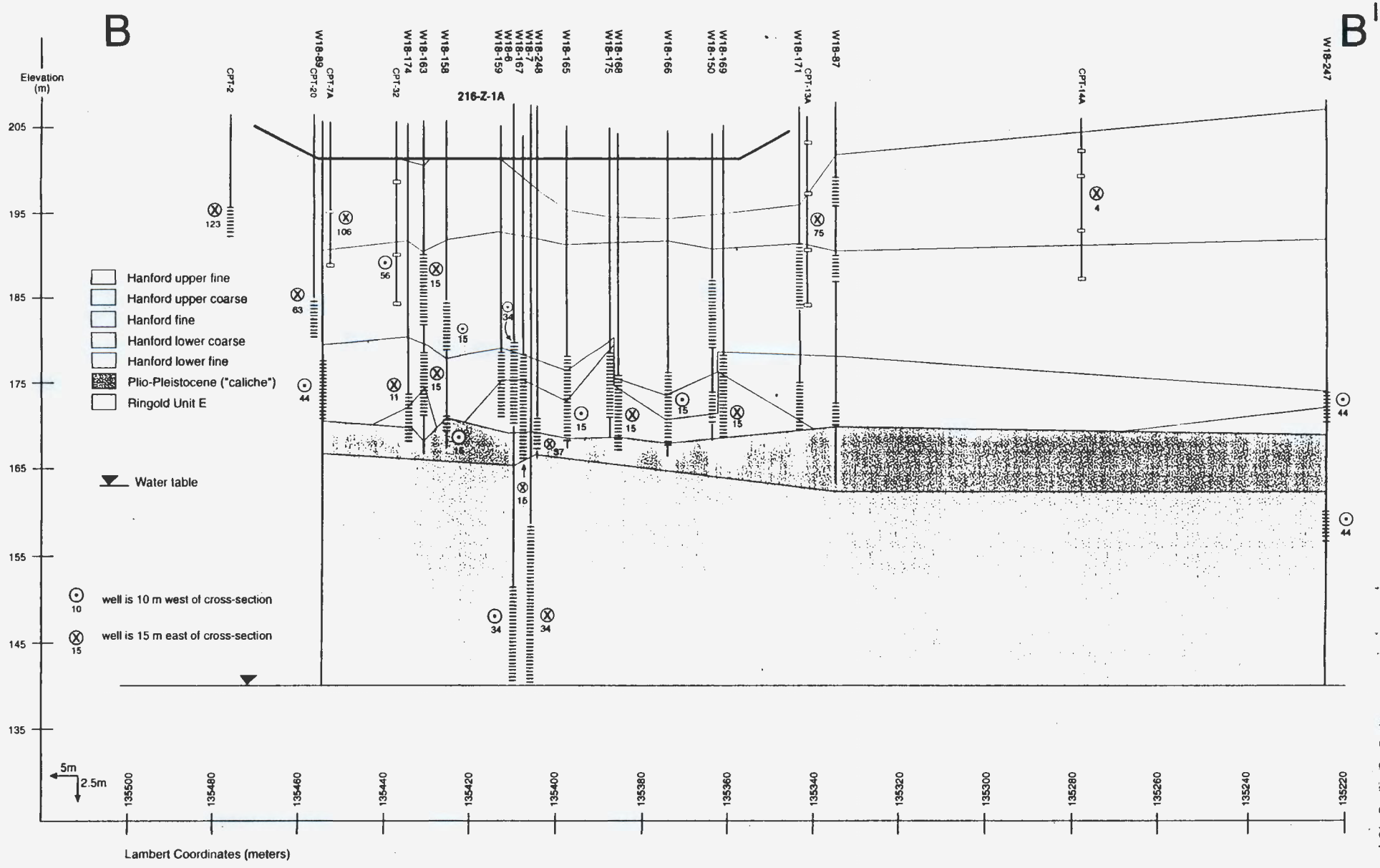
B
B'
Elevation (m)
205
195
185
175
165
155
145
135
CPT-2
W18-89
CPT-20
CPT-7A
CPT-32
W18-174
W18-163
W18-158
W18-159
W18-6
W18-167
W18-7
W18-248
W18-165
W18-175
W18-168
W18-166
W18-150
W18-169
W18-171
CPT-13A
W18-87
CPT-14A
W18-247
216-Z-1A
Hanford upper fine
Hanford upper coarse
Hanford fine
Hanford lower coarse
Hanford lower fine
Plio-Pleistocene ("caliche")
Ringold Unit E
Water table
well is 10 m west of cross-section
well is 15 m east of cross-section
5m
2.5m
135500
135480
135460
135440
135420
135400
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135320
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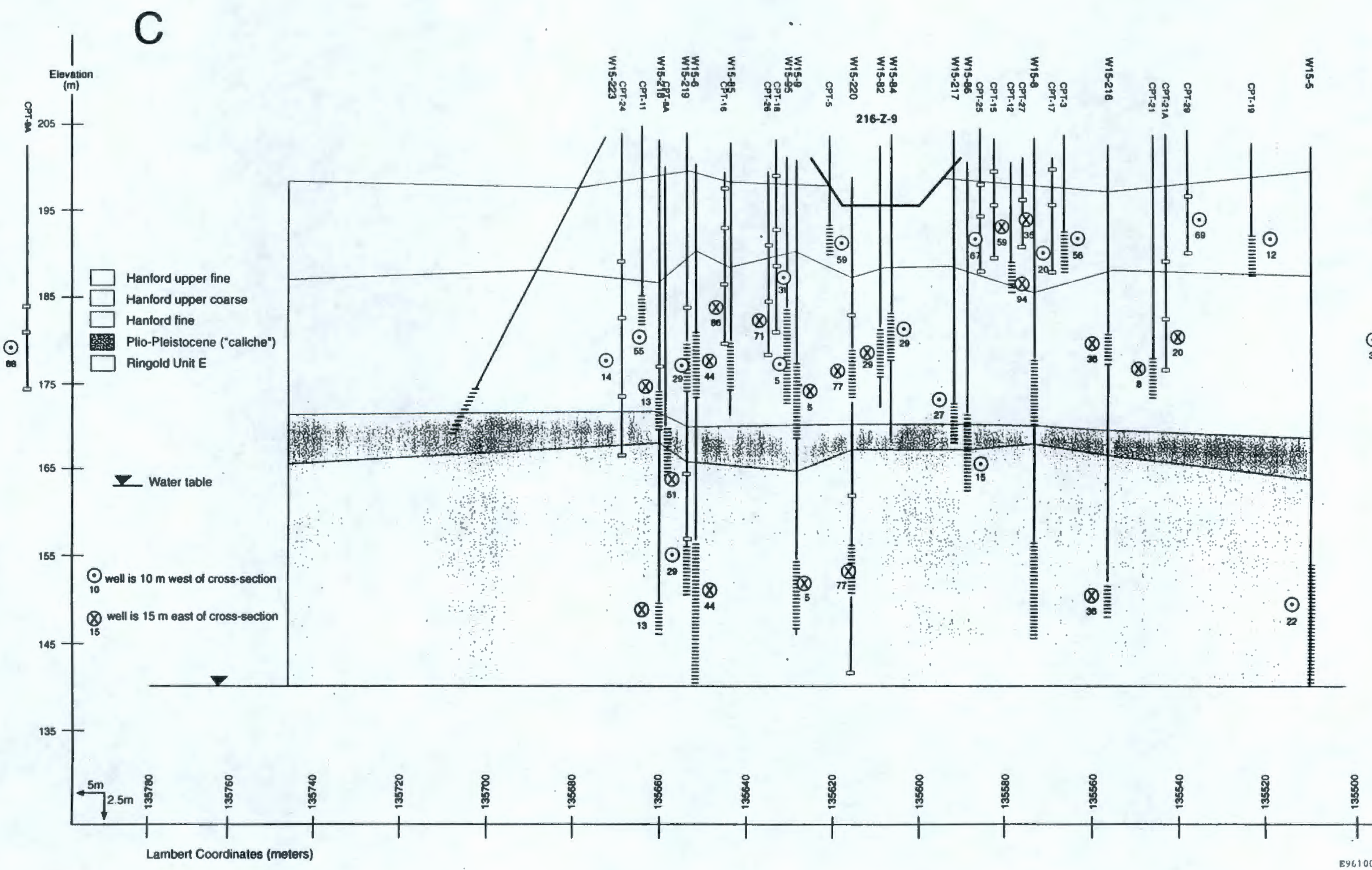

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